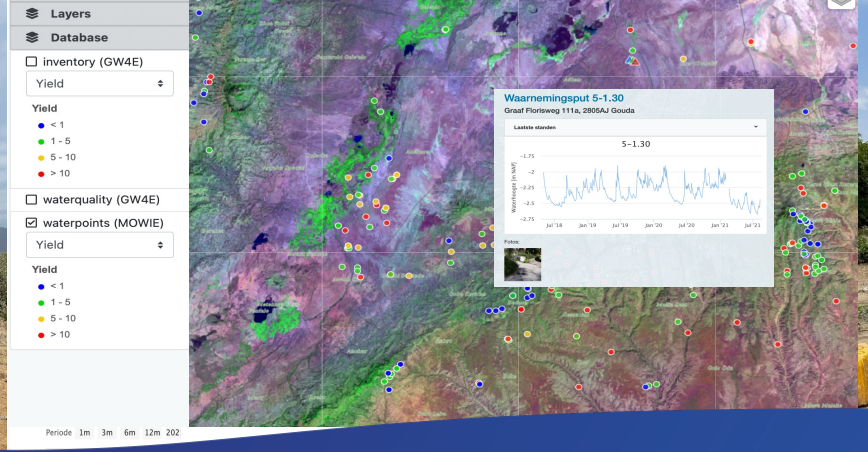


Hydrogeological Mapping for Climate Resilient WASH in Ethiopia – Lot 5

7 feb 2022

Validation Workshop Phase II

BDA/ICB/GW01/2021

Theo Kleinendorst, Arjen de Vries

aquacon ENGINEERING PLC

ACACIAWATER
www.acaciawater.com

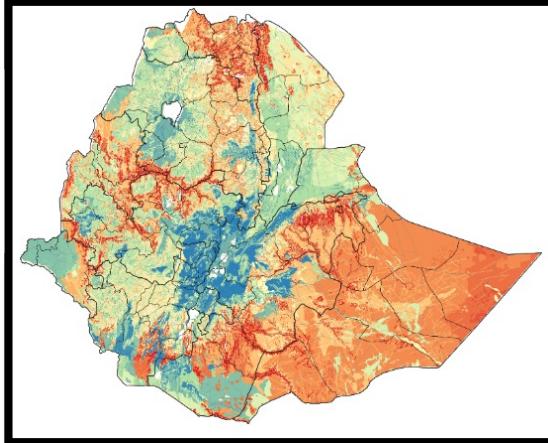
Content

- Objectives and activities
- Response to key remarks from inception phase
- Design
- Demonstration of database
- What is next
- Discussion

Key objectives

- Review existing groundwater information systems
- Develop a web-based platform
  - two-way information flow; storage and retrieval
  - Management system for outputs LOT1-4
  - test its operation
- Training RWB/ministry staff
- Migration of existing data into that database

The information should be reliable, complete, and stored in a well-structured database that is easily accessible.



Planning

LOT V	2021							2022		
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1. Phase I: Desk Study										
1.1 Assess and review the status and configuration of the existing NGDB										
1.2 Identify alternate sources of groundwater information										
1.2 Identify existing functional and non-functional components and system requirements										
1.3 Functional Design										
1.6 Draft Inception report										
1.7 Validation workshop										
1.8 Final Inception Report										
2. Phase II: System design and implementation										
2.1 Design and implementation of database stucture										
2.2 Design and implementation of front-end										
2.3 Design and implementation of validation protocol										
2.4 Migration and validation of available data										
2.5 Testing (unit, integration and system)										
2.6 User manual										
2.7 Release										
3. Phase III: Training and migration										
3.1 Training to BDA staff for the migration of existing information										
3.2 Data migration and support to BDA										
3.3 Final report										
3.4 Validation workshop and acceptance test										
3.5 Data and software transfer to BDA										

