

TRANSFORMATIONS IN SPATE IRRIGATION IN WADI SIHAM

HOW WATER CONTROL IS MOVING UPSTREAM

Linden Vincent,
Irrigation and Water Engineering Group
Wageningen University, The Netherlands

PRESENTATION

1. HOW THIS STUDY WAS DONE, LEARNING FROM THIS

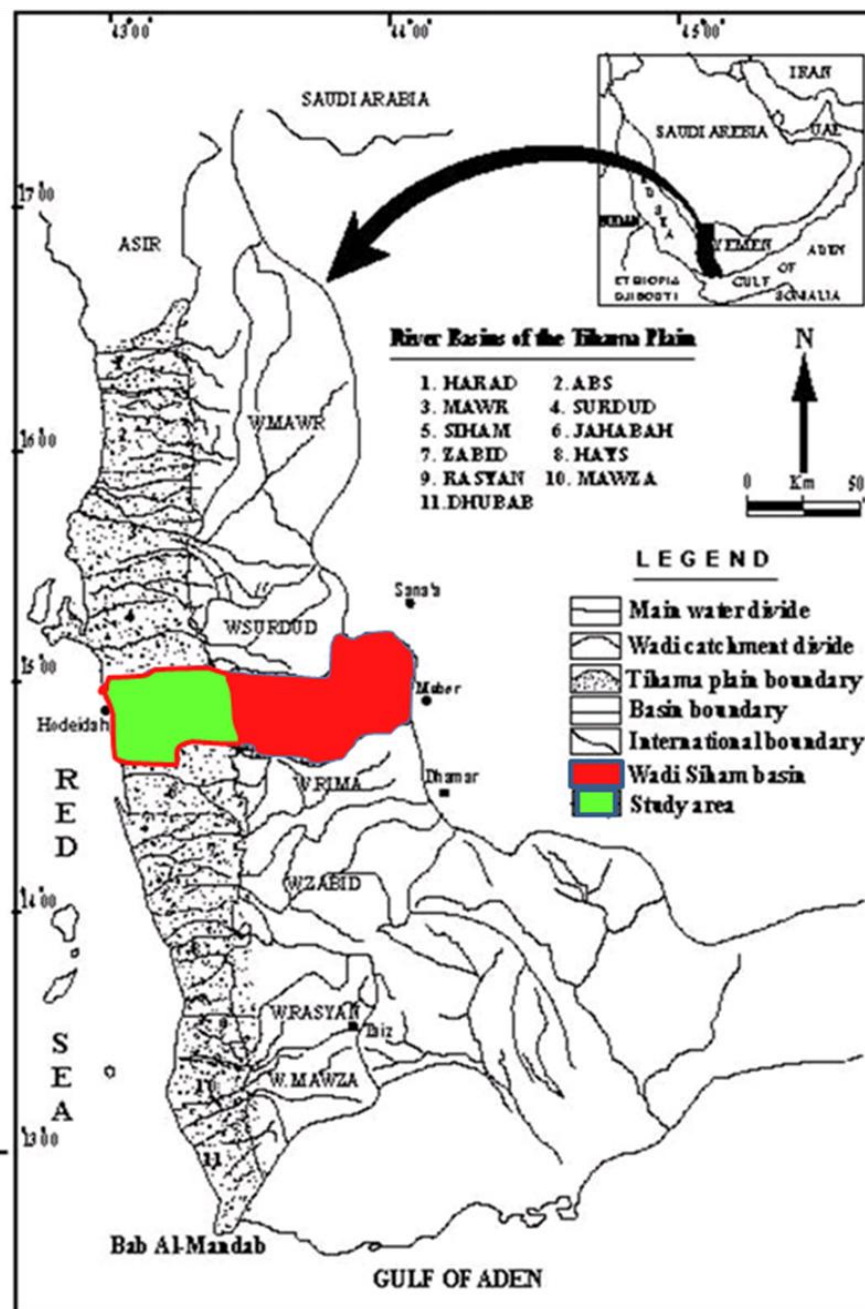
Thesis study done by 2 European MSc students with an international NGO, fieldwork with in 3 month period in 2009.

2. PROBLEM CONTEXT OF STUDY:

Spate irrigation as a unique 'traditional' irrigation approach, being reshaped by opportunities and threats. What have been the changes in access to water and why?

