



**Ministry of Environment
and Tourism**



Adaptation fund



*Empowered lives.
Resilient nations.*

“Ecosystem-based Adaptation Approach to Maintaining Water Security in Critical Water Catchments in Mongolia”, MON12/301 Project

Ecosystem-based adaptation approaches implemented in river basins in Mongolia

*Manila workshop II, Philippines
31st January-1st February, 2018*

Tuya Tserenbataa, Former NPC of UNDP Mongolia
tuyatseren22@gmail.com



Facts about Mongolia

- Landlocked country borders with Russia and China
- 1.564 million square kilometers
- Population 3 millions
- Major eco-regions: -Mountainous, Taiga, Steppe grasslands, Semi-desert and Desert
- ~8% of the country is covered by closed forest.

How much is being lost in last years?

- About 550 rivers, 450 lakes dried out
- 75% of pastureland is degraded
- 1.5 ml ha forest area deforested
- Argali, Khulan, Gazelles and other mammals' population reduced

Reasons: Climate change impact
Anthropogenic impacts



Project duration:	2011-2017
Executing entity:	Ministry of Environment and Tourism
Implementing entity:	UNDP
Financing:	
Adaptation fund:	5,069,124 \$
UNDP:	500,000 \$
Government of Mongolia (in kind: 5,000.000 \$)	actual was 8 million
Total (In cash):	5,569,124 \$
Total amount:	10,569,124 \$

- The one of first AF projects on EbA. Main approach was IWRM.
- Main economy sector- Husbandry (32% work force- herders and farmers)

Overall agriculture sector (nomadic herding and non-irrigated crop farming) and biodiversity are totally dependent on the ecosystems ability to provide water provisioning and regulation services.

Administrative structure of Mongolia: 21 Provinces/ Aimags-355 Soums

WEST SITE: Kharkhiraa and Turgen river basins, Mongolian Altay Mountains in 7 Soums of 1 Province. Replication is in 29 Soums of 3 Provinces



Water fed:

Turgen, Kharkhiraa rivers: 70-80% snow and ice melts

Catchment areas: 5321 sq. kms. Drains into Uvs lake

Main economy sector: Livestock, agriculture

**EAST SITE: Ulz river basin, Mongol-Daurian Steppe; 10
Soums of 2 Provinces. Replication is in 17 Soums in 2 Provinces**



-Ulz is 375 kms long river, down stream areas in the Mongolian Daurian Steppe Strictly Protected Area; in network of Ramsar Sites.

1400	1311	1222	1133	1044	956	867	778	689	Daguurin mongol A Yahi lake Ugtam	897.3 1544 460.2	Norovlin 5759 2615 43.659
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Water fed:

Ulz river: 8-15 % snowmelts

- **65-70 % rain**

- **20-25 % ground water**

- Catchment areas:** 37962 sq. kms

- **Main economy sector:** Livestock, agriculture, mining

Cover area: River basins of two different eco-regions negatively affected by Climate change impacts

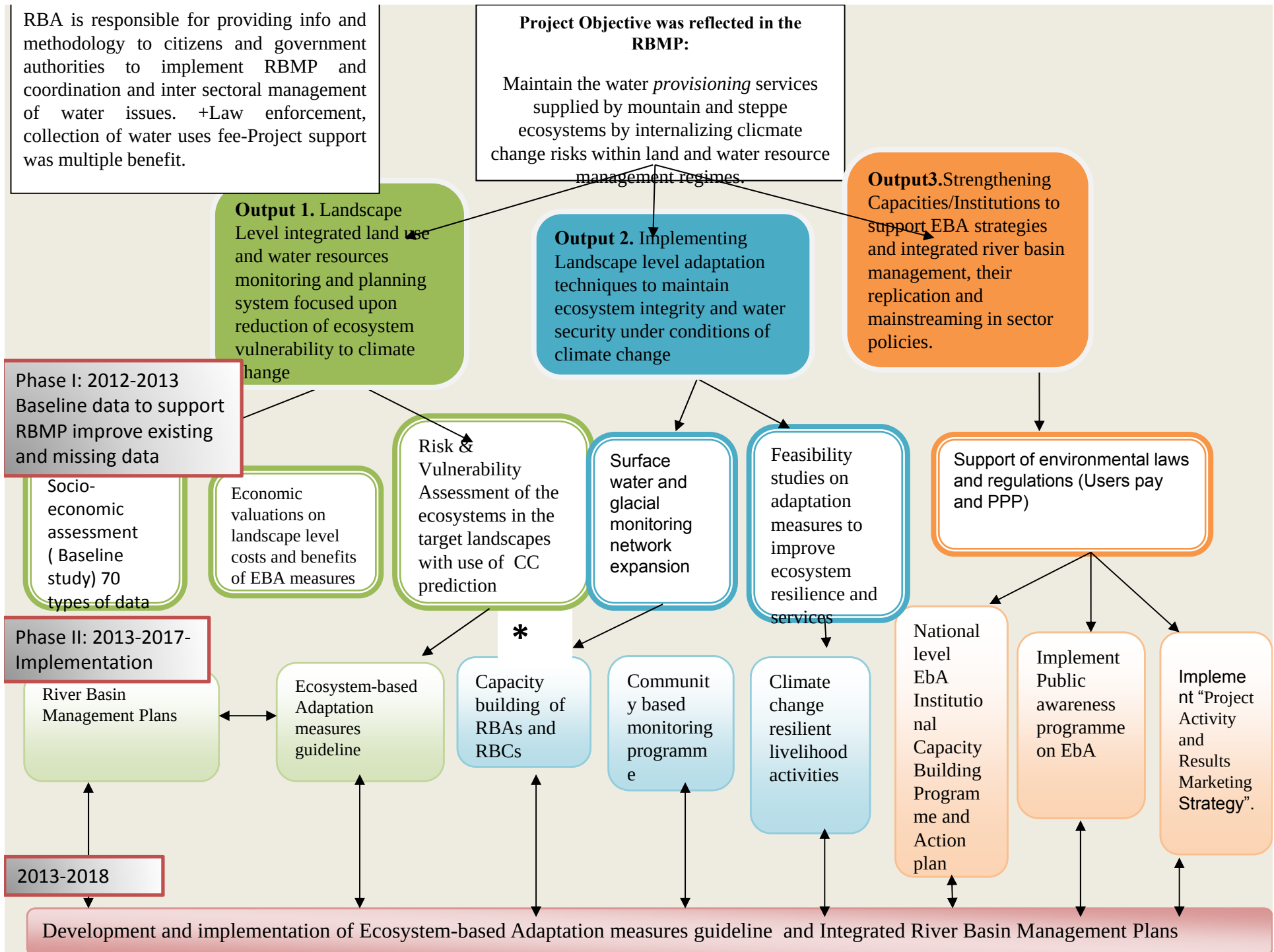
Results/ outcomes – Ecoregions specific and measurable outcomes on pilot adaptation measures (population, social and landscape level)

