Agricultural Water Management in Africa

Highlights from 3 SDC supported initiatives

Département fédéral des affaires étrangères DFAE
Direction du développement et de la coopération DDC

Federal Department of Foreign Affairs FDFA
Swiss Agency for Development and Cooperation SDC

Dipartimento federale degli affari esteri DFAE
Direzione dello sviluppo e della cooperazione DSC

Departamento Federal de Asuntos Exteriores DFAE
Agencia Suiza para el Desarrollo y la Cooperación COSUDE

Overview

- *Strengthening Agricultural Water Efficiency and Productivity at the African and global level*
- *Innovative Monitoring, Modelling and Managing Water (iMoMo)*
- *Water and Land Resources Centres*

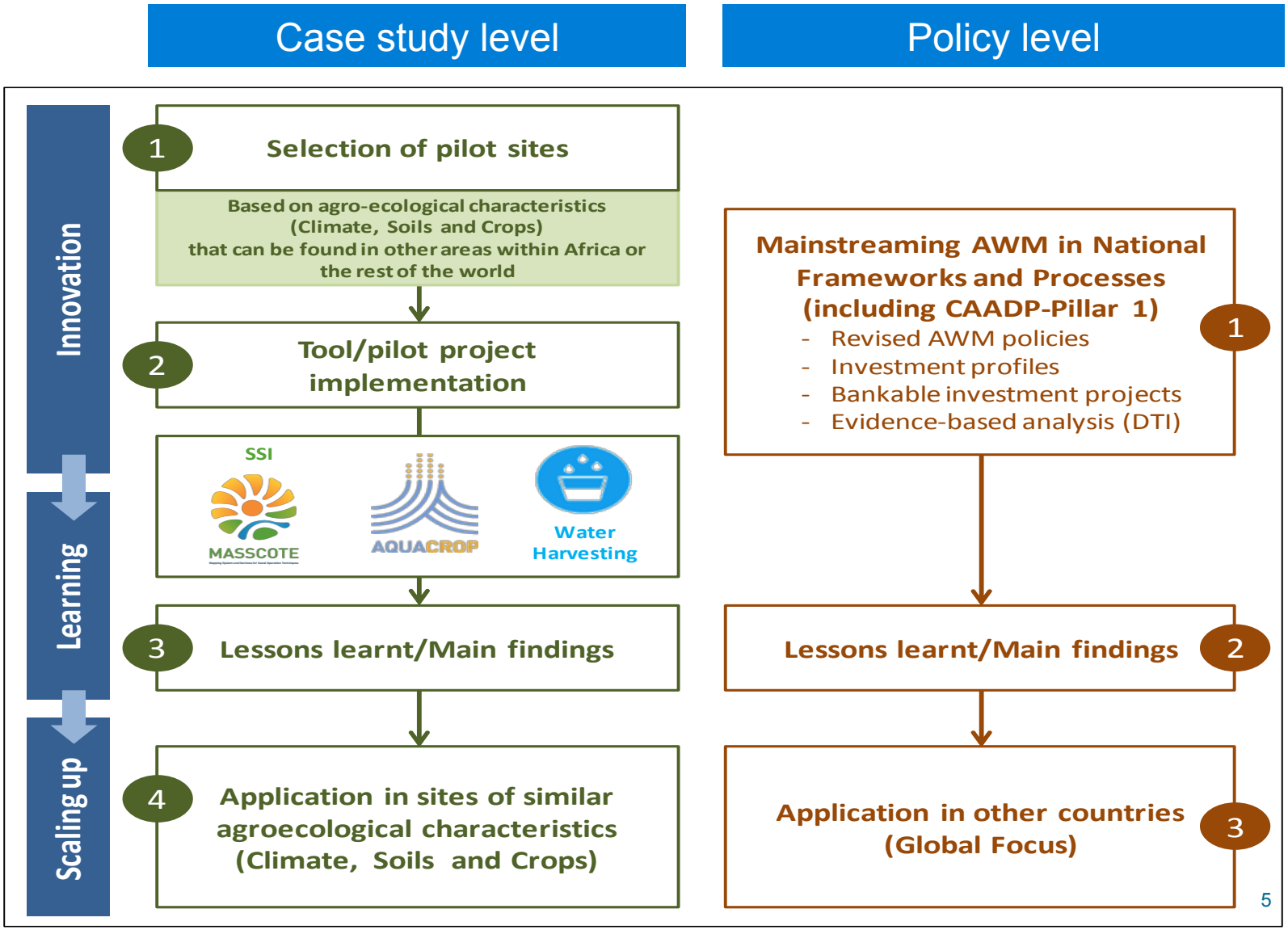
Background

- Agriculture accounts for more than 70% of global freshwater withdrawal and 90% of consumptive use
- The biggest potential to enhance water efficiency and at the same time to increase yields is in rainfed areas. Potential is highest where agricultural productivity levels are far from reaching their full potential.
- Irrigated areas contribute more than 40% of global food supply, but water efficiency is low in general. Most irrigation systems in developing countries need upgrading.

