

NOS 8-uur Journaal – gisteravond (11/5/2016) - over Zuid Sudan

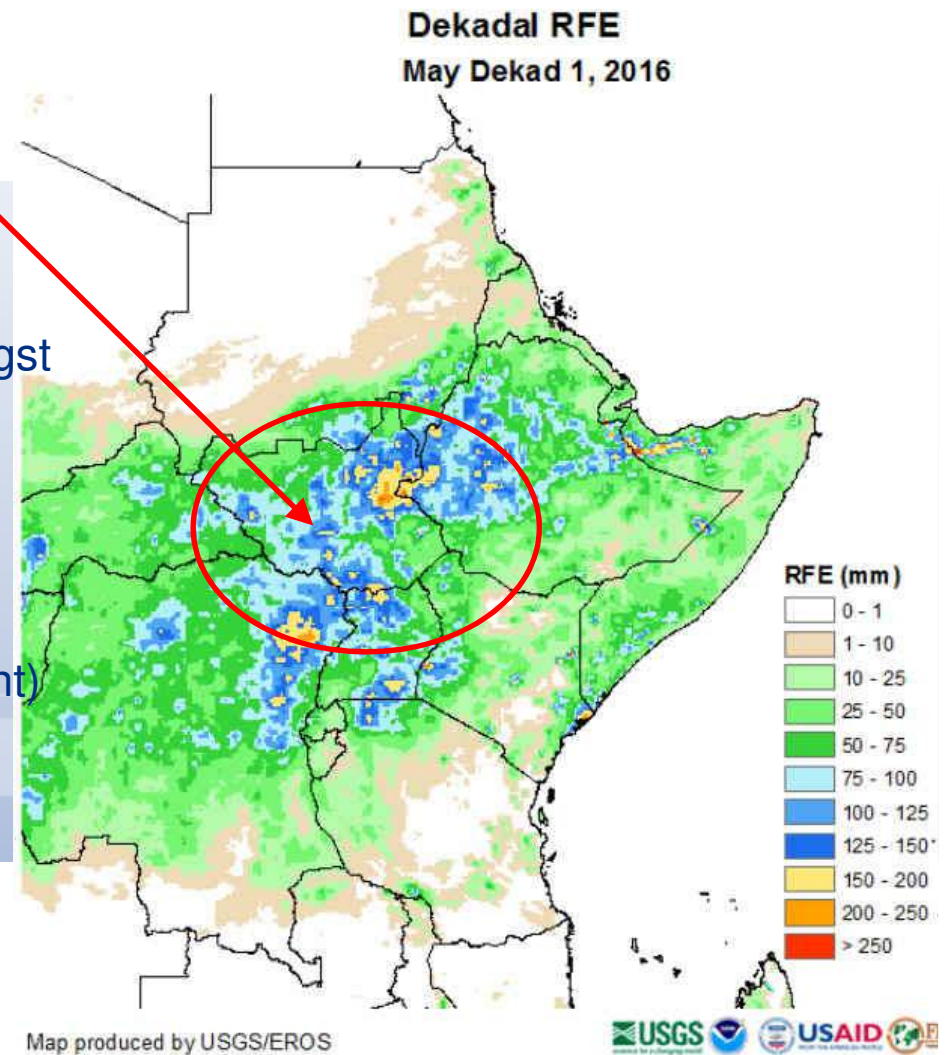
‘droogte’, ‘mislukte oogsten’, ‘voedseltekorten’



Echter op dit moment in 'Lakes State'
(Centraal Zuid Sudan)

- regenseizoen is gewoon begonnen in april
- oogsten dus pas over een paar maanden
- begin regenseizoen – periode voor de 1^e oogst
- is elk jaar meest voedsel schaarse periode
- Tussen 1 & 10 mei 2016: meer dan 'normale regen' in grootste deel Z Sudan

Onveiligheid (bewapende veehouders & conflicten), slechte economie (= geen koopkracht) & jaarlijkse 'free food aid' maakt het lastig voor boeren om voldoende land te cultiveren



International water consulting: from Afghanistan to South Sudan



International Development Division, Cambridge / Arnhem

Bart Goes - Hydro(geo)logist International Projects – May 12th, 2016



Contents – international water consulting

1. Reoccurring common experiences & ‘export of Dutch knowledge’
2. Helmand River Basin Master Plan Project, Afghanistan
Asian Development Bank / DFID-UK Aid
3. Water for Lakes State Programme, South Sudan
Netherlands Ministry of Foreign Affairs

International water management projects

reoccurring personal experiences from various projects

- Often in 'fragile' states → security constraints
- Often much 'historic' river flow & little groundwater data → surface water modelling (e.g. WEAP) & 'classic' hydrogeology
- Selection of local counter-part staff → key factor for success
- Sustainability beyond lifetime project → capacity building, budget for water ministries to continue?, role water users (communities & private sector), try to use license free / user friendly software
- Remote sensing → valuable in data poor areas but sometimes overrated expectations on accuracy of derived products (river flow, rainfall?) → reduced appetite with managers to support field monitoring

Integrated Water Resources Management - Does it work?

- National (remote) ministries with 'large new water infrastructure visions'
- Administrative Boundaries often continue to dominate in planning

