



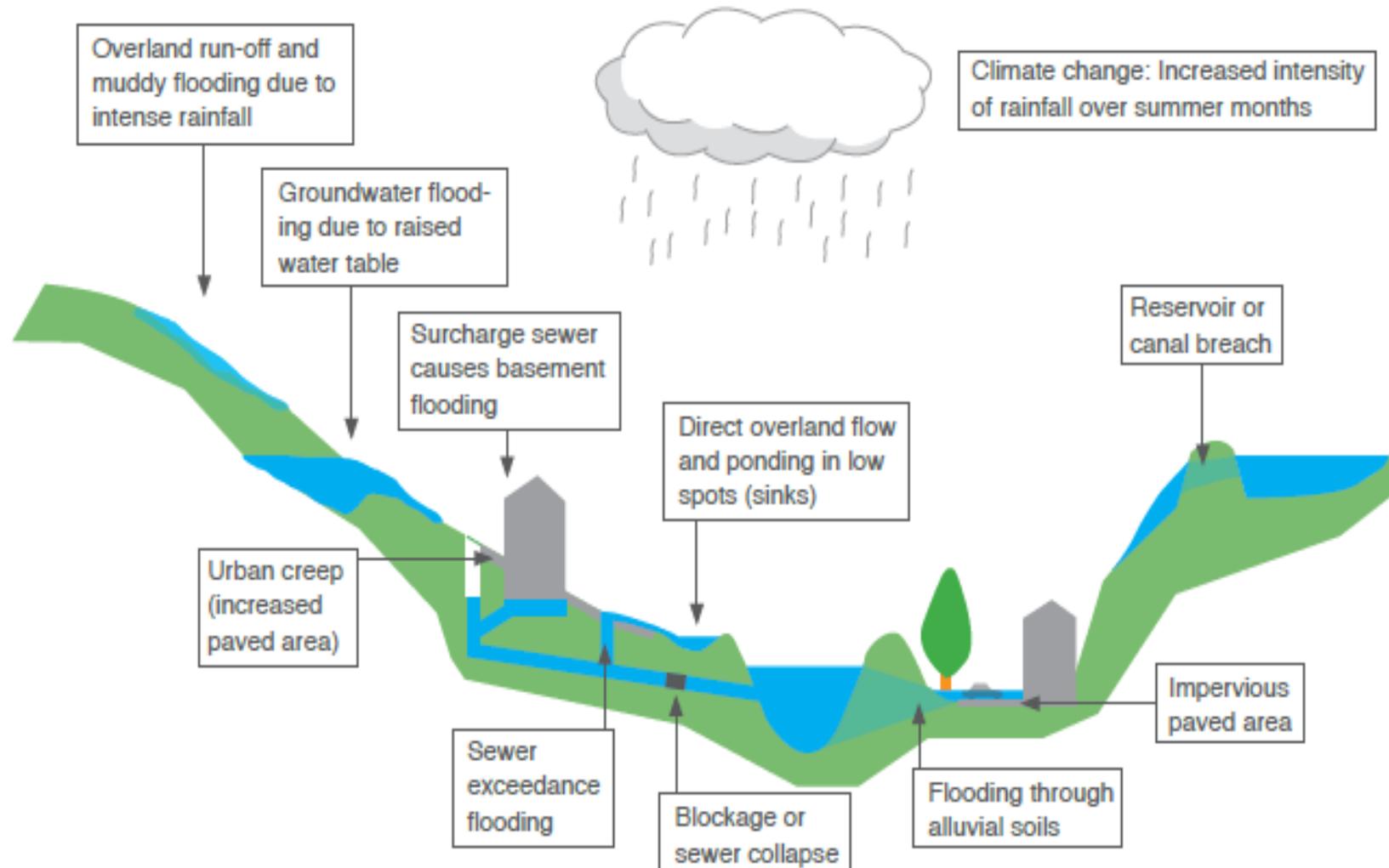
SPACE TECHNOLOGY FOR FLOOD WATER HARVESTING

“Integrated Flood Water Harvesting and Management Schemes For Multipurpose Use in 3 Districts of the Upper East Region of Ghana”

A Project Proposal

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FLOOD: SCHEMATIC DIAGRAM & Typology



Typology

1. Riverine
2. Flash
3. Mudflows
4. Coastal/tidal



FLOODS: A CURSE OR BLESSING?

❑ PERCEPTION OF FLOODS

❑ IMPACTS

○ NEGATIVE

○ POSITIVE

❑ NATURAL PROCESS



FLOODS: CAUSES

NATURAL

ANTHROPOGENIC



LIVING WITH FLOODS

- WHY? - BENEFITS
- WHEN? – PERIOD
- WHERE? – LOCATION
- HOW? – TECHNOLOGY
- WHAT ?- RESOURCES

THE PROJECT



Concept

- ❑ Harness and store flood water at appropriate scales (dams, dykes, geo-tanks, special boreholes) during the raining season.
- ❑ Make water available for multipurpose use through integrated water management systems (irrigation, stock water, aquaculture, household water)
- ❑ Provide environmental services through ground water recharging and watering of wildlife
- ❑ Rehabilitate vegetation buffers along rivers and streams
- ❑ Use space technology to select suitable project sites

Why space technology?