Challenges and Opportunities

- Agricultural policies in DC often lack an IWRM perspective and set unrealistic targets of agricultural area expansion without considering water availability
- Current policies often fail to adress the potential and need of better agricultual water management
- NEPAD has identified agricultural water management (AWM) as central for poverty alleviation and food security
- CAADP pilllar 1 aims to extend the area under sustainable land and water management in Africa. CAADP process and compact allows to strengthehning agricultural policies, but so far not sufficient attention to AWM

Intervention Strategy



Innovation

- Project based on national water audits, allowing for a cross-sector IWRM approach
- Combination of top-down activities at the policy level and bottom-up activities with case studies on the ground
- Leverage effect through development of bankable investment projects
- Development of targeted outreach material for practitioners (in collaboration with agricultural extension services) and policy makers (in collaboration with CAADP country processes)

Schweizerische Eidgenossenschaft
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iMoMo Global Initiative

Innovation in Monitoring, Modeling & Managing Water

Using integrated low-cost, high-tech and user centred approaches in order to measure and account for water at local levels in irrigation

Tobias Siegfried, hydrosolutions, Zurich, Switzerland

Local, Regional & Global Data Challenges

- Data for sound water management are scarce
- Traditional monitoring approaches are expensive and not scalable
- Existing data/information often hard to access for end users
- Disconnect between end users and agencies
- Agency underfunding and weak institutions leave little room for improvement
- Need for paradigm shift

Global iMoMo Initiative: Mission Statement

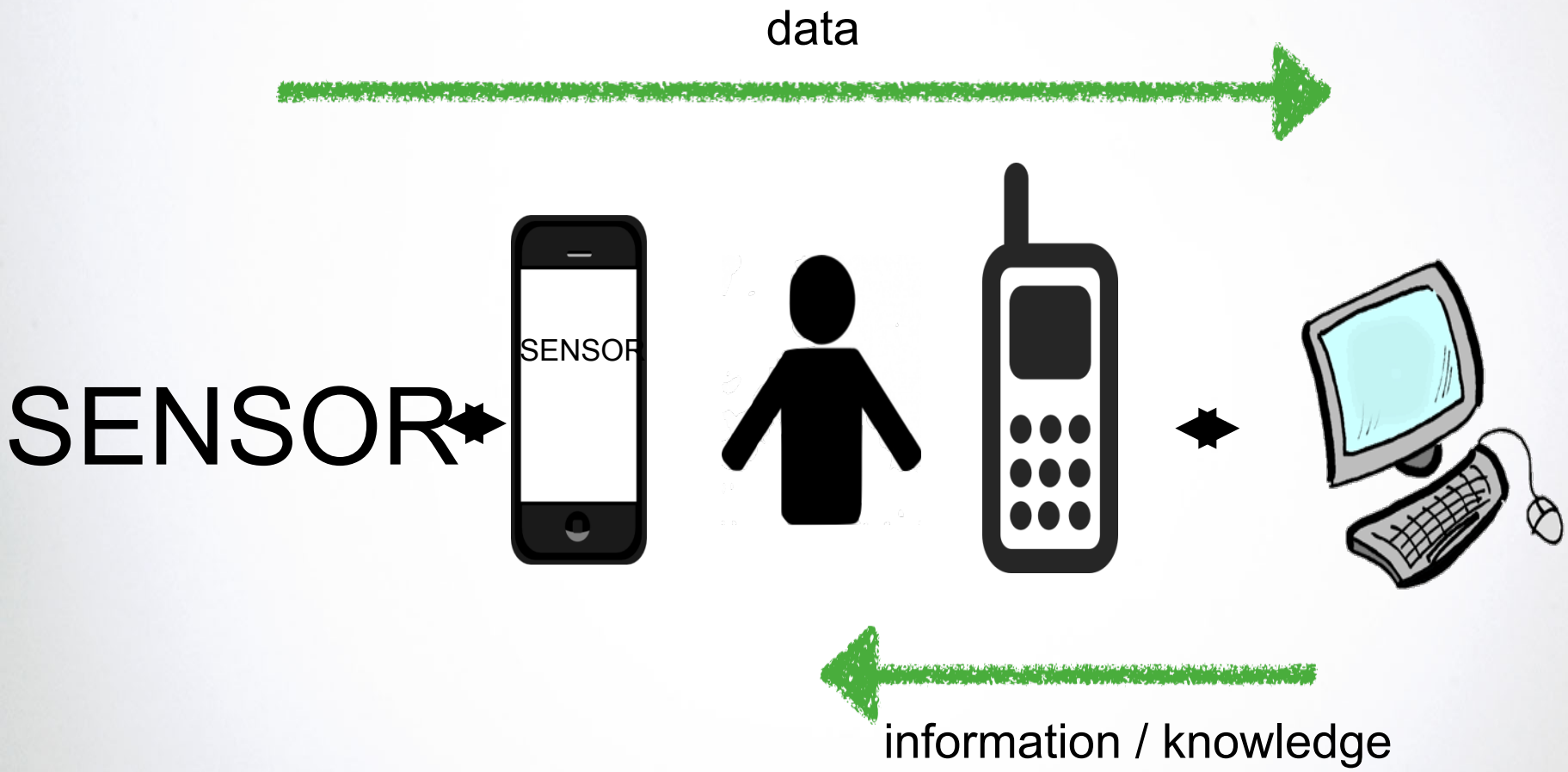
- Fostering innovation in hydro- and agro-meteorology for
  - low-cost, user-centered & non-traditional monitoring / crowd-sensing
  - automatic / secure transmission of data
  - digital data management, analysis and exchange using open-source and secure web technologies for the modernisation of (existing) workflows

- Started in 2013, incubated by the Swiss Agency for Development and Cooperation (SDC)

