Water and Conflict in Central Asia

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Statement

- ‘Nowhere in the world is the potential for conflict over the use of natural resources as strong as in Central Asia’ (Smith 1995)

Storyboard

- Common Pool Resource Problems
- Background to Water Management in CA
- The Syr Darya
- The Amu Darya
- Way forward: ???

Two Common Pool Resource (CPR) Problems

- Appropriation: related to substractability of the benefits consumed by one member from those available to others
- Provision: related to the operation and maintenance of the resource delivery system

Historical Background

- Russia: focus on cotton production in CA
- Soviet Union no change in agricultural focus
- Khrushchev: virgin land policy in 1953
- Hydraulic mission (pump stations, canals)

Background to water management

- Central control in Moscow
- Two-fold subordination sectorial (irrigated agriculture) and national
- “The water management infrastructure was designed for a unifying purpose and placed where it made sense geologically” (Lange 2001)
- Issue-linkage approach: Food, energy and water

Extend of 'hydraulic mission'

- Infrastructure:
  - 5 regional and 53 national reservoirs
  - Main and inter-farm canals: 28,000 km
  - 1,464 pumping plants
  - 4,942 pumps for 2,3 million ha
- Increase of irrigated land
  - 1965: 4.5 million ha
  - 1991: 7 million ha
  - 1999: 8.1 million ha

Amu Darya & Syr Darya

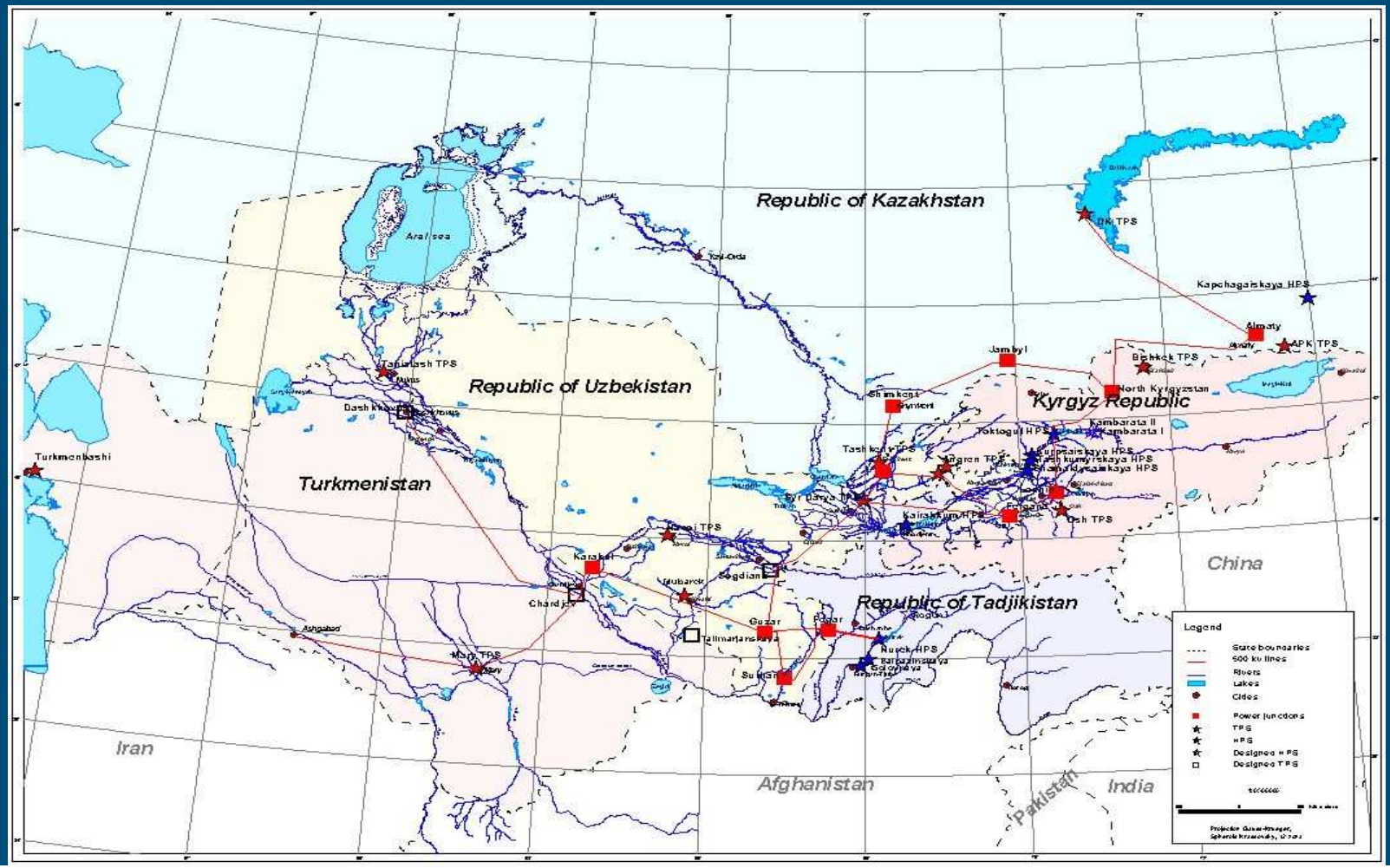
Country	River Basin		Aral Sea Basin	
	Syr Darya	Amu Darya	Total	Total %
Kazakhstan	2.4	-	2.4	2
Kyrgyz Republic	27.6	1.6	29.2	25
Tajikistan	1.0	49.6	50.6	43
Turkmenistan	-	1.5	1.5	1
Uzbekistan	6.2	5.1	11.2	10
Afghanistan and Iran	-	21.6	21.6	19
Total for Aral Sea Basin	37.2	79.3	116.5	100

