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Water Resources Availability and Water Required for Cocoa Production in Ghana

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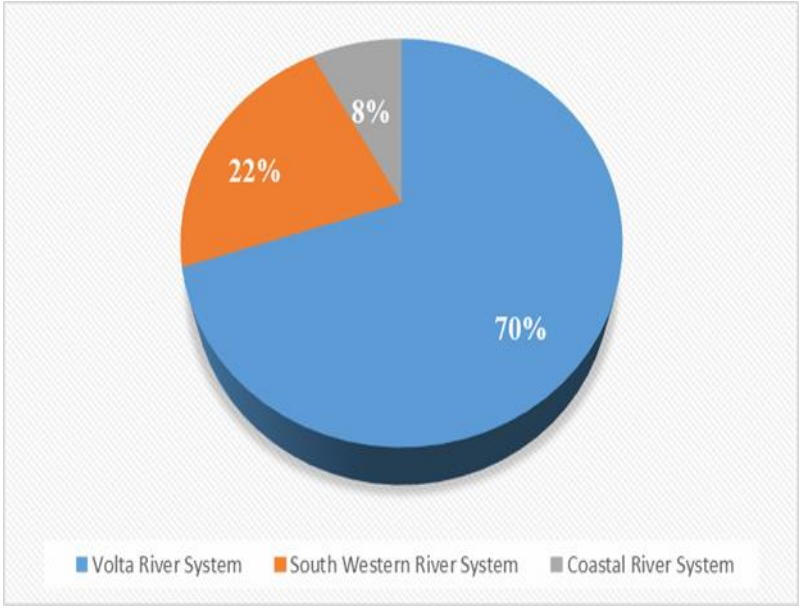
STATE OF GHANA'S WATER RESOURCES

Ghana's water resources are mainly ground water and surface water, with impoundments or reservoirs.



GROUNDWATER RESOURCES

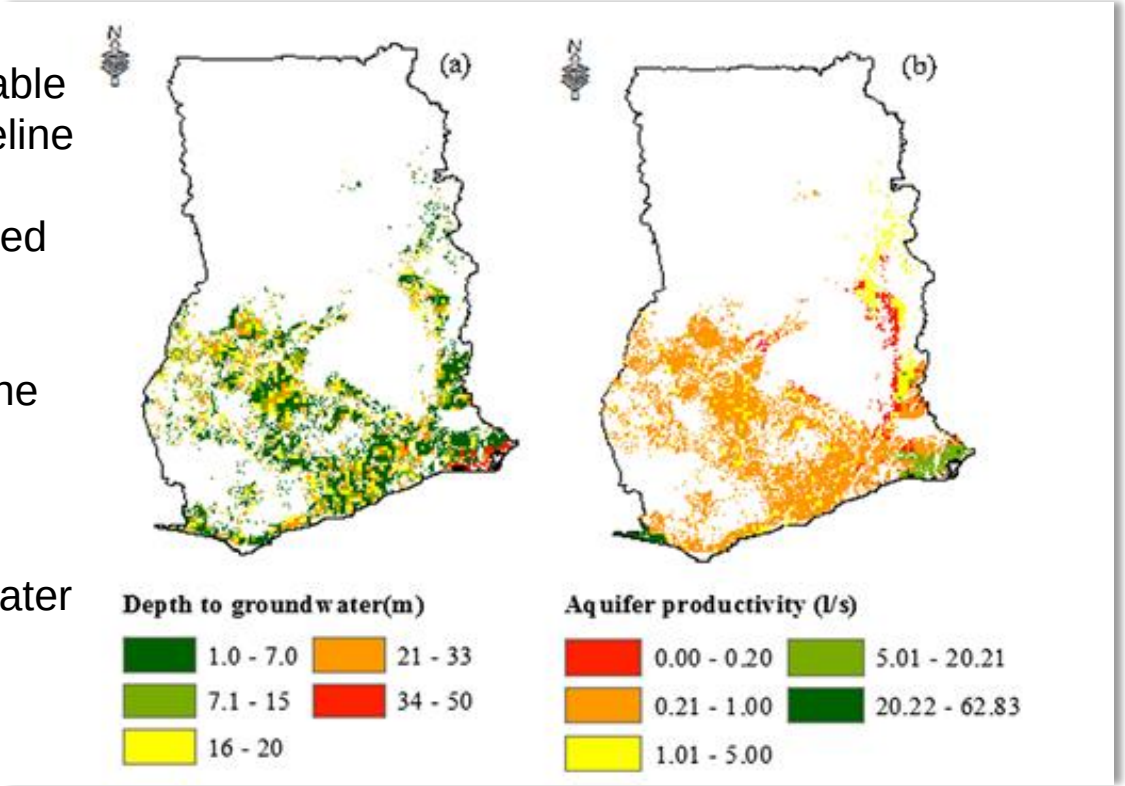
- Estimated depth to groundwater in Ghana is 14 m on average from the surface, with a maximum depth of 50 m.