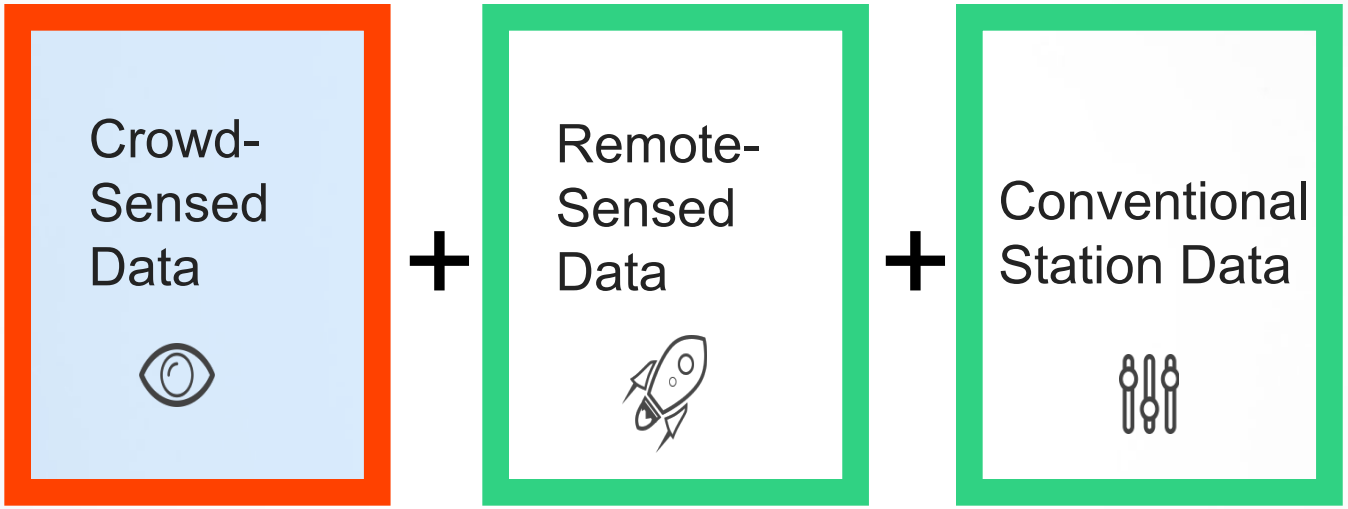
Global iMoMo Initiative: Innovation HUB & Solutions

- iMoMo Global Innovation HUB to be embedded in an upcoming WMO Global Hydrometry Support Facility for global advocacy and innovation scouting.
- Implementation of tailored solutions in projects jointly with local and international partners.
- Current activities in Tanzania, Mozambique and Kyrgyzstan. Upcoming in the greater Central Asia Region and elsewhere.

iMoMo Innovation Technologies for Crowd-Sensing

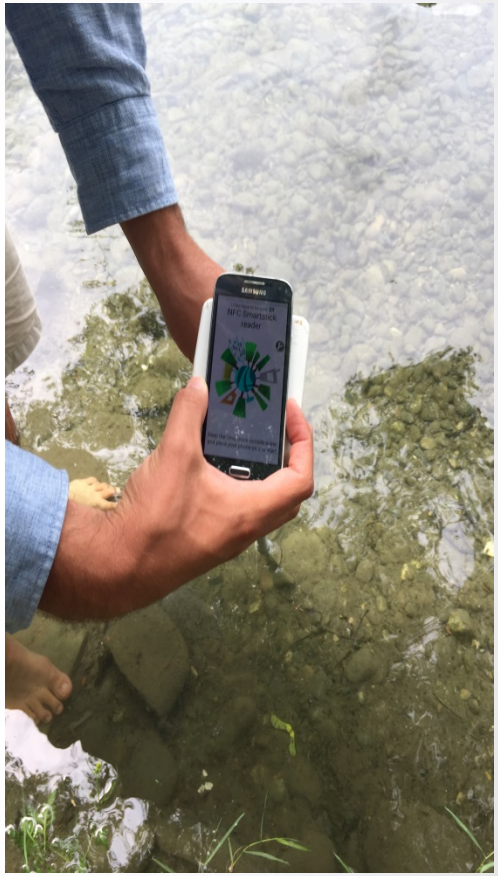


Complementarity of Non-Traditional Data to Existing Data



Monitoring: iMoMo Sensor Technology SmartStick NFC & Smartphone App

- Intended for users of NFC compatibles smartphones
- Data transmission via SMS or Internet
- Direct link from sensor to database
- GPS time & space referencing of measurements
- Configurable stick length
- Very low cost & sustainable
- No installation, No battery, Easy to use
- Local manufacturable & maintainable



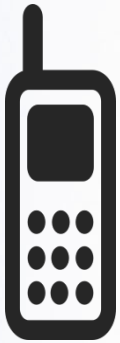
Monitoring: iMoMo Smartphone App for Water Level & Discharge Measurements (Beta)

