

Ecosystem Services of the Ili River Delta, Kazakhstan and willingness to pay for their protection by inhabitants of Almaty – an interview based study

Niels Thevs<sup>1,2</sup>, Victor Martinez Bolea<sup>2</sup>, Volker Beckmann<sup>2</sup>, Sabir Nurtazin<sup>3</sup>, Ruslan Salmyrzali<sup>3</sup>, Azim Baibagysov<sup>3</sup>

<sup>1</sup>World Agroforestry Center, Central Asia Office, Bishkek, Kyrgyzstan <sup>2</sup>Institute of Botany and Landscape Ecology University of Greifswald, Germany <sup>3</sup>Biological Faculty, Kazakh National University Al-Farabi, Almaty, Kazakhstan Water resources in Central Asia and the Ili Balkhash Basin Ecosystem services

The IIi Delta and ist ecosystem services

Monetizing ecosystem services

# **Central Asia: region of closed river basins**



# **Central Asia: region of closed river basins**



# The IIi Balkash Basin



The largest lake in Cnetral Asia, after dessiccation of the Aral Sea. Ili Delta, one the largest, if not the largest wetland in Central Asia.

# The Ili Balkash Basin



# **Project background**

Project Ecosystem conservation and sustainable land use in the IIi-Delta, Balkhash Lake, Kazakhstan, under decreasing water resources, BMBF

ELD regional study Central Asia

ELD = Economics of Land Degradation, a global approach to assess the costs of land degradation / loss of ecosystem services



## Monetarization of ecosystem services

# **Monetary values and ESS**



**TEEB**, 2010

# **Monetary values and ESS**



revenues from products - costs

# The IIi Delta and its vegetation



# The III Delta and its vegetation



# ESS in the Delta, mainly from wetlands

Provisioning: Fodder (-> food from animal products), fish (spawning place), game Raw material (-> construction material, chip boards, paper)

Regulating: C-Sequestration Regulation of water quality for Lake Balkhash Regulating local climate (cooling effect)

Cultural: Opportunities for recreation (hunting, fishing, bird watching) Information and inspiration Identity

## Land cover classes for monetizing use values



Thevs N, Beckmann V, Akimalieva A, Köbbing J-F, Nurtazin S, Hirschelmann S, Piechottka T, Salmmurzauli R, Baibagysov A (2017) Assessment of ecosystem services of the wetlands in the Ili River Delta, Kazakhstan. Environmental Earth Sciences 76: 30. DOI 10.1007/s12665-016-6346-2.

## **Monetarization of ESS – use values**

Monetarization of use values attached to ESS of the Ili Delta, 2013-2015: Market prices, travel cost approach, household and farm interviews

Assess wetland area and productivity: remote sensing.

Land cover class	Area [ha]	ESS
Water bodies in the delta	100208	Fish, tourism
Submerged dense reed (standing biomass (above water) 2014: 869,097 t	85400	Biomass, fish, carbon storage, water quality, tourism
Non-submerged dense reed	126378	Fodder
Open reed and shrub vegetation	138400	Fodder

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# Use values of ESS as enjoyed in 2014

Ecosystem service	Use value [million USD	Valuation method				
per year]						
Provisioning of fodder	6.6	Market prices: farm-gate selling prices of animals and milk as animal product.				
Provisioning of fish	1.9	Market prices: 60% of the annual fish catch of Lake Balkhash 60% of all fish in Lake Balkhash grew up in the Ili Delta.				
Provisioning of biomass	Currently small scale, is planned to be expanded.	Market price for harvested reed biomass: farm-gate selling prices				
Retain carbon in organic matter under submerged reed beds	Unclear if IIi Delta acts as carbon sink. when water drops -> organic carbon is exposed -> $CO_2$ will be emitted.	Carbon price from voluntary market for organic matter that is exposed if water level drops				
Water purification	5.1	Transfer value from other wetlands (de Groot et al. 2012)				
Recreation – tourism	4.25	Zonal travel cost approach				
Total	17.85					

Thevs N, Beckmann V, Nurtazin S, Salmmurzauli R, Baibagysov A, Akimalieva A, Baranowski EAA, Schäpe TL, Röttgers H, Tychkov N (2016) Ecosystem service assessment of the Ili Delta, Kazakhstan. Contribution to Regional ELD Study for Central Asia. http://54.229.19.198:8080/xmlui/handle/20.500.11766/4975.

# **General design of WTP investigation (2016)**

- Offer for which respondents shall state their WTP:
  - The implementation of a plan to avoid 60% reduction of water flow in Ili River and avoid 60% reduction of Ili Delta area in 20 years.
- Results of 60% reduction of river runoff was illustrated to respondents, e.g.:



Fish production

Currently  $\rightarrow$  10,000 t/yr Under -60%  $\rightarrow$  3300 t/yr



# **Data collection**

• Structured questionnaires

Section	From 20th to 31st May 2016
1st	Presentation
2nd	Previous knowledges of the ecosystem
3rd	Description by means of pictures and data
4th	Set out a potential scenario
5th	Elicit the WTP
6th	Socioeconomic factors



- 8 survey points
- In person
- By group of students
- Only adults and Almaty residents for at least 1 year

## -> 388 interviews were taken



#### Do you know...? / Have you been there...?

# **WTP decision**

	Ν	Yes responses	Mean (KZT)	Mean (USD)
WTP decision	388	55%	3.042	<b>9,15</b> (17.19)*
			1USD = 3	32,473 KZT (2016)

\*in brackets conversion according to exchange rate in 2014 (1 USD = 177.086 KTZ

Reasons	for "Y	ES" res	ponses
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Reasons for "NO" responses

	Ν	%		Ν	%
Ili Delta is a great source of resources for Kazakhstan	86	21.9	I do not earn enough	63	26.1
Ili Delta should be preserved for future generations	162	41.3	Should be paid from general budget (rearranging priorities)	50	20.7
			Lack of confidence in the vehicle of payment	19	7.9

Nobody objected that payment for ecosystem services should take place.

# **WTP of population of Almaty City**

WTP to avoid decrease of Ili River runoff and Ili Delta area by 60%:

Average WTP per	Population of	Total WTP (USD)
respondent (USD)	Almaty City (>18	
	years)	
9.15	1,249,460	11,431,148

### WTP to protect the whole IIi Delta:

WTP to	WTP quantity (USD)	WTP estimation
protect 60%	11.431.148	
protect 100%		19.051.914

Willingnes to Pay of the Almaty city people to preserve IIi Delta is  $\rightarrow$  **19,051,914 USD/yr** (35.7 million UDS after exchange rate of 2014): This reflects TEV of the IIi Delta.

# **Impacts on WTP decision**



No significant differences were fond regarding age, gender, or education level.

## **Discussion and conclusions**

- Amount of positive WTP statements lower than in other studies outside KAZ -> possibly due to opinion that government is responsible.
- Negative WTP statements were due to dis-trust in government or lack of money, not due to objection to protect Ili Delta: There was no objection against importance of ecosystem services of the Ili Delta.
- Quantity of WTP statement is in a similar range as in other studies for Xinjiang, e.g. Rumbaur et al. (2015) in China.
- TEV per area is low compared to other wetlands world wide: Many wetlands are near to cities and therefore receive a lot of visitors which increases TEV.
- Total WTP = Total Economic Value of 19 million USD higher than value of use values. This TEV reflects the lower boundary of TEV: People attribute a substantial significance to non-use values of the IIi Delta.

# Thank you for your attention









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