3. WHAT DID THIS STUDENT RESEARCH APPROACH SHOW?

Description of problem contexts and possible options different from 'blueprints'



Research for this study

2 MSc students (IWRM), working with French NGO

1. Defined clear, 'do-able' research question, relevant for time, methodology
How and why have patterns of water control evolved over time and space within water networks in the area of the Wadi Siham Irrigation Project?
2. Worked with a conceptual framework that opened up study of technical and social features
3. Wadi-wide view for research with detailed site studies later, helped understand spatial interactions
4. Committed emphasis on fieldwork, travelling with translators/counterparts even twice a day into the wadi, almost every day
5. Presentation of findings to local groups of farmers for reactions, as well as talking with agencies

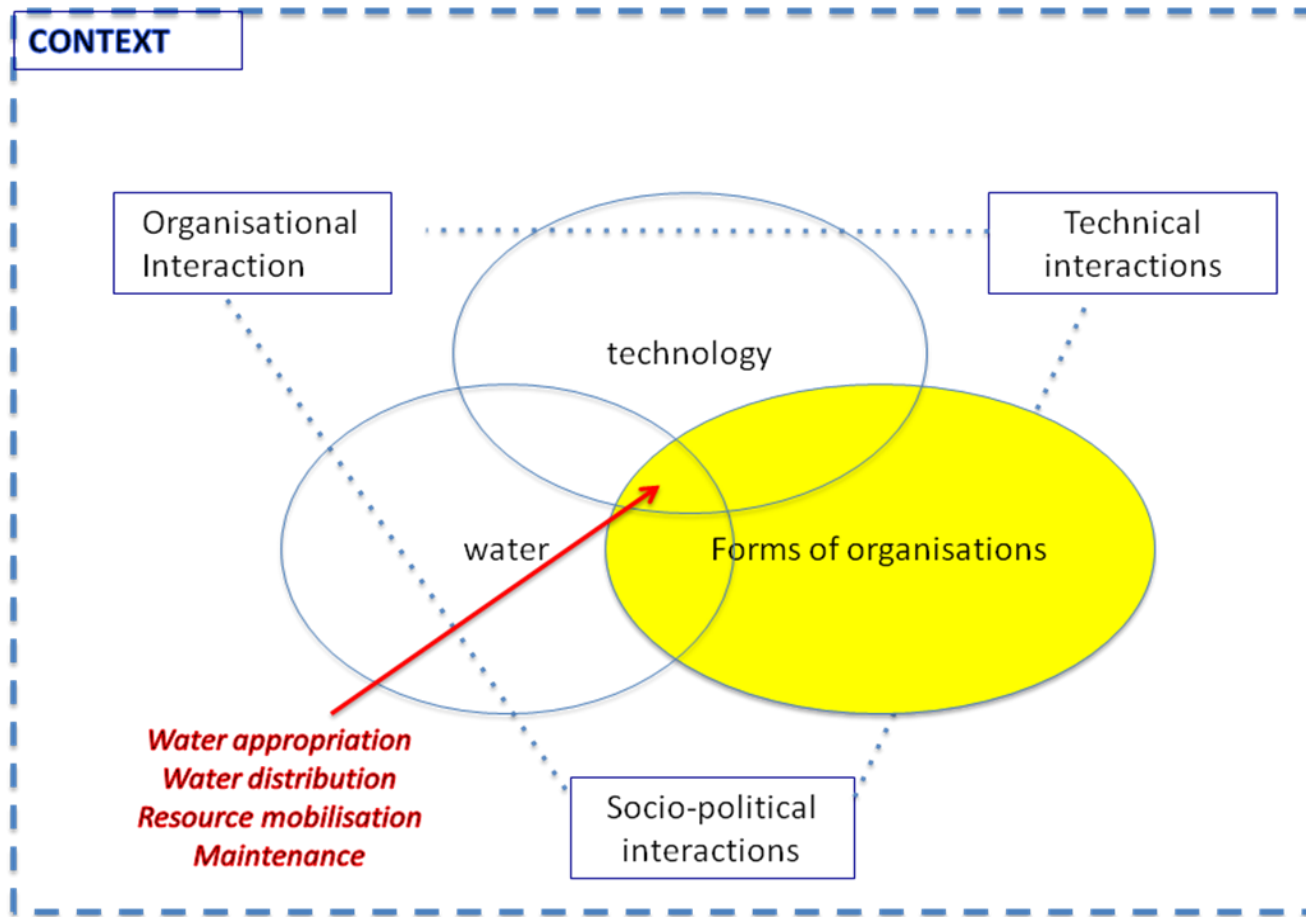
FIELD RESEARCH METHODS

research methodology for interdisciplinary study

- i. Collection of maps, designs and other secondary data, interviews with state organisations, first rapid study of the wadi and its infrastructure 2-3 weeks: from this:
- ii. Detailed work in 3 zones: mapped villages, irrigation infrastructure, and crops, interviews with local groups and farmers – helped reconstruct the history of the wadi (One month)
- iii. For study of viability of potential new initiatives, detailed fieldwork with interview in local canal areas – upstream and downstream, collective and private (2-3 weeks)
- iv. Three workshops with farmers that assessed current situation and water management reforms (2 weeks)

Some 150 interviews in the wadi: mainly male: aimed for a cross-section: old families and newcomers, local and external landlords, small and large farmers, authority figures and local water users

Conceptual framework for research water control, water networks



Spate irrigation

Floods are a resource, recharges aquifers
BUT
variability and uncertainty in time & space:

Destructive power affects construction

Valued fine sediments fertilise lands but
coarse sediment and rock damaging

Needs clear rights and entitlements

Authority to supervise maintenance and
(re)construction

Open to emergence of inequalities

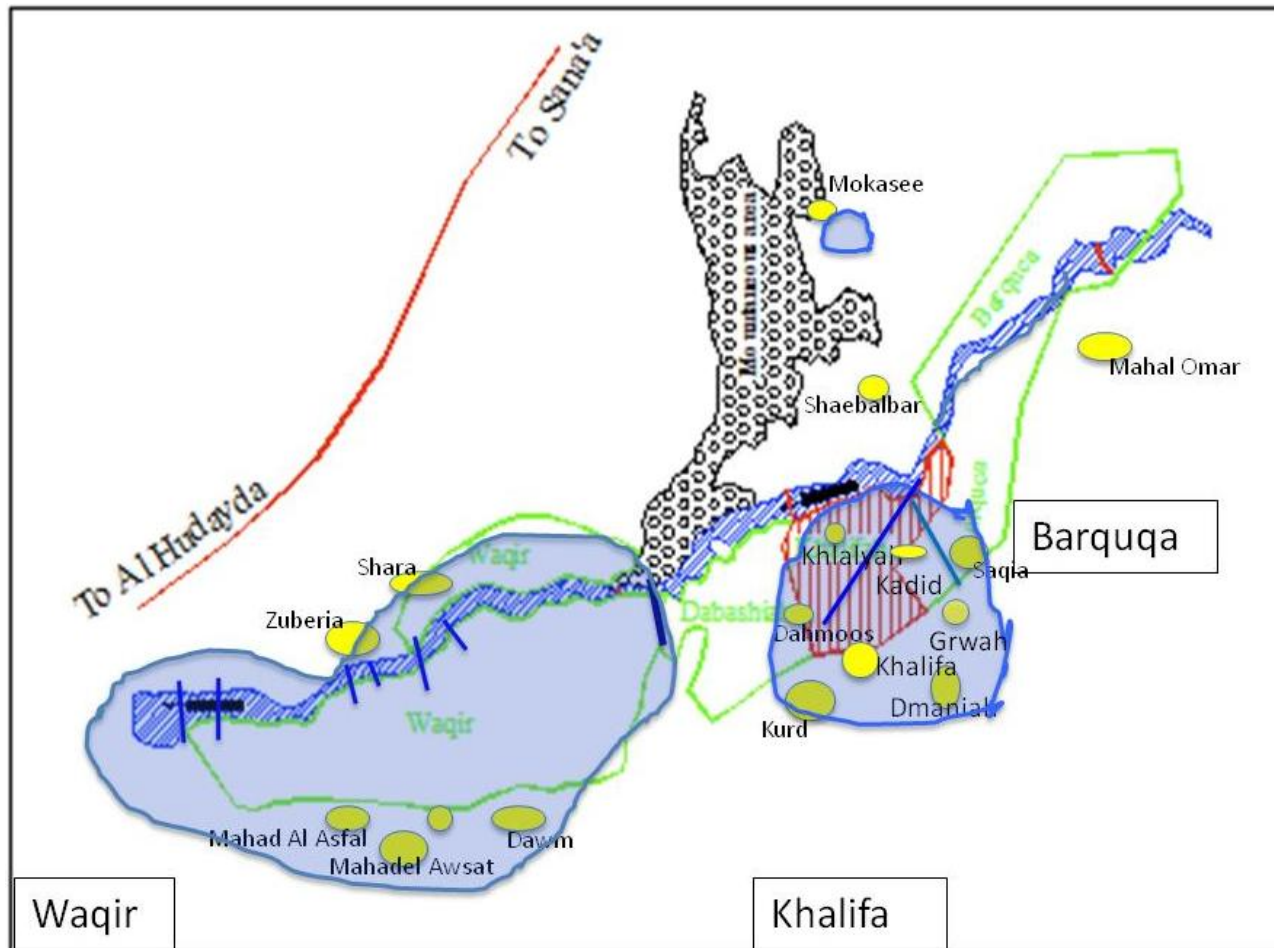
Particular needs of authority to manage

- **Very diverse forms:**
 - **Uncontrolled systems:** without permanent structure at the headworks or within the system to control water and sediment flow” and managed by farmers.
 - **Controlled:** have permanent structures, designed to give greater diversion and control capabilities, larger, managed by a public agency, which directs their operations and management at primary level.
 - Key developments of control – permanent works, GATES
 - **OVERLAPPING FORMS** (not normally ‘seen’ or documented) – situation in Wadi Siham.