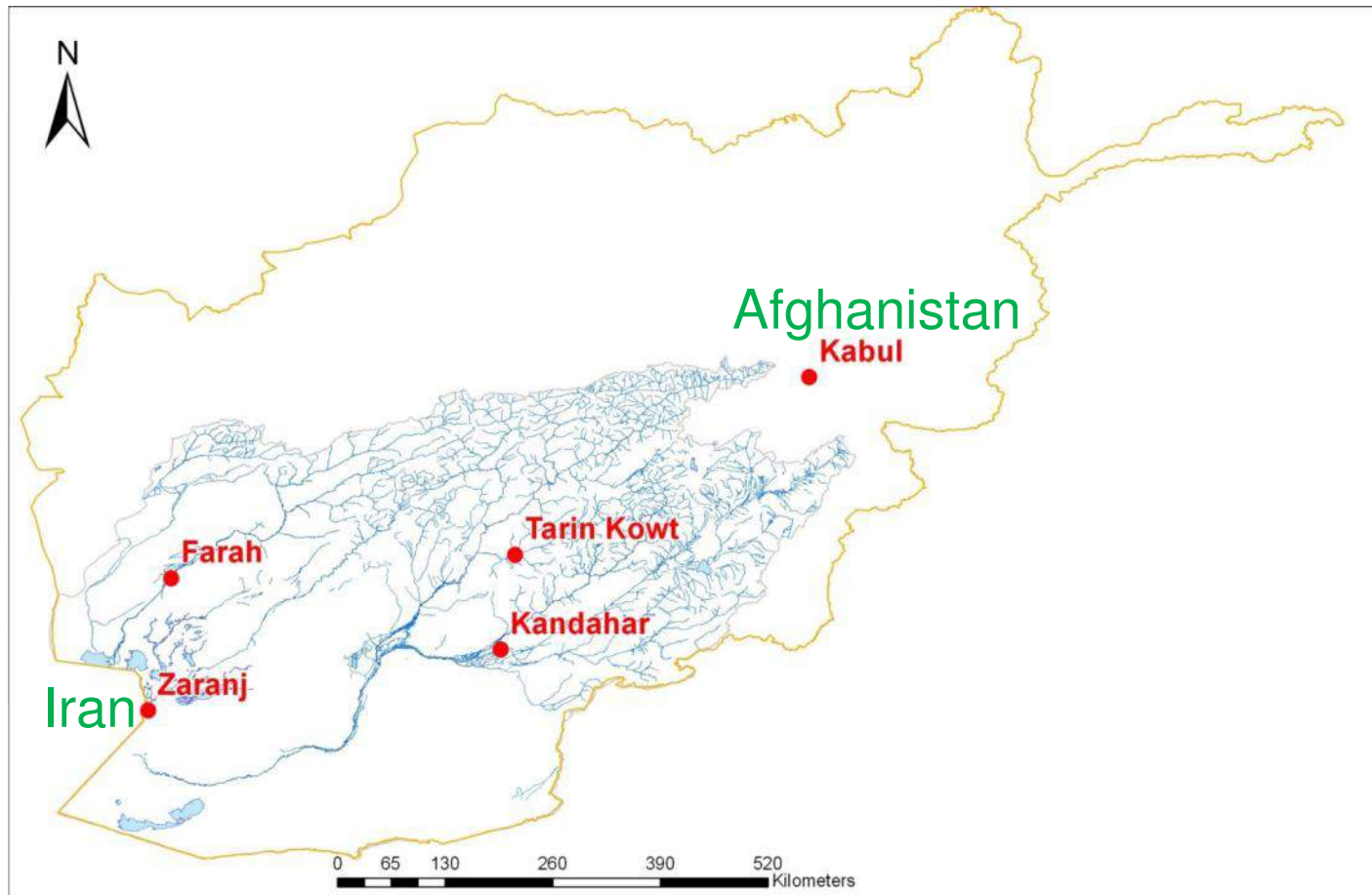
‘export of Dutch knowledge’

examples from various projects

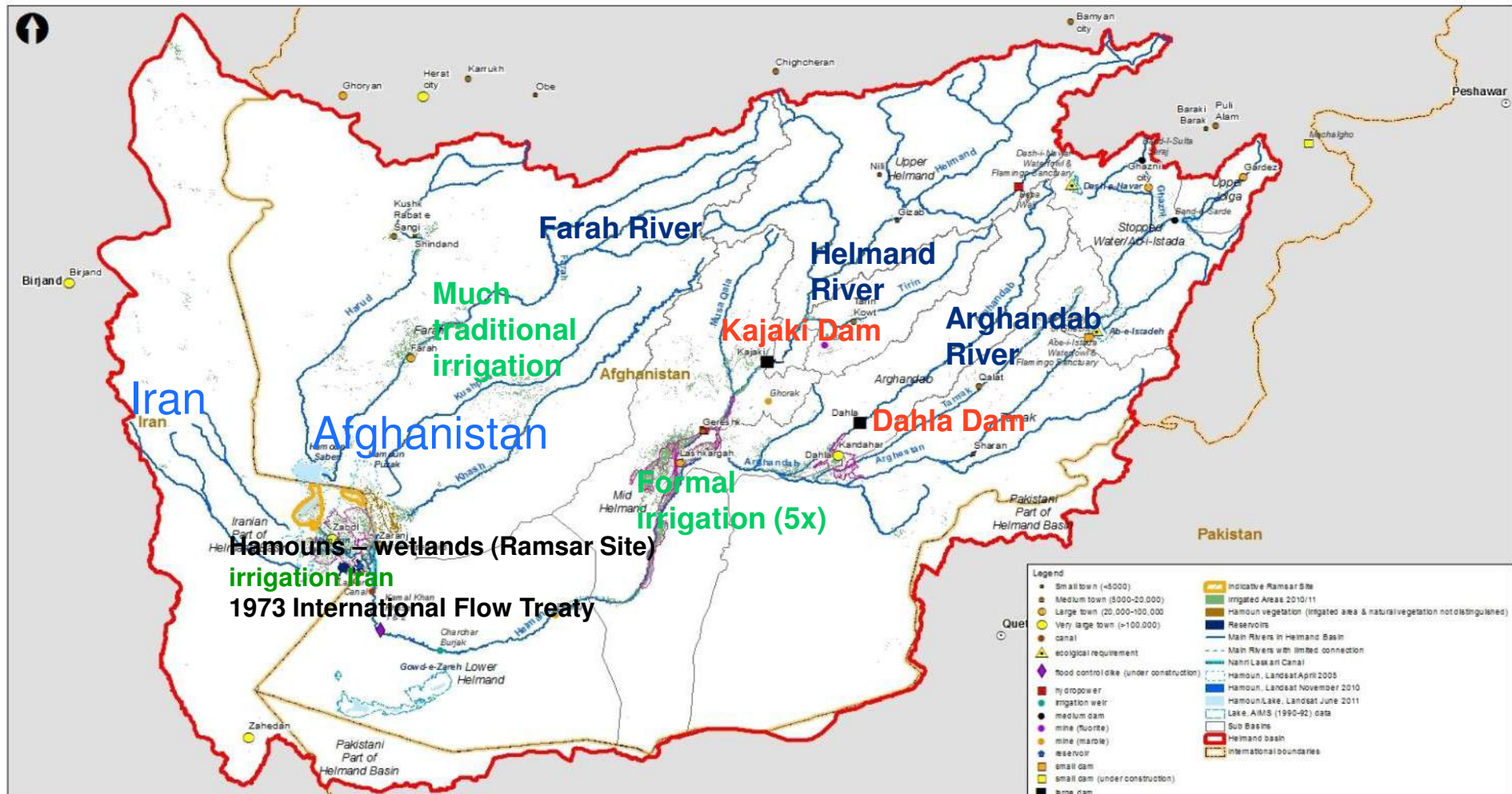
- **MLU software package** (Hemker & Post) - interpreting pumping tests and predicting drawdowns in an near irrigation boreholes (Bangladesh)
- **Blue Pump** – a robust relatively low maintenance hand-pump that seems to be more durable compared to other hand-pumps especially in areas with a deep groundwater table (South Sudan)
- Van Essen (now Schlumberger) **pressure ‘divers’** for monitoring river and groundwater levels
- Ambition to **integrate groundwater and surface water** (one expert)
- Priority Water countries set by Ministry of Foreign Affairs create collaboration opportunities for the sector (‘kennis-overheid-bedrijfsleven’)