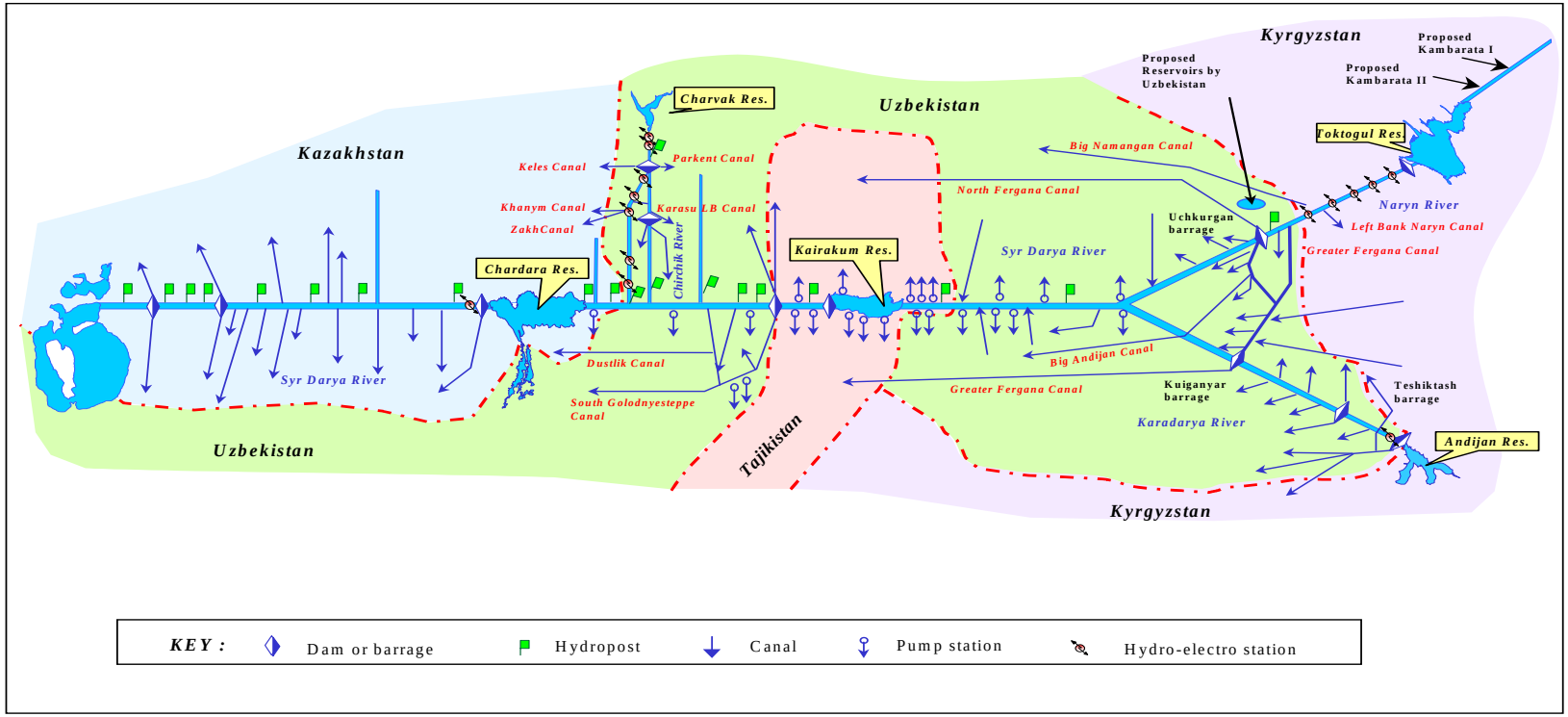
Source: Diagnostic Study, November 2001, SPECA.