Legal environment was favorable: It's start was coincided with policy adoption of IWRM as one options of the EbA: 21 River Basin Administrations established as a network since 2012 and operational having IWRM plan implemented.

The target 2 RBAs and RBCs were established in 2012 and Project assistance in development of the RBMP, its implementation and M&E and re;ication.

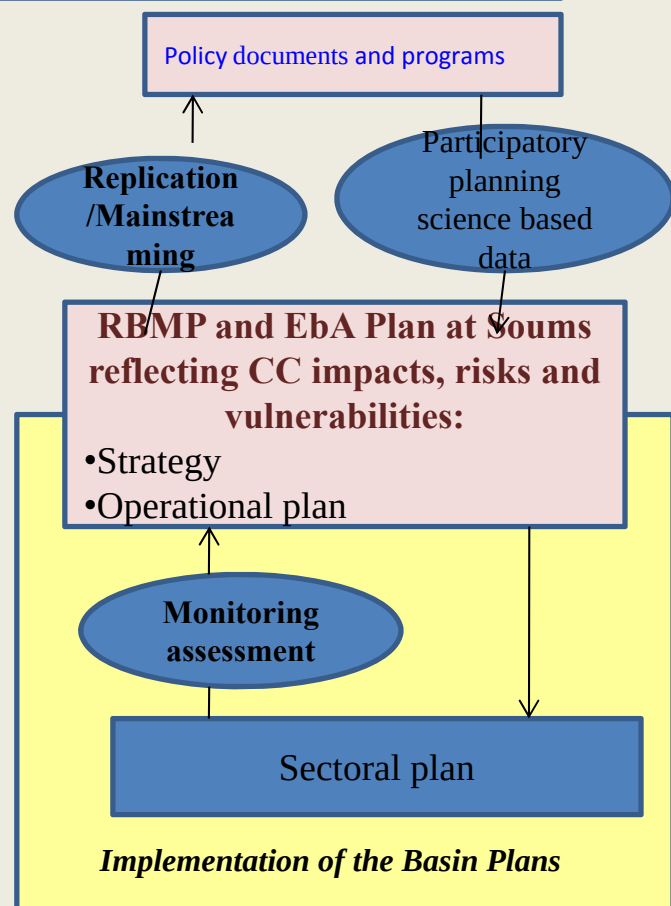
Mongolian Law on Water. 3.1.17 quotes

“IWRM plan is the document to manage water resources protection, appropriate consumption and restoration related activities in the River basin, based on the integral approach”.



