SUSTAINABLE WATER RESOURCE USE IN ASIA CLOSING WORKSHOP

China

2012,Bangkok

Activities and outputs

Activities	Outputs
Inception workshop at Shanxi Province	Work plan of Case studies
	Outline of case study report
Case studies	Case study reports
	Case study of national and provincial level
	Case study of irrigation district
Dialogues	Dialogues reports
	National level dialogues
	Provincial level dialogues
	County level and below
Progress Reporting	Inception reports
	Progress reports
Summing-up	Conceptual framework for the analysis
	Summary of key drivers, pressures, trends, state and impact from each project basin

Methods of the case study

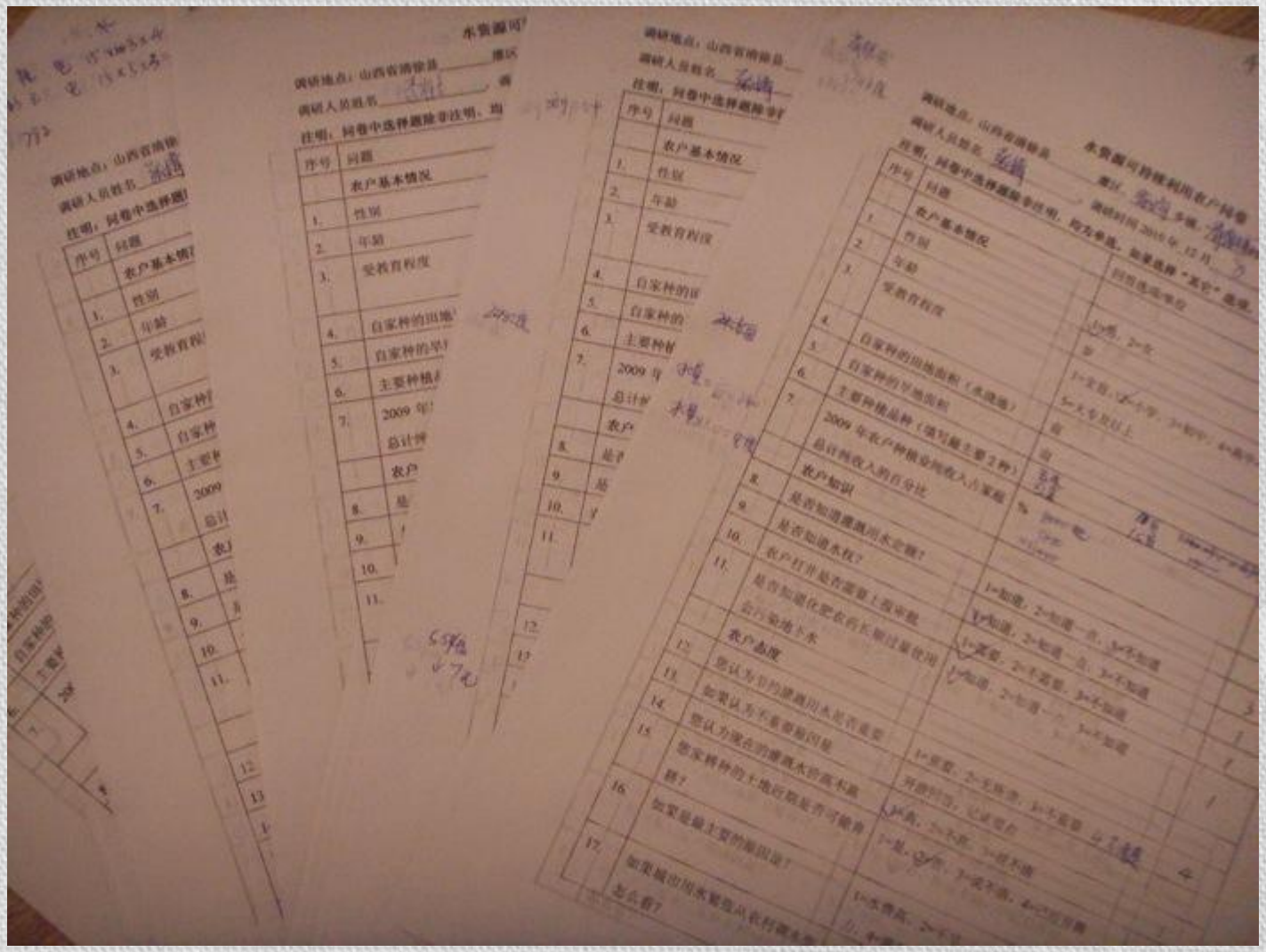
- Statistical data collecting and analysis
- Policy and institution analysis
- Literature review
- Interviews at different levels
  - National level
  - Provincial level
  - Irrigation districts and county level
  - Township level
  - Village level
- Questionnaires for farmer households（3 villages, 41farmer households）

Interviews and questionnaire

Interviews

Interviews at different levels	Division/Locations	No. of interviewees
Ministry of Water Resources	Water Resource Division, Planning Division, Law and Regulations Division, Irrigation Division, CIDDC ,IWHR	20
Water Resource Bureau, Shanxi Province	Water Resource Division, Planning Division, Law and Regulations Division, Irrigation Division, International cooperation and research Division	10
Irrigation districts, Shanxi Province	Jiamakou Irrigation District, Yuncheng city; Dunhua Irrigation District, Qingxu County	20
Water Resource Bureau of Qingxu County	Water Resource Division, Planning Division, and Irrigation Division	10
Management Station of Water resources at Township level	Xugou township, Jiyi township	10
Villages	Qingdepu village, Xihuaiyuan village, Xiaowang village Village cadre, the head of the irrigation management committee at village level, and farmers	10
Farmer households		41