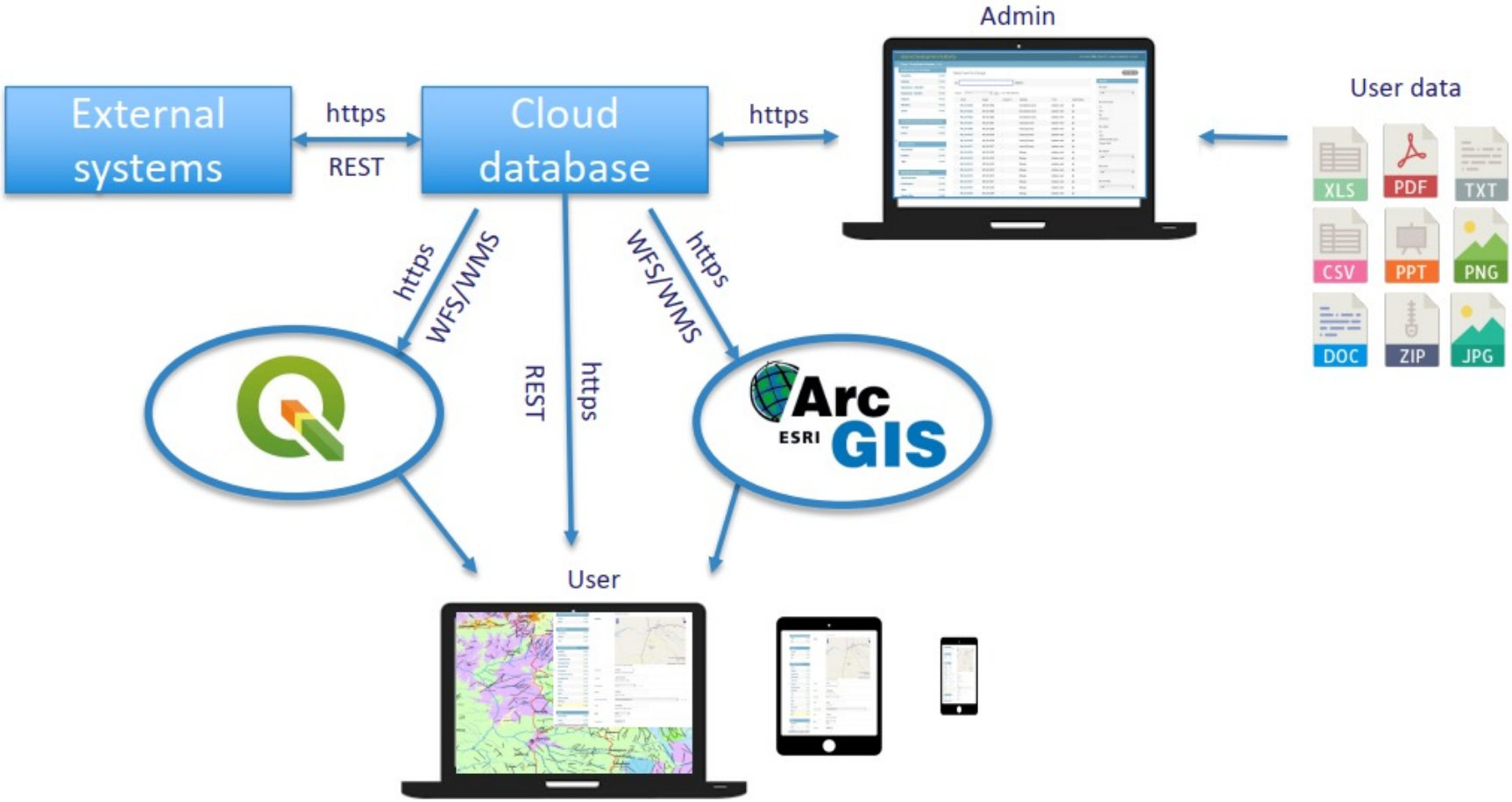
Some observations

- Parallel development of water resources database
  ➔ alignment for GW aspects crucial
- Challenges earlier initiatives:
  - Partly unvalidated data
  - Not all available data used/imported
  - High level of experience needed, not user friendly
  - Restricted access
  - Monitoring data missing
  - No formal database management procedures
  - Complex support and post-processing procedures
- The current system intends to avoid these challenges

Design principles

- Easy to use and accessible to different users
- Open source, cloud based, client-server
- Data store + Content Management System
- Quality and completeness of data
- Modular, extendable design (small is beautiful)
- Web API for exchange with external systems
- Off-line use
- Access through secure, encrypted SSL connection

system


Admin
External systems
https
REST
Cloud database
https
User data
XLS
PDF
TXT
CSV
PPT
PNG
DOC
ZIP
JPG
https
WFS/WMS
REST
https
WFS/WMS
https
ESRI
ArcGIS
User

Remarks inception workshop

- Compatibility with WR database
- Ownership and protection
- How to overcome connection issues
- Does it work offline
- Can new parameters in future be added?
- What linkages to analyses tools are possible
- Is it open-source code; will that work in future
- learned needed of old databases
- Linkage to national water inventory survey
- Expect issues with accessing from the cloud
- Who owns the data
- Why not use commercial software
- Other options than API
- Issues with hosting; who will pay

- Security
- Sustainability
- Compatibility
- Accessibility
- Ownership/authorization/hosting?