Original irrigated area until the mid-1960s

locally developed structures

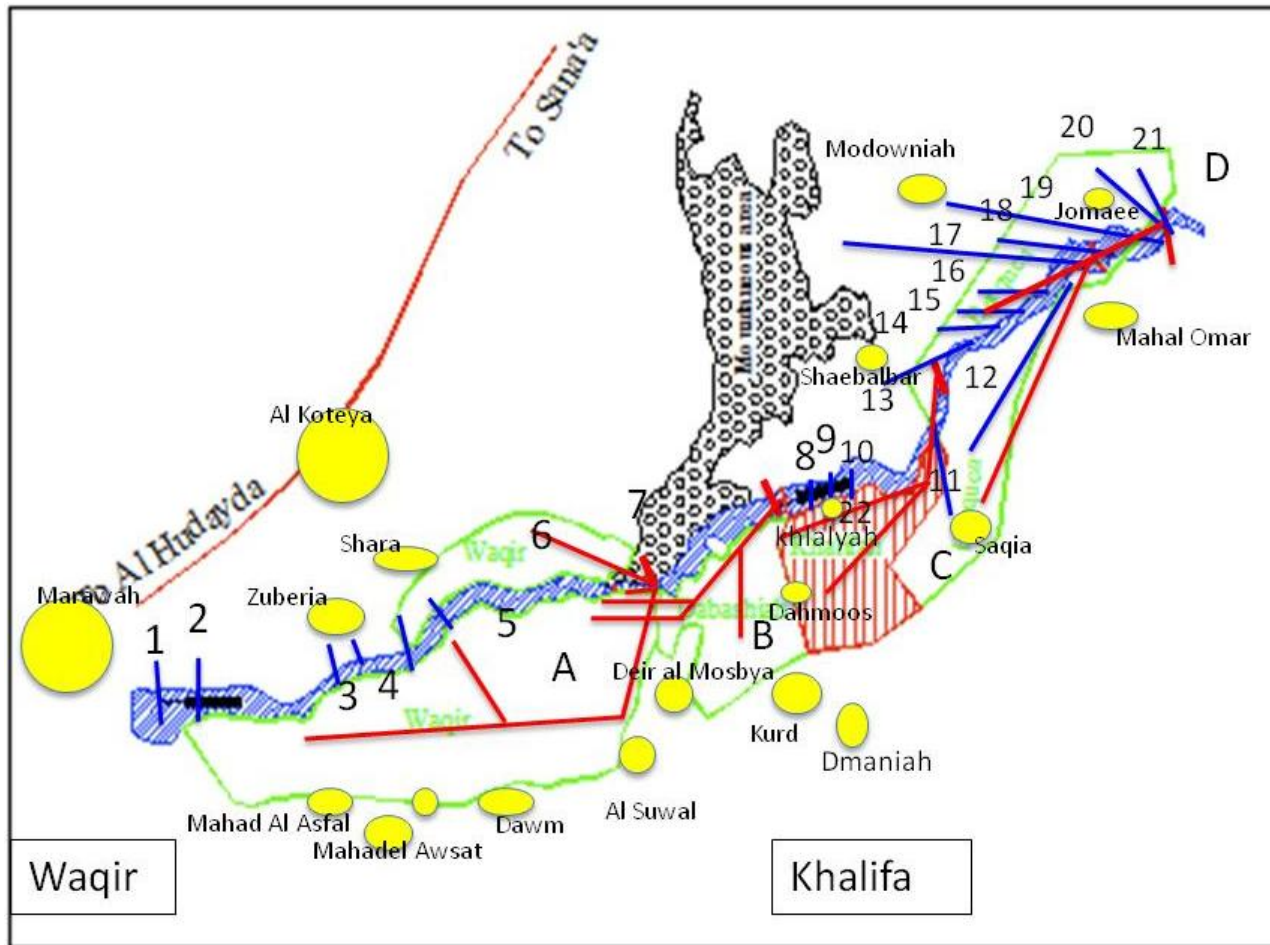
state improvement systems



Current irrigation infrastructure

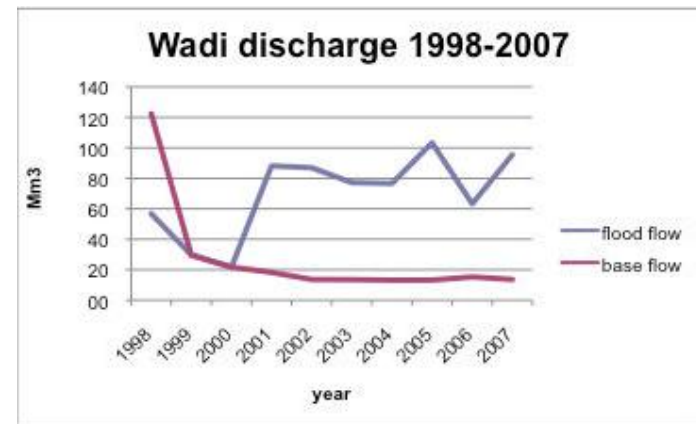
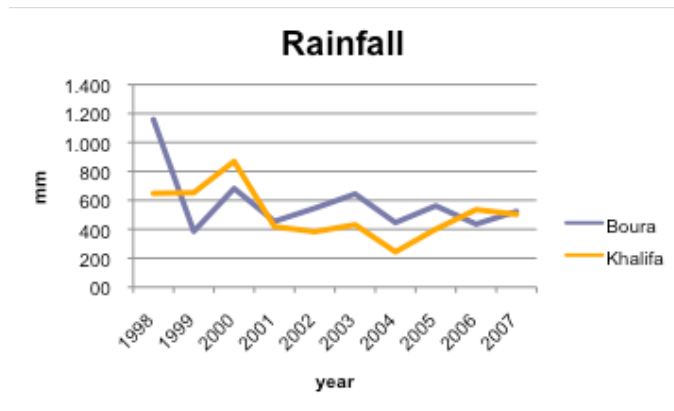
locally developed structures

state improvement systems



Variation in rainfall and runoff (from TDA)

(groundwater not measured, but decline in levels)



SOME KEY CHANGES

GOVERNANCE

Sheikhs & aqils, Imam

1962 YAR

Local councils, 2001 reform

- Water user associations

PROJECTS:

1973 TDA

- Groundwater promotion
- Spate irrigation improvements from 1993 onwards, various international contractors