Good experiences with openness of US based organisations (USGS, USACE) on sharing water related data, can we learn from them?

Helmand Basin in Afghanistan



Helmand River Basin - main water uses



Helmand River Basin Master Plan Project

~3 mln USD, July 2011 - Dec 2013

Client: DFID-UK Aid, Asian Development Bank & Ministry of Water (Afghanistan)

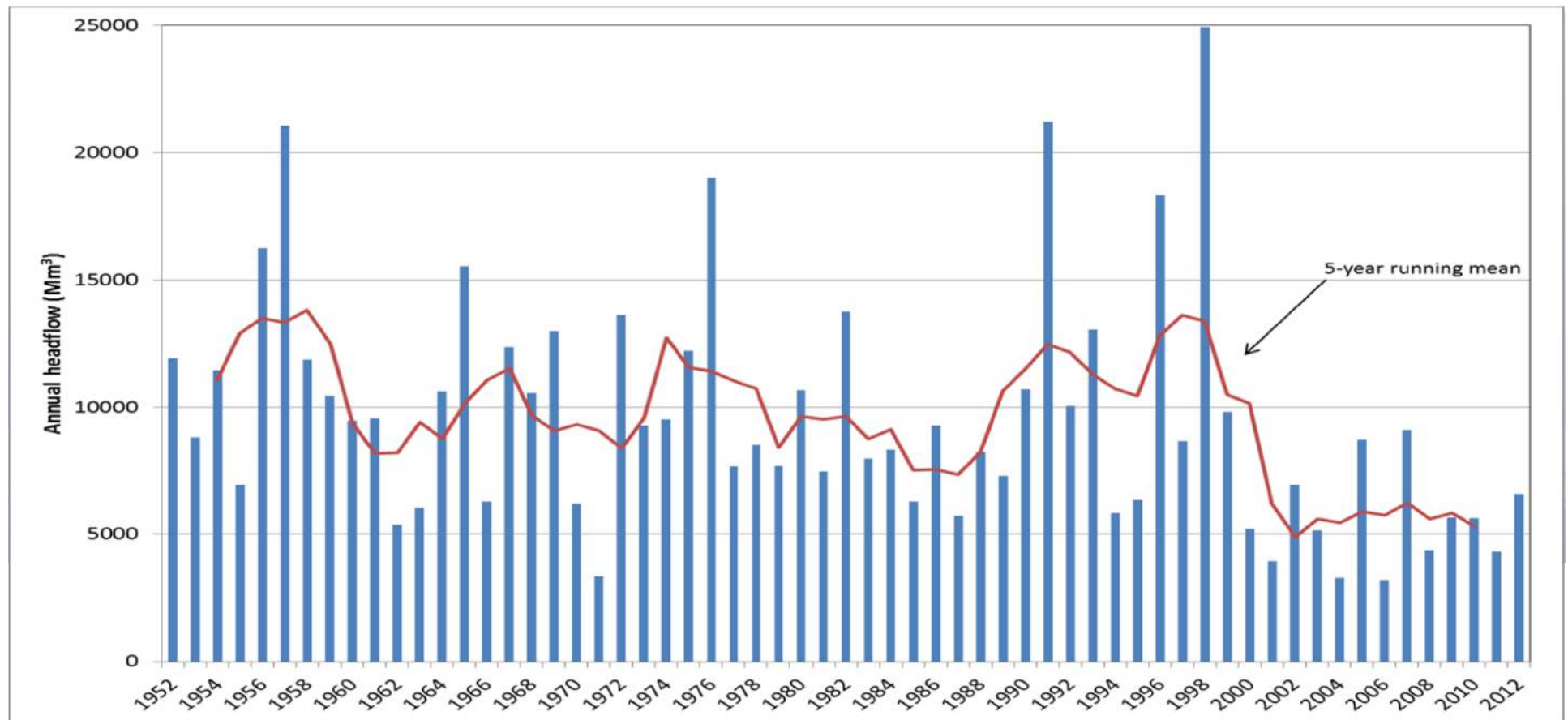
Aim: Improved management and development of water resources and irrigation in Helmand River Basin

Main outputs:

