Groundwater management and the role of Water User Associations (WUAs) in northern China

Experiences from WRDMAP Project

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Water Resources in China

- Water scarce – particularly in the north: groundwater levels declining

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- Water owned by state, managed by water resources departments
- BUT: groundwater pumped by numerous locally owned tubewells, abstraction often exceeds recharge
- SO: Government is promoting water saving society as one of many responses

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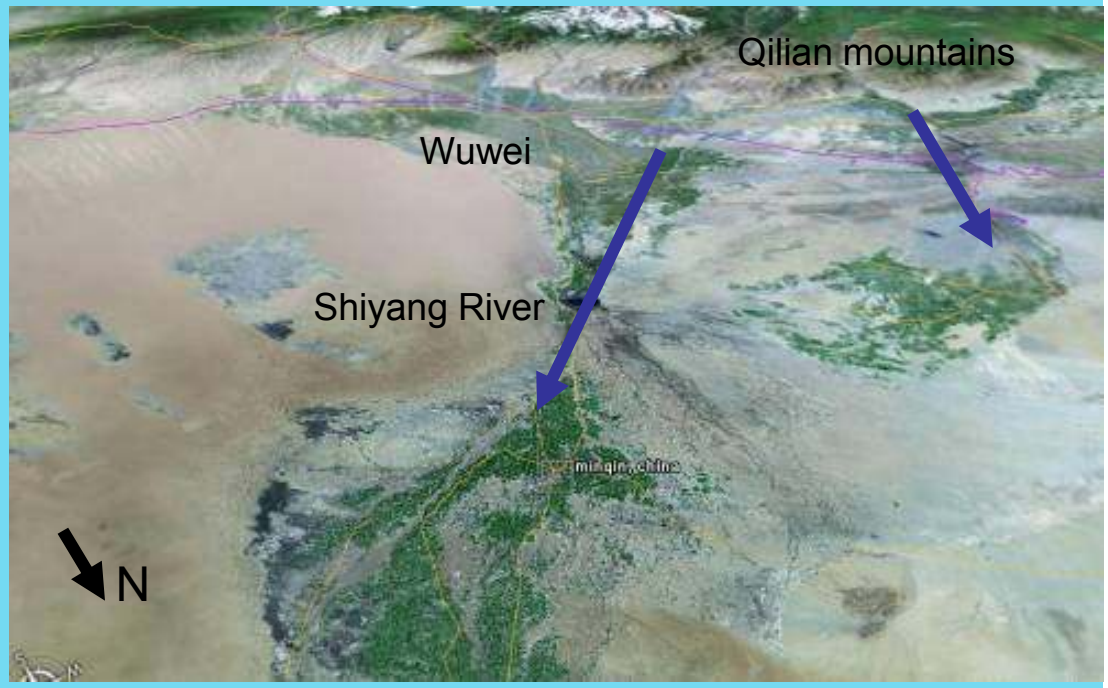
Shiyang River Basin, Gansu Province

- Inland river - from the Qilian Mountains towards Gobi desert
- Surface and groundwater used separately or managed conjunctively
- Very low rainfall, aquifer recharge from irrigation return flows (and historically through flood spills which are now rare)



Water Resources Demand Management Assistance Project (WRDMAP)

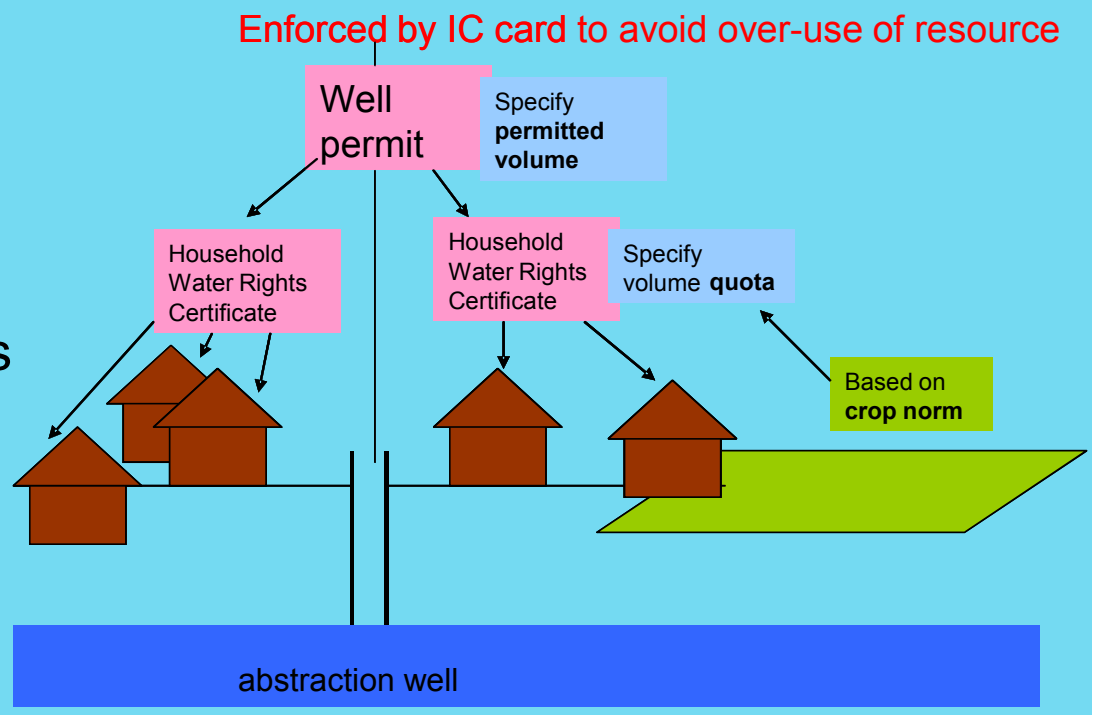
• Implemented by Ministry of Water Resources, funded by DFID, advised by Mott MacDonald