- Majority of the country (98%) has groundwater access under 25 m from the ground surface.

SUITABILITY OF GROUNDWATER RESOURCES FOR SURFACE IRRIGATION

- Approximately 9% of Ghana is suitable for surface irrigation under the baseline period (1990-2010).
- Large portion of potential land located in southwestern area.
- Potential suitable land has average groundwater access of 12 m from the surface with an average borehole potential yield of 2.5 l/s.

- Favorable for utilization of simple water lifting technologies.



(a) Depth to groundwater (m) and (b) Aquifer productivity (l/s) over the potential suitable land (suitability greater than 80%)

ASSESSMENT OF THE CROP WATER REQUIREMENT (Etc) FOR COCOA

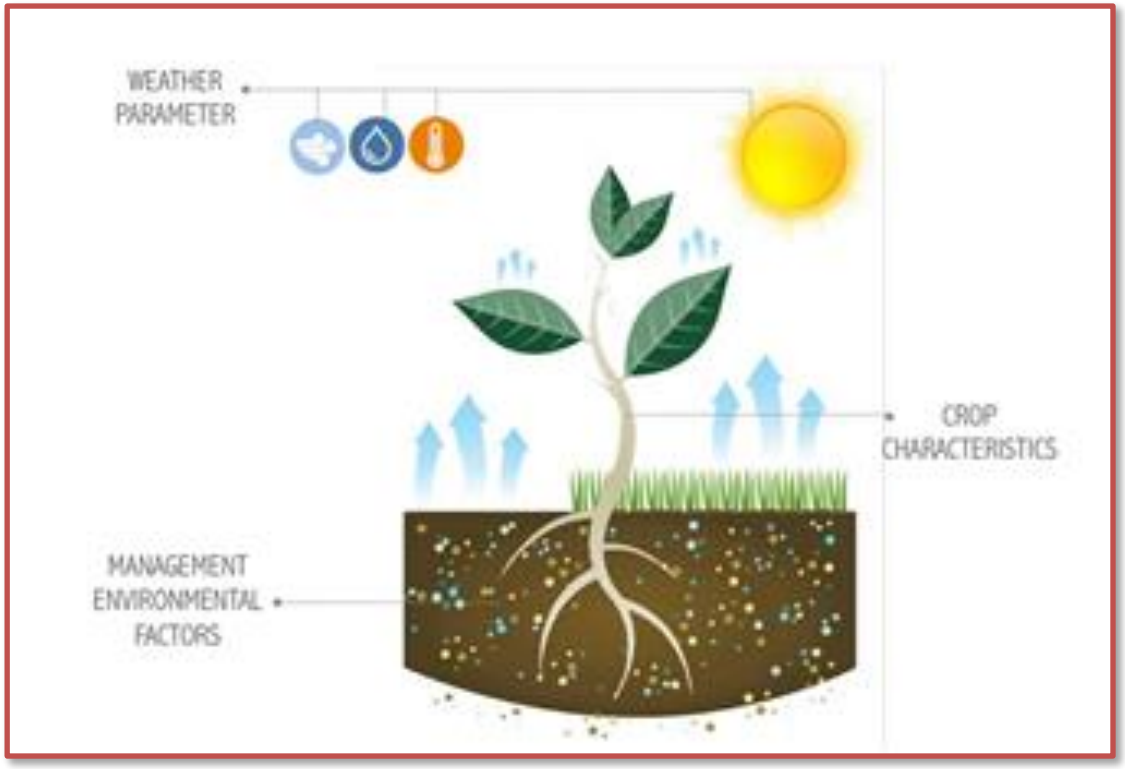
Crop evapotranspiration

Evapotranspiration (ET)

- Combination of water lost from the soil surface by evaporation and from the crop by transpiration.

Factors affecting ET

- Weather parameters (radiation, air temperature, humidity and wind speed), crop characteristics (type, variety and development stage), management and environmental aspects (e.g. poor land fertility, poor soil management).