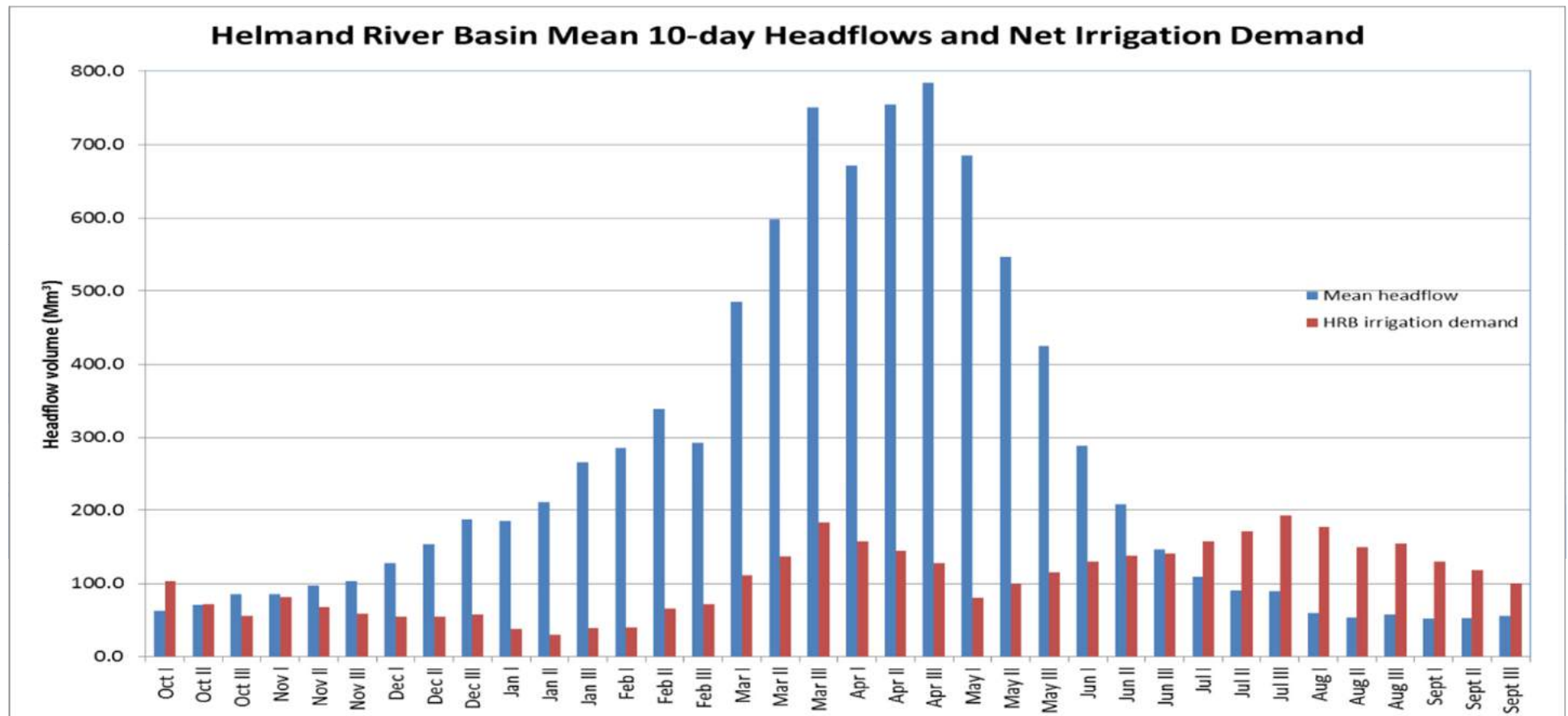
1. Capacity building water ministries (Helmand & Kabul)
2. Studies & surveys to support plan
3. Water allocation model (WEAP) for river basin planning
4. A Master Plan for Helmand River Basin to guide prioritising and 'scaling' water related investments

Inflow (1952-2012) all main rivers - Helmand Basin

Note: post 1980 simulated with a Rainfall-Runoff Model



Seasonal variation: **mean river flow** (1952-2012)
on-farm irrigation demands (2010/11)



Summary current situation - Helmand Basin

- >97% of river water abstracted is for irrigation
- Long-term river flow (1952-2012): much surface water available, recent river flow (1999-2012): little water available for additional uses
- Storage decline: reservoirs (siltation) & snow (predicted temperature rise)
- Sufficient new land available for irrigation
- **Potential new net irrigation area on surface water calculated** but assuming additional storage & using long-term mean
Helmand River: 15-50 kHa, Arghandab River: ~6 kHa, Farah River: ~14 kHa
- Some formal irrigation projects affected by salinity
- >50% of karezes (groundwater fed tunnels) no longer functional
- Groundwater use developing rapidly but little data (sustainable?)

Helmand Basin Master Plan - project selection

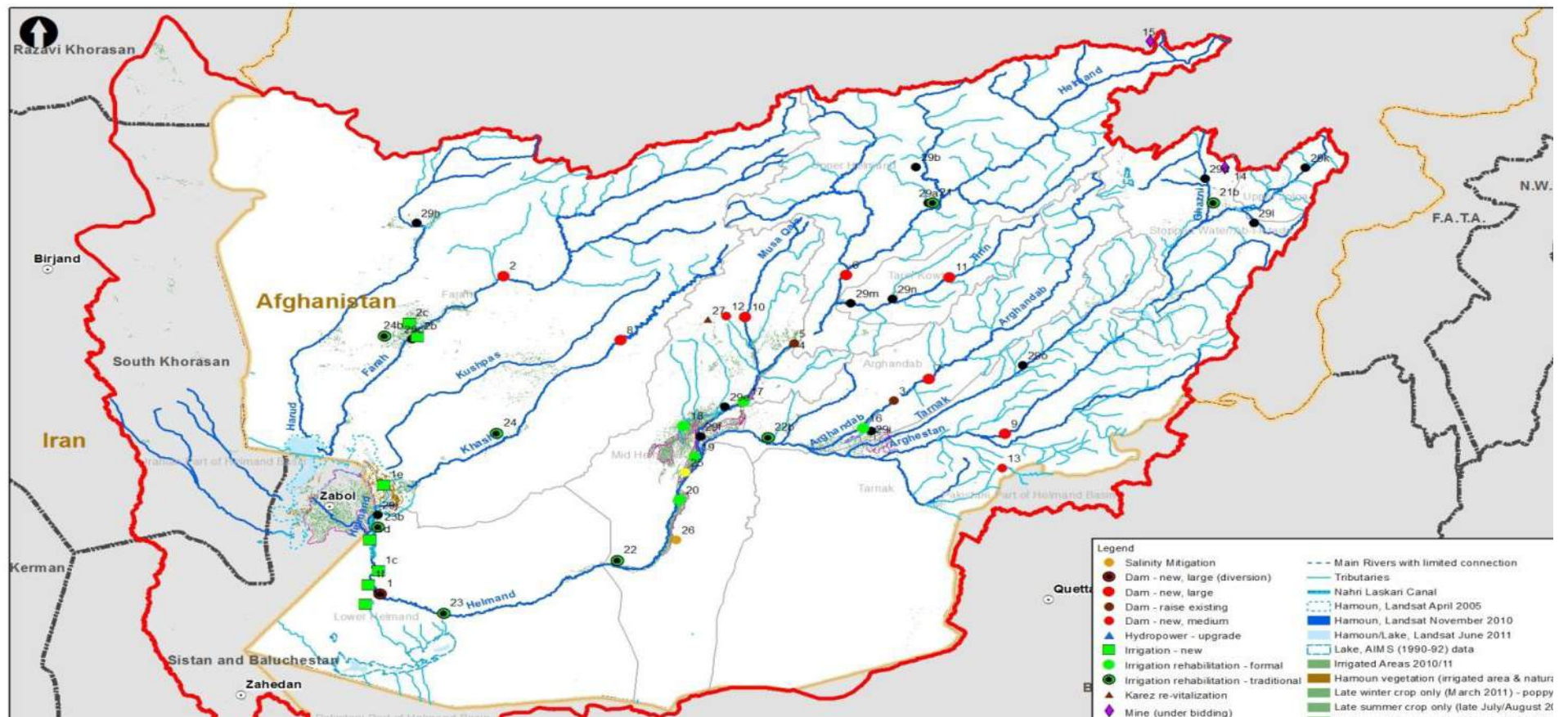
- **Long-list:** ~430 water projects have been proposed for Helmand Basin
- **Shot-list :** selection of ~30 projects (based on stakeholder consultations) for detailed evaluation