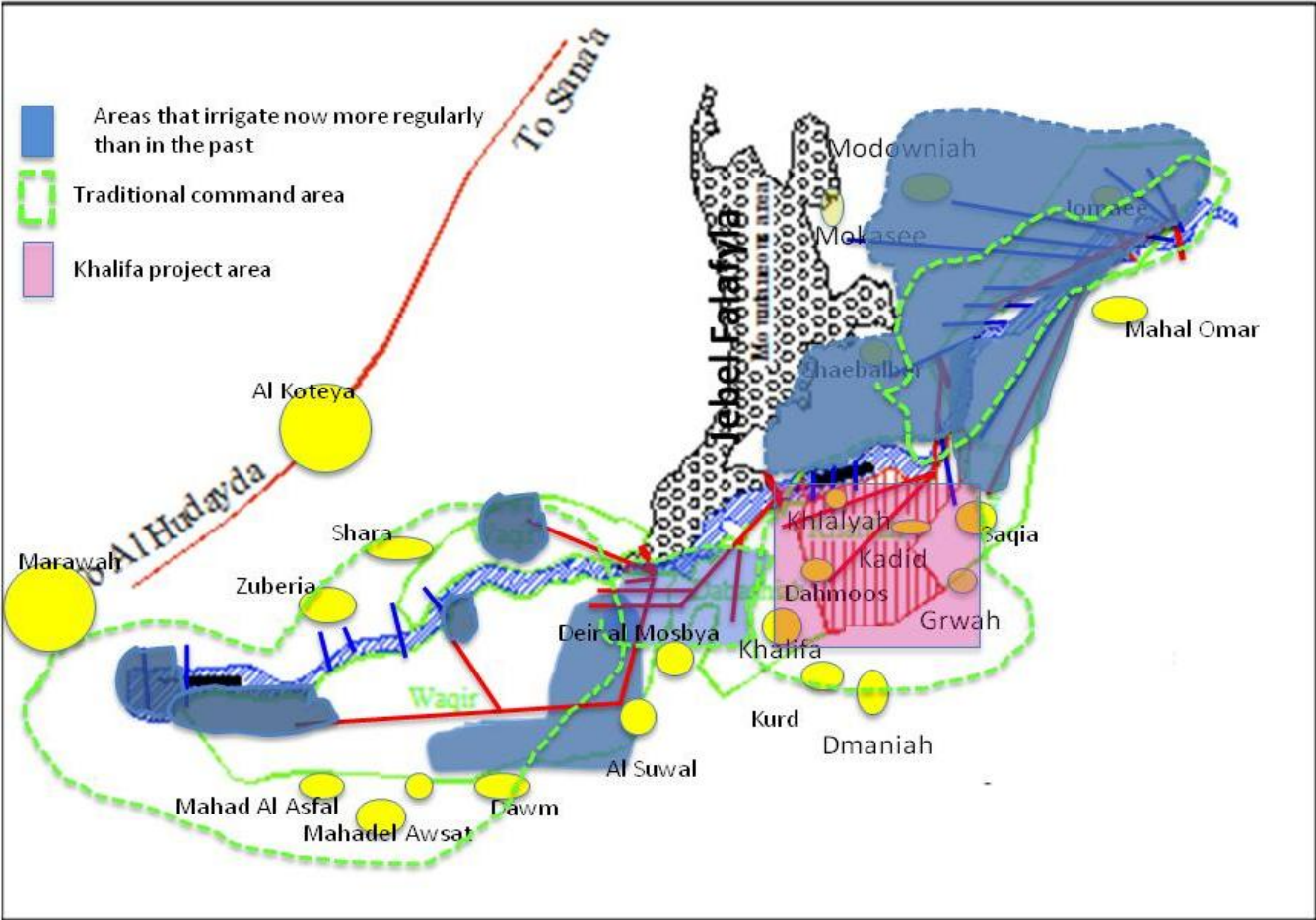
CROPS

- sorghum, & tobacco
- Cotton 1970s-90s
- Tractors, bulldozers
- Mangos, vegetables, fodder