Site Calibration

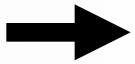
Measurement and Analysis

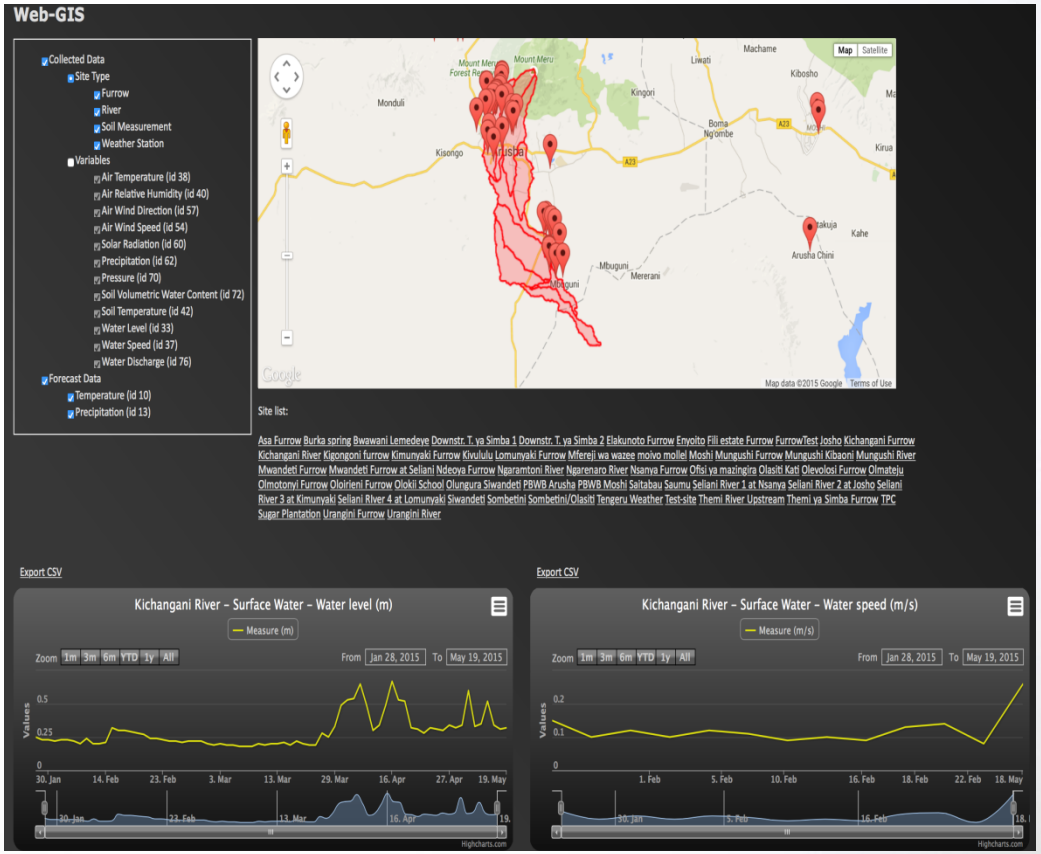
iMoMo

Operational Management: Water Manager Toolkit / Dashboard



Data Authority



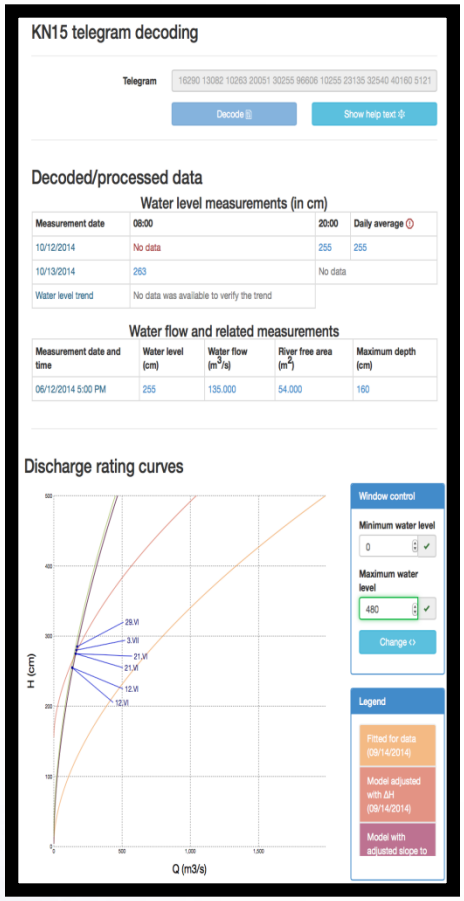


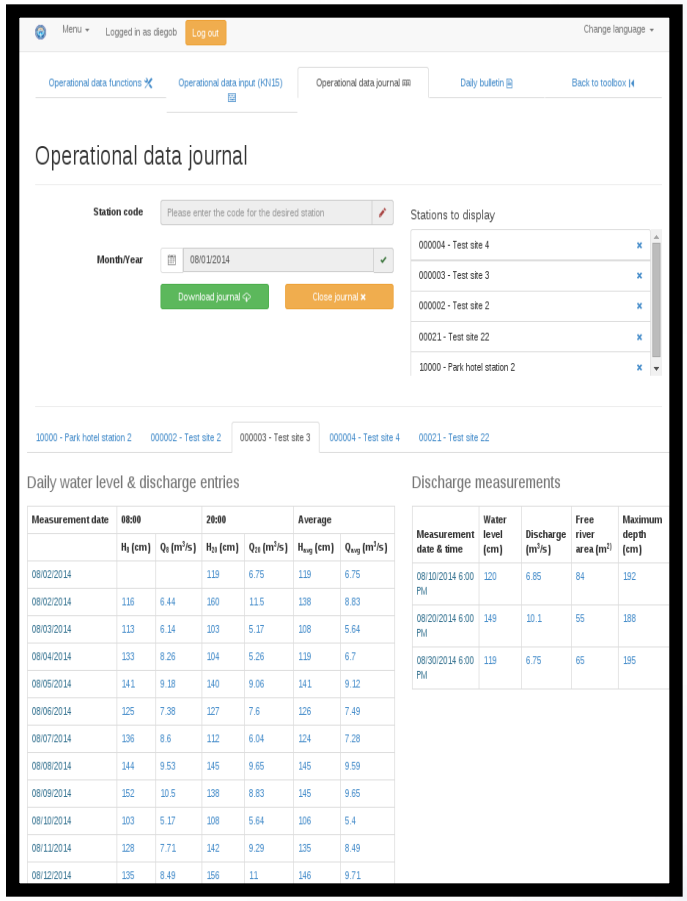
iMoMo Database
based on open-source
HIS database