Syr Darya

- Length 3,019 km
- Catchment 219,000 km^2
- Annual flow 37.2 km^3 , variation between 21 and 54 km^3
- Originates Tien San Mountains, Kyrgyzstan
- Riparian states: Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan

The Syr Darya




Kyrgyzstan
Proposed Kambarata I
Proposed Kambarata II
Proposed Reservoirs by Uzbekistan
Toktogul Res.
Naryn River
Left Bank Naryn Canal
Greater Fergana Canal
Uchkurgan barrage
Big Namangan Canal
North Fergana Canal
Syr Darya River
Kairakum Res.
Charvak Res.
Uzbekistan
Kazakhstan
Keles Canal
Parkent Canal
Khanym Canal
Karasu LB Canal
ZakhCanal
Chirchik River
Chardara Res.
Dustlik Canal
South Golodnyesteppe Canal
Big Andijan Canal
Kuiganyar barrage
Teshiktash barrage
Karadarya River
Andijan Res.
Tajikistan
Kyrgyzstan
KEY :
Dam or barrage
Hydropost
Canal
Pump station
Hydro-electro station

Agreement

- Setting limits: February 7, 1984
- Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan

Set Limits

Table 4. Water Use Limits in the Syr Darya Basin following Protocol No. 413 of February 7, 1984

Republics	Water Use in Year of Availability of 90% of Annual Average Flow (km^3)			Irrigated areas in Basin Development Plan (ha)
	From surface water sources		From ground-water and return flows	
	Total	From Naryn-Syr Darya		
Uzbekistan	19.7	10.5	5.8	1,982
Kazakhstan	12.3	10.0	3.0	780
Kyrgyz Republic	4.0	0.4	0.9	456
Tajikistan	2.5	1.8	1.2	262
Total for Basin	38.5	22.7	10.9	3,390

Resource allocation

- Almaty Agreement 1992: states retained their Soviet-period water allocation
- Water allocation continued
- Energy and Food exchange did not continue (national strategy on energy and food)

Irrigated area in the Basin

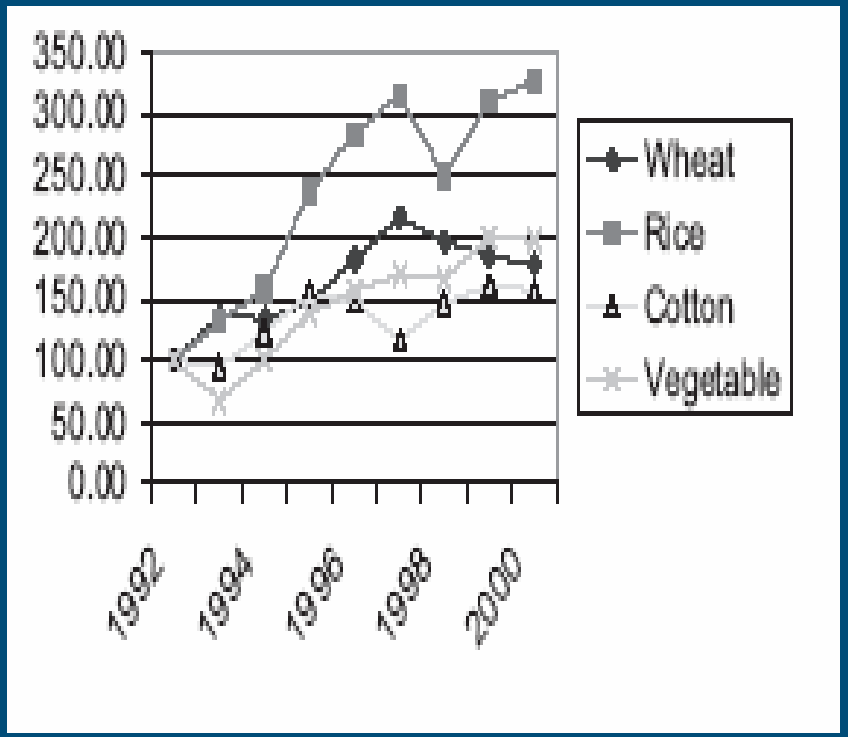
- Kazakhstan: 800,000 ha
- Kyrgyzstan: 400,000 ha
- Tajikistan: 300,000 ha
- Uzbekistan: 1,900,000 ha

Land privatization (Kyrgyzstan)

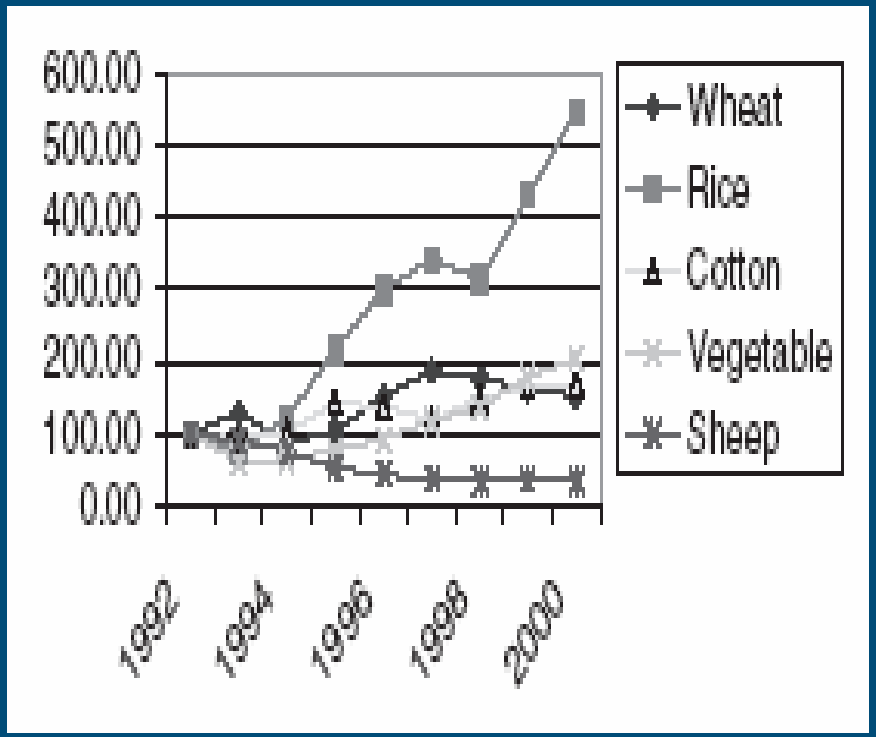
- Kyrgyzstan:
  - 1990: 450
  - 1996: 40,000 private farms
- Implications:
  - On-farm infrastructure not equipped to control small farms
  - Change from livestock to food crops
  - Increase of water use (Ul Hassan et.al. 2004)
  - Set limits on the national level are not followed
  - This trend is similar in Tajikistan and in Kazakhstan,
  - Trend in Kazakhstan creates ‘only’ conflicts within Kazakhstan