- ❑ Capability to accurately identify and map flood prone areas, flood regimes and extent to guide the selection of sites for establishing flood water harvesting systems for communities.
- ❑ Remote sensing products will serve as baseline data for flood analysis of rivers and streams, vulnerable communities and other environmental resources that are impacted by climate change.
- ❑ GNSS based survey and mapping of properties of communities where water storage systems and irrigation would be established
- ❑ RS/GNSS based monitoring of agricultural activities in the irrigation schemes, crop production, water use as well as the vegetation conditions



OBJECTIVE

- Provide beneficiary communities with enough water particularly during the long dry periods of the year to increase their agricultural productivity.
- Make the project area water secure and build the resilience of project affected communities and the region towards climate induced floods and droughts.
- Promote the use of Space tools in development planning



PROJECT COMPONENTS

Six (6) project components envisaged include:

- PROVISION OF IRRIGATION FACILITIES,**
- PROVISION OF STOCK WATER AND FODDER BANKS,**
- PROVISION OF PORTABLE WATER TO DEPRIVED SCHOOLS AND VULNERABLE COMMUNITIES,**
- ESTABLISHMENT OF WILDLIFE WATERING POINTS WITHIN FOREST RESERVES,**
- REHABILITATION OF EXISTING VEGETATION BUFFERS ALONG SELECTED STREAMS AND RIVERS AND**
- BUILDING THE CAPACITIES OF FARMERS, WOMEN AND OTHER WATER USERS IN WATER MANAGEMENT AND POST CONSTRUCTION MANAGEMENT OF WATER FACILITIES**



PROJECT OUTCOMES

- ❑ Increased crop and livestock production, especially rice, maize, guinea corn, onion and other leafy vegetables, sheep. Goats etc.
- ❑ Increased employment and livelihoods
- ❑ Increased capacities of water users in water management
- ❑ Enhanced capacities of women in post-harvest processing and storage
- ❑ Improved resilience of communities in three districts towards water stress and floods
- ❑ Reduction in time spent by women and school children looking for water for domestic and other uses
- ❑ Wildlife and forest reserves would be restored to appreciable levels to support flora and fauna.



PROJECT LOCATION



Project area - FLOODING



The area is subject to annual flooding but the floods are followed by long periods of drought which makes the people water insecure. Rivers and valleys dry forcing the people to cultivate within the river beds and along the river banks causing further degradation

A FLOODED COMMUNITY



Project area - DROUGHT



DRY BED OF
MOGNORI RIVER



DRY VALLEYS

THE COMMUNITIES
CULTIVATE CROPS IN
THE VALLEYS



METHOD: SPACE APPLICATIONS & PROJECT DEVELOPEME

PROJECT IDENTIFICATION PHASE

- IRRIGATION SITE SELECTION

PROJECT DEVELOPMENT /CONSTRUCTION PHASE

- VEGETATION, SOIL AND WATER RESOURCE SURVEYS
- DAM AND RESEVOIR SURVEYS
- LAND USE SURVEYS
- TOPOGRAPHIC SURVEYS
- CADASTRAL SURVEYS

POST PROJECT CONSTRUCTION/ OPERATION PHASE

- CROP PERFORMANCE /LIVESTOCK MONITORING
- WATER RESOURCE MANAGEMENT MONITORING
- PEST AND DISEASE MONITORING
- IRRIGATION INFRASTRUCTURE MONITORING



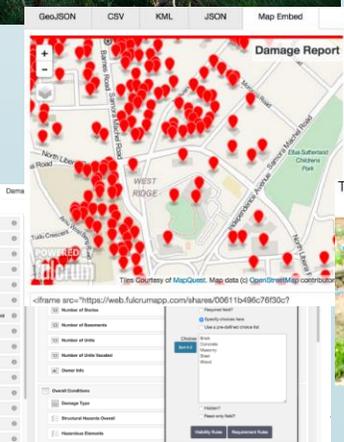
SATELLITE DATA

POTENTIAL IRRIGATION SITE

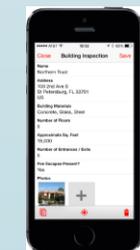


GROUND SURVEY DATA

GNSS
GNSS
GNSS



FIELD MONITORING DATA



fulcrum
fulcrumapp.com



Track data collector's daily performance

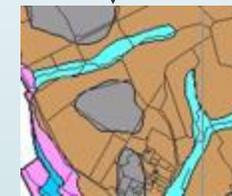
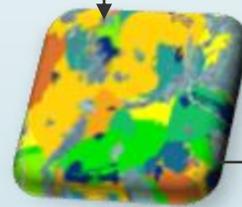
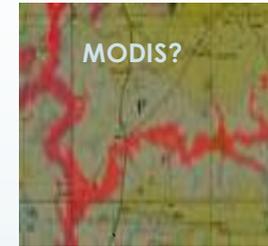
SCHEMATIC PROCESS