iMoMo

Operational Management: Gauging Station Administration for Operational Hydrology

Water level & Discharge Data





Bulletins

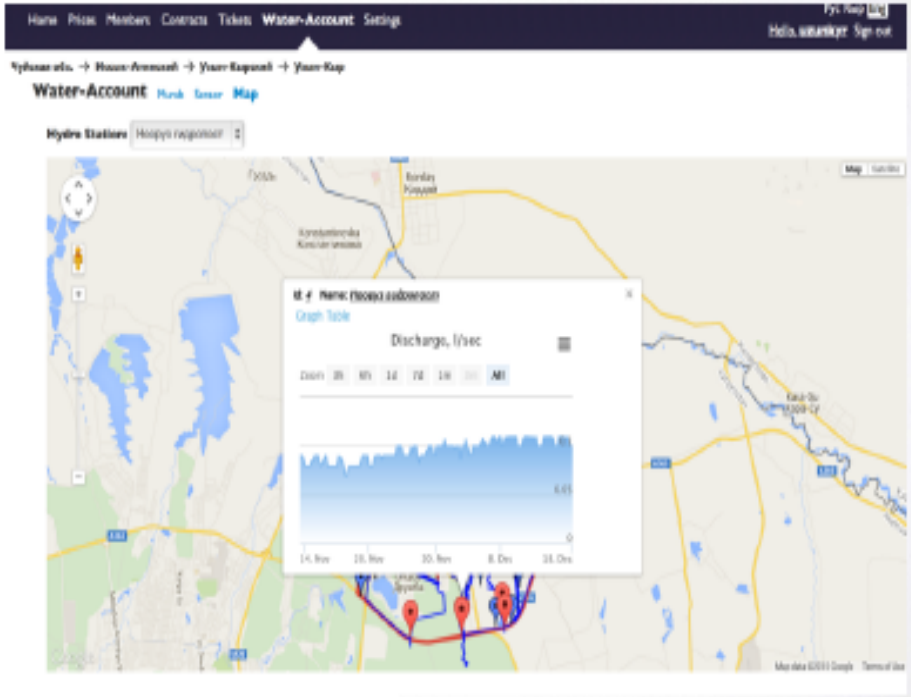
Used for a) station administration, b) maintenance and update of rating curves, c) generation of bulletins and d) forecasting flows

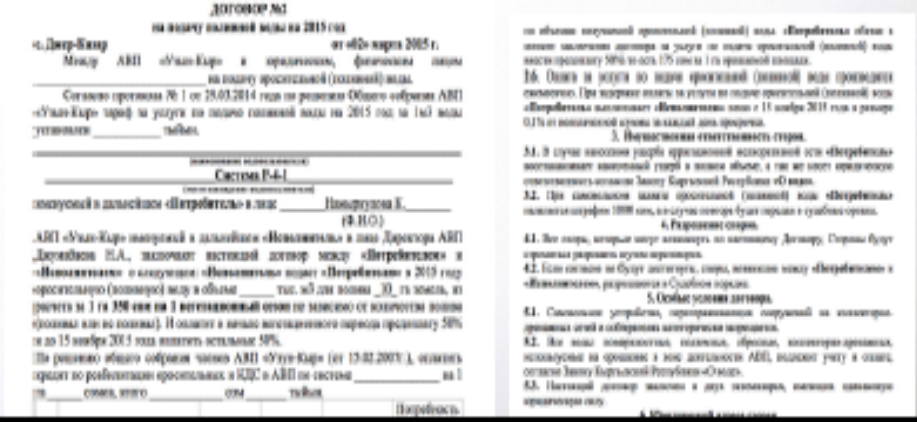
iMoMo

Web-based Water Accounting System for WUAs

Easy, secure and fully integrated web-based accounting and reporting

- Users: a) WUAs
- Automatic / secure accounting for any unit, including for
  - farm-levels and farmers
  - canal and structure levels
- Automatic reporting and billing