Food security in Kyrgyzstan

- Area harvested (%)



- Production (%)



Future plans on agriculture:

- Kyrgyzstan wants to increase its irrigated area by 230,000 ha
- Tajikistan wants to increase its irrigated area by 500,000 ha (not all in Syr Darya basin)

Sectors competing for water

- Increases in water consumption upstream were not contested (in one sector)
- But the problems started when water was utilized in a different sector (energy production)
- Downstream agriculture needs water during the summer, upstream energy sector needs water during the winter
- Not the water allocation was contested, but the timing of water delivery.

Agreement reached

- March 17, 1998: Kazakhstan, Kyrgyzstan & Uzbekistan sign agreement on water and energy
- But, the agreement 'did not provide a means of enforcement'
- Does not include service provision and backgrounds the food security strategy upstream

Service Provision

- Article VII, 1998 Agreement: requires the republic in which the facility lies to finance and conduct O&M of those facilities
- O&M only 40 per cent of what is needed
- Infrastructure deteriorates

Paying for water?

- Kyrgyzstan would like to charge downstream countries for water, “water as national commodity”
- Downstream countries argue: water is given by GOD
- But, Kyrgyzstan provides a service to downstream riparian states, can it charge service fees?
- Chu-Tallas basin: Kazakhstan is contributing to emergency repair work

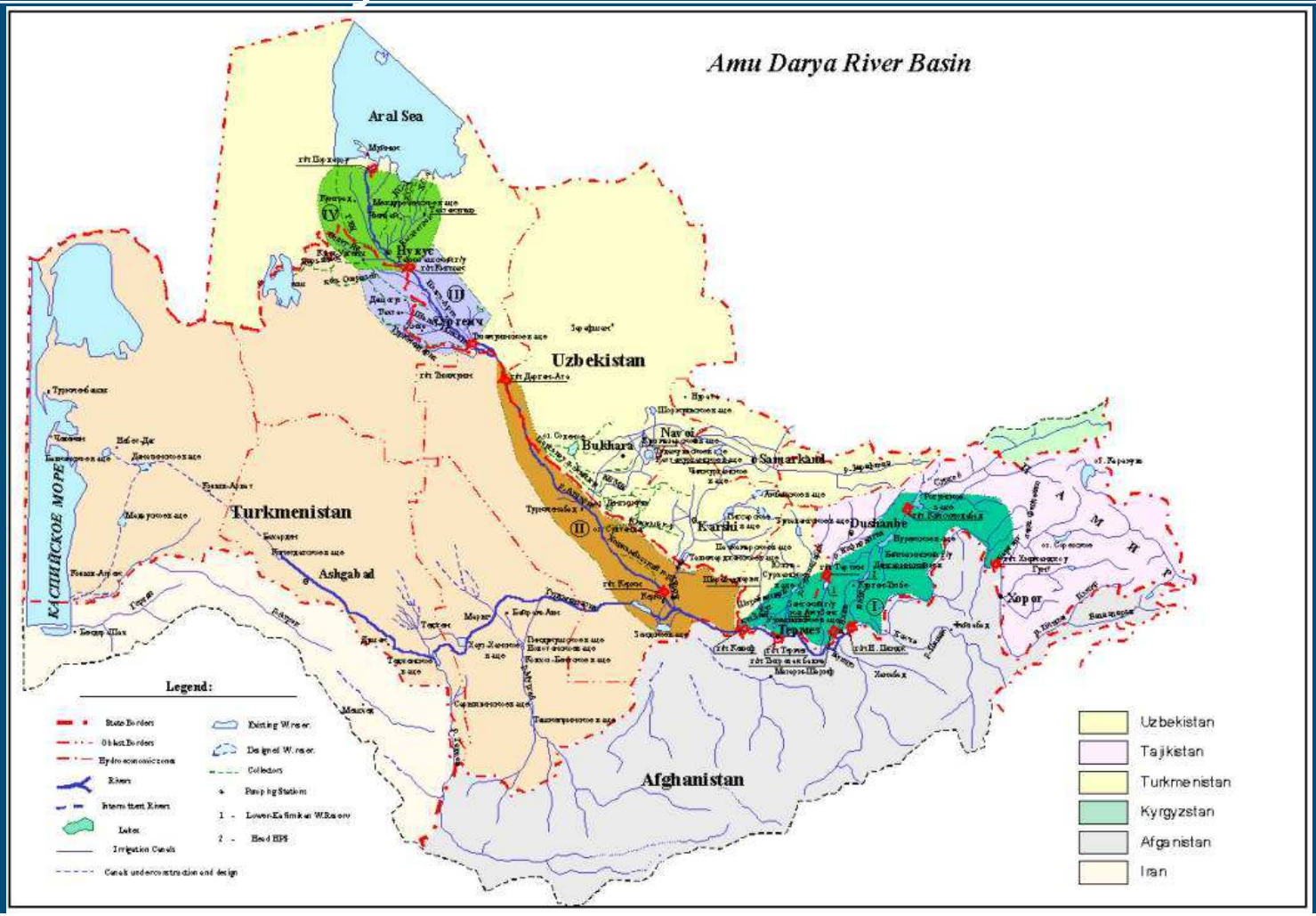
Concluding remarks Syr Darya:

- Skewed water allocation did not lead to conflicts between the riparian states, but the dis-integration of different sectors
- Increase in water demand upstream will lead to shortages downstream. Allocation has to be renegotiated
- Reached agreements 1998: only focus on Energy and Water, but are not enforceable, do not solve the problem of service provision and upstream strategy of food self-sufficiency

Amu Darya

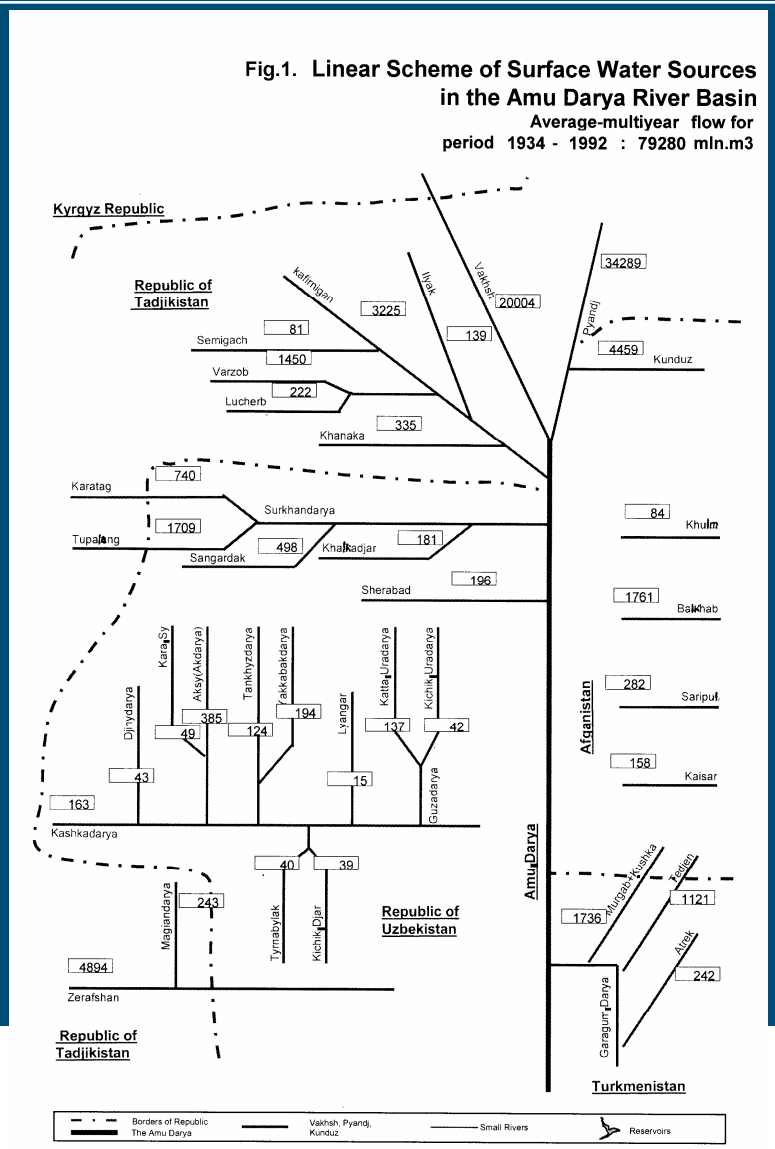
- Length 2540 km
- Catchment 309 000 km^2
- Annual flow 73.6 km^3, variation between 47 and 108 km^3
- Originates Vakjdjir Pass, Afghanistan
- Riparian states: Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

The Amu Darya Basin



Contributing rivers

- Map is old, only really represents contribution of Tajikistan
- Khulm, Balkh, Sur-e-pul, & Sherintagab contributing rarely to the flow, but groundwater contribution
- Wakhan, Pamir, Badaskhshan, Kokcha & Kunduz



Agreement

- Setting limits: March 12, 1987
- Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
- “it appears that the available annual flow of 61.5 km^3 assumed diversion by Afghanistan at that time of 2.1 km^3.”
- It is not evident that the amount allocated to Afghanistan is based on international agreements
- In 1977 Afghan delegation went to Tashkent, to claim equal share of the Amu darya
- no agreement on the amount Afghanistan is contributing, estimates vary from 10 to 20 km^3

Set Limits

Table 1: Water Distribution Limits in the Amu Darya Basin following Protocol 566 of March 12, 1987.