Types of projects: new large and small dams, raise existing dams, hydropower, rehabilitation existing irrigation projects, pilots (salinity mitigation, improved operation existing structures)

Multi Criteria Analyses (MCA)

for shorted listed projects with stakeholders determining weights.

Short-listed 30 projects for evaluation



Looking back

Impact Helmand Master Plan Project

- Continued wide support (including funding) for raising of Dahla Dam – potential benefits widely recognised
- Limited national political support for investing on improving efficiency of existing formal irrigation schemes
- New project with high political priority – water allocation model is getting recognition to support a project planning scale that fits the water resources availability better

Current caution:

- A new (2015) remote sensing 'water accounting study' grossly (>50%) overestimates river flow → can raise unrealistic expectations



Programme for the Water Sector between
South Sudan and the Netherlands



Water for Lakes State

Implemented by:

Euroconsult Mott MacDonald



Mott MacDonald

MINISTRY OF PHYSICAL
INFRASTRUCTURE
LAKES STATE
DEPARTMENT OF WATER
SUPPLY AND HYDROLOGY
Bahr el Jebel Water
Bahr el Jebel Water
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Water For Lakes State Programme

Aim: stimulate economic development in Lakes State (South Sudan) using water as an entrance

Focus components:

1. People (WASH)
2. Livestock
3. Agriculture
4. Fish & habitats
5. Integrated Water Resources Management (IWRM)

Water for Lakes State Programme

partners, time & budget

- Netherlands Embassy in Juba (donor)
- Ministry of Electricity Dams Irrigation and Water Resources (Juba)
- Directorate Water, Sanitation and Hygiene - Lakes State (main counter-part)

Time - 5 year programme: Nov 2013 – Dec 2018 (pending mid-term review)

(actual start May 2014 due to Dec 2013 fighting)

Total budget ~**30 mln Euro**

Bulk of budget for drilling new and rehabilitating existing boreholes!



