The Regional Environmental Centre for Central Asia (CAREC)

15 years

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Advancing the Ecosystem Approach in Central Asia: CAREC experience

Saltanat Zhakenova

15 YEARS OF EXPERTISE FOR BETTER ENVIRONMENT

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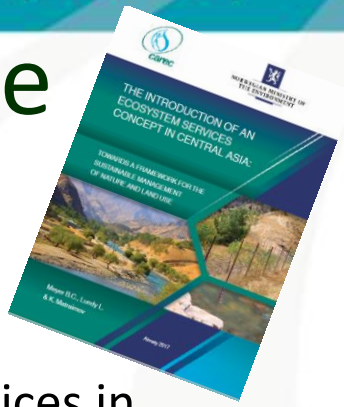
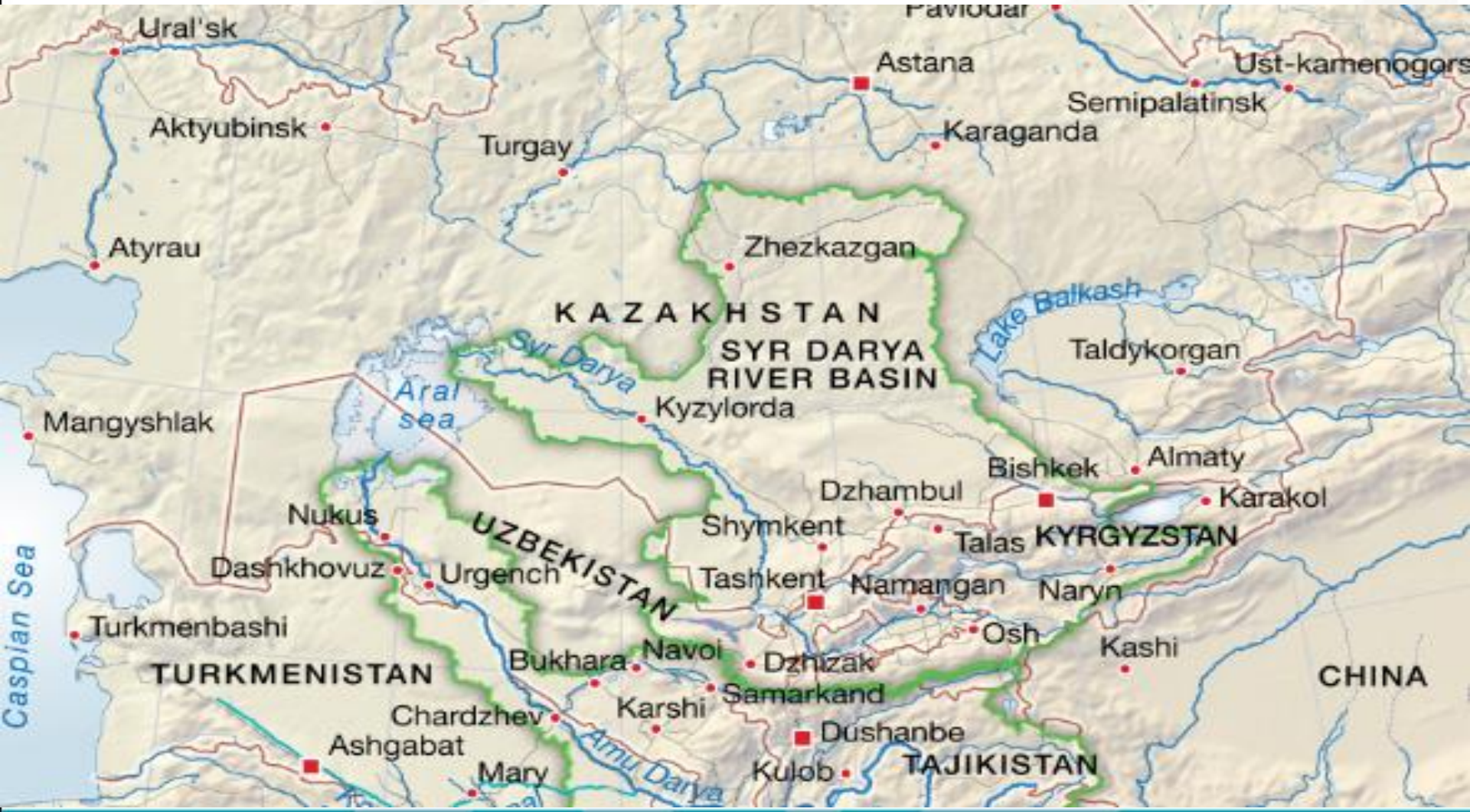
Promoting the approach to the process of decision - making