Design – back-end

Groundwater data

1. Waterpoint data (inventory data)
2. Well construction data
   - Casing arrangements
   - Screen setting
   - Pump details
3. Groundwater data
   - Well logs (driller's logs, lithological and geophysical logs)
   - Water samples and analyses
   - timeseries of quality and quantity
4. Pumping tests

Design – back-end II

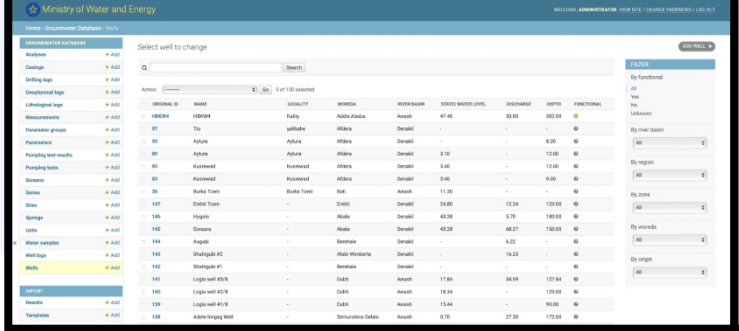
The back-end is also a datastore for other data:

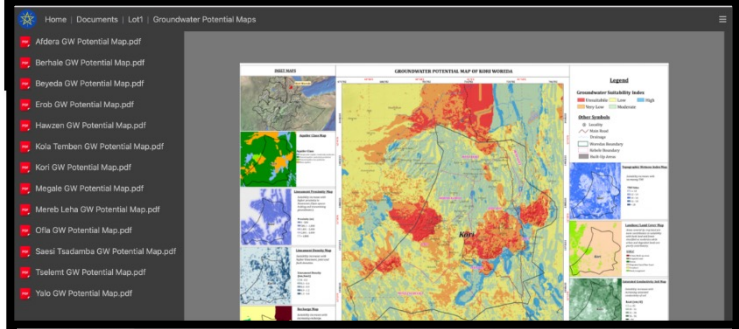
- Documents, spreadsheets, pictures, GIS files, etc.
- Administrative divisions (CSA, 2007)
- Map sheets (1:250,000 and 1:50,000)
- Map compositions for the map viewer

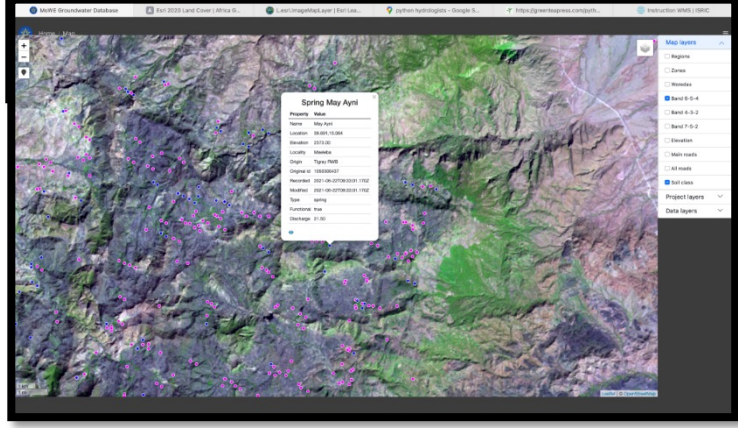
Front-end

Three main modules:

1. Database interface
   - Management
   - data entry
   - Querying
   - Import/export
2. Document repository
   - documents and maps LOT1-4
   - other relevant documents
3. Map viewer
   - interactive
   - Standard and project specific layers







What is next?

- Training on functionality of database
- Final documentation
- Database and related software transferred
- Short term
  - The target users to migrate their own data to the system
  - Staff of ministry and RWBs to work with database
  - Start developing institutional arrangements
  - Taylor database; look and feel of frontend, and database structure
- Medium term
  - Embedding database in organisation, including linkages with WR database
  - Management of system
  - Development of analysis toolset
  - Offline functionality for field purposes without internet

Support after project

In 2022 Acacia will:

- Keep the database up and running
- Provide support for the migration process
- Make a helpdesk available
  - to provide support to users and administrators.
  - a repository for change requests (RFC) and bug reporting.
- Update the database regularly and fix bugs

Do be discussed

Current project

- Front page design; look and feel
- Access rules / authorization
- Repository structure
- Database administration

Future

- Medium- and longterm activities/ambitions

Ministry of Water and Energy

Groundwater database

- Documents and Maps
- Map Viewer
- Database

Demonstration

Thanks for your attention

Feb 7th, 2022

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