• Case Studies - establishing "**water saving societies"** and **participatory water management** in pilot communities of the basin

New tools for groundwater management

Strong administrative control:

- crop norms and rules
- water rights (of sorts)
- abstraction permits
- IC Card control on pumps



And economic measures

- water resource fees
- full cost recovery

Impact of less water mitigated by:

- technological improvements
- assistance with crop diversification, use of greenhouses, etc
- in extremes, resettlement with compensation

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Key challenges for groundwater management in China

- Administrative burden of issuing and managing household rights, permits, IC cards etc ?
- Enforcement of rights and permits?
- Cost recovery for the new systems – who should pay?
- How will farmers cope with the reduced volume of water?

Example of water rights certificate

WATER RIGHTS GUIDELINE DOCUMENT

Number				User Name				
Name of WUA				Irrigation Group				
Agricultural Water Rights Areas (mu)				Agricultural Water Supply Index (m3)		Wet Year		
						Average Year		
						Dry Year		
Total	Surface	Groundwater		Total	Diversion	Gate	Well meter	
Number				Domestic Water net guideline (m3)				
People	Livestock	Pigs	Sheep	Total	People	Livestock	Pig	Sheep
Water supply Engineering Supply and Supply Index	Name			Supply Area (mu)		Total Amount (m3)		

WATER RESOURCES UTILISATION RECORD

Supply Time	Supply EngineeringName	Supply Amount (m3)	Water Fee (Y)	Signature

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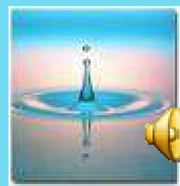


Alternative approaches

- Traditional approach: top down control, with economic incentives
- New approach: Water Saving Society development
  - Establish water rights
  - Promote awareness of water resources issues and need for water savings
  - Encourage community participation (through WUAs) in water resource management (and water use)