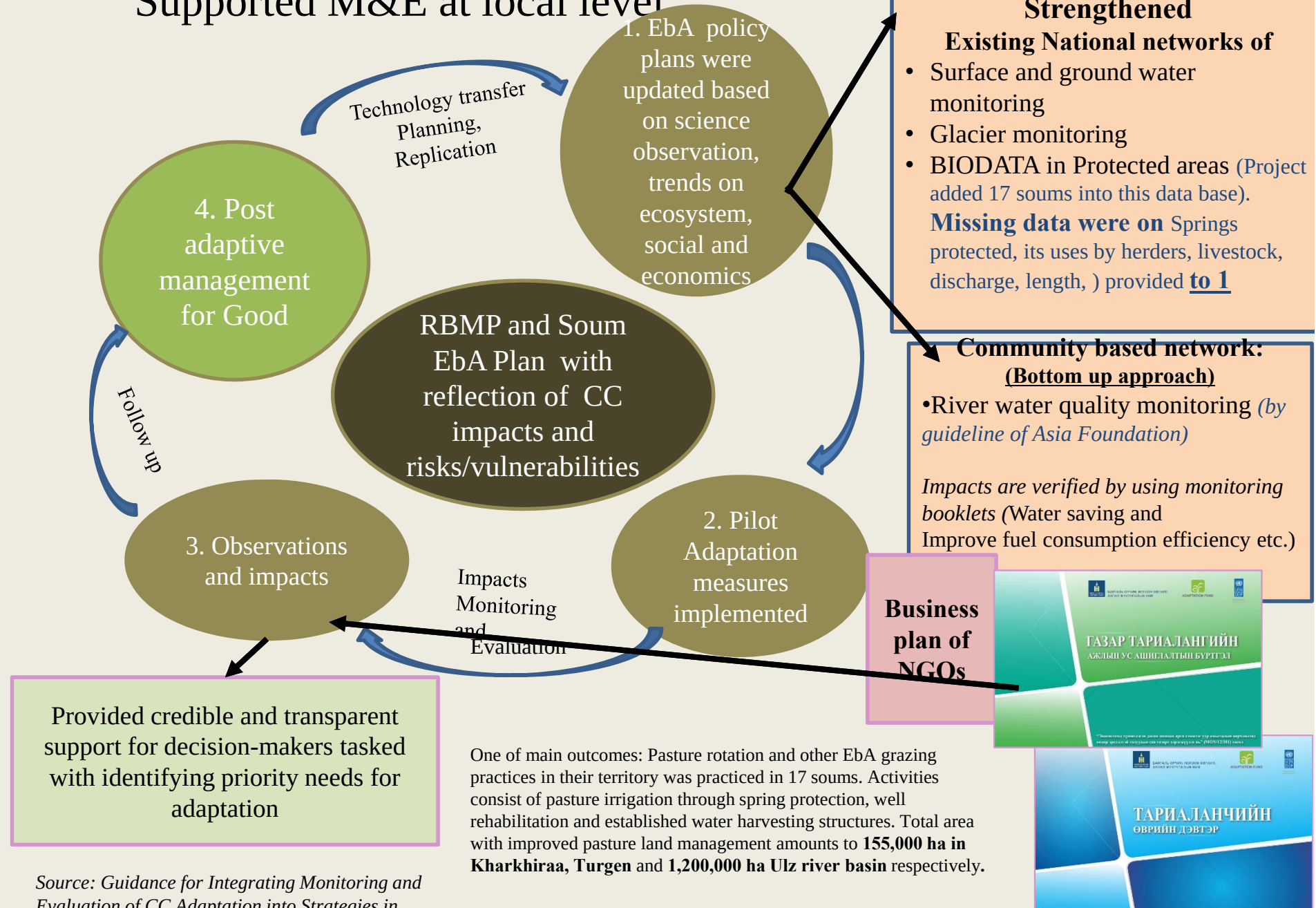
Multistakeholders engaged in implementation of Integrated River basin management plan (IRBMP=RBMP) Implementation status-45%

Guideline on Development of the RBMP was updated by the Project support to reflect adaptation interventions considering CC impacts and risk and vulnerabilities (15-25% of the measures is on Adaptation soft and hard technology transfer)



№	Participants/ Stakeholders	Responsible	experts	partner	support
1	River basin Council	✓	✓	✓	✓
2	River basin administration	✓			
3	Ministry of Environment and Tourism	✓	✓	✓	✓
4	Ministry of Education		✓		✓
5	Ministry of Food and Agriculture			✓	✓
6	Ministry of Finance			✓	✓
8	Ministry of Finance			✓	✓
new	National Agency on Economic Development		✓	✓	✓
9	Aimag/ Provinces authorities	✓	✓	✓	✓
10	Soum authorities	✓	✓	✓	✓
11	Quality control agency		✓	✓	
12	Emergency agency		✓	✓	✓
13	Administrations of the Protected Areas	✓	✓	✓	✓
14	Local communities	✓		✓	✓
15	Secondary school and other public organizations	✓		✓	
16	Private sector			✓	✓
17	<u>International organizations , projects and programmes</u>		✓	✓	✓
18	NGOs		✓	✓	✓
19	Research institutions		✓	✓	✓

Supported M&E at local level



Source: Guidance for Integrating Monitoring and Evaluation of CC Adaptation into Strategies in Mongolia, GIZ



Key results and recommendations from the Studies and Monitoring informed stakeholders for awareness raising for policy planning and replication

Permafrost mapping of Mongolia /Scale1:1000 000 /was updated after 43 years

1



Figure 1 Geocryological map, 1971

Key outcomes of mapping permafrost in Ulz river basin :

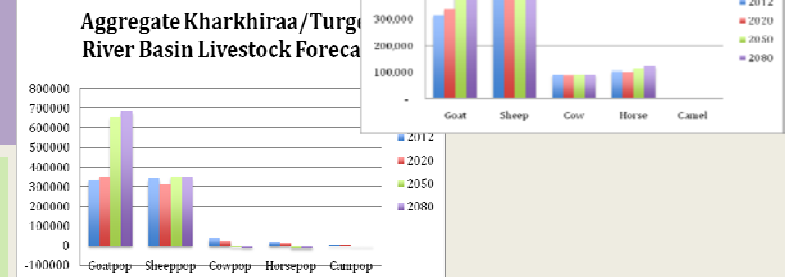
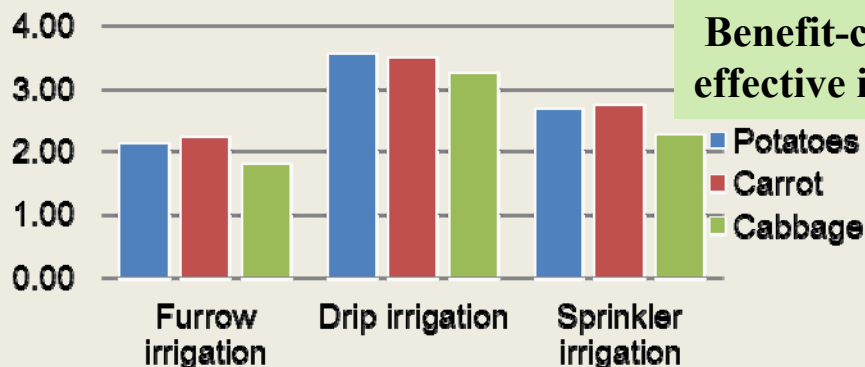
In 1971, patchy distribution of permafrost throughout Ulz river basin was recorded at certain points . However, there is no more permafrost recorded in this river basin according to the study conducted between 2014-2015.