Completed Questionnaires



Findings of case studies

National and provincial level

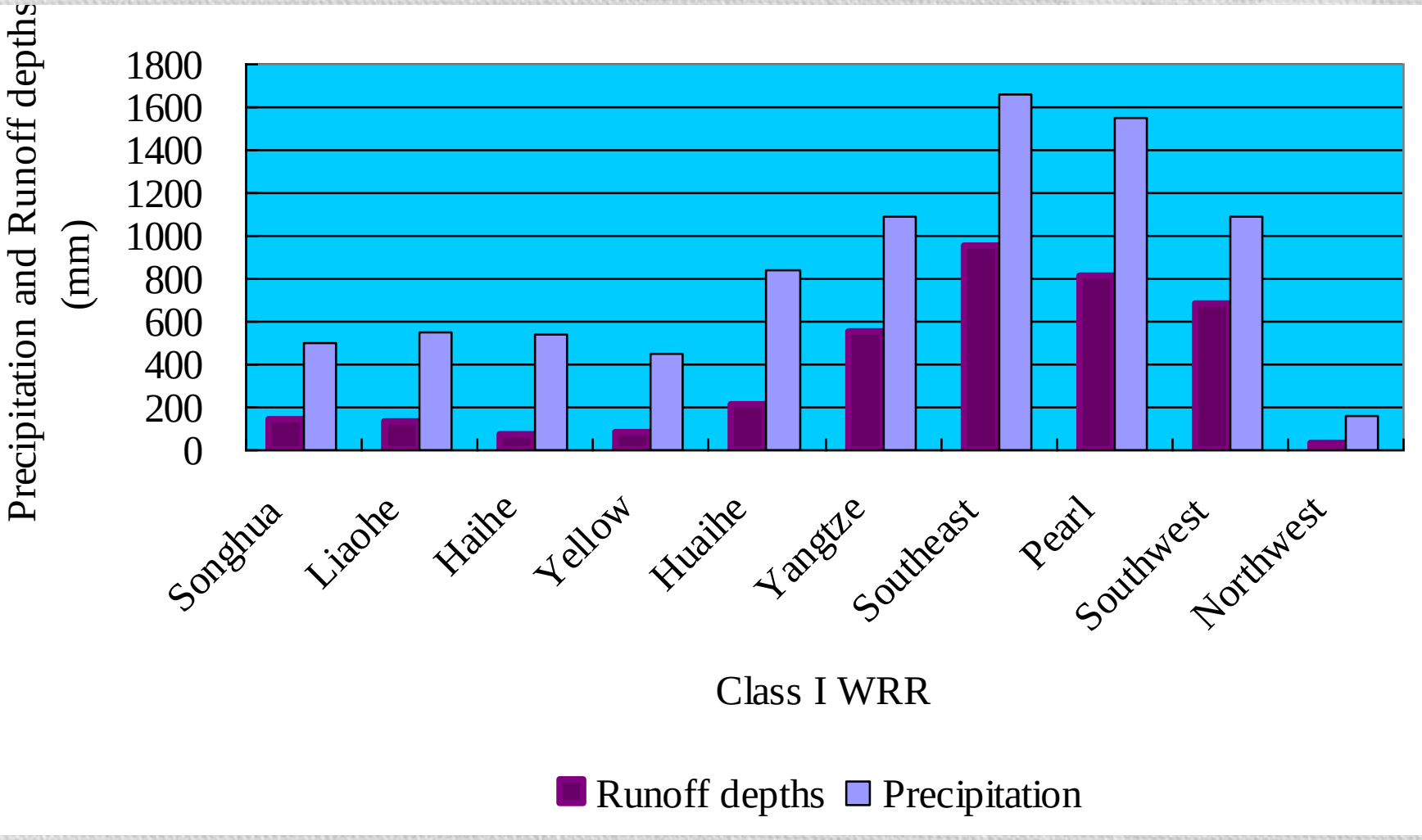
China's low per capita water resources

Unit: m^3

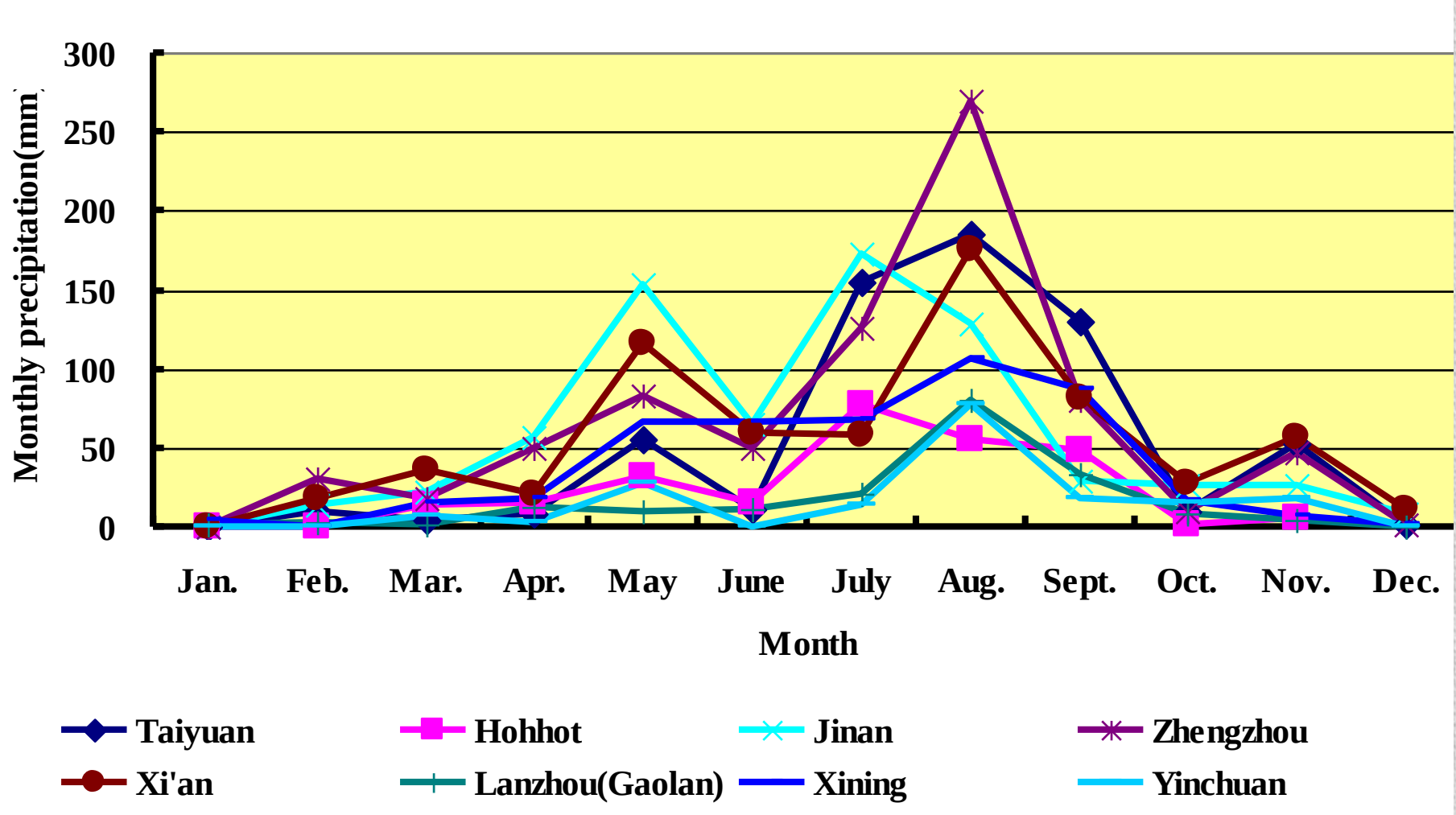
country	water resource quantity per capita	country	water resource quantity per capita	country	water resource quantity per capita
China	2200	Brazil	45900	Pakistan	3300
Japan	4400	Russia	29100	India	2200
Germany	2100	USA	9600	Bangladesh	19600
Canada	98500	Indonesia	12700	Australia	19000

Water Resource Regions in China

Spatial uneven distribution



Temporal uneven distribution: monthly rain fall precipitation of major cities in the Yellow River Basin



Water scarcity status

- Limited water resource per capita.
- Uneven (temporal and spatial)distribution of water resources.
- Frequent floods and droughts.

Legislation and institution system

◆ So far, the total number of laws, regulations and normative documents authorized by the state, provinces, autonomous regions and municipalities has reached more than 700. The Chinese Government has preliminarily established water resource management system with the "Water Law" as the core and composed of multi-level supporting laws and regulations.

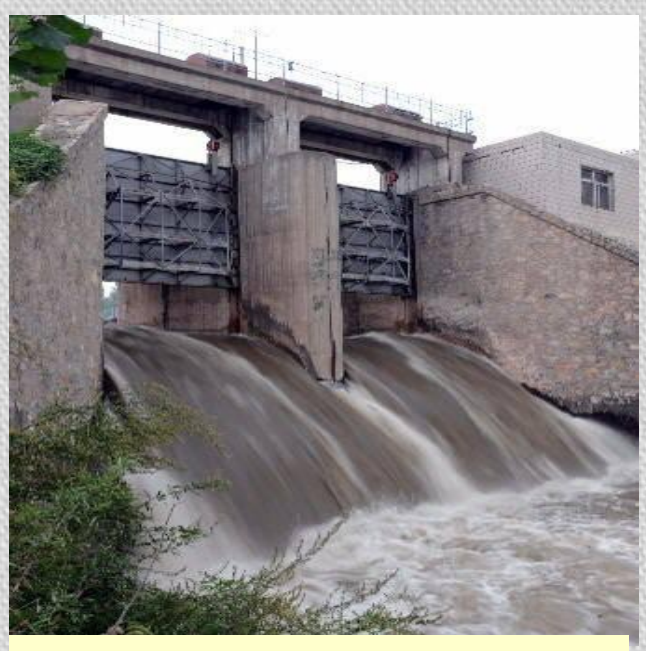
Water resource planning and water quota system

江西省五河水量分配方案成果汇总					
水资源总量（亿立方米）	可供分配总量（亿立方米）	分水总量（亿立方米）	分水总量占水资源总量（%）	分水总量占可供分配总量（%）	余留可供分配的水量（亿立方米）
1340.33	412.61	320.91	23.94	77.78	91.70

◆water resources planning system has been preliminarily established

◆Significant progress has been made in the construction of national water quota system