SATELLITE DATA
ACQUISITION
base data

GIS DATA
PROCESSING
intermediate
products

SITE MAP –final
product



MAP
OVERLAYS





DATA REQUIREMENT

- SATELLITE IMAGES
- TOPOMAP/SHEETS
- HYDROLOGICAL MAP
- LAND USE MAP
- SETTLEMENT MAP
- SOCIO-ECONOMIC DATA
- FIELD SURVEY DATA (GROUND TRUTHING AND VALIDATION)
- RAINFALL DATA
- SOIL MAP
- GEOLOGICAL MAP
- OTHER DATA (GEOPHYSICAL, BOERHOLE etc.)



PROCESS MODELS

- RESERVOIR CATCHMENT AREA ASSESSMENT
- LAND USE ASSESSMENT
- SITE ACCESSIBILITY ASSESSMENT
- SOIL SUITABILITY ASSESSMENT
- SOCIO-ECONOMIC IMPORTANCE/VULNERABILITY ASSESSMENT
- GROUND WATER ASSESSMENT
- DAM/RESERVOIR SITE SUITABILITY MAPPING



IMPLEMENTING AGENCY

□ IRRIGATION DEVELOPMENT
AUTHORITY



□ GHANA WATER PARTNERSHIP





FUNDING SOURCES

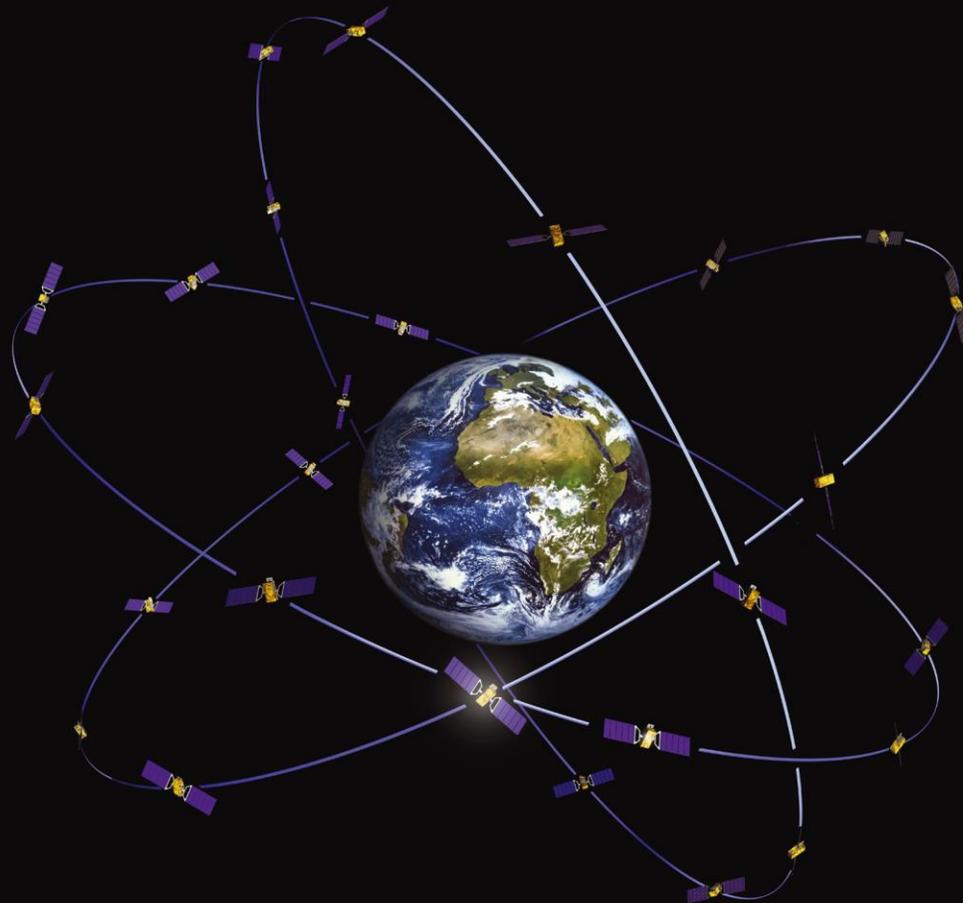
□ 30 MILLION USD

□ TO BE PROVIDED BY DONOR
COMMUNITY



PROJECT DURATION

5 YEARS



Thank you!