



**afrialliance**

Africa-EU Innovation Alliance for Water and Climate

# Improving Monitoring & Forecasting of Climate & Water Resources using innovative Approaches

Chris Mannaerts

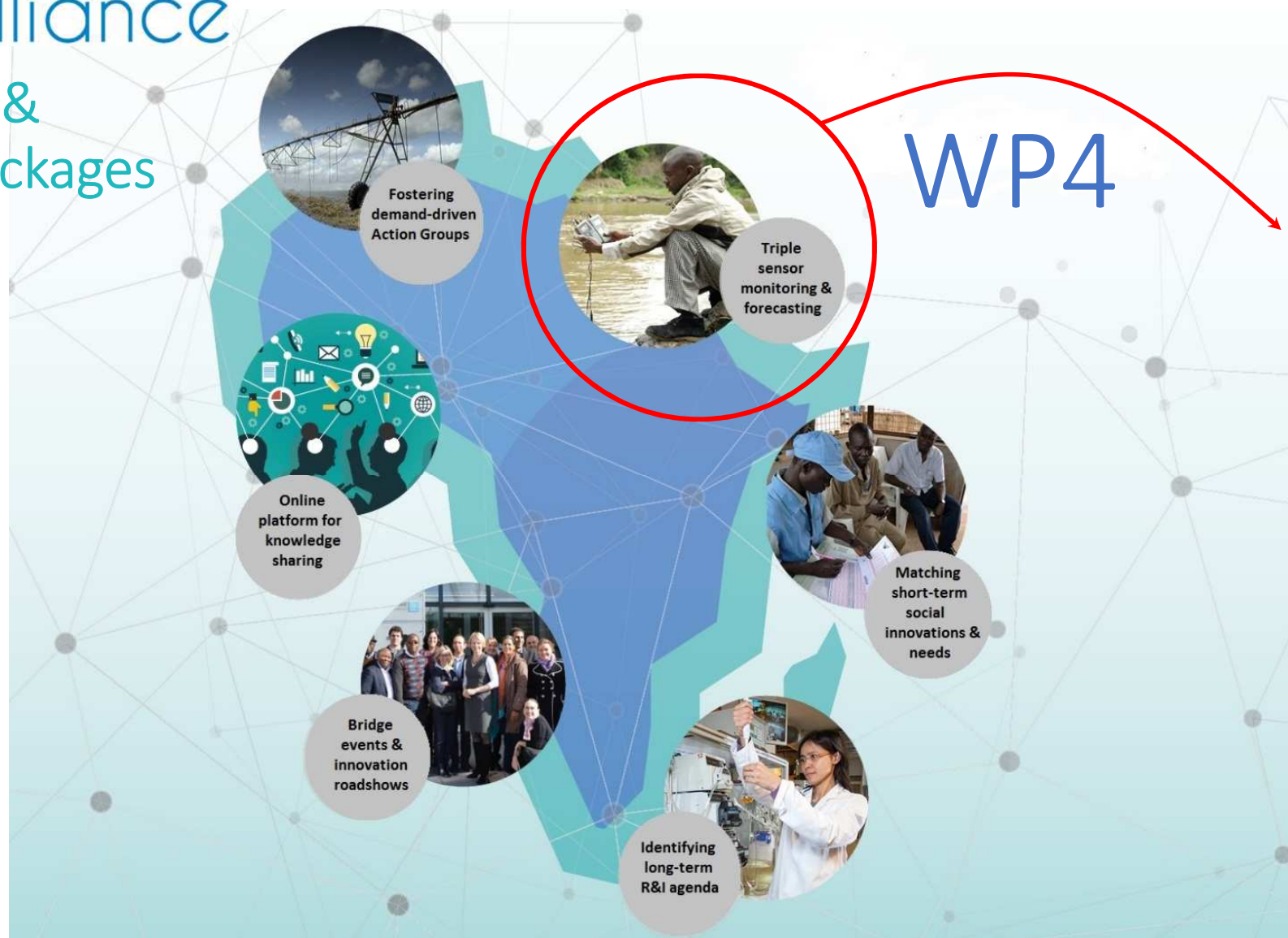
AfriAlliance Work Package 4 lead

31 Oct 2018

WATERNET Symposium, Livingstone, Zambia

# afrialliance

## Actions & Workpackages



# afrialliance WP4

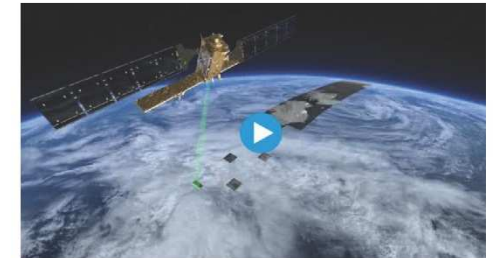
Afrialliance WP4 aims to help improve Tools, to address Water & Climate Change

It uses a novel Triple Sensor approach, observations, with newly emerging citizens

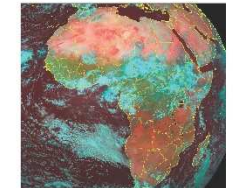
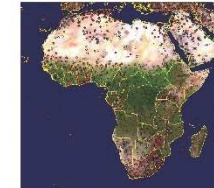
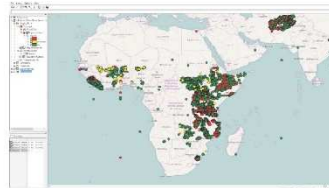
WP4 is providing African and European geographically explicit Monitoring & Forecasting analysis on Water & Climate Challenges

WP4 has developed a "Handbook on Data Monitoring strategy for all Water points

The Observing System for Monitoring & Forecasting of Climate and Water ranges from surface measurements, citizen observations to multi-billion € satellite earth observation missions



Data are continuously gathered today in Africa by three sources: citizens, technicians and satellites



Combining these triple sensor data will lead to:

- Increased ground truth, reliability and accuracy
- More social acceptance of monitoring information on climate and water