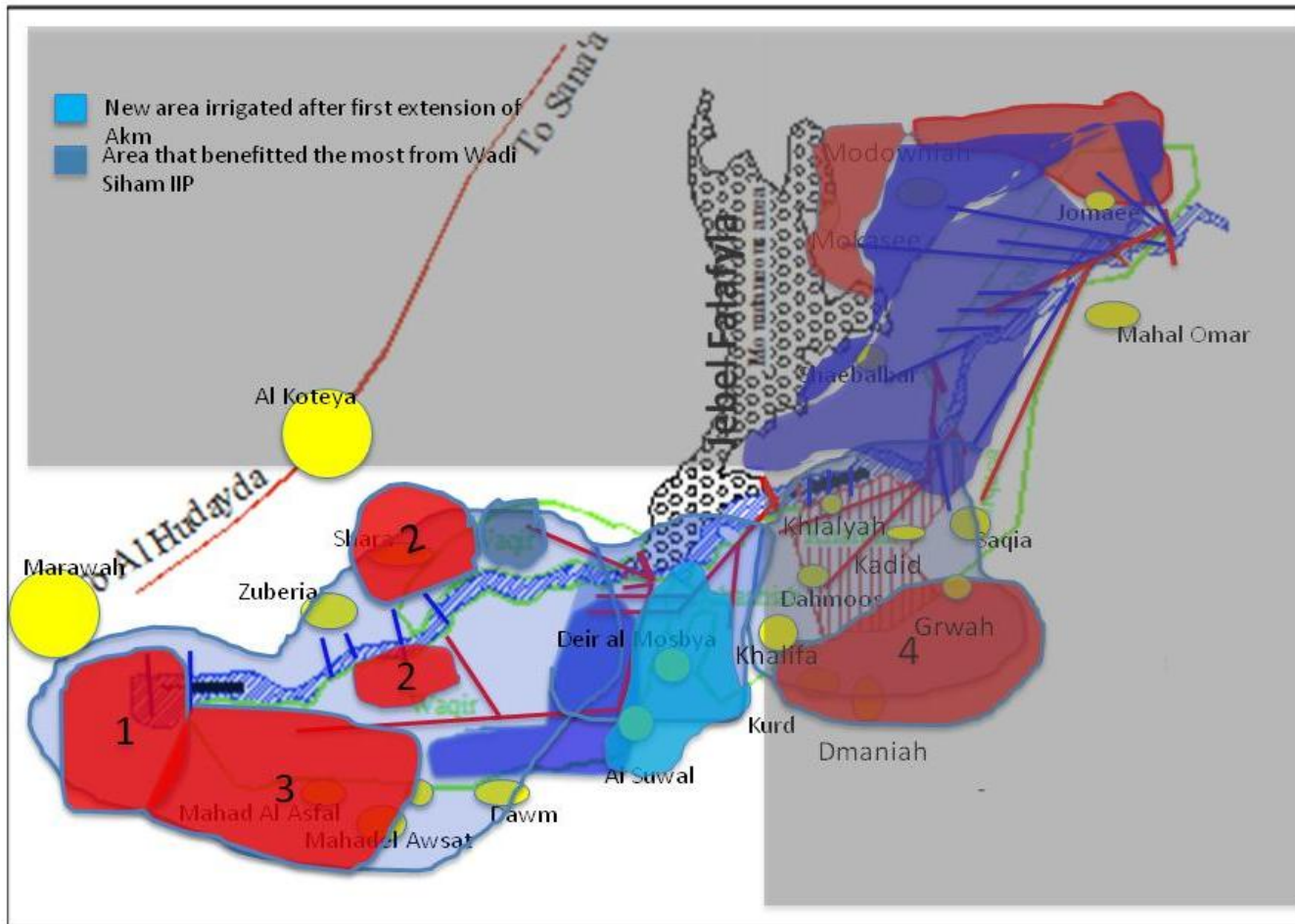
PEOPLE

- Migration to Gulf, cash inflow
- Less labour to maintain
- External investors
- Baby boom, land pressure
- 'Generation of sons'