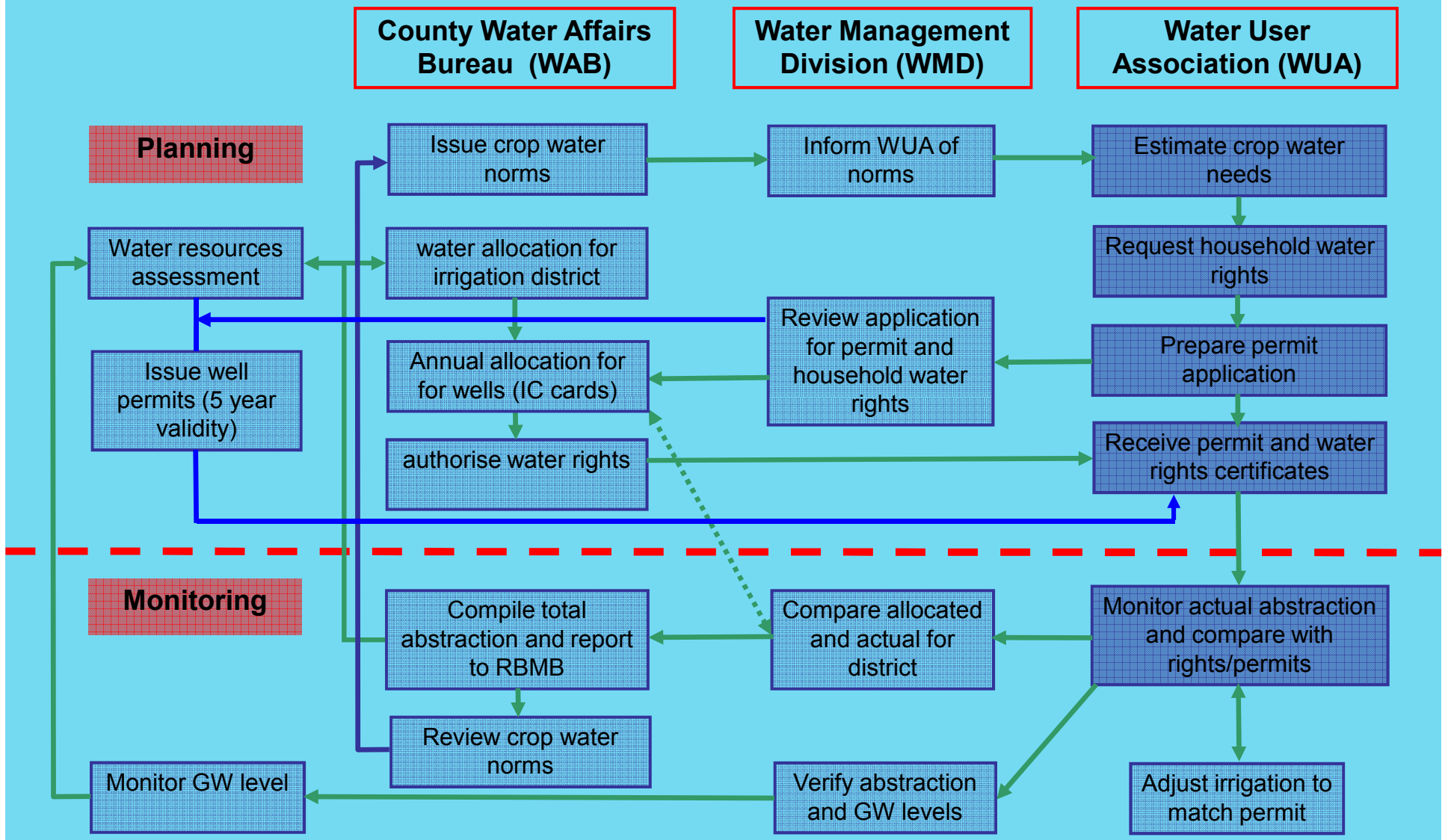
Role of WUAs for GW management

Dual Role

- WUAs can help local government in administrative systems, ensuring compliance with abstraction permits
- More importantly, WUAs also help farmers, in ensuring access to water and in coping better with limited water supplies

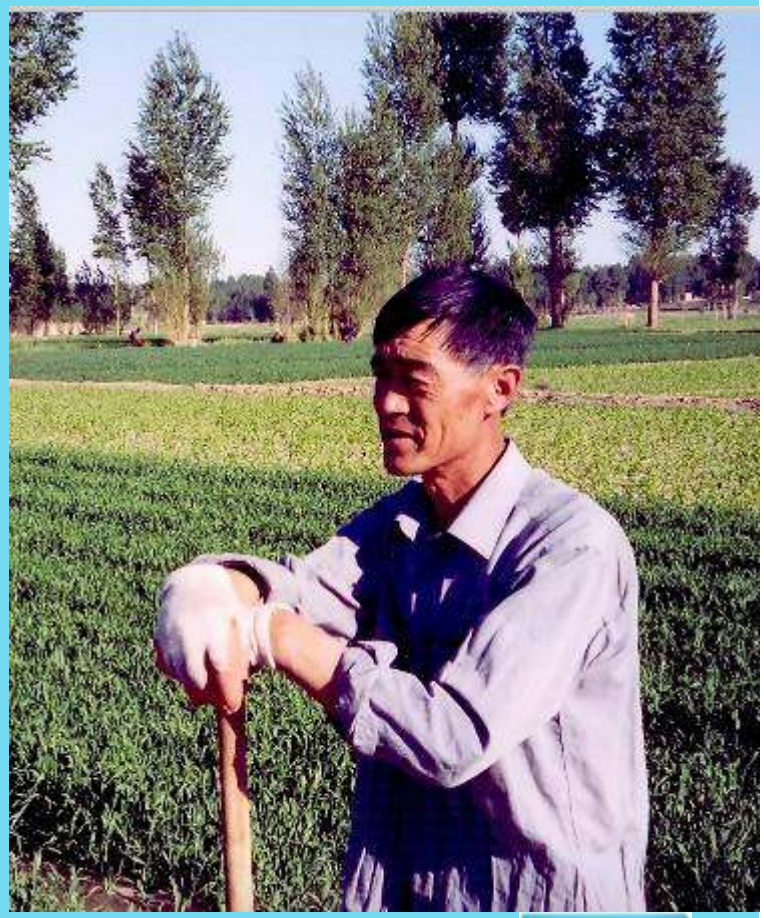
But financial arrangements are critical

Flow diagram for administration of groundwater controls



Final Messages

- Permits should be based on an accurate assessment of water resources which should continuously be refined
- WUAs are important for successful groundwater management and implementation of water saving measures. BUT:
  - they will only be sustainable if there are clear incentives for farmers to participate
  - representative WUAs needed – important that they reflect the interests and rights of the whole community
  - there must be sound financial arrangements for new WUAs
  - there must be technical support for farmers through the WUA (training, demonstrations)
- There is a need for greater participation by stakeholders, and more feedback from field data.
- The new techniques are still at an early stage; many details are still being worked out, and there is some resistance to the changes required
- China has made good progress; there is still a reliance on top-down control but the prospects for real reform are encouraging



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