2

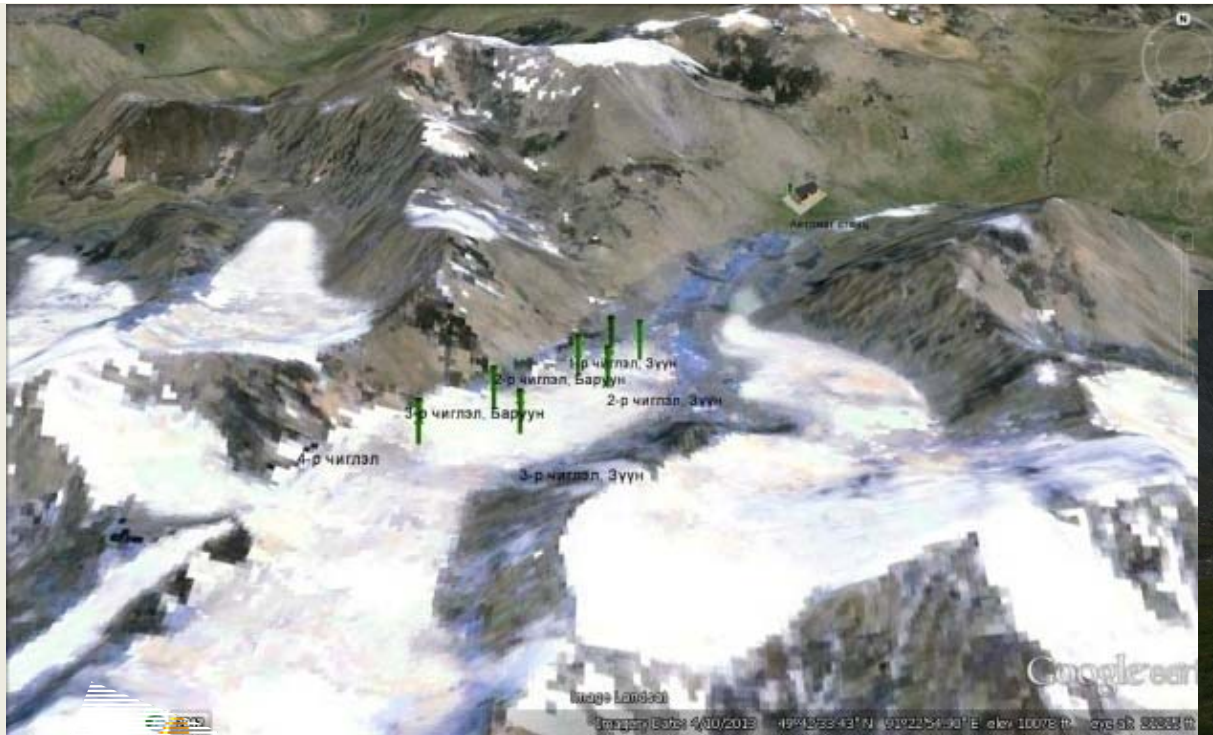
Within Series of Economic evaluation (EV) studies: EVI- EV on Climate change and ecosystem services in Kharkhiraa/ Türgen/ Ulz river basin- Policy recommendations on Agriculture, Husbandry, Water, Forest and Wildlife sectors – EVII- CBA on 2 Adaptation measures

3 Cost and benefit analysis on EbA approach

- Types of irrigations on household farming
- Riparian area rehabilitation



Completed in cooperation with “Eastern Asian Regional Program on Economic Analysis and Capacity building for Climate Change adaptation”- One of best Evaluations of 6 countries among 17 countries-will be published in the Compendium



Glacier melting and accumulation rate previously measured at Glacier monitoring post in Turgun mountain (3500 meters above sea level)

As of July, 2017 the measurement at first post at Turgun mountain shows that the glacier melt is intensive and thinned 12 meters down between 2013-2017 that warns decision makers to consider and take urgent actions on implementing the actions recommended by the latest studies and researches- Influenced for planning and replications.

Observation data of Glacier and water monitoring posts was regularly uploaded into the National Hydro-Meteorological database for research and proper decision making. The Agency continues regular and operational monitoring and committed to reflect required budgets to ensure sustainability of monitoring posts established by the project.

For dissemination and replication purposes: Impacts of adaptation interventions on 4 thematic areas as summarized (2012-2017)- 24 pilot measures at local level listed ([Source: EVIII. Technical guideline on EbA pilot measures.2017.EbA project](#))

Protection and rehabilitation of water

- Rehabilitation of broken wells
- Riparian area rehabilitation reforestation
- Reduction of evatranspiration

Proper/sustainable use of water

- Rehabilitation of channels for reducing of water loss
- Water reservoirs/dry well
- Efficient irrigation technology in household level farming
- Improvement of distribution of irrigation
- Optimization of irrigation norms
- Pilots on intensified livestock farming
- Freezing extra waters

Surface and rain/snowmelt water accumulation

- Traditional rain and snow water harvesting/ reservoir
- Engineered rain and snow water harvesting/reservoir

Others (water resources use conflict resolution, Disaster risk reduction, diversifying adaptation measures, education and awareness raising, PA network extension..)