Infrastructure of water resources control and transfer



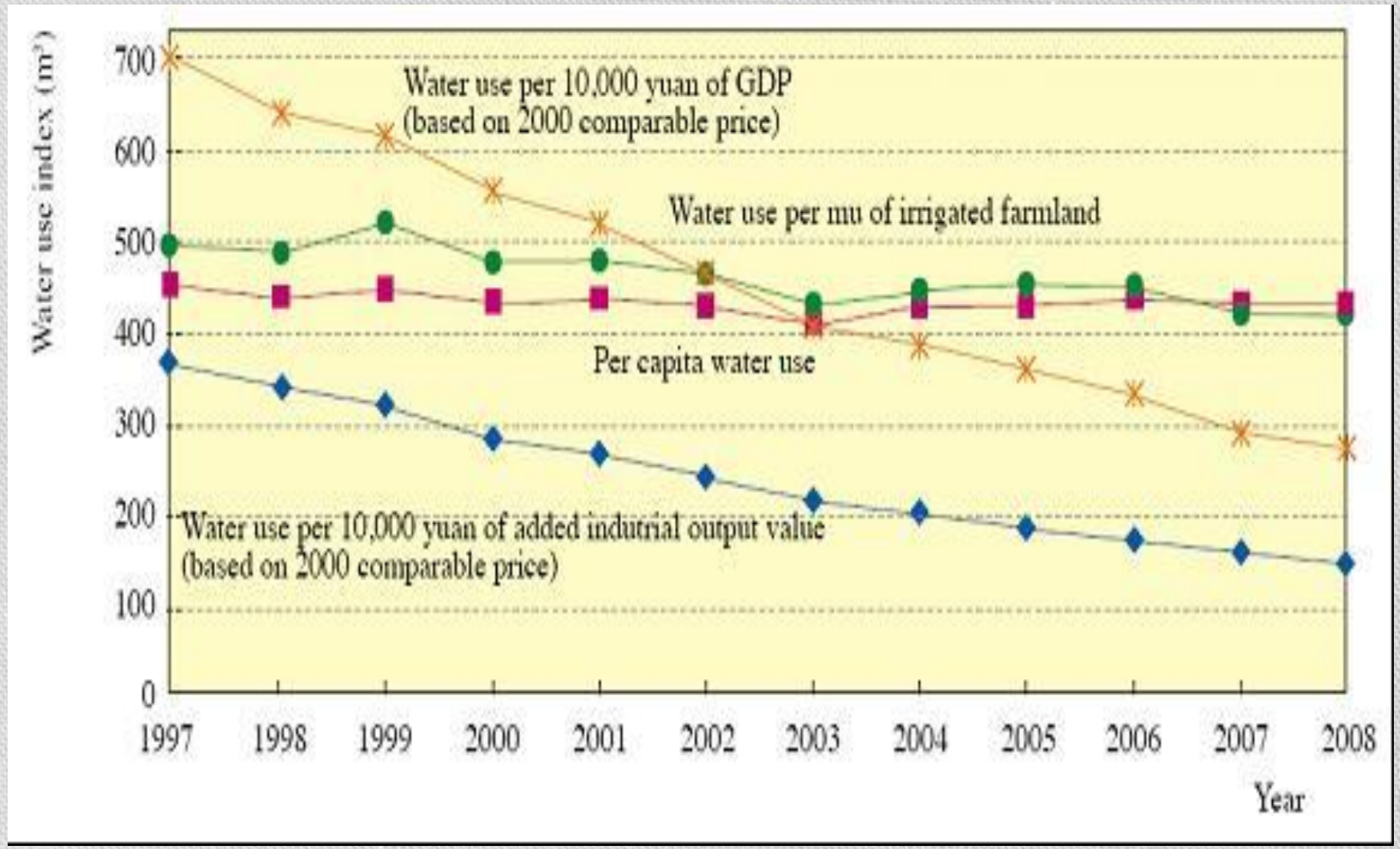
South-to-North Water Transfer Project supplies water for Peking through the middle main channel

Diversion of water from the Yellow River to Tianjin

Diversion of water from the Yangtze River to Taihu Lake

◆water transfer, storing, diverting and lifting projects have been constructed to improve water resources control capacity

Increasing water efficiency

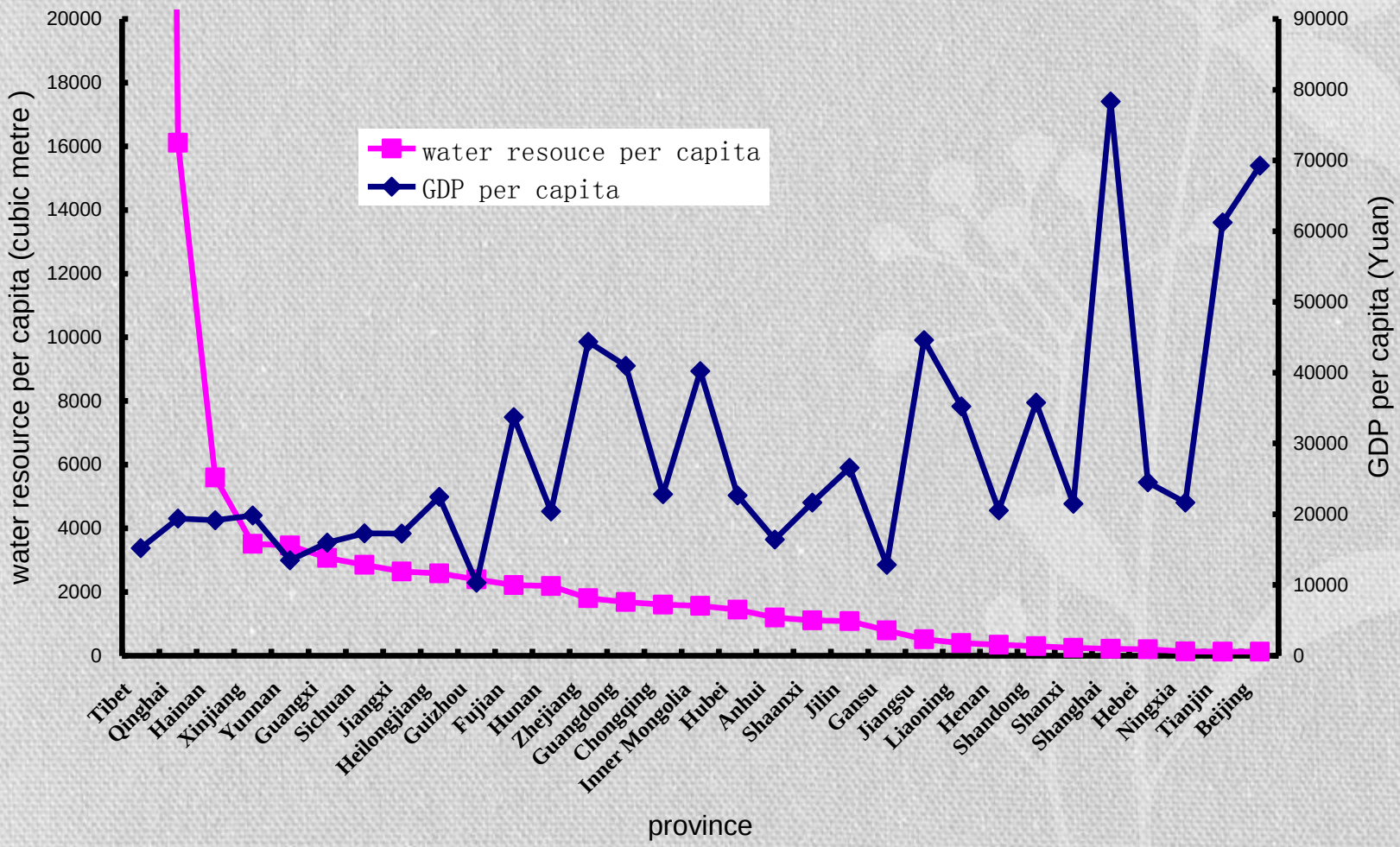


Challenges

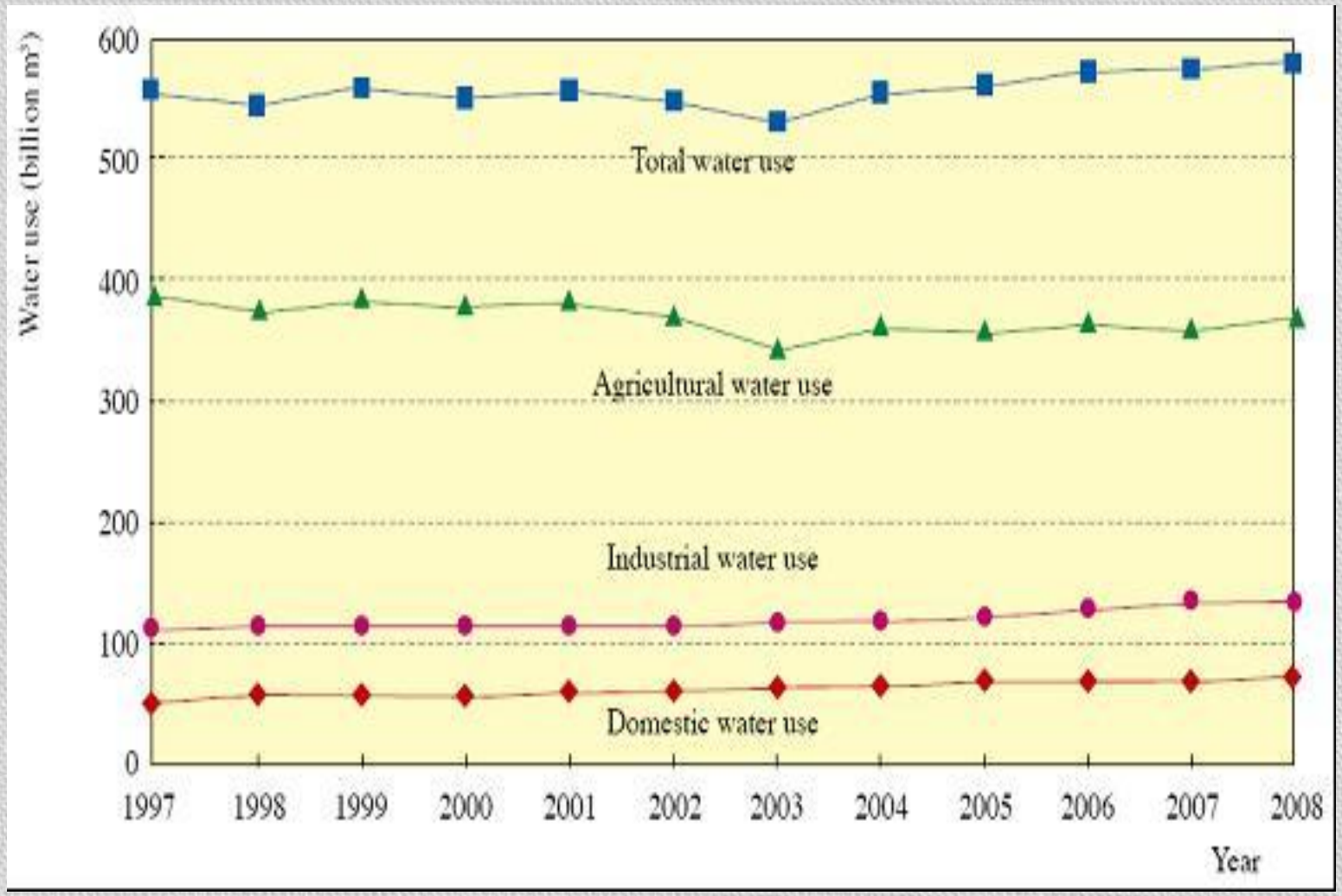
Urbanization and industrialization/ Climate change