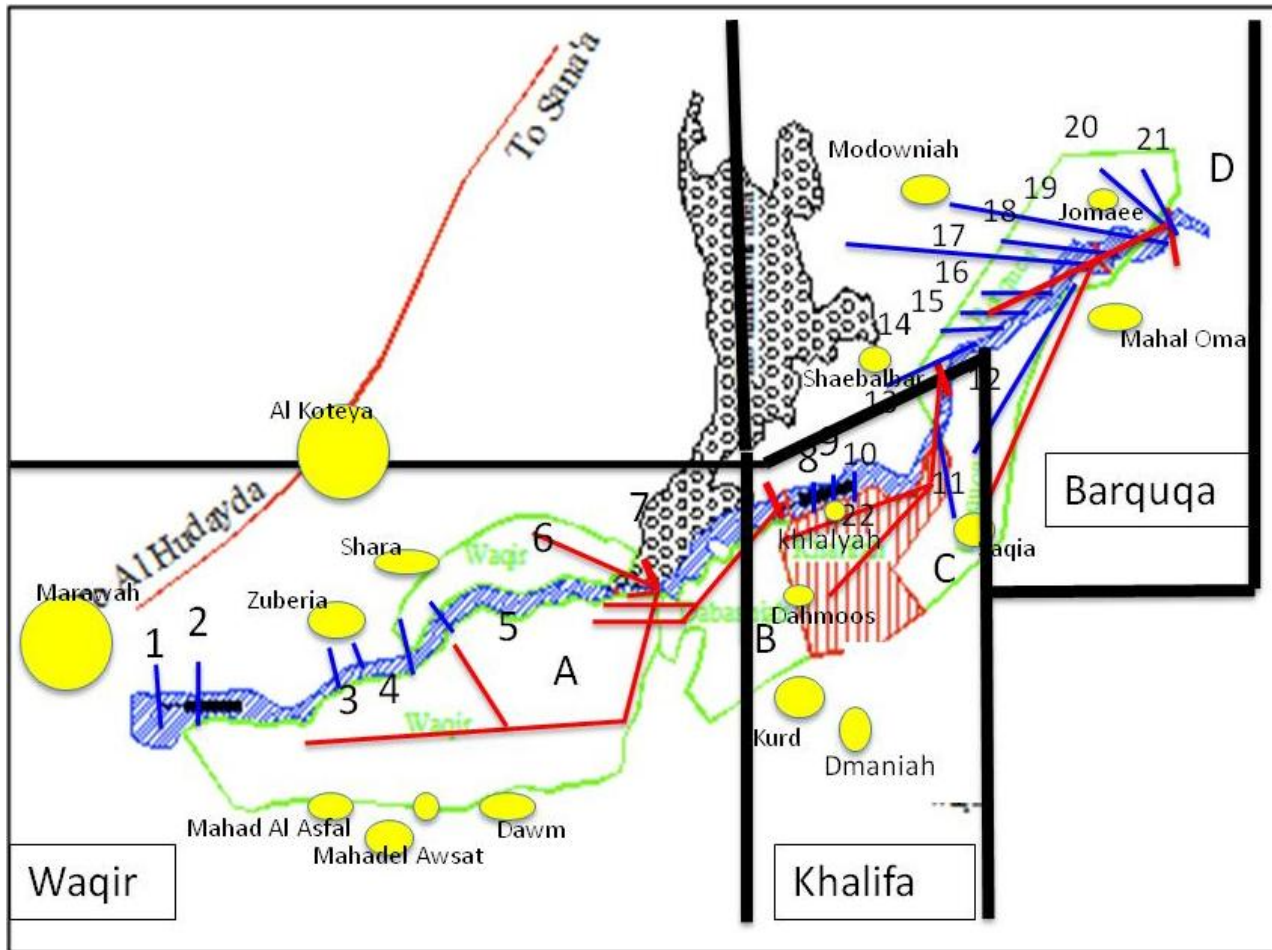
Water redistribution in Wadi Siham



Winners and losers, how it is happening



Student research 1 – looking at areas, saw uncontrolled and controlled systems being developed that also crossed and interacted



Student research 2

- ‘Overlapping systems’ not seen well, continued expansion of private and informal spate not allowed for. Sites of interaction crucial in management
- There are no clear demarcations between traditional and new organisational arrangements and figures, institutional power is still in transition
- Not all difficulties and scarcities comes from interventions: transformations in location of irrigation started before TDA , still happening
- Water now appears more technically and institutionally connected but there are serious operational and organisational discontinuities
- Water scarcity is “manufactured”, by choices of technologies, institutions, and politics
- Permanent headworks at the sites of infrastructure of powerful families
- Problems in design criteria and construction in improvement schemes
- Rather than only criticise ‘blueprint’ creation of Water User Associations, understand also how WUAs operate to suit own needs rather than embedded principles, understand struggle within local politics