- More reliance on information for early warning and disaster risk reduction
- Improved design of local climate adaptation measures

For more info:  
Pls. follow us @ [www.afrialliance.org](http://www.afrialliance.org) and Work Package 4 on Monitoring & Forecasting of Water & Climate Challenges in Africa or contact Uta Wehn ([u.wehn@un-ihe.org](mailto:u.wehn@un-ihe.org)) a/o Chris Mannaerts ([c.m.mannaerts@utwente.nl](mailto:c.m.mannaerts@utwente.nl))

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UNIVERSITY OF TWENTE.



(Picture sources from AKVO, ITC and European Space Agency (ESA))

## Task 4.3: Blueprint for Monitoring Water Sources -> the “Handbook for Data Collection” [akvo.org](http://akvo.org)

### ***AfriAlliance Blueprint (T4.3)***

*“a generally applicable plan on how to develop a full Monitoring system covering all Water points in a region, country, basin or city in Africa”*



Akvo is a not-for-profit foundation that creates open source, internet and mobile software and sensors. We focus on making international development and country governance more effective, transparent and collaborative.

### **10 Step Plan:**

- Prepare Project
- Design project / program
- Data Research
- Sample & survey design
- Prepare data collection
- Collect data
- Analyze and visualize data
- Share data and insights
- Take informed decisions
- Evaluate and apply lessons learned