- Increasing conflicts between economy growth and water scarcity
- Increasing gap between water demand and supply.
- Sector conflicts
- Farmland irrigation facilities

Per capita GDP and water resources



Total amount of water use by sectors



Case study of Qingxu

General information of Qingxu County

- The traditional agri county under Taiyuan city
- Arable land: 419.5 thousand mu. Arable land per capita: 1.6 mu
- 193 villages，agri population: 260.5 thousand
- Per capita income of farmers：7864 yuan
- Year 2008: irrigated area 335.0 thousand mu ，irrigated area by surface water: 220.6 thousand mu，irrigated area by groundwater: 114.4 thousand mu

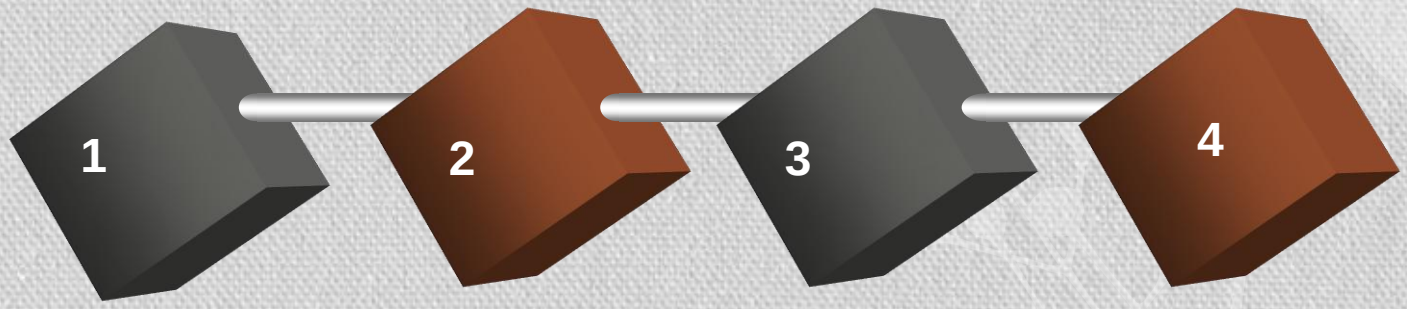
Establishing the water saving society

- Construction and technology
- Water quota allocation
- Water price differentiation
- Establish the Information system for water resource management
- Develop water saving agriculture

Develop water saving agriculture

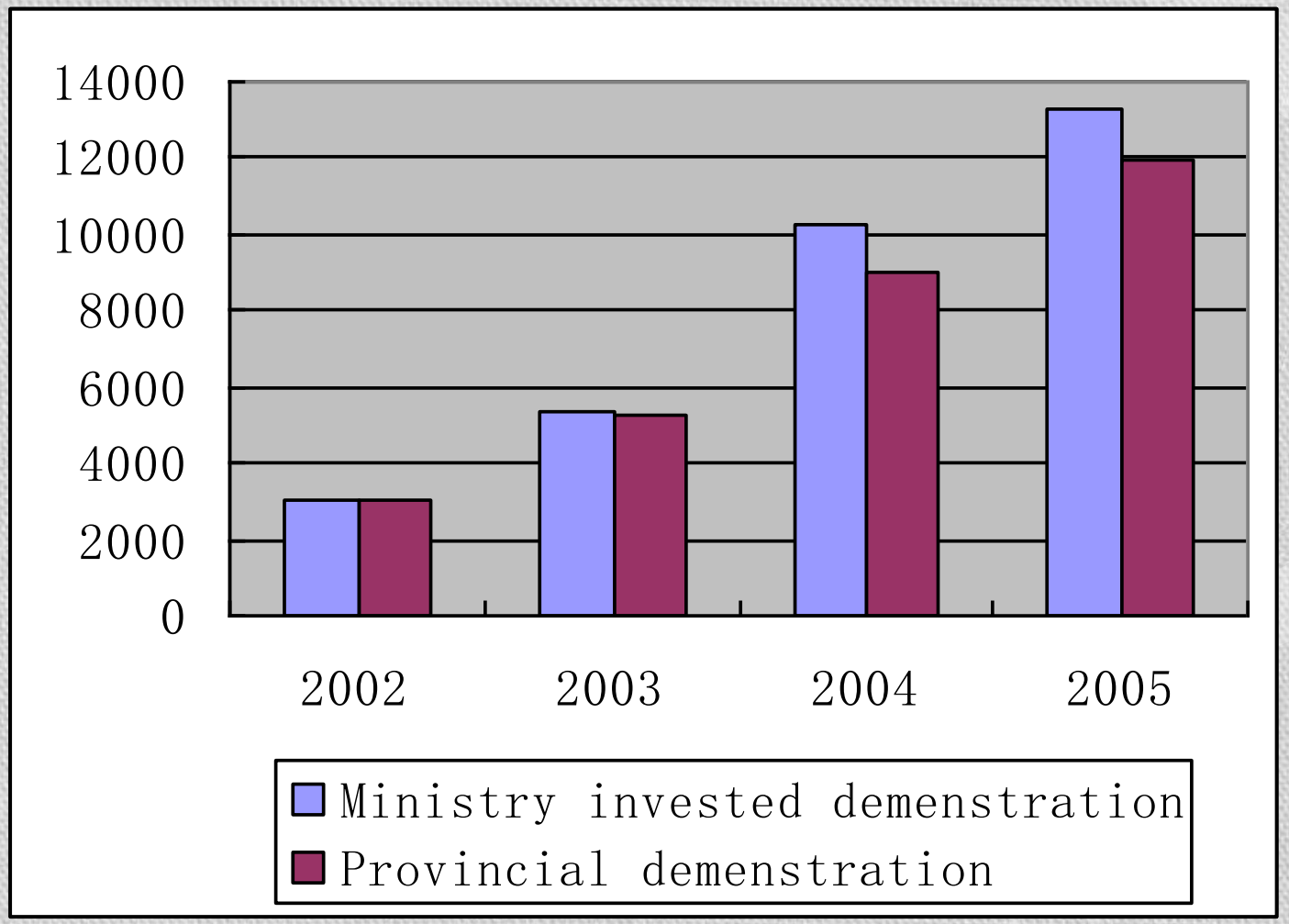
- Develop the water saving irrigation area
- Install metering equipment for all of the 1298 wells
- Real time monitoring system for groundwater
- License for water access
- Allocate the irrigation quota to farmer households
- Based on the quota, implement water price ladder for irrigation
- Establish Water User Committee for irrigation management at 50 villages
- Capacity building (KAP, Knowledge, attitude, practice)

Water resource allocation mechanism at county level



1	2	3	4
Construction and technology	Administrative Measures Water quota System	Real time monitoring system	Economic measures

Area of high standard water saving irrigation demonstration (mu)