ASSESSMENT OF THE CROP WATER REQUIREMENT (Etc) FOR COCOA

10 years (2006 to 2016) daily maximum and minimum temperature of six stations, monthly relative humidity, sunshine hours and wind speed

Climate stations used in the study

No.	Station name	Latitude	Longitude	Elevation
1	Axim	4.87	-2.23	37.8
2	Ho	6.60	0.47	157.6
3	Koforidua	6.08	-0.25	166.5
4	Kumasi	6.72	-1.60	286.3
5	Saltpond	5.20	-1.07	439
6	Sunyani	7.33	-2.33	308.8

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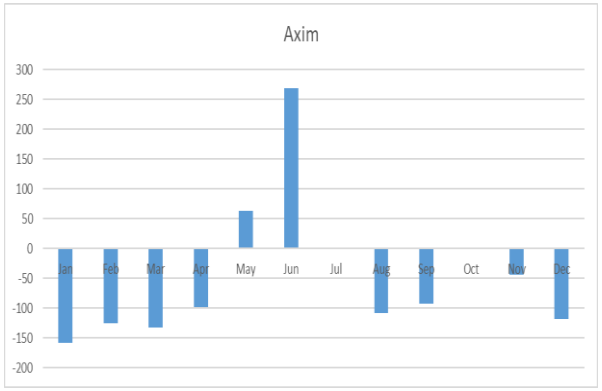
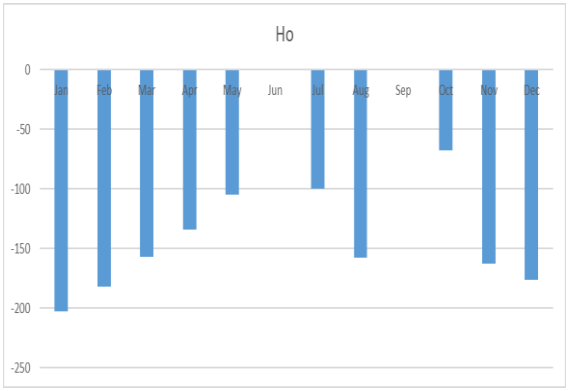
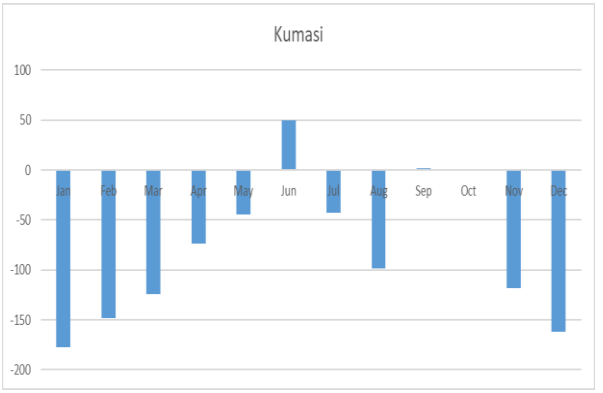
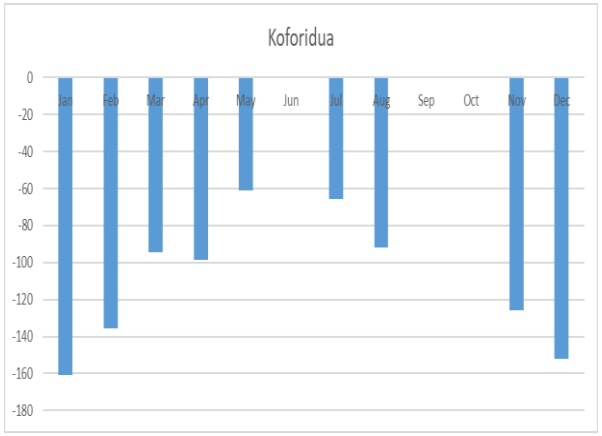
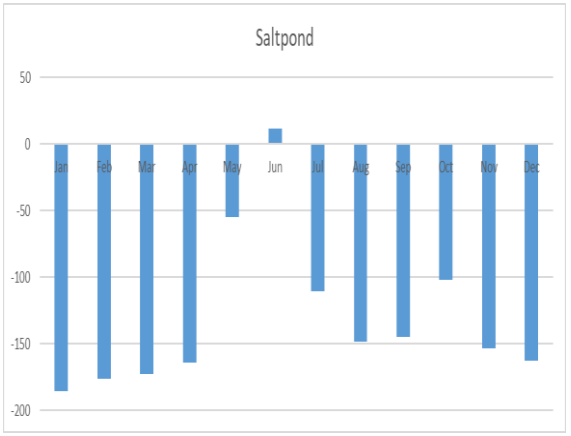
RESULTS: CROP WATER DEFICITS