- Small projects starting in 2008
- UNEP / CAREC Project (2014-2015) “Promotion of Ecosystem Services in Sectoral and Macroeconomic Programs and Strategies of the Republic of Kazakhstan”
- ICARDA / CAREC Project (2014-2015) “Ecosystem Assessment to Improve Water Management in the Agricultural Sector in the Republic of Kazakhstan”
- 2014-2017, Project “Supporting Local Initiatives in the Field of Environmental and Water Management in Central Asia: Phase 1-2”, Norwegian Ministry of Climate and Environment
- 2017, Component "Implementation of PES in the pilot territory" of the FAO / GEF project "Sustainable management of mountain forests and land resources of Kyrgyzstan in the context of climate change"

Pilot areas


Ural'sk
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KAZAKHSTAN
SYR DARYA
RIVER BASIN
Syr Darya
Aral sea
Kyzylorda
Lake Balkash
Taldykorgan
Mangyshlak
Bishkek
Almaty
Karakol
Dzhambul
Nukus
UZBEKISTAN
Shymkent
Talas
KYRGYZSTAN
Dashkhovuz
Urgench
Tashkent
Namangan
Naryn
Caspian Sea
Turkmenbashi
Osh
Kashi
Bukhara
Navoi
Dzhizak
TURKMENISTAN
Samarkand
CHINA
Chardzhev
Karshi
Dushanbe
Ashgabat
Amu Darya
Kulob
TAJIKISTAN
Mary

UNEP / CAREC project (2014-2015) "Promotion of ecosystem services in industry and macroeconomic programs and strategies of the Republic of Kazakhstan"

- An analysis of the value and corresponding value of land and water wealth based on key indices reflecting the impact of policies on natural assets, resources, and ES
- The main goal of the simulation is to demonstrate how economic valuation of ecosystem services can be used to develop targeted policies and analyze their potential impacts.




Regional Development Scenarios

A. Baseline scenario - assessment of water and land use for economic purposes within the framework of existing programs and policies in the field of water use

B. The second scenario - the potential benefits of two pilot areas from the implementation of the system of trade in rights to disposable water resources

C. The third scenario is an analysis of the potential benefits of improving water efficiency through the restoration and reconstruction of irrigation systems.

Project "Evaluation of Ecosystem Services for Improved Water Management in the Agricultural Sector in the Republic of Kazakhstan", ICARDA / CAREC

Pilot territory: Arys - Turkestan region (three villages: Old Ikan, Bugun, Karashik) SKO

The purpose of the study: To investigate the current situation with the state of irrigated agriculture and to propose alternative methods of irrigation with replacement for agricultural crops, requiring less irrigation water

ES assessment methods: SWAT model and RIOS model

SWAT model (soil and water assessment tool)

- Bio-physical model
- Explores the relationship between soil, water, and the atmosphere.
- Identifies problems with water, land and their impact on other resources, for example, excessive use of fertilizers increases the concentration of Nitrogen (N) in drainage waters
- Allows modeling scenarios with improved land and water use practices

RIOS model (Resource investment optimization system)

- Economic model
- Estimates various ecosystem services in terms of value (in USD)
- Identifies the areas with the highest ES value.
- Allows you to simulate scenarios with modified ES and the impact on the economy and population of the studied region

Simulation Results (SWAT)

Two scenarios:

Base scenario i.e. as it is with cotton growing by flooding and

An alternative scenario, with the conversion of land for cotton (21,109 ha), alfalfa, (13,589 ha) and grapes (5,740 ha) cultivated by drip irrigation.