Water quota allocation system

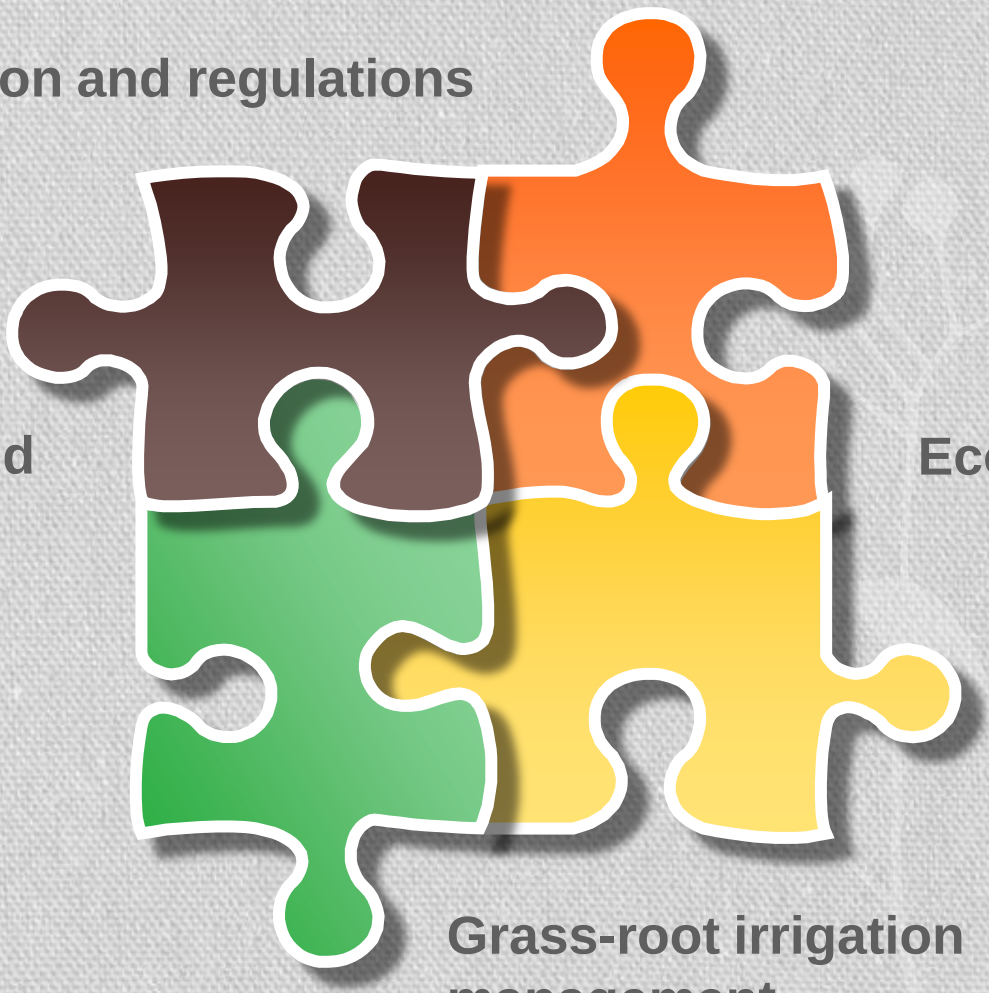
	Quota system of Water resource allocation	**Authority for water resource allocation**
1	Allocation among sectors	County Water Resource Bureau
2	Allocation among townships	County Water Resource Bureau
3	Allocation among villages	Township government
4	Allocation among wells and water users	Village Committee

Real time monitoring system for groundwater

Water price differentiation by sectors of Qingxu County (yuan/m^3)

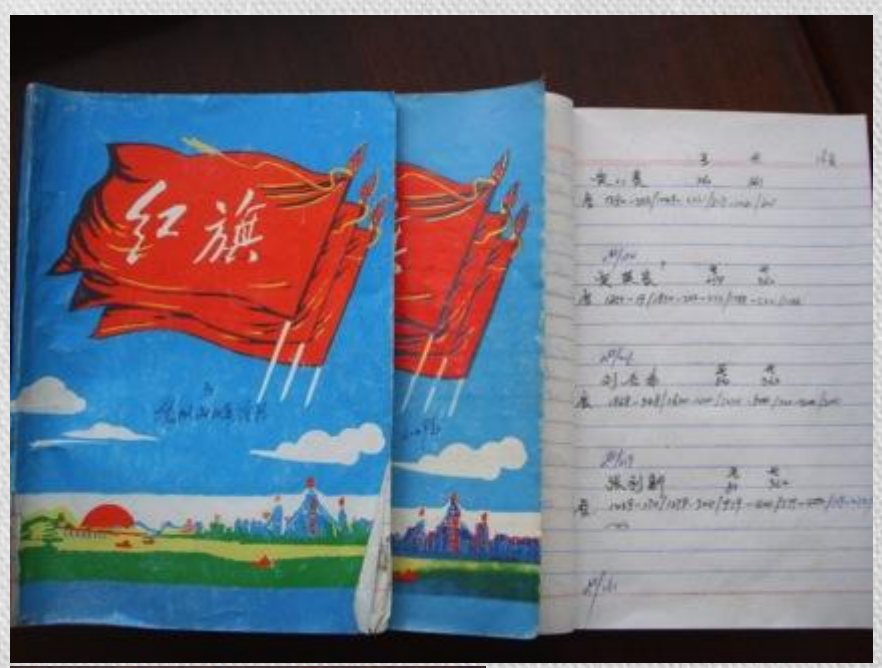
	Domestic use	Industry	Service sector	Administration	Special industry
Water price	1.75	2.5	2.7	2.7	15
Water resource fees	0	1.5	1.5	1.5	1.5
Sewage treatment fee	0	0	0	0	0

Water resource allocation mechanism at village level



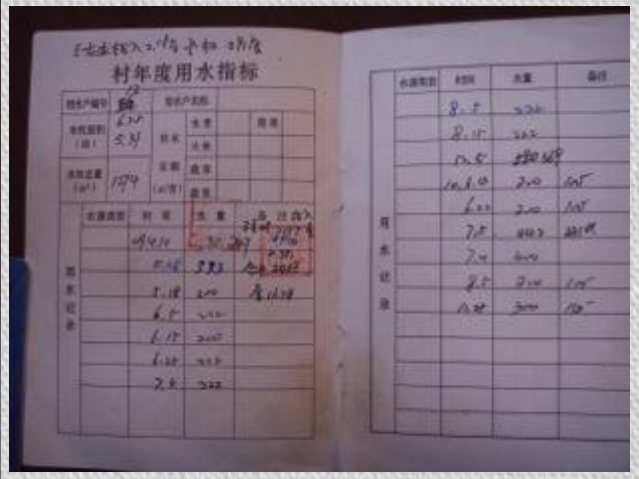
Investment percent of the farmland water-saving facilities

	Unit	Qingdepu village	Xihuaiyuan village	Xiaowang village
Investment per mu	yuan	300-400	400-500	N.A.
County government investment	%	40-50	60-70	80-90
Farmer labors	%	10-20	30-40	10-20
Head of the Village	%	The rest	0	0