- Natural resource monitoring based on professional institutions and community
- Water user groups (NGOs, private sector, local authority)
- Energy efficiency bricks
- Fodder plantation, silage
- Re-Introduction of marmots
- Extending PA networks
- Small grants
- CCA and EbA education

Example of Springs and Communities management:

Springs are vulnerable to dryness due to water comes from leakages from subsoil.

DP Approach is scientifically designed to address the technical dimensions of riparian issues while at the same time recognizing the social context

Restore springs using double protection method, which enables water penetration normally by allowing seeds of plants to grow.

Outcomes: water discharge increased to water more pasture lands& clean water access improved to people and livestock.

Naranbulag soum, Uvs aimag

Outcomes: Discharge increase by 15-20% in Western target basin by 10% in Ulz river basin likely due to repeated occurrence of dry summers in Eastern Mongolia in last 2 years. Flow increased by 0.5-3.5 kms.

To note: protected springs and water resources were not dried out or shrienked as many other ponds, springs not protected during extended dry seasons. Also post adaptive care and maintenance such as fence repair, clean of water channels for not disbursing etc.) was taken on rehabilitated springs by local authority and communities with involvement of relevant RBAs.

Double protection method DP (Fences and green protection)



Зураг 124. Булгийг хамгаалах ногоон бүс ба чулуун дэвсгийн технологийн схем

Features of this method:

Fence water catchment area (means large area as possible)

- Livestock/ wildlife drinking area separated
- Long-lasting and tolerant for soil movements caused by frosting and defrosting
- Fences are made available to be moved for another protection after green barrier established

Before =bad management

Oct.2013



After =good management

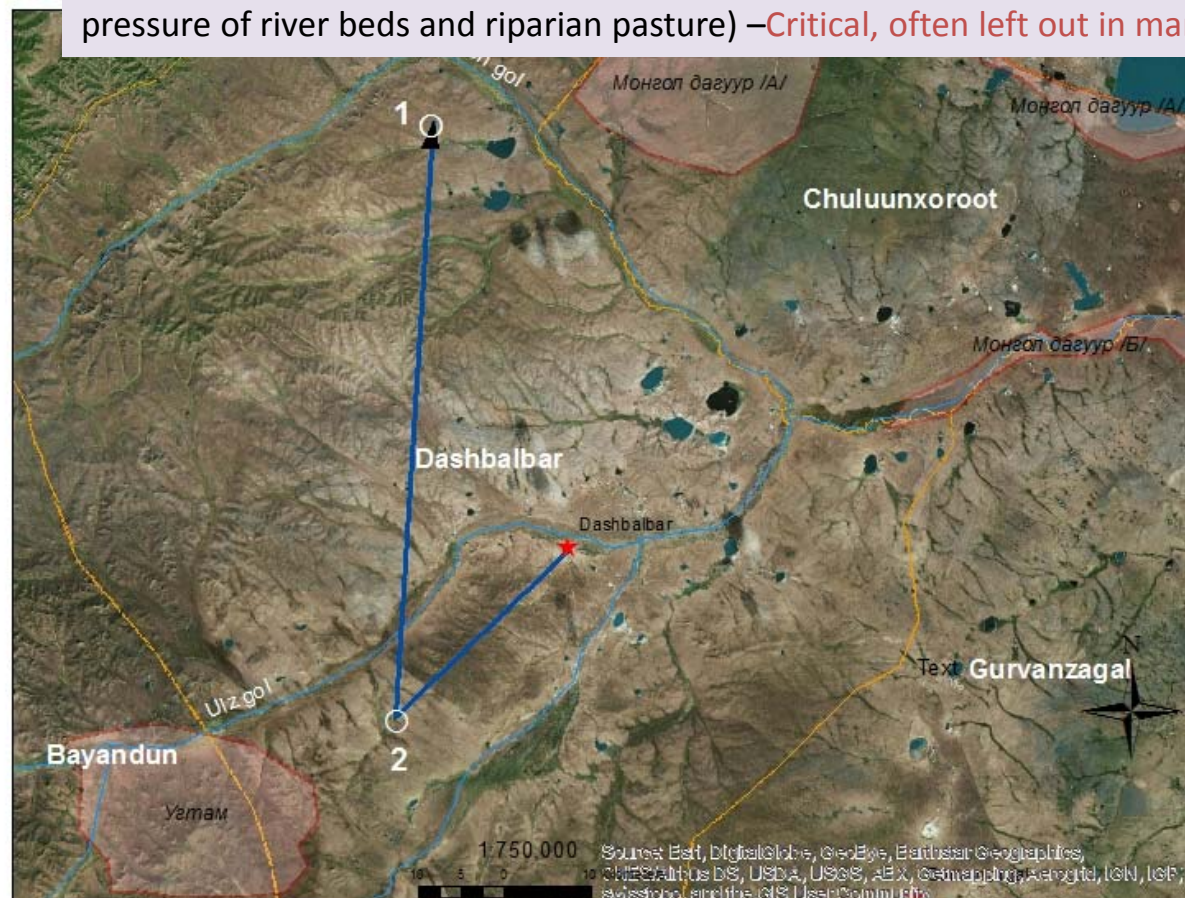
June.2014



July.2016



Continuing Strategy for Cooperative Riparian Restoration and Management with involvement of local community and authority using ground observation data to inform the good management (sustainable use of pasture and lessen pressure of river beds and riparian pasture) –Critical, often left out in many adaptation measures