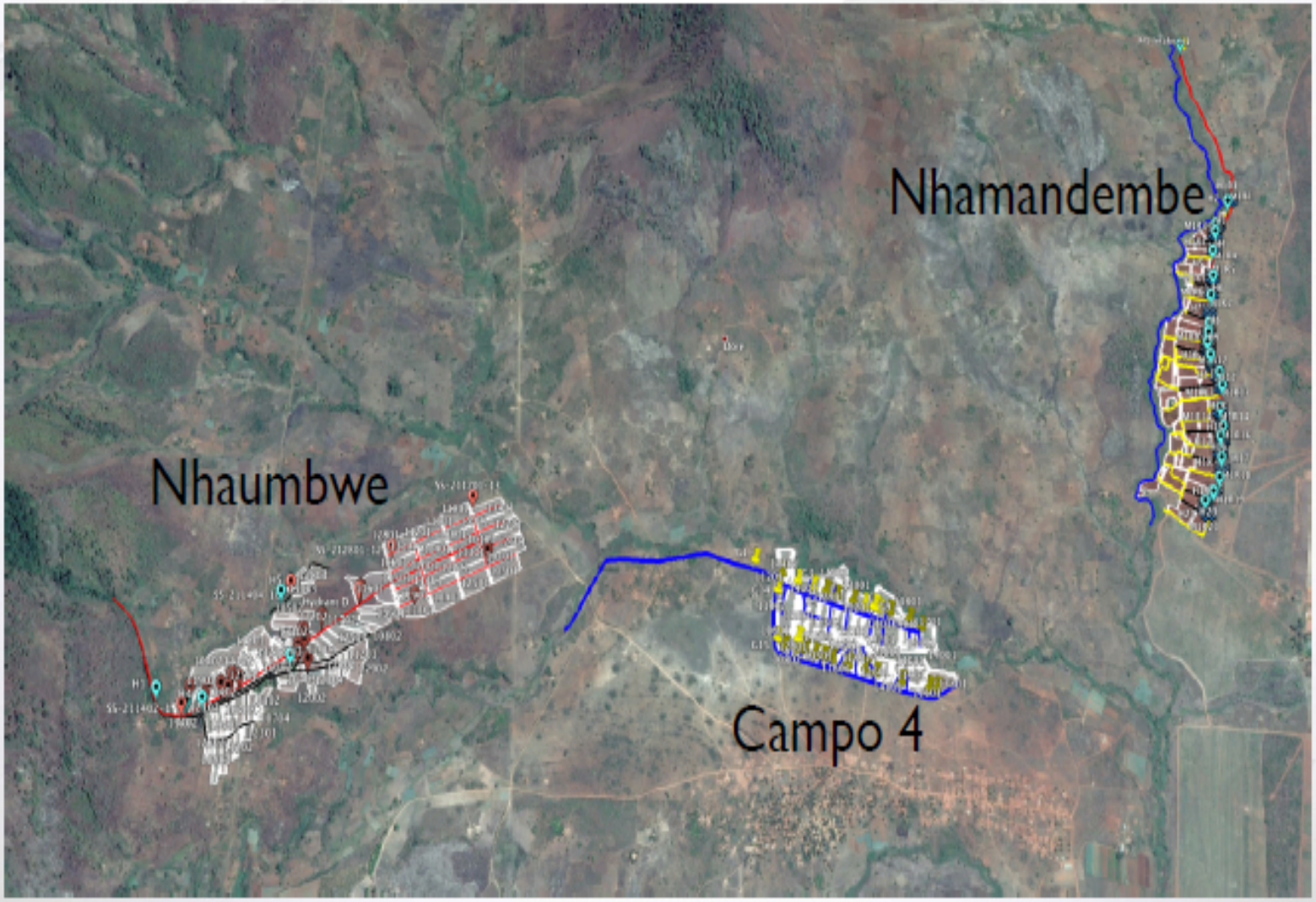


ДОГОВОР №1

на подачу поливной воды на 2015 год

Система Р-6-1

Result: 3 Schemes instrumented, daily measurements and web accounting for water productivity assessments



Information Services: iMoMo Push Service via SMS

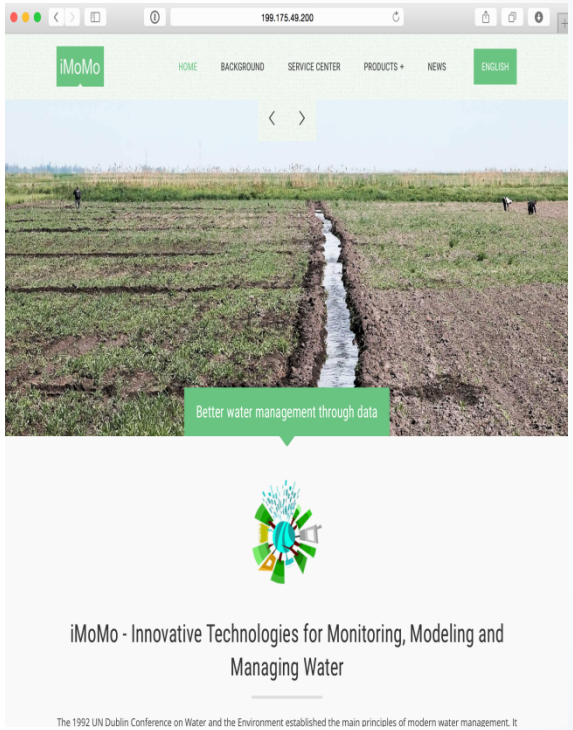
- Forecasts on expected water availability etc., inc. flows and reservoir level
- Advice on agricultural calendar and water demand estimates
- Weather and agro-meteorological information, including early warning
- Agro-economic market information
- All timely, place-specific and quality managed

Global iMoMo Initiative - Overall Conclusions

- Open-source, low-cost, high-tech technology innovations offer exciting new opportunities in hydro- and agro-meteorology for improving the data situation in water.
- These technologies should be developed and deployed in a place-specific context where needs are determining the particular monitoring and management technology choice.
- In conjunction with a global innovation HUB linked to the WMO, iMoMo solutions can be deployed in a timely and highly scalable manner.
- Technology diffusion and appropriation is made easier by existing institutions (formal and informal) which can benefit from them.
- Under any circumstances, institutional long-term support should be guaranteed by local i iMoMo Service Centers and Field Offices.