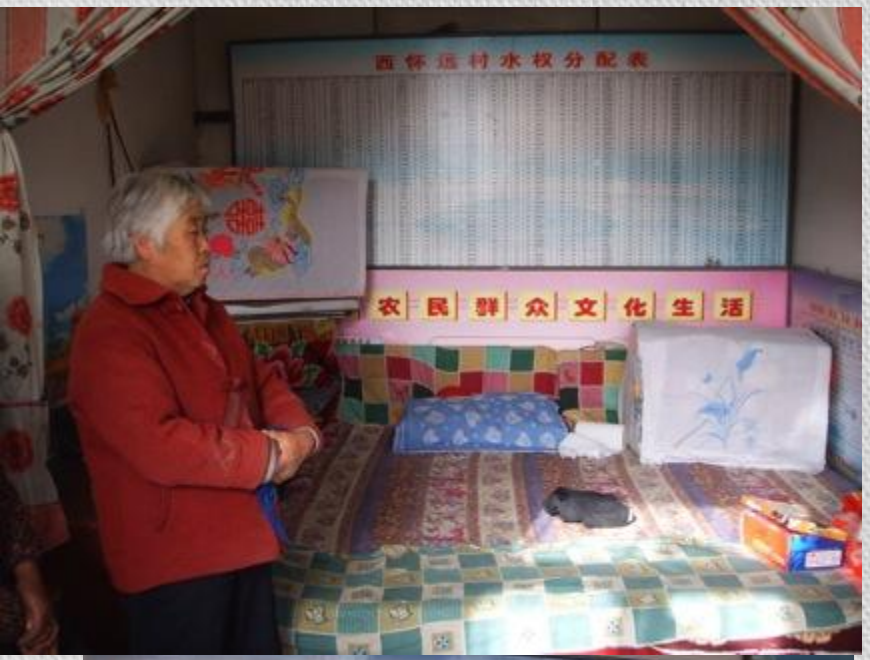

红旗

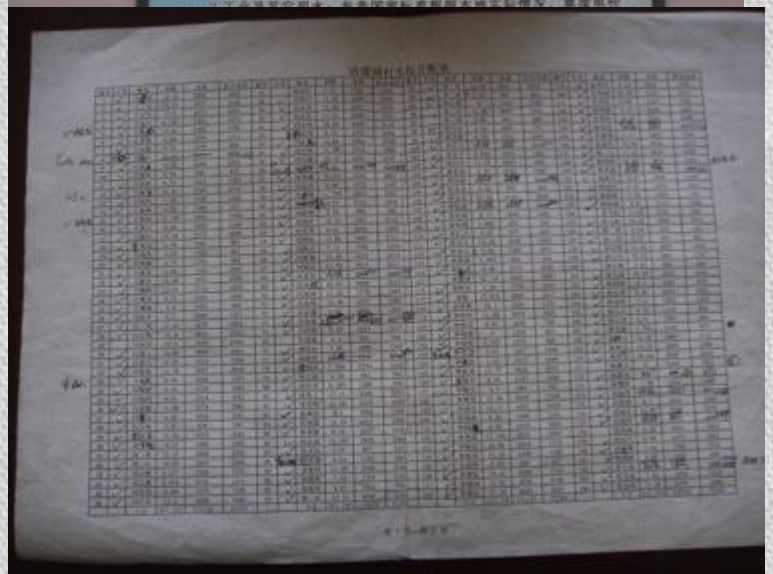

向观念要水，向机制要水，向科技要水！
新宇新科技


清徐县节水型社会
水权使用证
清徐县水务局


村年度用水指标

Publicity of the irrigation quota and the regulations at village level

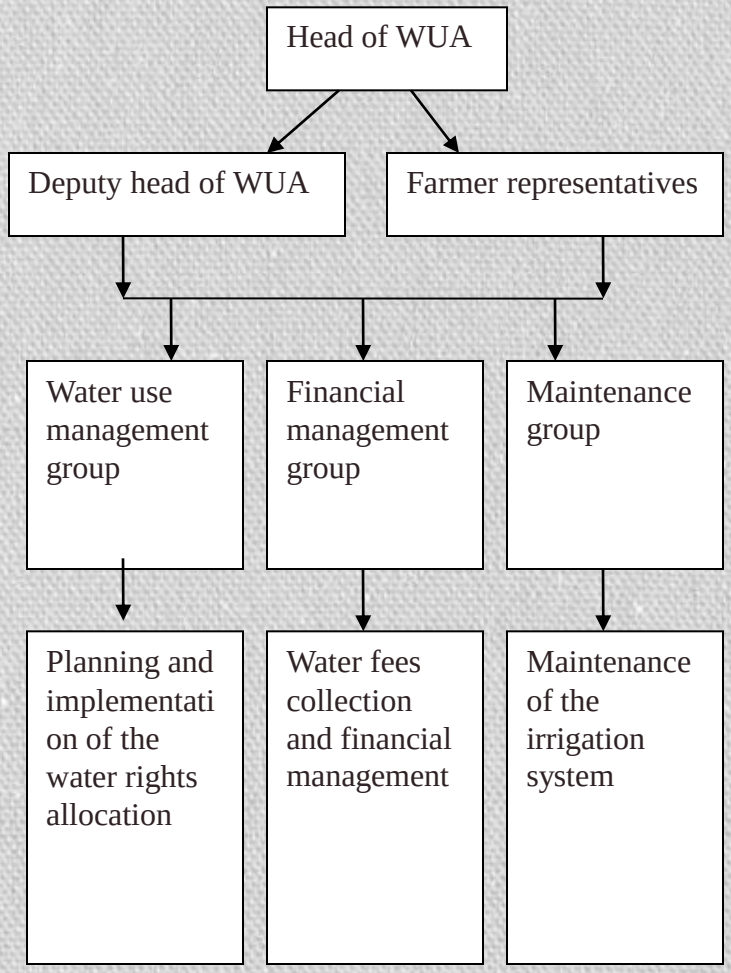




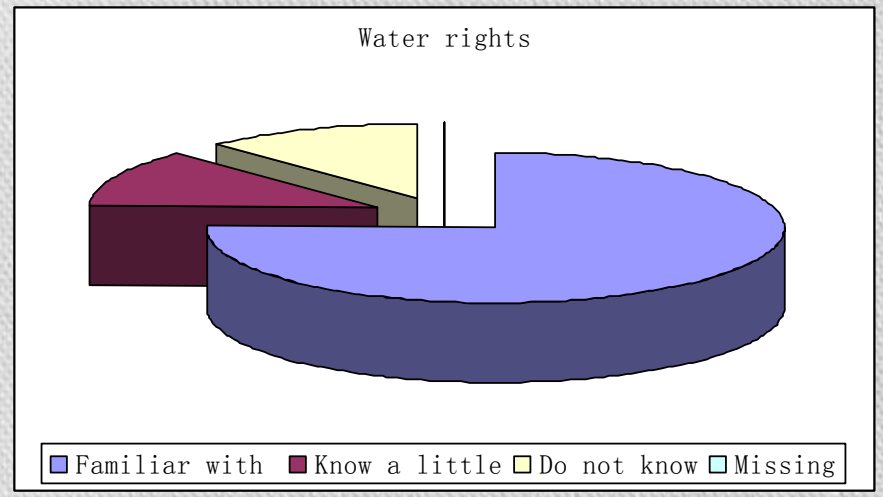
Quota and the water price ladder for the surveyed villages

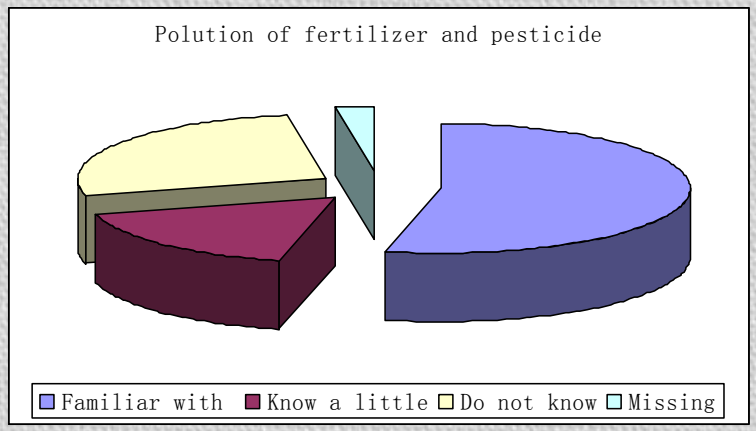
		Qingdepu village	Xihuaiyuan village	Xiaowang village
Total quota	10 thousand m^3	70	98	50
Quota per mu	m^3	240	240	180
Lifted water amount/kWh	m^3	1.4	1.8	1.5
Price within the quota	yuan/kWh	0.45	0.55	0.63
Price for ≤quota+30m^3 /mu	yuan/kWh	0.65	0.65	0.68
Price for >quota+30m^3/mu	yuan/kWh	0.7	0.7	0.8
Expenditure of the water fees		Electricity+ salary+ maintenance		
Expenditure of the over quota water fees		Besides, Electricity and salary, 50% for repair cost，and other 50% for developing new water resources		