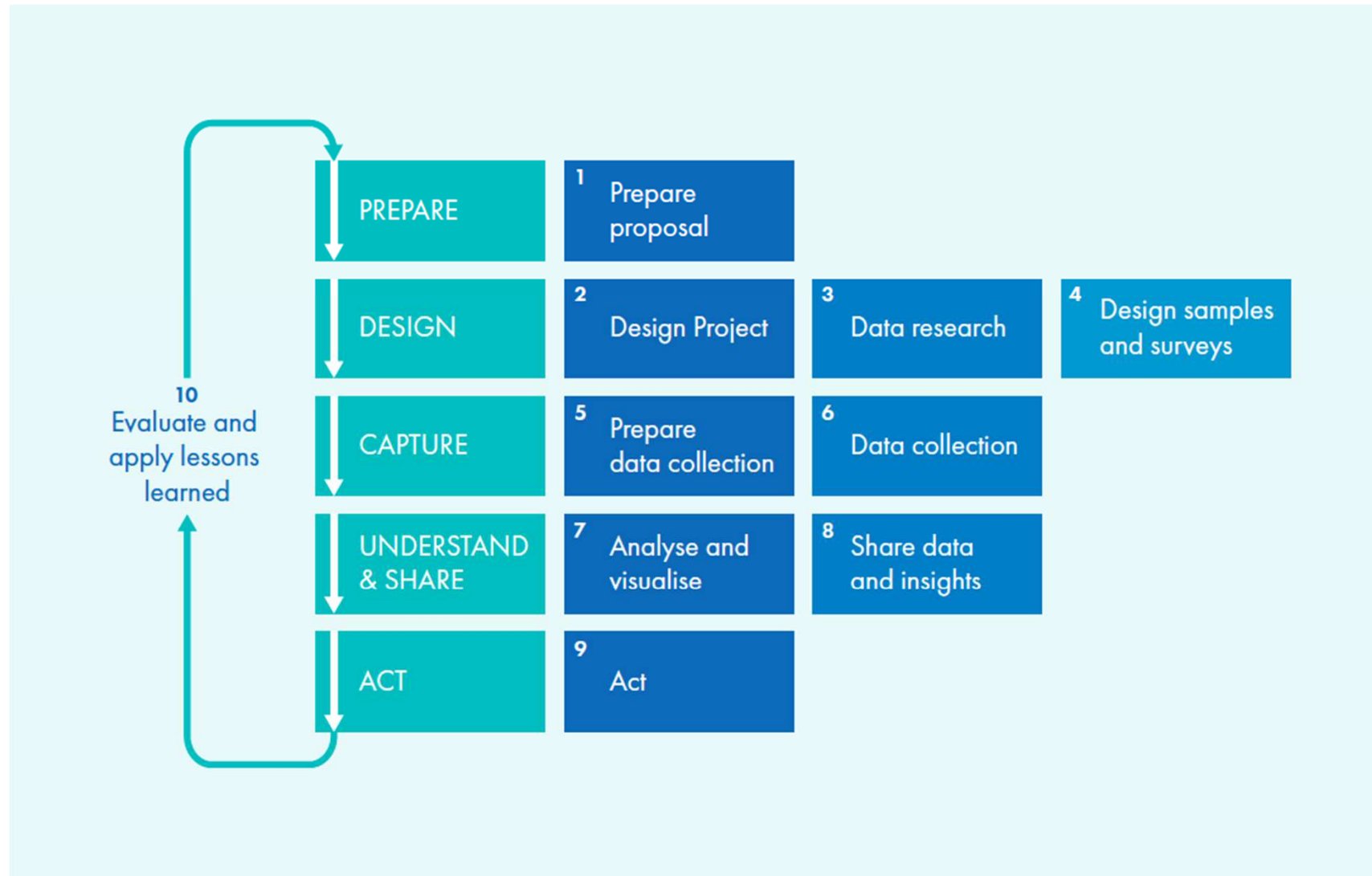
*Deliverable D.4.5: -> expected soonest (July 2018) by lead AKVO & partners*





# The Handbook on **Data Collection**

# “Data Collection” approach (AKVO)



# Task D4.6. WP4 Triple Sensor Demonstration package

*More reliable data, better decisions*

**Aim:** Making data and reliable spatial information for sustainable water resources management - under multiple stressors including climate - more easily available to stakeholders.

**Rational:** Reliance on single sourced (e.g. only station-based, pure satellite-based, human sensor, etc.) water monitoring is prone to failure(s) and inefficient investments. This hampers effective decision-support in water management, especially in areas with water scarcity, high variability in natural supply and fast growing demand. A multiple source data gathering and collocated analysis reduces information bias, presents more secure information gathering and may yield better – informed decisions on **H<sub>2</sub>O** matters.