- Winners and losers appear across areas of the wadi, but especially in original spate irrigated area

Irrigation in Wadi Siham has moved upstream!

WHAT NEXT

- Adapt farming practices to realities, be realistic about lost spate access and new irrigation options
- Understand farmers' perceptions and ground realities of water before new interventions
- There is potential to strengthen collective action (WUAs and other) despite growing inequalities mobilities
- TDA does have an important role and knows local realities, although it is also not homogenous, and external projects should also work more with TDA
- **Need organisational model that can improve communication and cooperation across the wadi**

CONCLUSIONS

STUDENT, STAFF AND AGENCIES CAN
RESEARCH TOGETHER

UNDERSTAND PROCESSES OF CHANGE
TO FIND REALISTIC OPTIONS FOR
CHANGING WATER SCARCITIES

THANK YOU!

Infrastructure Reference

KEY

<i>Sandy Barriers/Lateral dykes</i>	<i>Mandubi</i>		<i>IIP Irrigation systems</i>
1. Mahadeli 2. Bahlouli 3. Shroefia 4. Hussein 5. Uthun 6. Qamusia 7. Akm/ Waqir 24. Mohammed Yahya 25. Omar Qadi 26. Mohammed Abdallah	8. Humaiqani 9. Beshari 10. Khlalyah 11. Saqia 12. Dehna 13. Syali 14. Matani 15. Khanani 16. Magaribi 17. Barquqa	18. Marzouki 19. Qaserah 20. Wajeh 21. Shamiri 22. Hajar/ Hakoume 23. Beshari NEW	A. Waqir B. Debashya C. Khalifa D. Barquqa