SWAT Model Results

Base scenario

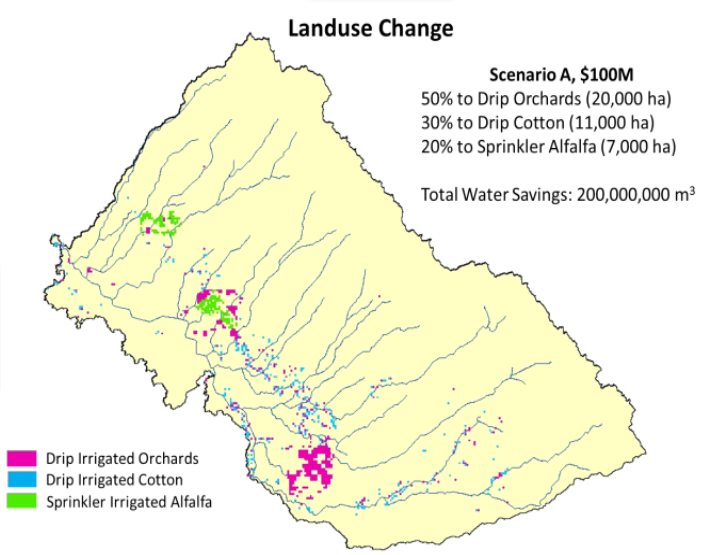
- Use as much water as now
- Return water in the same volume
- The same state of water quality
- The use of phosphorus fertilizers - 70 kg / ha
- The use of nitrogen fertilizers - 190 kg / ha

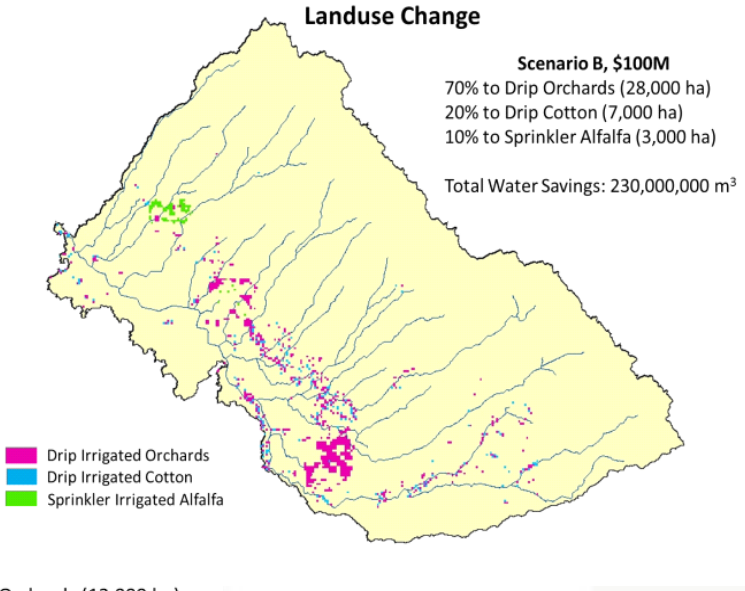
Alternative scenario

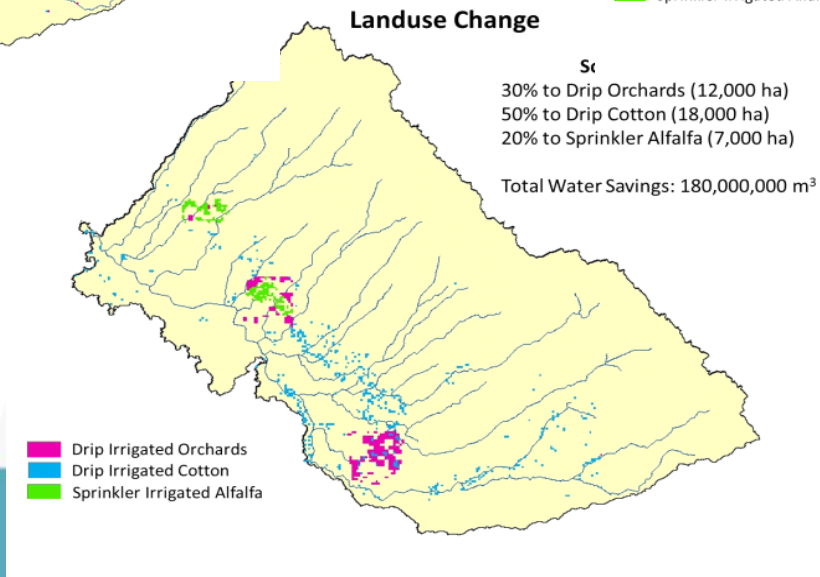
- Water saving (more than 220 million cubic meters of water annually)
- Return water volumes are down 0.5%
- Improving the quality of water by reducing losses of phosphorus and nitrate nitrogen from the fields
- Decreased use of fertilizers (78 kg / ha for drip-irrigated cotton and 13 kg / ha for grapes and not using fertilizer for alfalfa)