More Information available on the Web

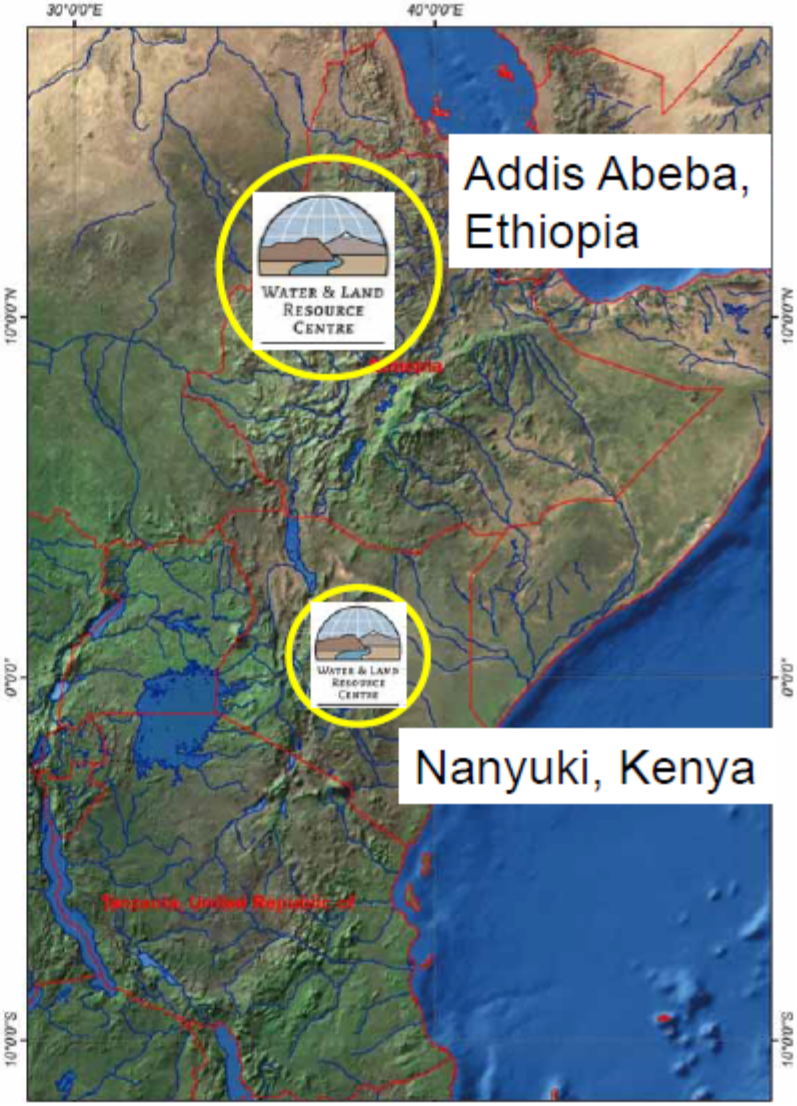
www.imomohub.org



Project context: WLRC – Phase II

Goal: Water and land governance and management is improved through knowledge generation and management….

- **Consolidation** of the Water and Land Resource Centres
- **Up- and outscaling of** products to national and regional/transboundary level



Key outcomes / outputs

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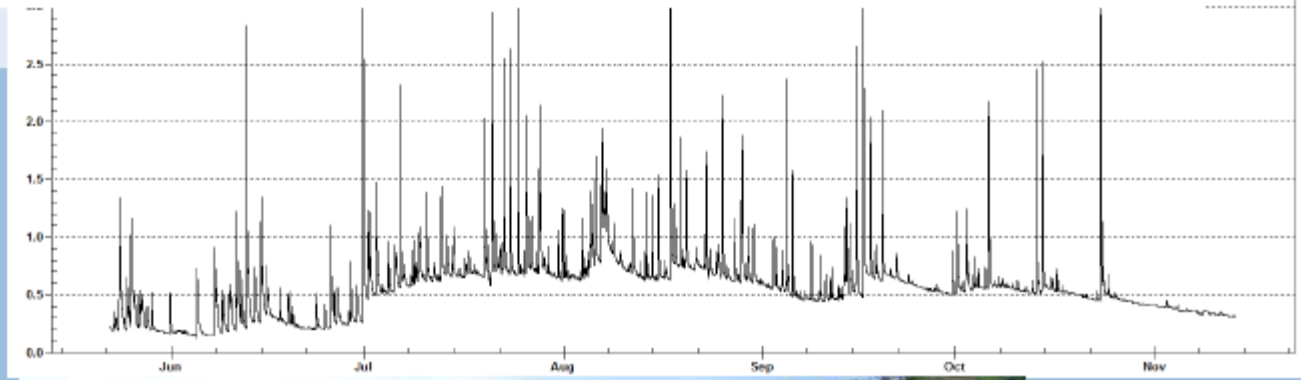
1 Knowledge generation	2 Knowledge for cross-scale policy dialogue	3 Outreach through capacity building
		

Data generation and integration into WALRIS

- Existing small observatories (3) and learning watersheds model cases
- Meso-scale observatories