	Limit (km^3/year)	Share %
Uzbekistan	29.6	48.2
Tajikistan	9.5	15.4
Kyrgyz Republic	0.4	0.6
Turkmenistan	22.0	35.8
Total for Basin:	61.5	100
Allocations downstream of the Kerki gauging site		
Uzbekistan	22.0	50
Turkmenistan	22.0	50

Irrigated area in the basin

- Kyrgyzstan 22,000 ha
- Tajikistan 469,000 ha
- Uzbekistan 2,321,000 ha
- Turkmenistan 1,735,000 ha
- Afghanistan 460,000 ha (1965)

Future plans on agriculture:

- Turkmenistan already increased irrigated area, but wants to increase further by 450,000 ha
- Tajikistan 500,000 ha (not all in basin)
- Afghanistan potential of total 1,580,000 ha
- Uzbekistan 634,400 ha suitable for new irrigation (not all in basin)

Changing water demands

- 1990: 40 % cotton & 7 % wheat
- 2000: 35 % cotton & 30 % wheat (consequence: lower demand)
- Tajikistan decreased livestock production and increased rice and wheat production (more water consumed)
- Leaching intensified
- Deterioration of irrigation infrastructure (higher losses)

Official water allocation since independence

State - Water User	1993-1994		1994-1995		1995-1996		1996-1997		1997-1998		1998-1999		Average		Limit, %
	Actual Data														
	km.3	%	km.3	%	km.3	%	km.3	%	km.3	%	km.3	%	km.3	%	
Kyrgyz Republic	0,15	0,29	0,13	0,26	0,16	0,31	0,17	0,34	0,14	0,28	0,14	0,27	0,15	0,29	0,29
Tajikistan	7,32	14,20	7,01	14,22	7,41	14,32	7,51	15,00	7,23	14,67	7,46	14,44	7,32	14,47	15,17
Turkmenistan	22,76	44,15	21,15	42,90	21,46	41,46	21,02	41,98	20,91	42,43	21,82	42,25	21,52	42,53	42,27
Uzbekistan	21,32	41,36	21,01	42,62	22,73	43,91	21,37	42,68	21,00	42,61	22,23	43,04	21,61	42,71	42,27
SUB-TOTAL	51,55	100	49,30	100	51,76	100	50,07	100	49,28	100	51,65	100	50,60	100	100
Aral	11,2		8,9		3,1		4,9		0,52		8,1		6,12		
TOTAL	62,75		58,20		54,86		54,97		49,80		59,75		56,72		

Water Distribution (1991 – 2001)

Table 4: *Water Distribution in the Amu Darya Basin (1991 – 2001) (in km^3)*

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Uzbekistan	45,0	61,6	50,8	52,9	37,4	42,0	33,4	58,5	42,9	26,9	19,1
Turkmenistan	21,9	22,5	22,4	22,9	20,9	20,8	21,2	22,5	22,0	16,4	13,4
Tajikistan	7,3	6,6	7,6	7,2	7,2	4,7	7,6	6,8	7,4	7,6	7,3
All	74,3	90,6	80,8	82,9	65,6	67,6	62,2	87,8	72,3	51,0	39,8

