Testing Adaptation in Flood-Based Resource Management Project

(From Africa to Asia and Back Again Project)

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Introduction:

Recently, Kassala has been suffering from floods and monsoon floods that hit the outskirts of the city, especially in the south and south-east. A series of seasonal valleys that descend from the Eritrean highlands and pour into the Sudanese plains in Kassala province.
Last year, a flood hit the southern neighbourhoods of Kassala (Makram Hela Musa and Elingaz) and caused heavy loss of life and property. This study aims to design a protective dam to protect the city from flooding through water harvesting techniques and the optimal use of flood and rain water.
Research Methodology:

Create the profile and X-section to know the General slope and width of wadi (study area) in outlet point of catchment.

Study and analysis of rainfall for the basin area using (hyfran).

Use ARCMAP(10.2) to Dlination and calculate the area of the Jabi basin.

Choose the design rain for the water harvesting project.

Choose the right location to fill the protection and design the dam.

Study the environmental and community impact of the dam.
Location map

- Gash River and Khor Amirai

Al_amirai straem

Streams

Legend:
- Gash River
- Khor Amirai
- Abo atapa
- Kassala
The Amirai and Kassala City
The Amirai and Kassala City

Protection work

جسر الحماية

مجري الخور
Amirai during dry season

خور الأميز اي في فترة الصيف
Rain analysis:

Rain data available from Kassala meteorological station. Statistical analysis was used to determine the design rain. Through the probability distribution, the rain was following the distribution.
Use distribution was used to calculate the design rainfall for periods Bounce 10,15,25 Year. The rational method was used to calculate the maximum design flow for each Design rain.

\[ Q = CIA \]

\[ Q = \text{FLOW} \text{ (m}^2\text{/s)} \]

C = A factor depends on the type of use of the land.
I = Rain intensity
A = Area of the pool of the Jabi (km)
Use the Geographic Information System (GIS) to calculate the area of the collector basin (elhood elgabi) With:
   ArcGIS10.2
   And
   Arc-hydro-tools
   HEC- HMS (Modeling)
حساب المساحة باستخدام نظم المعلومات الجغرافية (DEM)
حساب المساحة باستخدام نظم المعلومات الجغرافية

(Flow direction)
حساب المساحة باستخدام نظم المعلومات الجغرافية
(flow accumulation)
حساب المساحة باستخدام نظم المعلومات الجغرافية
(Catchment and streams)
THANK YOU FOR YOUR ATTENTION