Methods	Scenario A: ($ 100 million)			Scenario B: ($ 100 million)			Scenario C: ($ 100 million)		
	Paid to Budget(in %)	Earth transfor mation (thous. ha)	Paid to Budget(i n %)	Paid to Budget(in %)	Earth transfor mation (thous. ha)	Paid to Budget(i n %)	Paid to Budget(in %)	Earth transfor mation (thous. ha)	Paid to Budget(i n %)
Drip irrigated cotton	**30%**	10,7	51,9	**20%**	7,1	34,6	**50%**	17,9	86,6
Alfalfa Irrigated	**20%**	6,7	14,0	**10%**	3,3	7,0	**20%**	6,7	14,0
Drip Irrigated orchards	**50%**	20,	134,0	**70%**	28,0	187,6	**30%**	12,0	80,4
Total	**100%**	37,4	**199,9**	**100%**	38,5	**229,2**	**100%**	36,5	**181,0**

Spatial distribution of alternative farming systems







Project "Supporting Local Initiatives in Environmental and Water Management in Central Asia: Phase 1-2, Norwegian Ministry of Climate and Environment / CAREC

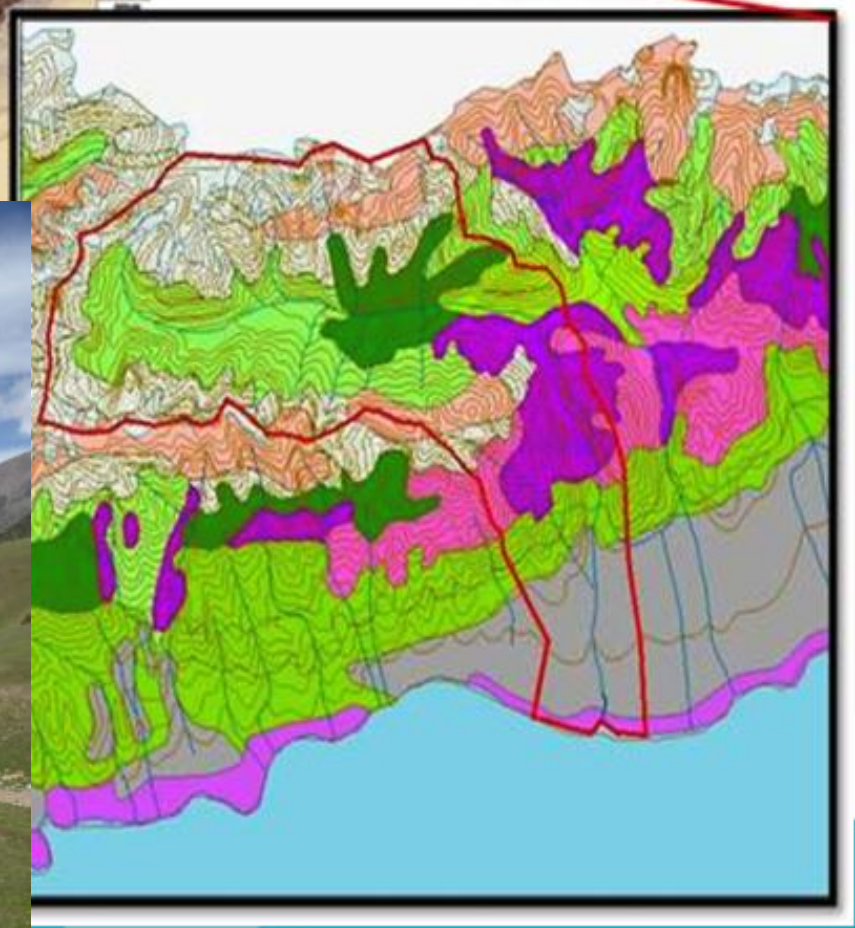
Pilot territories: State Enterprise "Shirkent" (Tajikistan), river basins. Chon-Aksuu, r. Zerger (Kyrgyzstan), river basin Ikansu (Kazakhstan)