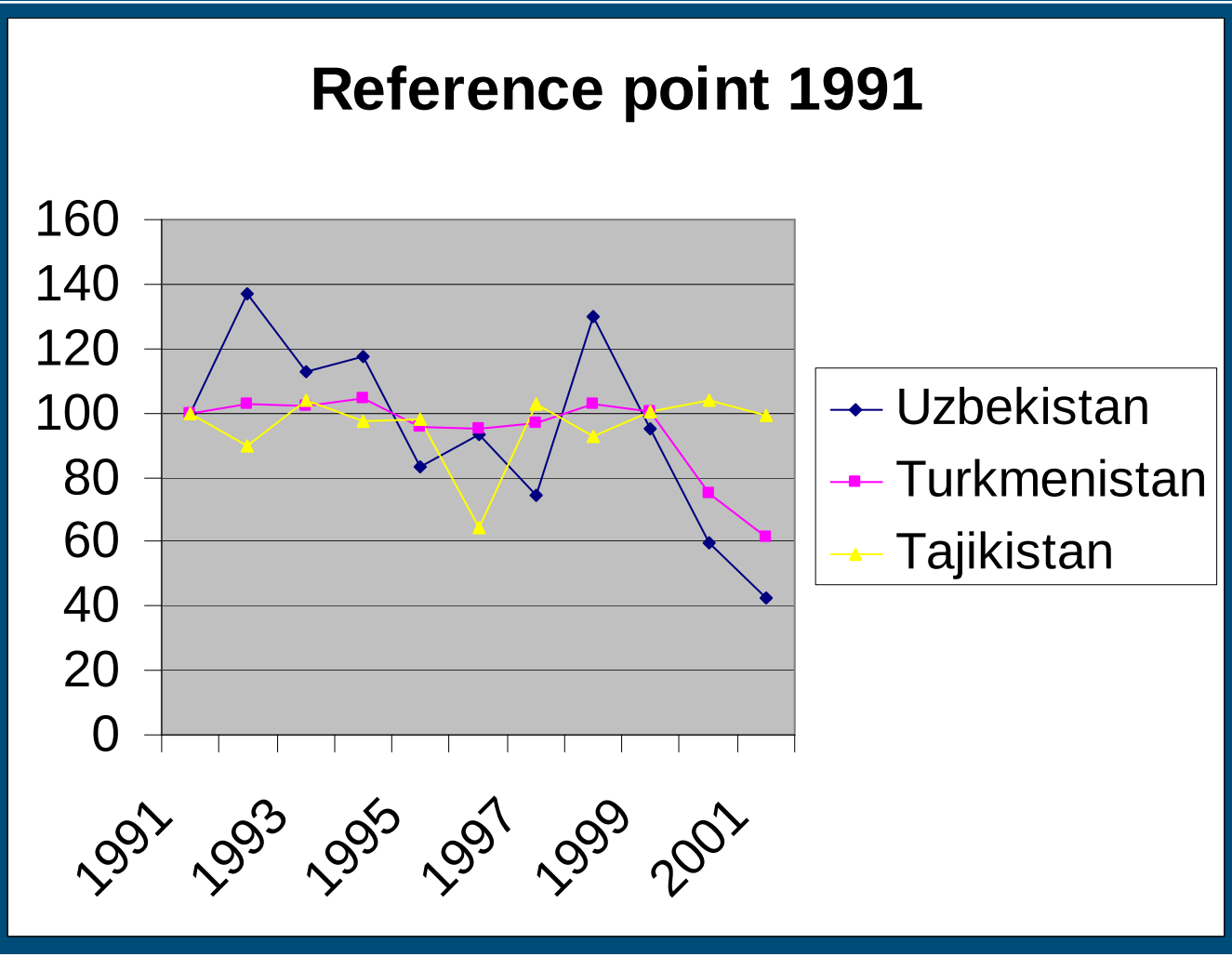
Table 5: *Water Distribution in the Amu Darya Basin (1991 – 2001) (in per cent)*

Uzbekistan	60,6	67,9	62,9	63,8	57,1	62,2	53,7	66,6	59,4	52,8	48,0
Turkmenistan	29,5	24,8	27,7	27,6	31,9	30,8	34,1	25,6	30,4	32,2	33,7
Tajikistan	9,9	7,3	9,4	8,6	11,0	7,0	12,2	7,7	10,2	15,0	18,3
All	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Table 6: *Water Distribution in the Amu Darya Basin (1991 – 2001) (in per cent, reference point 1991)*

Uzbekistan	100,0	136,7	112,8	117,4	83,1	93,3	74,2	129,9	95,3	59,8	42,4
Turkmenistan	100,0	102,5	102,2	104,5	95,6	95,0	96,9	102,8	100,3	74,9	61,3
Tajikistan	100,0	89,9	103,9	97,4	98,3	64,3	103,0	92,5	100,6	104,1	99,2
All	100,0	122,0	108,8	111,6	88,3	90,9	83,7	118,2	97,3	68,6	53,6

Fluctuations of Utilization



What does the data show?

- Uzbekistan is utilizing more than the set limits
- Even during drought, Tajikistan is utilizing limits (consequence water scarcity is higher downstream)

What does the data not show?

- Within Uzbekistan no equitable distribution, downstream provinces are worse off
- Turkmenistan metering stations internally controlled (is the data real?)
- Is there water left for the Aral Sea?

Is there any water for the Aral?

- Last metering station downstream shows 5 year average only 3 km^3, but metering station is 102 km away from original Aral Sea.

Average Water Discharge							
Metering Station	Distance from Sea (km)	2000			2001		
		Actual (km^3)	5 year average (km^3)	% of 5 year average	Actual (km^3)	5 year average (km^3)	% 5 year average
Tuyumayun	450	4.41	11.84	37.27	3.62	11.84	30.58
Kipchak	287	2.73	7.69	35.47	1.51	7.69	19.67
Samanbai	215	0.51	3.19	16.18	0.034	3.19	1.08
Kyzldjar	102	0.32	3.00	10.68	0.032	3.00	1.06

Future plans on energy:

- Tajikistan is planning to complete the Rogun Dam on the Vakhs River. This would put Tajikistan into a similar position as Kyrgyzstan with the Toktogul reservoir.