Gerda Meso-Scale Observatory

Outcome 1: Knowledge Generation Ethiopia component

1 2 3

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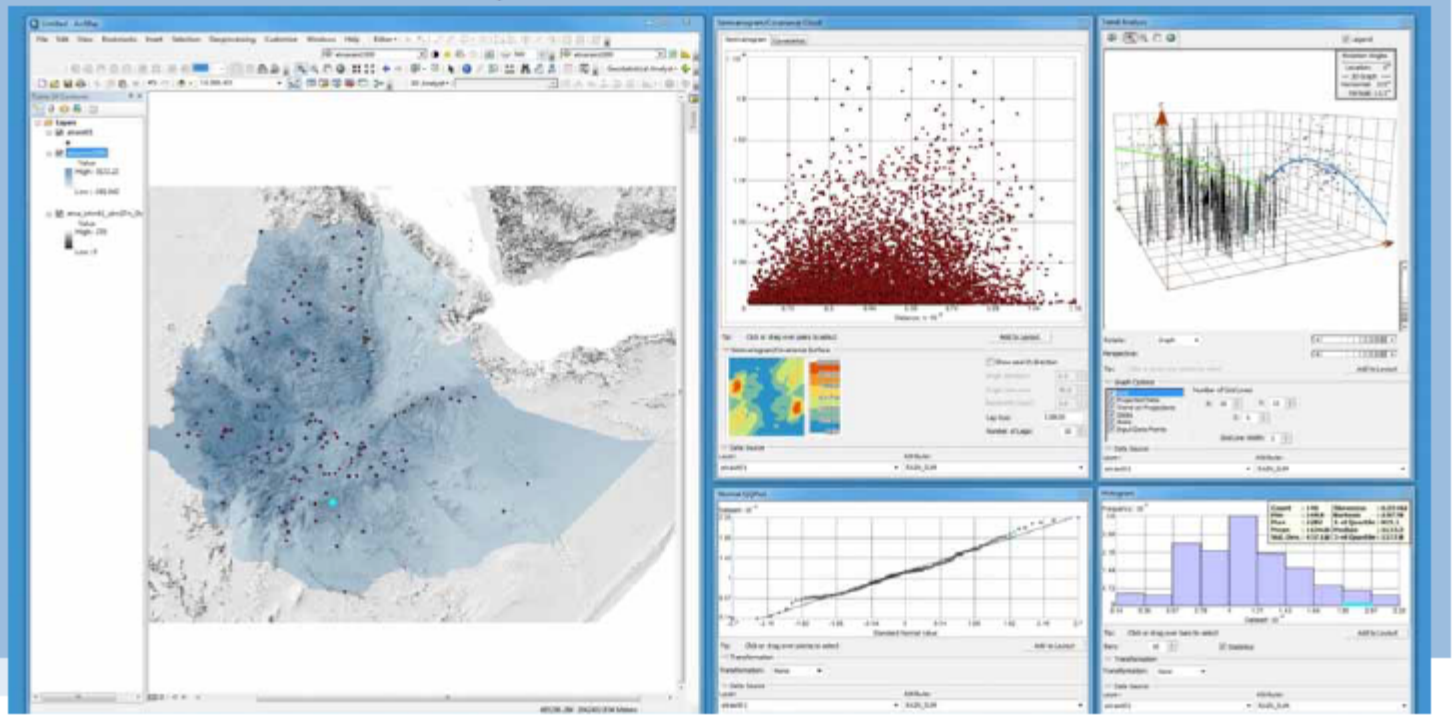
Specialised studies

- **Ethio-GIS-II**
  - Improvements of different layers (climate, water resources, land resources, soil, etc.)



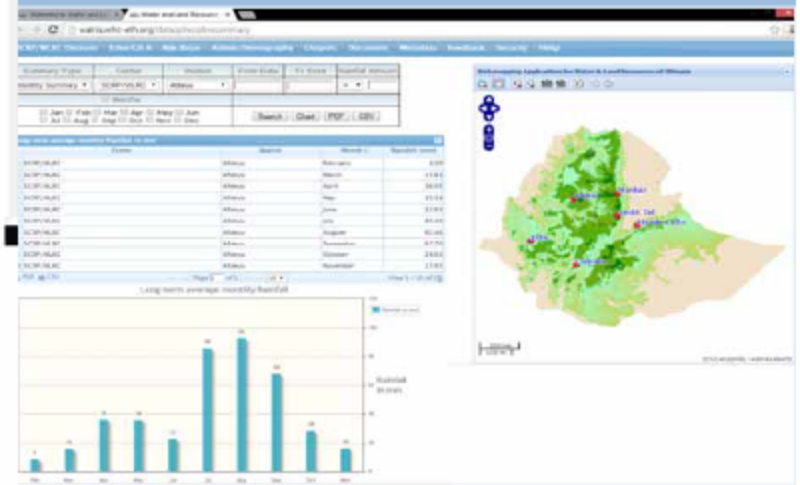
Outcome 2: Knowledge for cross-scale policy dialogue

Ethiopia component

1 2 3

WALRIS uploaded to web

- Used by different users
- Updated based on SDC / users comments



Outcome 2: Knowledge for cross-scale policy dialogue

Ethiopia component

1 2 3

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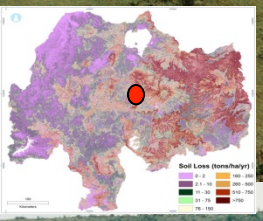
Learning watersheds

> as live learning platforms for policy makers, land users, researchers, extension, other projects

1984



Impact Monitoring

2010

1988

2006

Anjeni Observatory

Transformation in Learning Watersheds

Results

- Through its Learning Watersheds WLRC showed that:
  - Integ. Water and Land Res. Mangement (IWLRM) improves land productivity and livelihoods of upstream communities
  - IWLRM can also significantly reduce siltation of dams, increase base flow and enhance power generation
  - Overall regeneration of ecosystems