Project Objectives:

Improving the understanding and potential of target groups for introducing the concept of ecosystem services in Central Asia basin management

Strengthening local initiatives and enhancing local capacity for sustainable basin management

Chon-Aksu River Basin



The main problems of the river basin

- ✓ **The quality and quantity of water for irrigation - a high level of suspended sediment, a shortage in the summer and a low sanitary condition.**

1. **Forest degradation:**
   - Unauthorized logging
   - Weak forest ecosystem restoration
2. **Не регулируемый выпас**
   - Not adjustable grazing
   - Overgrazing in accessible pastures
   - Lack of clear systemic monitoring of animal health

- ✓ **Soil erosion**
- ✓ **Forest area reduction**
- ✓ **Soil water reduction**

or Central Asia (CAREC)

Stakeholder involvement

Water users

Mushroom pickers

Faced with ecosystem degradation issues:

- **Water quality is deteriorating;**
- **Forest ecosystems threatened by deforestation and degradation (impact on productivity)**

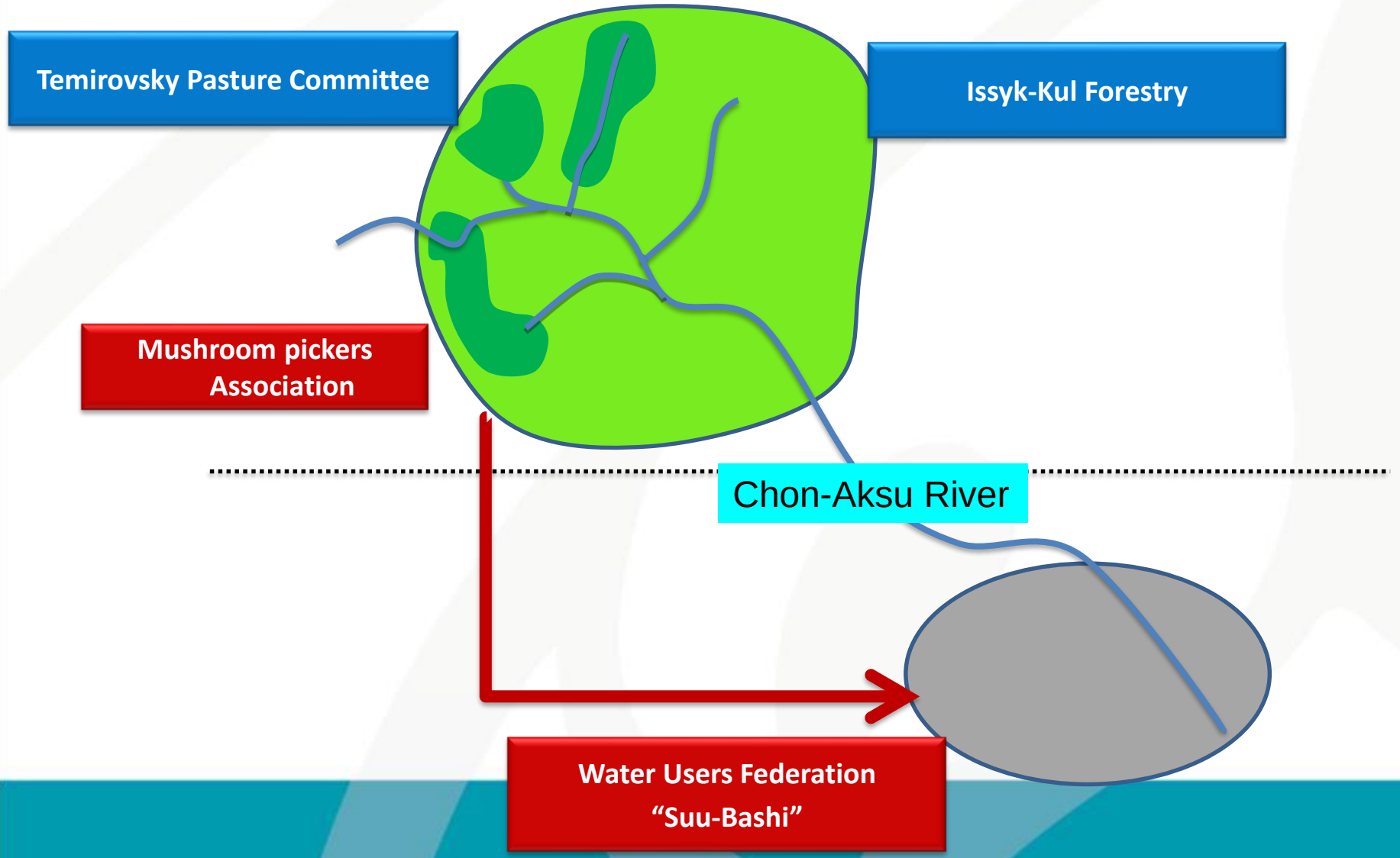
Forestry

Pasture committee

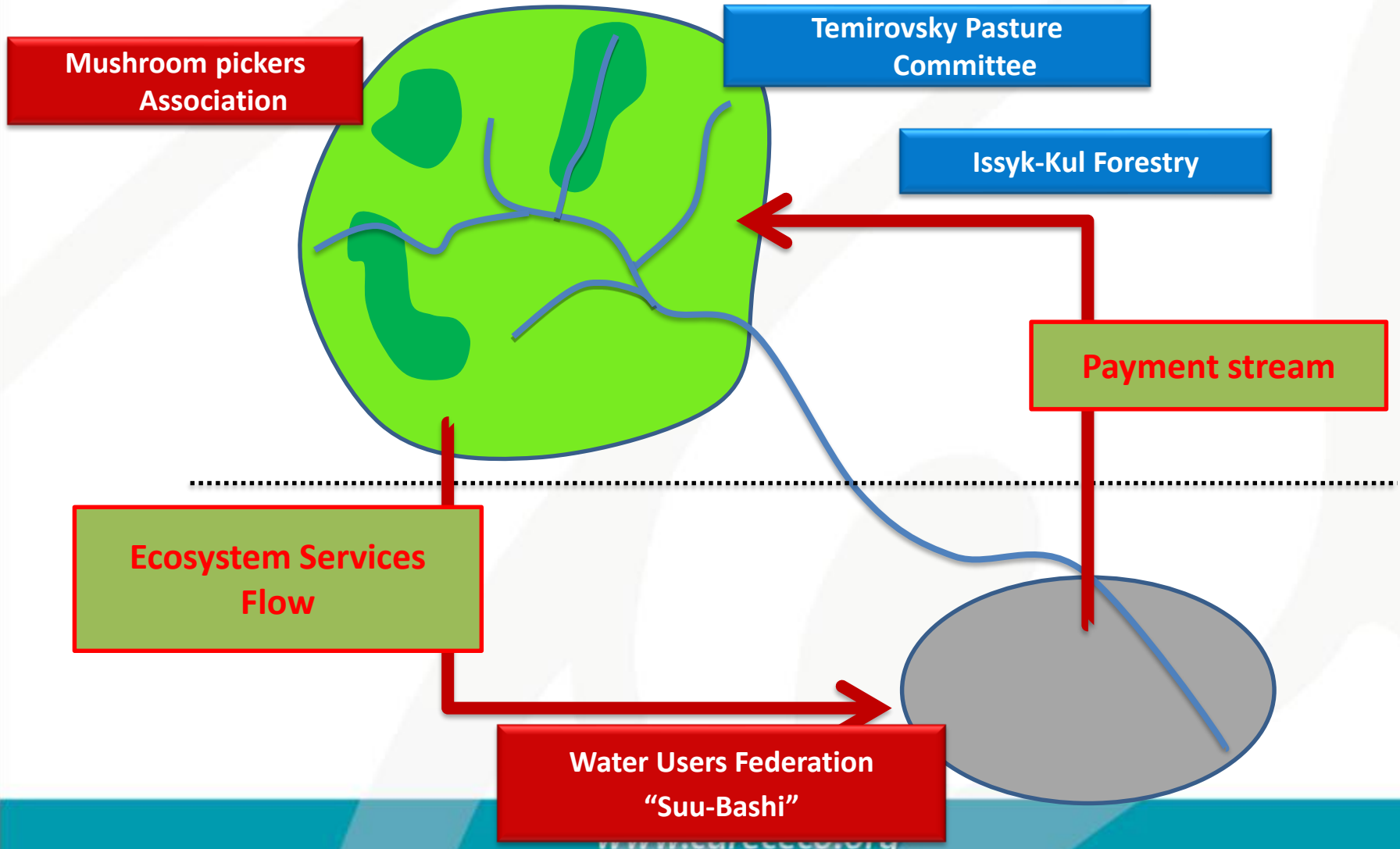
Unsustainable use of land in the upper reaches:

- **Restoration of forest ecosystems is insufficient due to overgrazing, and illegal logging;**
- **Pastures are degrading in certain areas and are subject to erosion.**

Before cooperation



Relationship of the parties



Formal agreement collaboration

1. Federation of water users pays with labor to the

Forestry: 10 people / days a year to help in planting seedlings, fencing, etc.

Pasture Committee: 20 people / days a year to improve the quality of pastures and pasture infrastructure

2. The Association of Mushroom pickers pays with labor to

Forestry: 30 people / days to help in preparing the soil for planting, in planting seedlings, etc.

Project Monitoring Scheme

- **Monitoring and Evaluation Plan (M&E)**

✓ 12 people from 4 organizations that signed the contract and CAREC employees.

✓ Monitoring and evaluation is carried out once a year and a report is prepared to the Coordination Committee

- **Steering Committee**

✓ Consists of 19 members representing state bodies and local authorities, NGOs;

✓ Monitors the entire mechanism, discusses the results of the mechanism and has the authority to extend or amend PES contracts

1. **Territory Definition**
2. **Definition of the list of ecosystems and major ES**
3. **ES usage analysis**
4. **Selection of assessment tools for each ES**
5. **Conducting an Economic Assessment ES**

Recommended

6. **Develop alternative scenarios to maintain sustainable use of ES**
7. **Development of recommendations**

State Enterprise "Shirkent"

	UoM	Volumes	Price in TJS	Cost in TJS	Cost, USD
Provision services					
Agricultural products, pasture use, forest products, water supply, animal husbandry, etc.				9 492 285	1 201 557
Regulatory Services					
Pasture Carbon Storage	t	7800	150	1170000	148101
Carbon storage in the forest	t	4529	150	679350	85994
Support Services					
Biodiversity	ha	31000	3950	122450000	15500000
TOTAL				**138 128 835**	**17 484 663**

River basin Ikansu

	UoM	Volumes	Price in tenge	Cost in tenge	Cost, USD
Provision services					
Agricultural products, pasture use, forest products, water supply, animal husbandry, etc.				9 801 585 521	32 809 871
Regulatory Services					
Pasture Carbon Storage	t	59880	5010	299 998 800	898 200
Support Services					
Biodiversity	ha	126986	100200	12 723 997 200	38 095 800
TOTAL				**22 825 581 521**	**71 803 871**

River basin Chon-Aksu

	UoM	Volumes	Price in som	Cost in som	Cost, USD
Provision services					
Agricultural products, pasture use, forest products, water supply, animal husbandry, etc.				337 709 692	4 756 474
Regulatory Services					
Pasture Carbon Storage	тн.	15 215	1 349	20 524 671	289 080
Carbon storage in the forest		140 000	1 349	188 860 000	2 660 000
Cultural services					
Ecotourism		22 560	4 500	101 520 000	1 429 859
Support Services					
Biodiversity	га	38 938	35 500	1 382 299 000	19 469 000
TOTAL				**648 614 363**	**28 604 414**

River basin Zerger

	UoM	Volumes	Price in som	Cost in som	Cost, USD
Provision services					
Agricultural products, pasture use, forest products, water supply, animal husbandry, etc.				182 603 890	2 571 883
Regulatory Services					
Pasture Carbon Storage	тн.	90 000	1349	121 410 000	1 710 000
Carbon storage in the forest	тн.	2 950	1349	3 979 307	56 047
Support Services					
Biodiversity	га	25960	35500	921 580 000	12 980 000
TOTAL				**136 331 527**	**17 318 049**

More information on project results at

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Thank you for attention!

szhakenova@carececo.org