Eastside: Dornod aimag, Dashbalbar soum

Creeks monitoring by community and rangers

1.Зүүн-Жараахайн/ б

2.Хайчын булаг



2014.09.06



2014.09.07



2015.08.30



2015.06.30



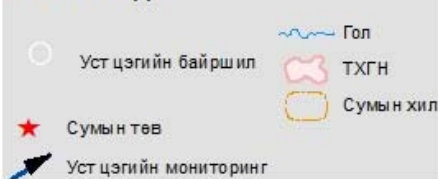
2016.09.07



2016.09.06

Creek name		Discharge		Plant density(ha/c)			Uses		
		Diametr (m)	Length (km)	100m	500m	1km	Livestock# used to be	Household	Livestock#
Зүүн-Жараахайн булаг	2014.09.06	60	0.12	Нүцгэн хөрстэй	-	-	5000	1	-
	2015.07.30	70	0.55	0.9	1.2	1.6		3	1350
	2015.09.10	70	1.4	1	1.1	1.5		4	1800
	2016.07.30	70	2	1.1	1.4	2		4	2000
	2016.09.06	60	1.2	1.1	1.3	1.8		5	3000
Хайчын булаг	2014.09.07	50	0.19	-	-	-	2000	-	-
	2015.07.20	60	0.45	1	1.5	2		3	1350
	2015.09.09	60	1.1	1	1.1	1		4	1800
	2016.07.30	60	3	0.9	1.2	1.9		1	2000
	2016.09.06	60	2	0.8	0.9	1		5	3000

Таних тэмдэг:



SMALL-SCALE RAIN AND SNOW ENGINEERED WATER HARVESTING reservoirs/Risky place became water reservoir for use of farmers and green place

ACTIVITY Traditional water catchment facility with the volume of 9000 cubic meters for snow and rain water harvesting was constructed in Batnorov soum of Khentii aimag in Ulz river basin with local co-funding.

OUTCOME The objective is to irrigate 12 hectare agricultural area during an extended dry season without effecting its natural flow. A total of 18 farmer households are expected to be benefited.

EXAMPLE SITE Batnorov soum, Khentii aimag

RESULT COMPARED BEFORE

YEAR September, 2015

SITE PICTURE COMPARED



AFTER

October, 2016



YEAR September, 2015

SITE PICTURE COMPARED



October, 2016



Adaptation group

Post adaptive management on efficient and sustainable use for quality of life

"Nimgen khar" spring, which is a source of water to Reservoir, besides rain and snow



Another example of cooperation. REHABILITATION OF Irrigation CHANNELS FOR REDUCING OF WATER LOSS and collect Snow melt and rain water

funding of soum Government under guidance of experts and Water User Group and by trained local community members. The water channel in Sagil soum of Uvs aimag was rehabilitated.

OUTCOME The rehabilitated water channel ensures water supply for over 20.000 livestock of 80 herder households and 3400 ha area.

Increased water table of Khagiin lake

EXAMPLE SITE Sagil soum, Uvs aimag
RESULT COMPARED BEFORE
YEAR October, 2014

SITE PICTURE COMPARED



AFTER
September, 2015



The costs for construction co-financed by the soum Government (proportion is 70:30) and the project.

RESULT COMPARED BEFORE
YEAR October, 2014

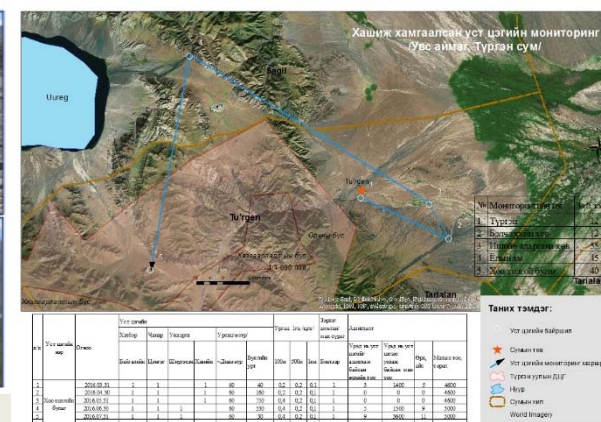
SITE PICTURE COMPARED



AFTER
September, 2015



M&E



Gender equality and empowerment assured in all interventions and livelihood diversification measures: Value added-eco felt product “Sonohon” brand was newly released through series of trainings- It was a small activity but brought multiple benefits (value added product, proper herd structure (valuable as cashmere-influence to goat#, pasture management, gender etc.).



wool product brochure



Some cases on EbA policy mainstreaming

- **EbA approaches mainstreamed in sector policy:**
- A new concept to provide a financial support from State budget for an establishment of a **small scale water harvesting structure for and water saving technology on irrigation purpose** was reflected into **the amendment of Law on Agriculture of Mongolia (19.5.1)** based on the recommendations of Cost-Benefit analysis made within the project framework.
- Recommendations from the EbA Strategic priorities (EbA project, 2013) –reflected into National Climate Change Adaptation programs for Agriculture, Water resource& Forest sectors.
- Chapters and sections of assessment and study conducted within the project framework (Risk and Vulnerability assessments in 2 target eco regions and Economic valuation of natural resource in context of climate change) were used as basic data and information for Mongolia second assessment report on climate change-2014 (Chapter II&III of MARCC-2014).
- **The knowledge on MaxEnt for forest and species' distributions newly transferred within the Environmental experts and researchers of Mongolia was used in other project research**
 - "Identifying representatives of Ecological Region's gaps for establish connectivity of current SPA by determining movement and potential habitat of Forest ungulates (Reindeer, Red deer, Musk deer, Roe deer, Moose, Wild boar), White-naped Crane, Argali sheep and Mongolian gazelle" done by MRPA project of UNDP)