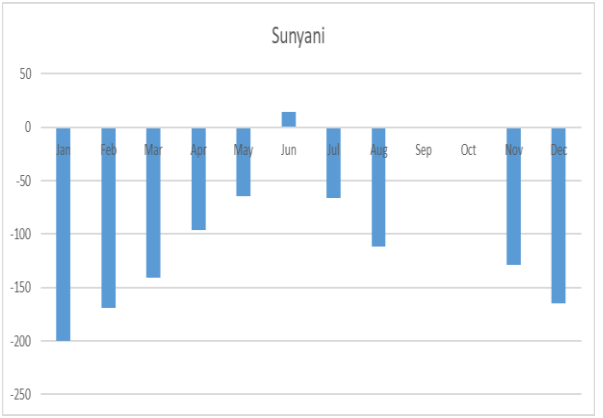












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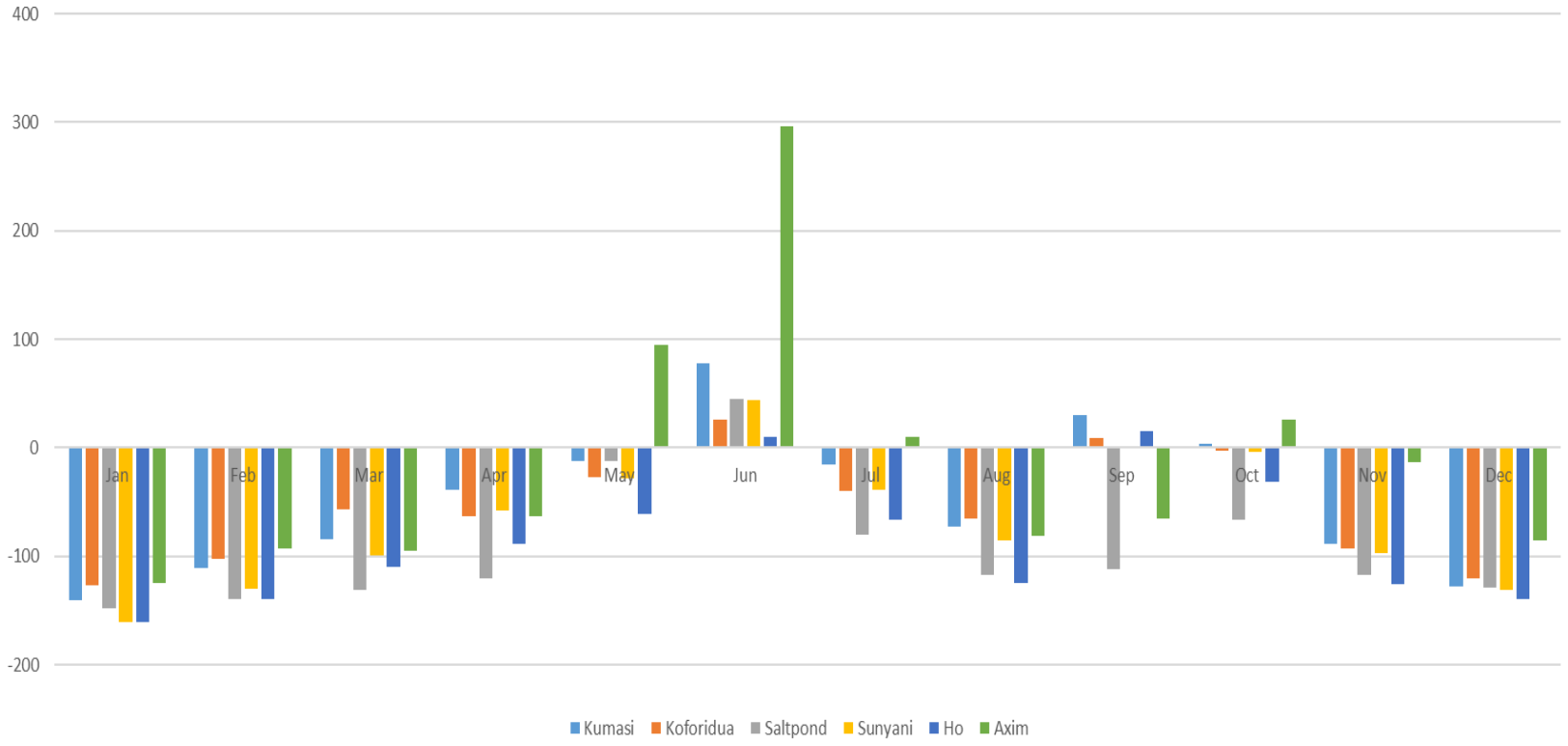
RESULTS: CROP WATER DEFICIT GRAPH

- The crop water deficit graphs (mm/month) have been calculated by subtracting the monthly water need from the effective monthly rainfall (Pe) for 10 years (2006 – 2016).



KEY MESSAGES

- Crop Water Requirement for cocoa production in Ghana varies between 130 mm/month and 235 mm/month.
- Results of the Crop Water Deficit analysis suggests the need for supplemental irrigation.
- Ghana's water resources (both ground and surface) can be used to support supplemental irrigation.

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Thank You ☺

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