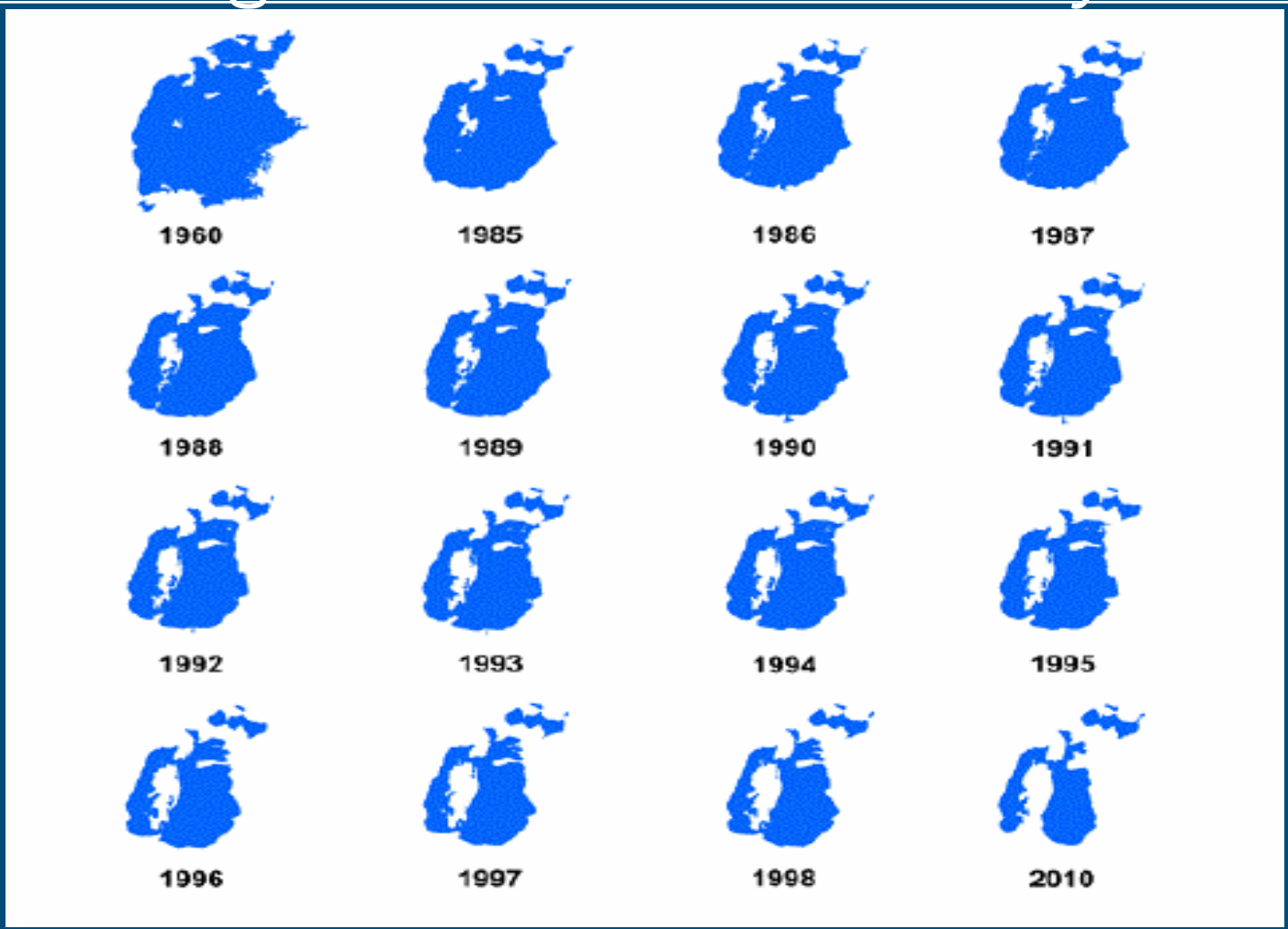
Concluding remarks Amu Darya: Afghanistan

- What is the real contribution of Afghanistan?
- Can Afghanistan 'sell' its share to downstream countries? "water as a commodity"
- What consequences would it have for irrigation in downstream countries? (Pump station: Kashkardarya)

Concluding remarks Amu Darya: BVO

- Why are there two different data sets?
- What does it say about the BVOs as “neutral” organizations?
- What does it say about “data” in general? Is data political?

Concluding remarks Aral Sea: Today is 2010



Way forward:

- Pledges for closer co-operation in the PAST:
  - Nukus 1995
  - Dushanbe 2002 (River Basin UN status) (Afghanistan not included)
  - UN did not react
- Recent pledges for closer co-operation:
  - Almaty 2005: call for track-two initiative
  - Dushanbe 2005: call for closer co-operation
  - But how 'real' are these pledges?
  - How willing are the stakeholders to negotiate their shares, and maybe to give up their shares?

But: issues addressed only international level:

- Is it possible to address the national level without solving the lower administrational levels?
- Deterioration of infrastructure and underinvestment lead to distribution conflicts on the national level
- Creation of WUAs (local level): But does it function? Do they save water?
- Is it possible to make water management more efficient on the local level? Charging for water? What are the constraints?