Key contributions of Ecosystem based Adaptation (EbA) measures to the policy, planning and implementation of Integrated Water Resource Management and Climate change adaptation: Extending SPA networks

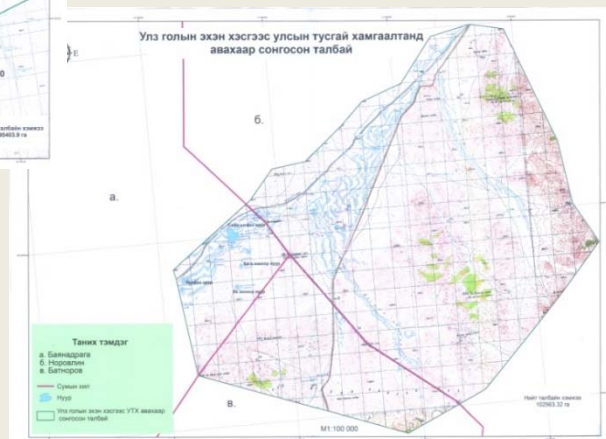
Extension of Special area network :

- **State Protected area** : 567,433.22 ha area under State protection in upstream of Rivers and Lakes
- **Local protected area** : 1,015,665.17 ha under local protection in wetland/ riparian areas
- **Benefit/Outcome:** Watershed and forest resources areas will not be permitted for exploration and mining licenses.

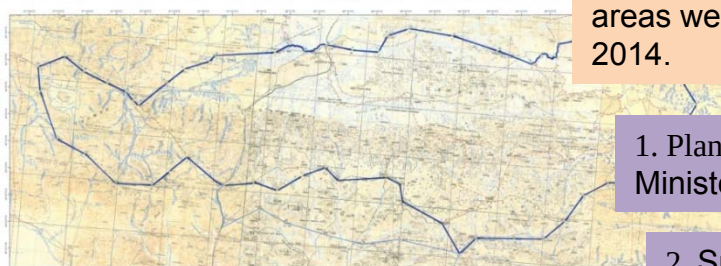
Proposals on extensions of PAs in Khukh Lake basin (95,403.9 hectares)



Proposals on extension of PAs upstreams of Ulz river basin (102,563.32 hectares)



Proposals on extension of PAs in upstream of Tes river basin (369,466 hectares)



The proposals on extensions on the following 3 areas were developed and handed over to MET in 2014.

1. Plans were discussed and appraised by Minister's Council in June 2016

2. Submit to Parliament for approval in 2018

2017:

Proposals to include 19 sites of 15 soums of Uvs, Khovd, and Bayan-Ulgii aimags into locally protected area network were developed and supported by relevant soum Parliaments. The lists were reviewed and added into data base of the Agency of Mineral resources and petroleum for further not permitting provision of exploration and mining licenses.

Template sheet on IWRM implementation on effective monitoring and evaluation

- “Guidance for development of IWRM plan” was amended (already in use) that enables EbA principles reflected into new plans development and updates ([Decree# A-187 of Minister of Environment, Green Development](#))

Amendments reflected

Section 8. Reduce CC impacts on water resources in river basins

8.1 To conduct vulnerability and risk assessment on climate change impacts and desertification on water resources in River basins and define associated risks and perspectives

8.4 To define mitigation and adaptation measures aimed at reducing climate change negative impacts on water resources in River basins

Template sheet was developed and adopted to assess IRBM implementation to ease workload of ministry officials and for efficient and result-oriented monitoring

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
УВС НУУР-ТЭСИЙН ГОЛЫН САВ ГАЗРЫН УННМ-ИЙН ТӨЛӨВЛӨГӨӨНИЙ ХЭРЭГЖИЛТ										ОН: 2015							
		Хэрэгжилт	он	Биеэлэлт, хувиар	Бюджет хөрөнгө оруулалт, сая. төгрөгөөр	Ужлын төсөв	Орон нутгийн төсөв	Тэднийг дотлоогийн төсөв хөдөлгөөр, тээв, тусламж	Хувийн болон бусад	Тайлбар		Ужлын төсөв	Орон нутгийн төсөв	Тэднийг дотлоогийн төсөв хөдөлгөөр, тээв, тусламж	Хувийн болон бусад		
1		2	3	4	5	6	7	8	9								
ҮНДСЭН АСУУДАЛ 1: ХҮРЭЭЛЭН БҮЙ ОРЧНЫ УС																	
13	1.1.1	1.1.1.Тэс голын эхэн хэсэгт судалгаа хийн улсын тусгай хамгаалтанд авах. (Хөвсгөл аймгийн Цэцэрлэг сум, Цагаан-Уул (Булнайн нуруу), Завхан Их-Уул, Тэлмэн)	2015	40.0	8.9	20.0		80.0		Судалгаа хийгдаж, үндэслэл боловсруулагдсан.	2015	1	1.8	0.0	7.1	0.0	8.9
14	1.1.2	1.1.2.Тэс голын урсац бүрдэх эхийн хамгаалалтын бүсийг нарийвчлан тогтоож, шаардлагатай тохиолдолд улсын орон нутгийн хамгаалтанд авна. (Тэс голын эх, Булнайн нуруу орчмын)	2015	40.0	8.9			100.0			2015	1	0.0	0.0	8.9	0.0	8.9
15	1.1.3	1.1.3.Сав газрын томоохон голуудын урсац бүрдэх эхийн хамгаалалтын бүсийг нарийвчлан тогтоож, орон нутгийн болон улсын тусгай хамгаалтанд оруулна. (Булнай, Ханхөхийн нуруу, Хэвхизээ Тулгэний үүлсээг эх эхэн голчлал)	2016								2016	1	0.0	0.0	0.0	0.0	0.0
UNHMT UNHMT YEAR UNHMT2015 UNHMT2016 UNHMT2017 Summary Table Sheet5 Sheet3																	