Lakes State Overview

Dry-season vegetable farming along Lake Yirol

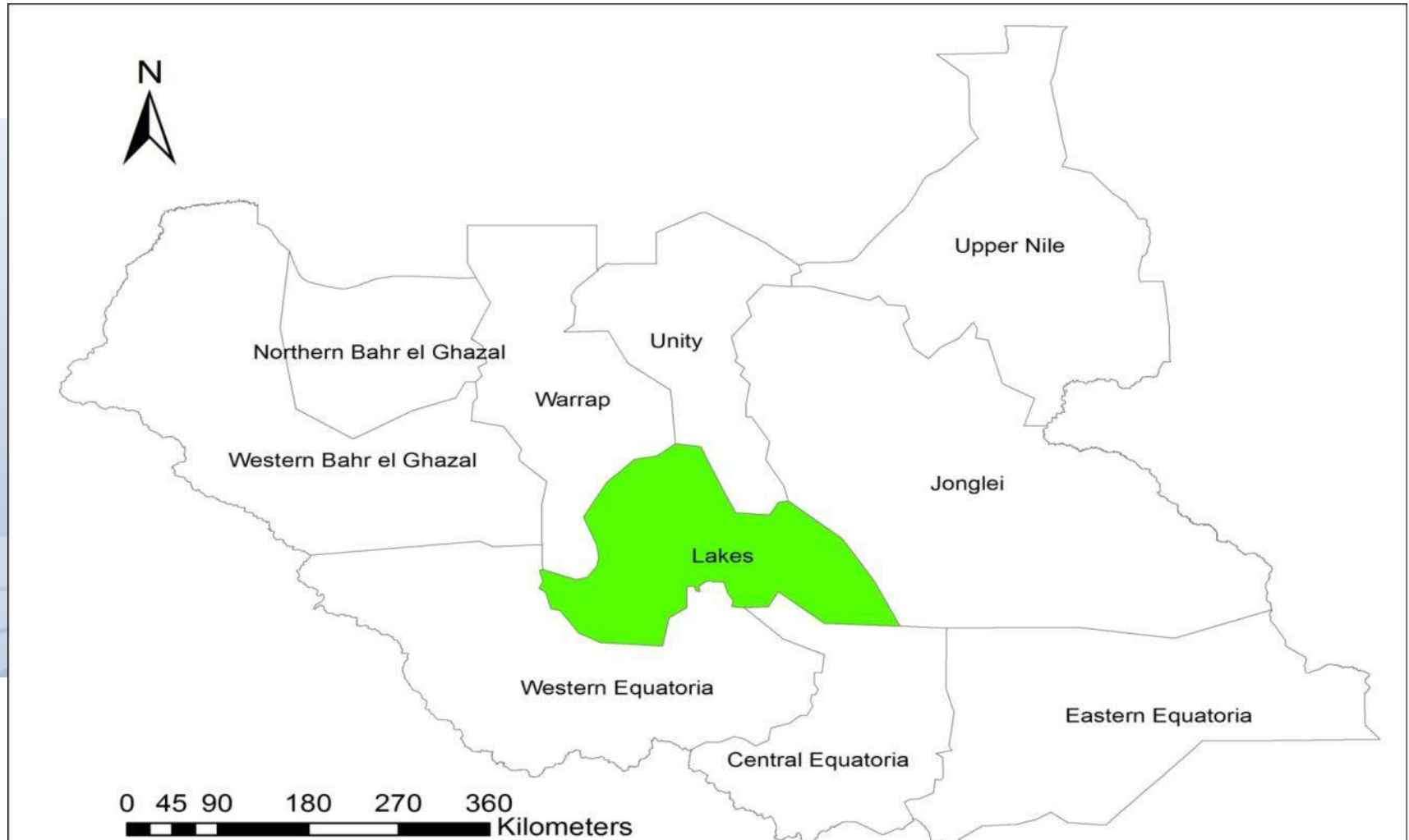




South Sudan – White Nile



South Sudan – ‘former’ States

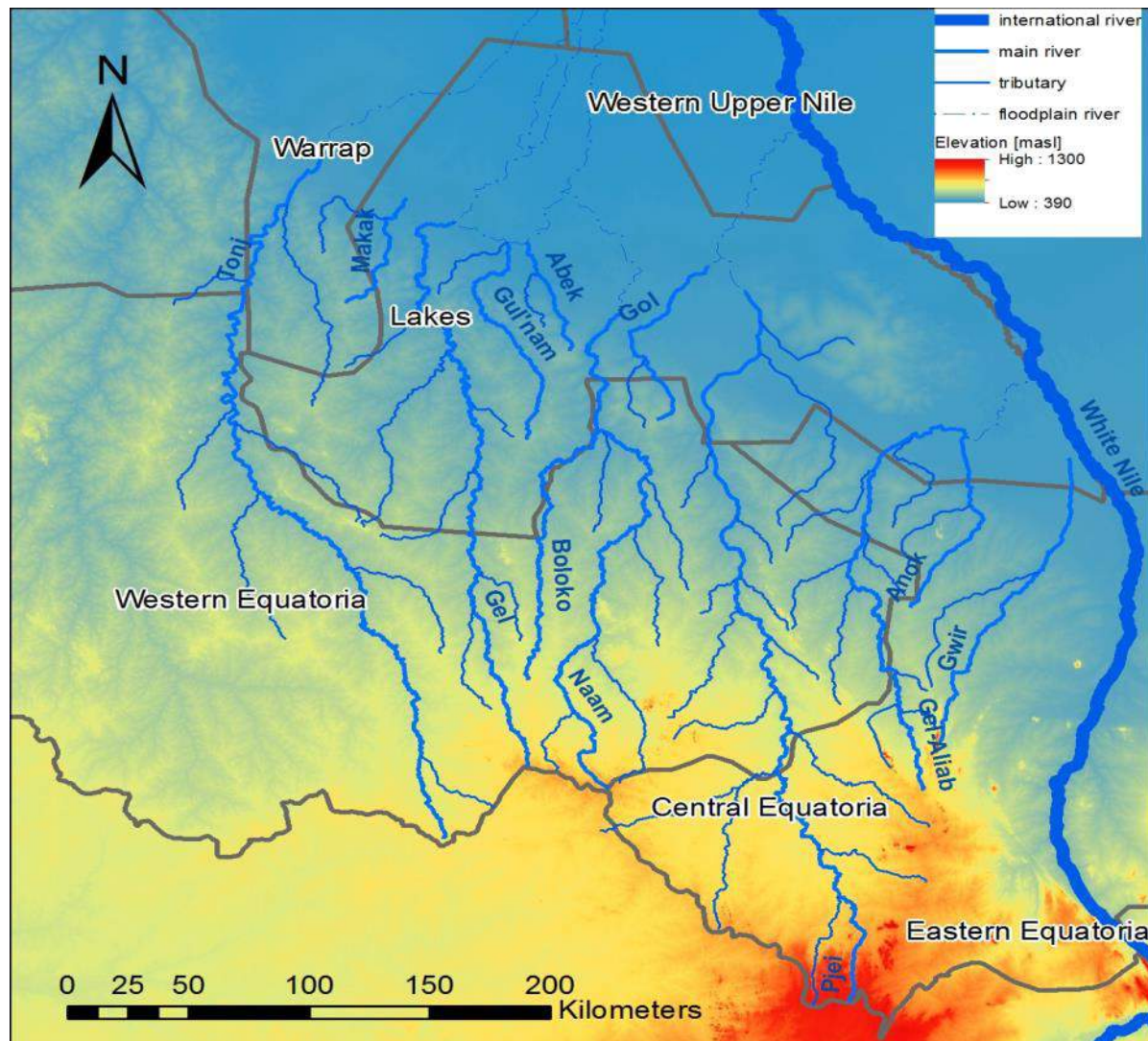


Lakes State – characteristics

- Modest population: ~1 million on a large area 43,500 km²
- Limited water infrastructure (~1750 public boreholes)
- ~1.3 million cattle (FAO, 2014)
- Livelihood: crops (33%), livestock (25%), casual labour (11%), salaried work (8%) (FAO, 2014)
- High poverty & low literacy
- Poor accessibility in peak of wet season (~5 months), no hardened roads
- Poor Operation and Maintenance culture: partially caused by years of aid programs (free hand-outs)
- Insecurity: Kalashnikovs omnipresent, culture of 'revenge killings', cattle raids & internally displaced people from other States