©hydrosolutions.ch; “we are not alone”; more people are looking at the approach, ref. This pic I got from a hydrological sme

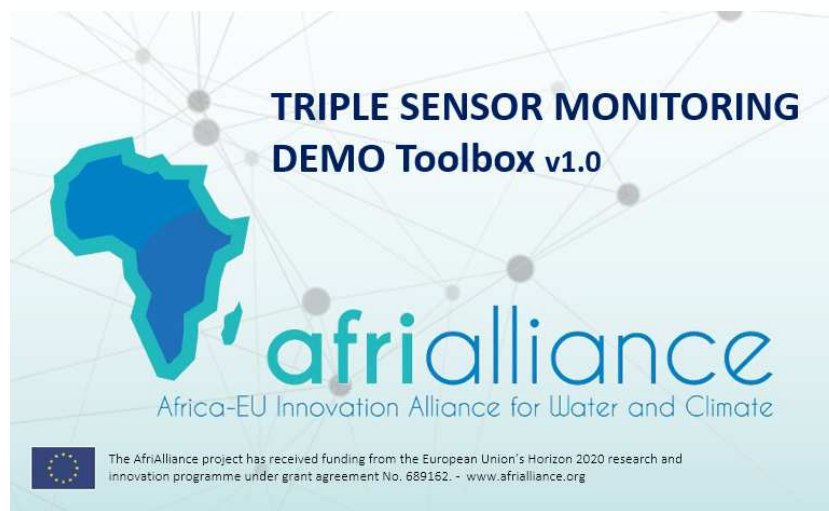
The AA Work package 4 tasks work towards improved water resources monitoring and forecasting under climate stress. The **D4.6 demo-package** will provide hands-on experience in:

- rapid geo-located **view & analysis** of essential water and climate data and info across Africa
- dual and **triple sensor** collocation of data and analyze differences, error sources and bias..
- a **forecast tool** (app) based on open access GFS data



# AA Triple Sensor Demonstration package

Available as “TOOLBOX” Plug-in  
in ILWIS Remote Sensing GIS software



**Available at WATERNET; ask software  
and Demo from ITC C.Mannaerts, V.Retsios**



Available as web-based demo on  
<http://afrialliance.itc.utwente.nl/triplesensor/>

## Triple Sensor Collocation demo – AfriAlliance project

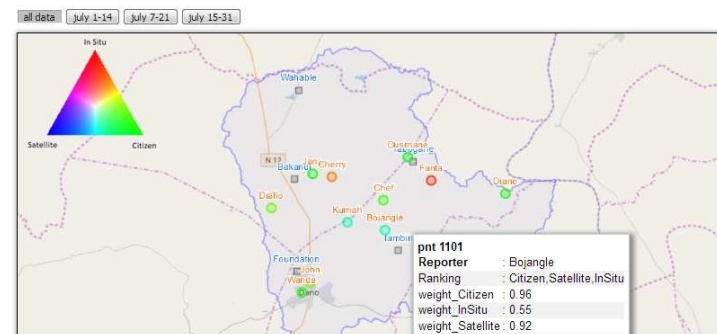
Triple Sensor Collocation can be used to validate 3 independent observations at a location, when the error-free true value is not known. With this you can judge, which water or climate observation, i.e. your citizen observation, conventional station data or a remotely sensed satellite look-up is most reliable.

### Stockholm Demo Use case: rainfall at the Dano area

The AfriAlliance web-demo illustrates the technique for rainfall observations (July 2015) near Dano in Southwest Burkina Faso, a research area of West African AfriAlliance partner WASCAL. Citizen locations were extracted from the Open access WPDx or Water Point Database. Citizen names were adapted (privacy) and rain data were generated for demo purposes. Observed meteorological station data were obtained from WASCAL.org and CHIRPS2 was used as open access satellite precipitation. This AA demonstration package is under development and will also be available on-line via the AA project portal [www.afrialliance.org](http://www.afrialliance.org)

### Run the Demo

Change the observation period and view which data source is most reliable in that period (compare the color of the symbols to the color triangle legend). Scroll map and move mouse pointer over Citizen location(s) for evaluation statistics.





# Parallel sessions on Afrialliance WP4 Innovative Monitoring Approaches and Tools

- 2 parallel demonstration sessions:
  - Handbook on Data Collection
  - Triple Sensor Toolbox
- Active participation
- Exchange your experiences on data collection...
- Toolbox: try out...; web-based or on your own laptop..; take home..
- Become part of the Afrialliance community and network