KEY SUCCESS

EBA MAINSTREAMING- LIVELIHOOD IMPROVEMENT-SOCIAL AND ECONOMY BENEFITS

Water management Improvement – Livelihood improvement:

promoting sustainable agriculture, improving pasture land for increased productivity, reforestation, riparian area restoration

- Introduction of high value crops and increased production from agriculture
- Women empowerment and leadership
- Increased green livelihood diversification



KEY SUCCESS

CAPACITY STRENGTHENED

- By integrating participatory approach of planning and implementation helped to enhance collaborative management at the local level between communities and local government
- By establishing monitoring stations for monitoring glacier, river, ground water and weather and also providing trainings the capacity of locals has enhanced for use of the data for planning, and policy development and every day life
- Capacity of the community groups were also enhanced on various subject including climate change, sustainable agriculture practices, water management, environment protection, enterprise development skills etc
- Local government human capacity has been enhanced on planning and implementing green economy
- By developing IRBMPs with locals their capacity has been enhanced to make it on their own

KEY SUCCESS

MULTI-STAKEHOLDER ENGAGEMENT-CO-MANAGEMENT

Strategy

The project closely collaborated with:
Related ministries MET, MOF, Aimags
and Soum level government, private sector,
research institutes and community groups.



Collaborative management has improved

Multi-stakeholder cooperation to continue the
project outcomes and results ensuring its
sustainability



LESSONS LEARNT



*Community
organisations lack
scientific knowledge –
Written or visualized
materials including
black board 2D video in
easy understandable
language*



Behavior change
activities using different
mechanisms to protect
local environment
through increasing their
green livelihood
diversification



Local knowledge
should be promoted
together with scientific
knowledge to respond
to local situation as they
are more easily adapted
by the rural
communities



The farmer exchange
visits promoted farmer
to farmer learning and
technology transfer
from one community to
another



LESSONS LEARNT



Created ownership mentality, developed local guardianships are -crucial to ensure the sustainability

Local communities are encouraged to learn EBA measures because it created economic opportunities for them



Regular communication in relation to project activities with the communities helps to promote successful, community-based projects as they built trust and motivation of the targeted local communities.

- Future needs:
- Requests/needs on replication of similar Adaptation measures from other RBAs and local Administrations
- Extensive needs on **introduction and testing of adaptation technology transfer** with combination of financing options
- Still facing visible climate change impacts: Lakes shrinkage, natural disasters, less water, pasture availability– creating conflict issues on use of resources- desertification problems
-

For more information please refer to

The recent report on “Capacity building on CC change impact assessments and Adaptation Planning in the Asia-Pacific region. 2017” listed two case studies from Mongolia.

-Case study1/1: “Status on Mongolia’s National adaptation planning”

-Case study 2/2: “EbA implementation in river basins of Mongolia”



Thank you for
your kind
attention!

2016

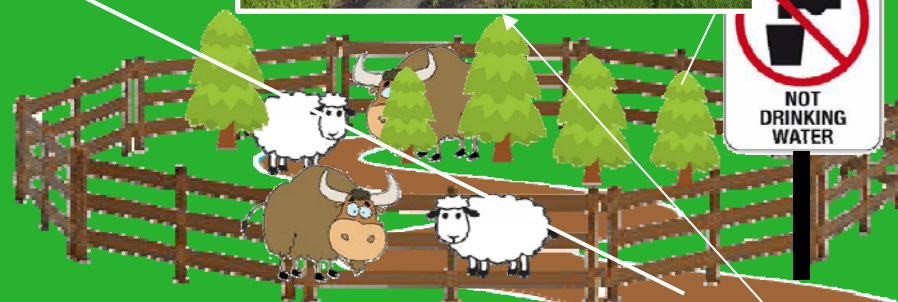
2014 October
Khaich spring, Dashbalbar soum,
Dornod province
Дорнод аймаг, Дашбалбар сум,
Хайч булаг

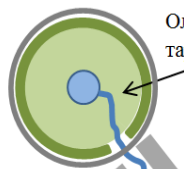


2016 June
Khaich spring, Dashbalbar soum,
Dornod province
2016 оны 6-р сар
Дорнод аймаг, Дашбалбар сум,
Хайч булаг



2015
Khaich spring, Dashbalbar soum,
Dornod province
Дорнод аймаг, Дашбалбар сум,
Хайч булаг





Олон наст ургамал
тариалсан хэсэг

Зураг



2017 August



ar soum,
е
р
бар сум,