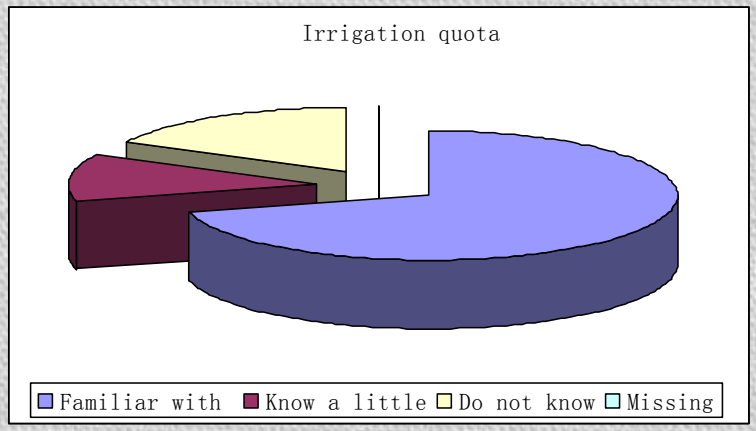
Structure and function of WUA



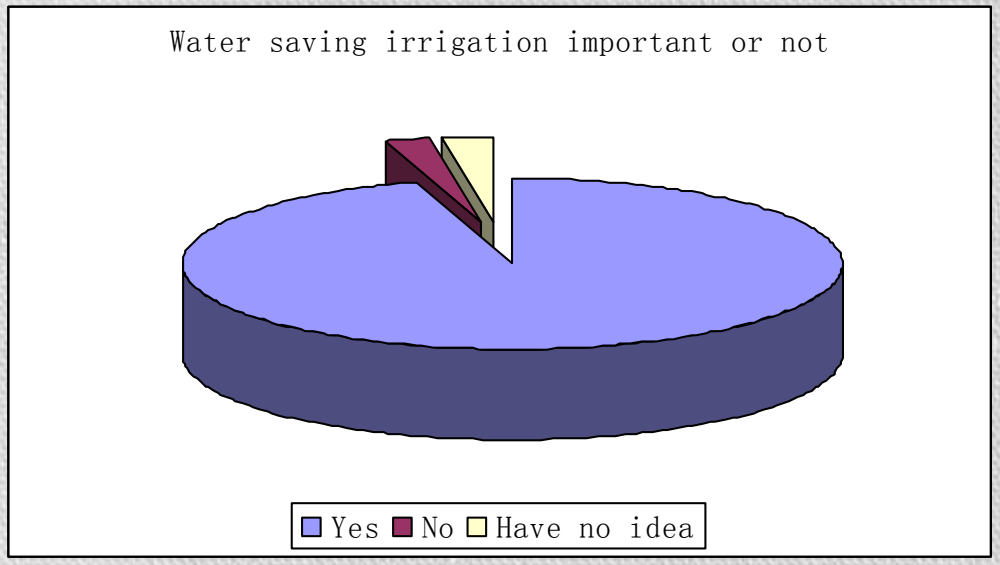
Awareness building -knowledge

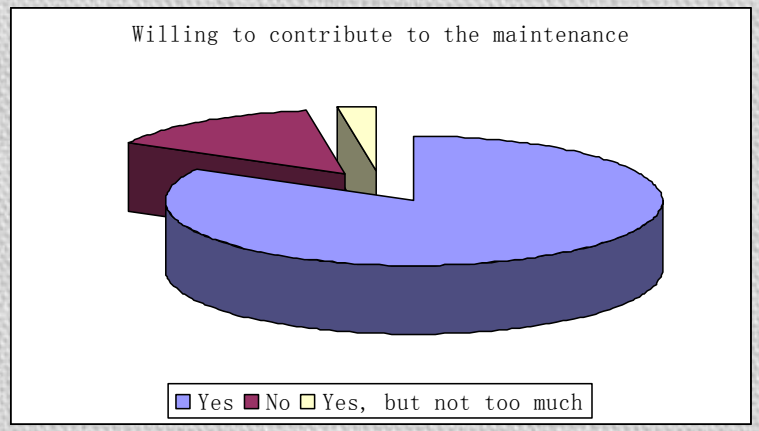


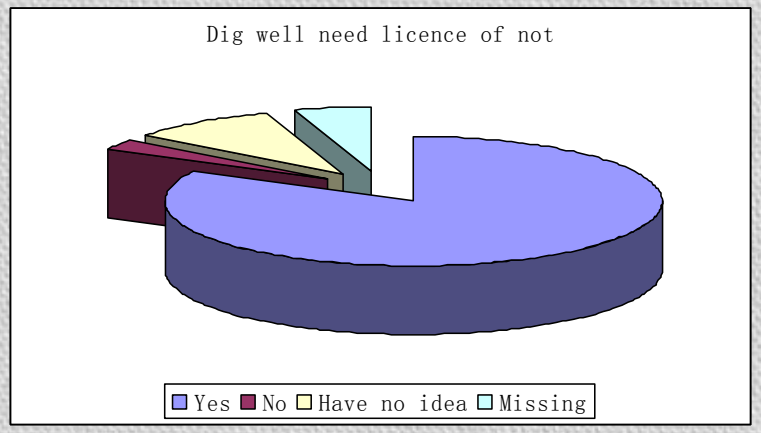




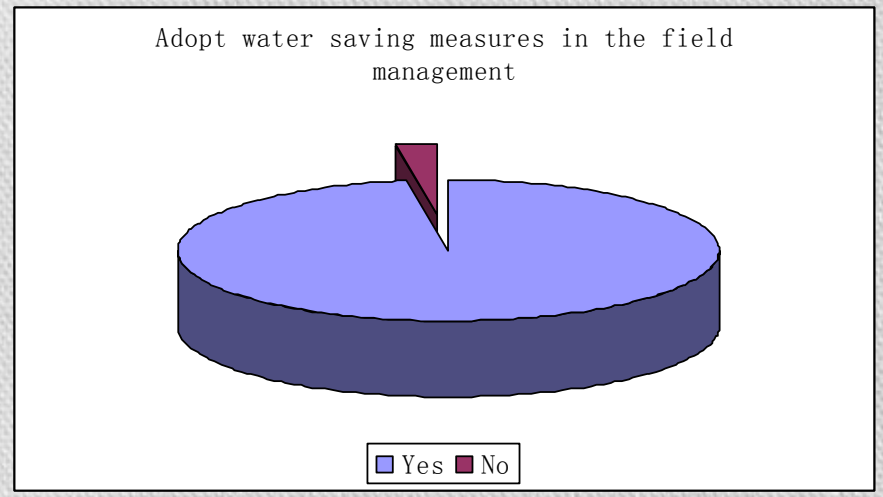
Attitude

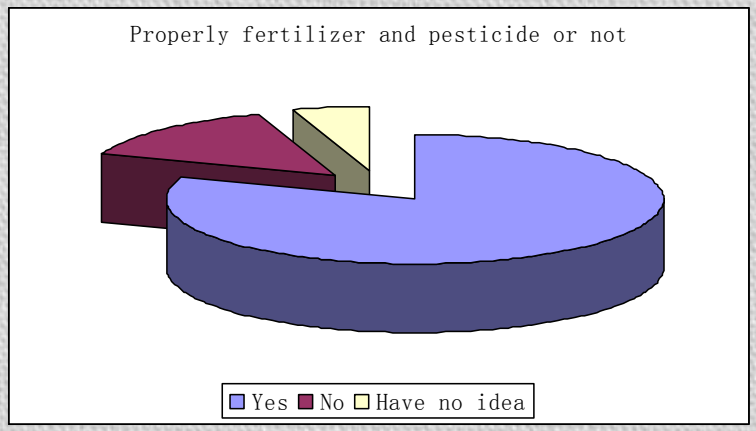

Water saving irrigation important or not
Yes
No
Have no idea

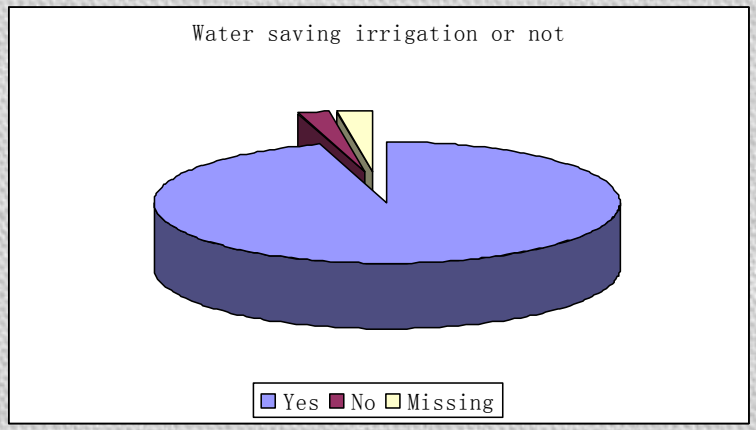

Willing to contribute to the maintenance
Yes
No
Yes, but not too much


Dig well need licence of not
Yes
No
Have no idea
Missing

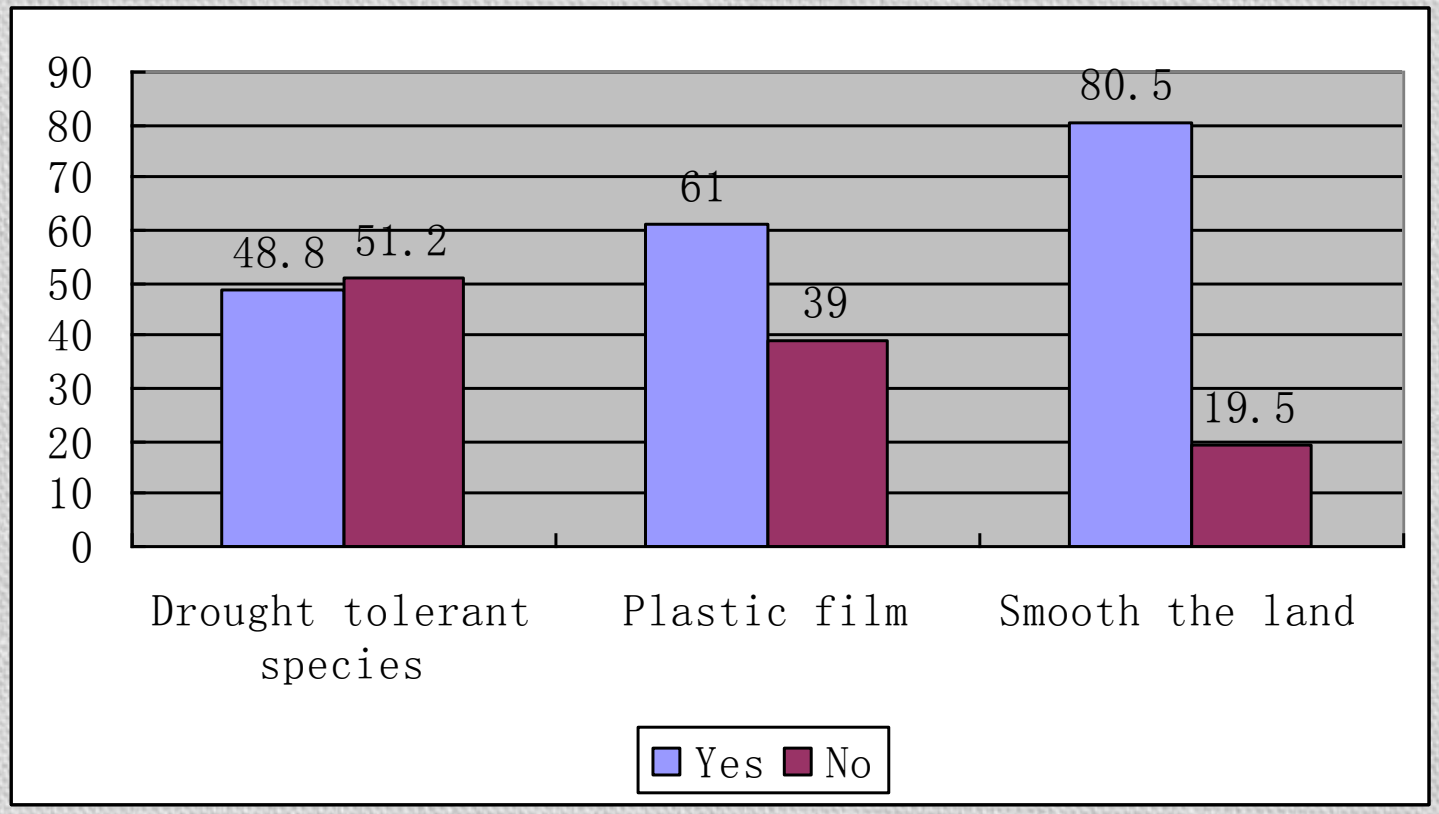
Practice


Adopt water saving measures in the field management
Yes
No


Properly fertilizer and pesticide or not
Yes
No
Have no idea


Water saving irrigation or not
Yes
No
Missing

The measures farmer adopted in the field management for coping with the drought （%）