But ... abundant rainfall (900-1400 mm/y) & abundant fertile lands



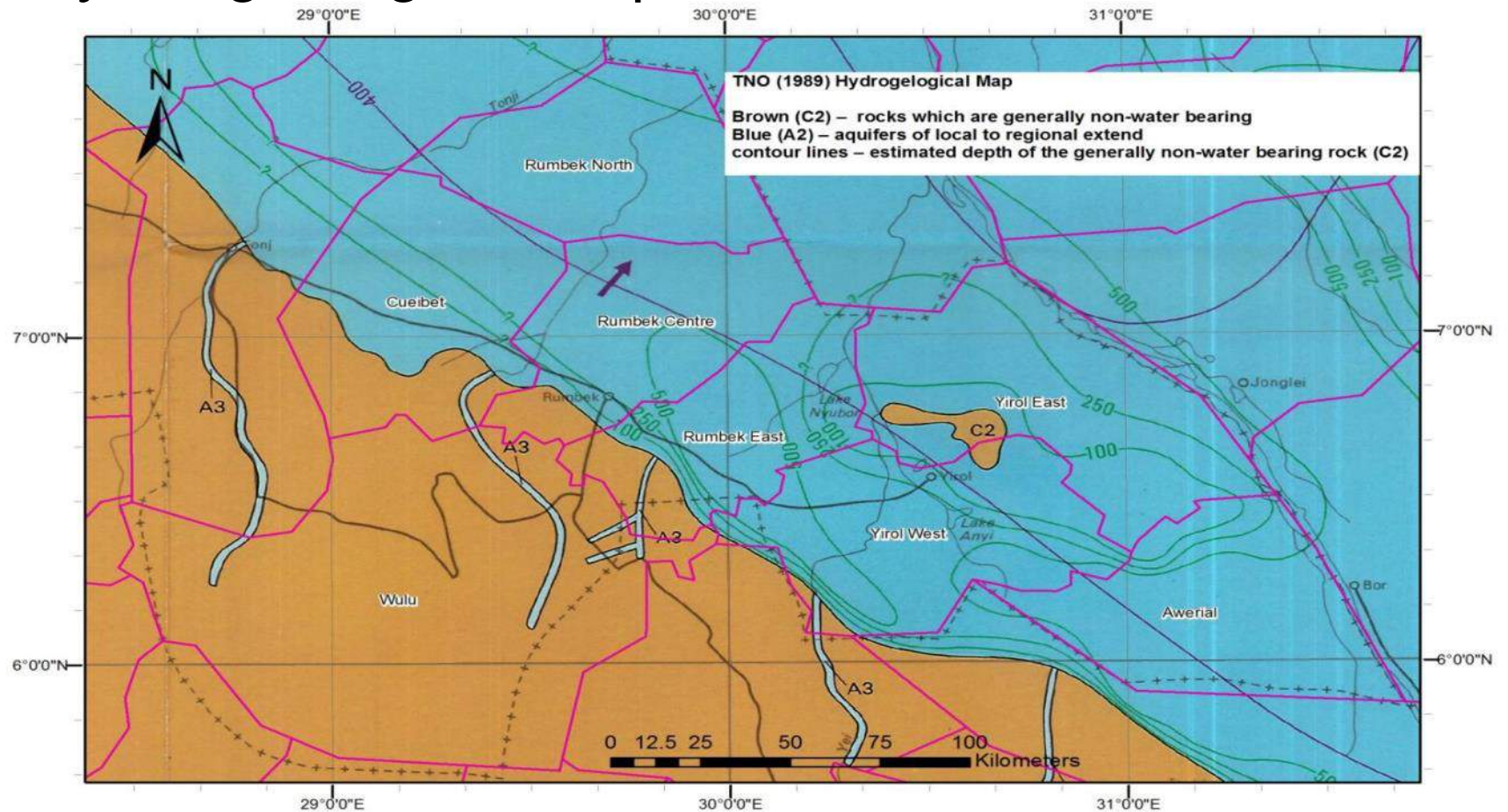


Watersheds
don't coincide with
admin boundaries

Going to field too soon after wet-season



Hydro-geological Map – zoomed into Lakes State



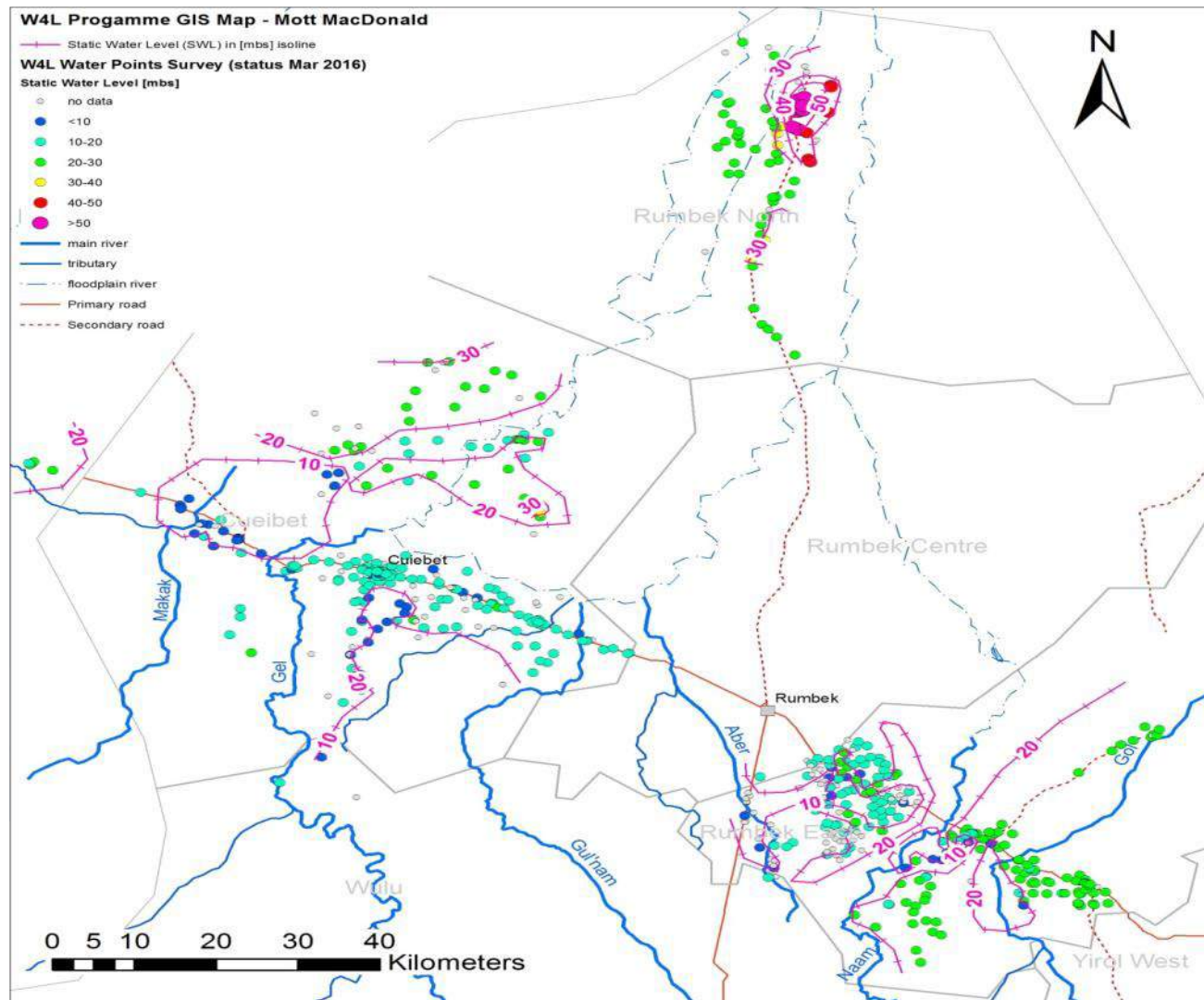
geo-electrical surveys for new borehole siting in areas with shallow Basement Rock