Farmers’ evaluation on village irrigation management

	Irrigation order		Maintenance		Transparency		Democracy		Metering methods		Water fees collection	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	0	0	0	0	1	2.4	0	0	0	0	0	0
2	1	2.4	0	0	2	4.9	6	14.6	0	0	4	9.8
3	3	7.3	6	14.6	3	7.3	3	7.3	5	12.2	8	19.5
4	15	36.6	13	31.7	6	14.6	6	14.6	9	22	7	17.1
5	22	53.7	22	53.7	29	70.7	26	63.4	27	65.9	22	53.7
Total	41	100	41	100	41	100	41	100	41	100	41	100

Needs assessment

Different level groups	The roles in policy process
Central and Provincial level	Policy maker
Irrigation districts, County and Township level	Policy implementation and monitoring
Village level	Policy target group

Level	The role in policy process	Training needs (self evaluation)	And more
Provincial level	policy maker	-Integrated water basin management -Water rights (experience and lessons)	Policy making process (for example: social evaluation)
County and township level	policy implementation and monitoring	-Awareness building of water rights -Irrigation Management (management of water conservancy)	-Policy process (social evaluation, monitoring and evaluation)
Village level	policy target group	Next slide	

Needs assessment at village level (multiple choice)

Training needs	Farmer households		Village irrigation managers	
	Frequency	%	Frequency	%
Water saving tech. for agri	28	68.3	3	75.0
Proper use of the fertilizer and pesticide	22	53.7	1	25.0
Water resource regulations for rural area	12	29.3	2	50.0
Participatory irrigation management	9	22.0	0	0

Needs assessment

Investment	Farmer households		Village irrigation managers	
	Frequency	%	Frequency	%
Well construction	38	92.7	2	50.0
Stall metering equipment	5	12.2	0	0
Capacity building for irrigation management	1	2.4	0	0
Maintenance	16	39.0	4	100.0
Salary for irrigation management	7	17.1	1	25.0
Training for water saving knowledge and tech.	5	12.2	3	75.0

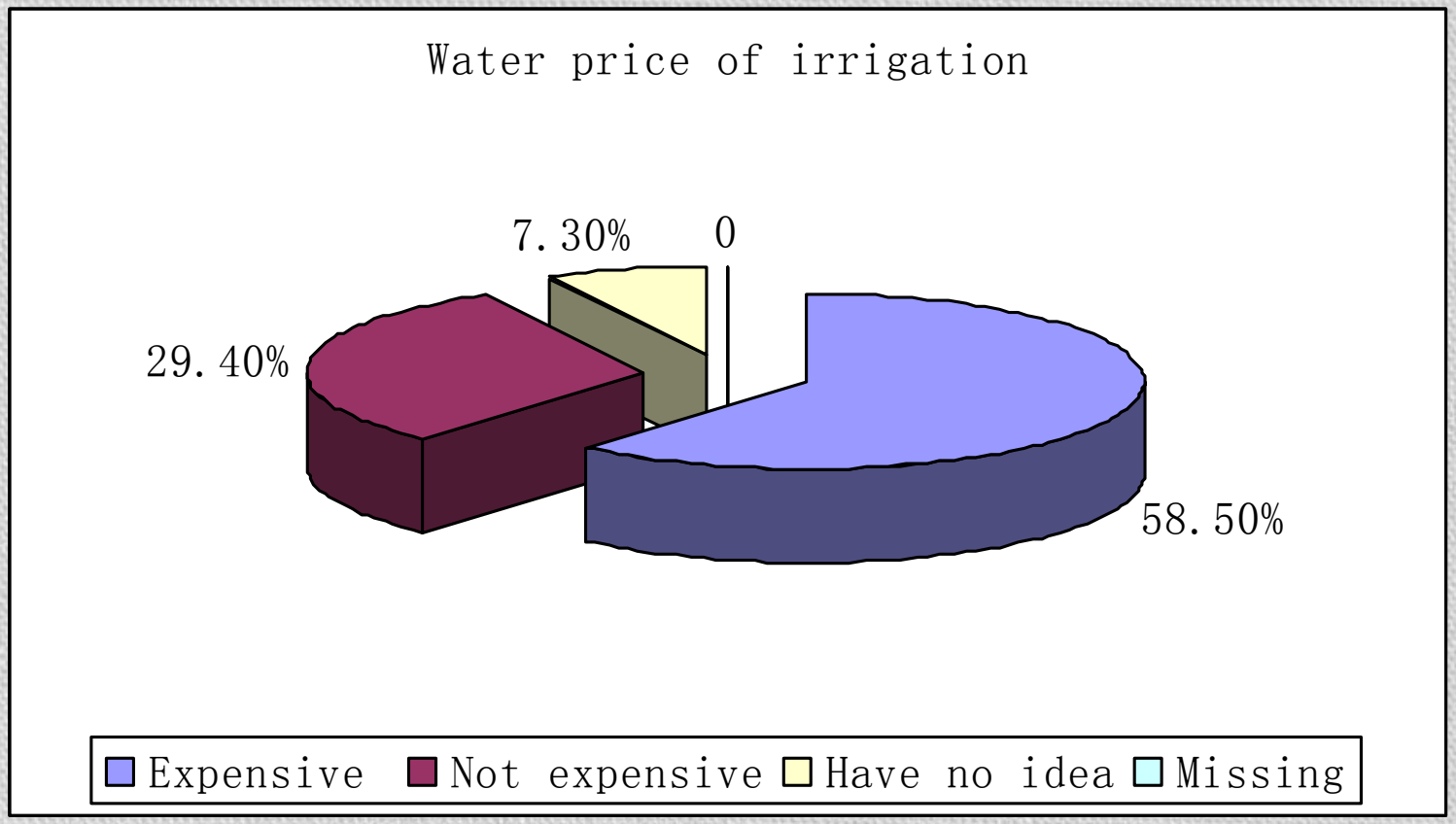
Challenges faced by water saving irrigation

- Water transfer to higher value sectors
- Lack of financial support for the O&M of on farm irrigation facilities
- Most of the Farmers think the irrigation price is high

Water resource allocation by sectors, Qingxu County, 2002(10,000 m^3)

Guarant eed ratio	Sectors	Demand	Quota	The ratio meet the demand	Guarant eed ratio	Sectors	Demand	Quota	The ratio meet the demand
P=50%	Industry	564.00	846.00	150.0%	P=75%	Industry	564.00	846.00	150.0%
	Agri	11341.20	5019.11	44.3%		Agri	14255.00	5029.53	35.3%
	Domestic	828.10	828.10	100.0%		Domestic	828.10	828.10	100.0%
	Eco	193.54	193.54	100.0%		Eco	218.06	218.06	100.0%
	Reserve		195.75			Reserve		189.11	
	Total	12926.84	7082.50	54.8%		Total	15865.16	7110.80	44.8%

Farmers attitude towards current water price of irrigation



Recommendations

1. Legislation and integrated planning
2. Water consumption control
3. Increase water efficiency
4. Management and technology innovation
5. Water price reform and irrigation subsidy

Reflection and follow-ups

The most important things you learned about water management and allocation in your basin during the project

- Establish the sound law and regulation systems
- Increase water efficiency by the innovation of technology and management
- For food security consideration, irrigation needs more support from public finance for the construction, maintenance, and capacity building
- Brought different stakeholders together for the decision making

How you plan to use the information you have gained

Dissemination of successful experiences on water resource allocation:

- Construction: water saving infrastructure , farmland facilities, metering and monitoring facilities
- Technology: water saving technologies and skills
- Management: price differentiation, price ladder, water rights system, WUA

How much you value the project experience and why

- Have the insights of sustainable water use
- Sharing the successful experiences and the challenges with other Asian countries
- Learn from each other