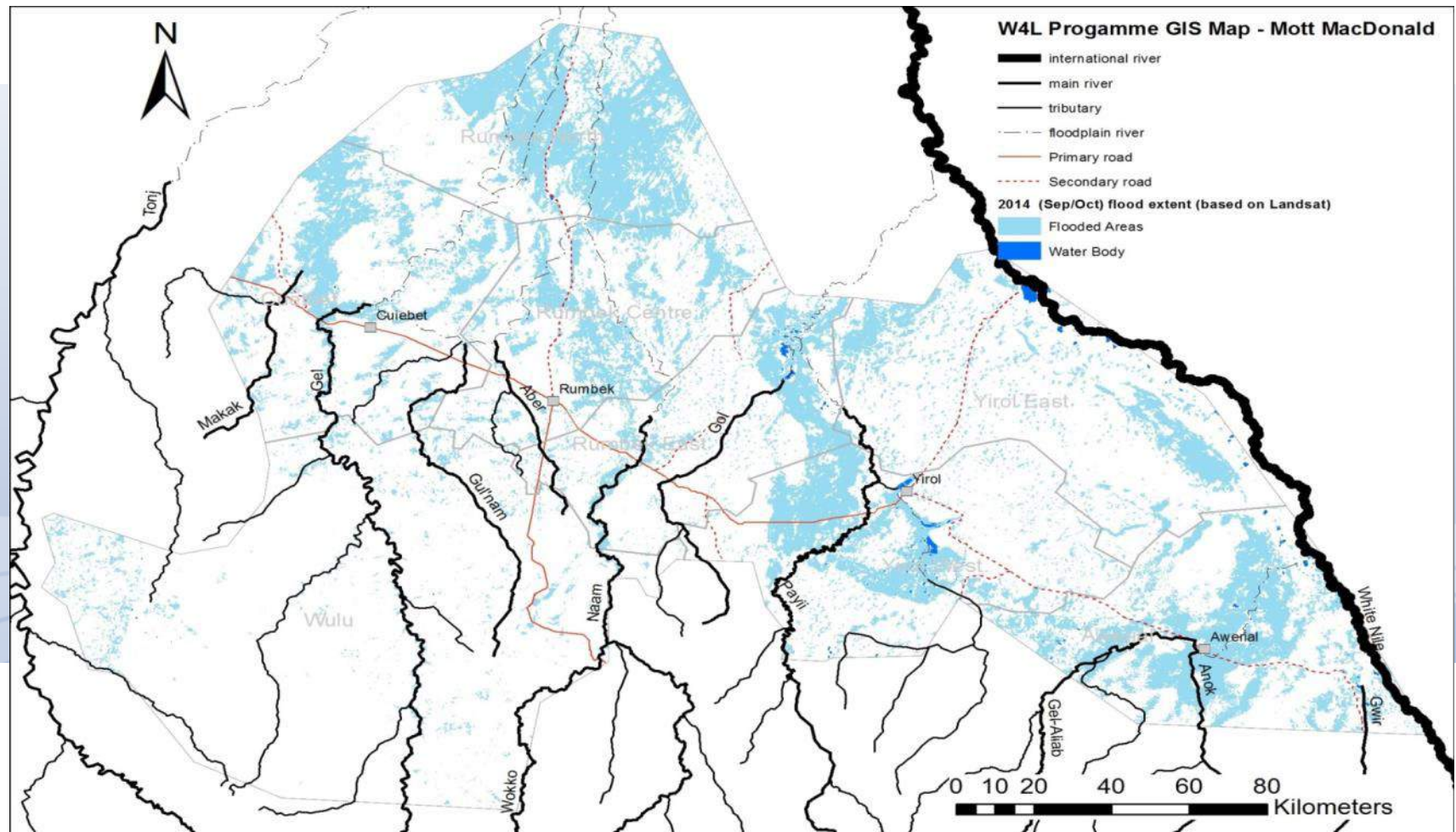
‘single well’ pumping test in the field



Mapped groundwater table depth



2014 wet-season flood extent mapped - Landsat



A crowded hand-pump

40% of payams ('municipality') have on average >1,000 people per water hand pump



Water for Lakes Project – progress water resources work

- Hydrogeology straight-forward (locating aquifers, sufficient recharge)
- Knowledge base for borehole locations & drilling (e.g. geophysics, pumping tests)
- Bulk of work is done by national staff
- Surface water monitoring at a modest scale

Some of the challenges:

- Equal distribution of new boreholes according to administrative boundaries?
OR boreholes in areas with 'longest cues' (>1,000 people per hand-pump)
- Sustainability Operation & Maintenance of boreholes
- Extreme inflation: +245% from March 2015 to March 2016 → Water User Committees fee collection, deflation salary government staff