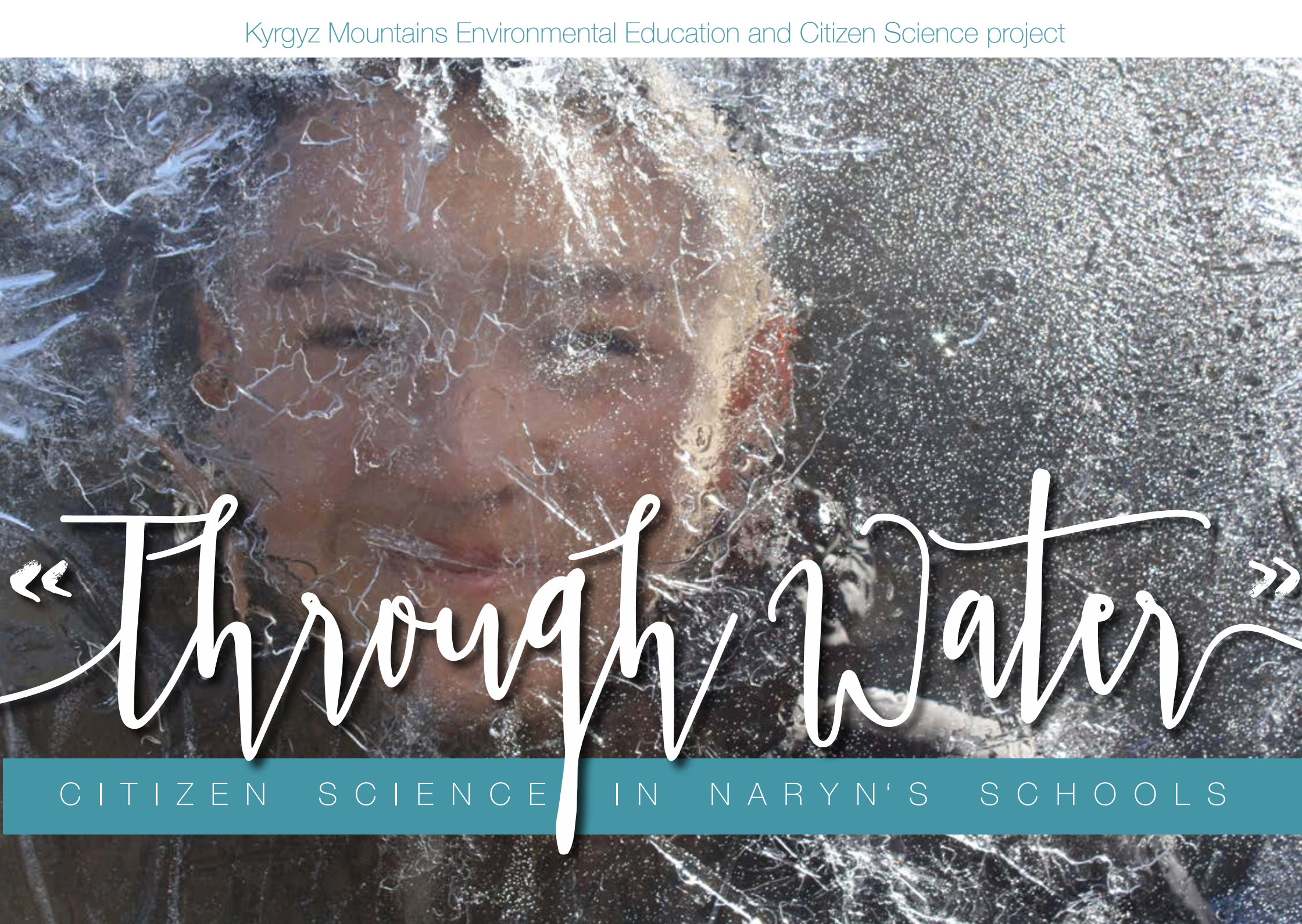


The background of the entire page is a photograph of a mountain stream. A large, dark, textured rock sits in the center of the frame, partially submerged in the water. The water is clear, revealing the rocky bottom and some small aquatic plants. The surrounding mountainside is covered in dense green vegetation. The overall scene is a natural, scenic view of a mountain environment.

«Through Water»

CITIZEN SCIENCE IN NARYN'S SCHOOLS

Kyrgyz Mountains Environmental Education and Citizen Science project



UNIVERSITY OF CENTRAL ASIA
MOUNTAIN SOCIETIES RESEARCH INSTITUTE

«Through Water»

CITIZEN SCIENCE IN NARYN'S SCHOOLS



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This eBook was developed based on the research results displayed at the exhibition, which were created using the manual “Studying Water through Experiments”. You can access this manual (in Russian and Kyrgyz) on the websites of CAMP Alatoo www.camp.kg and the University of Central Asia www.ucentralasia.org (download here [in Russian](#) | [in Kyrgyz](#))

The manual was developed within the framework of the project “Kyrgyz Mountains Environmental Education and Citizen Science” project (2015-2017), implemented in cooperation between CAMP Alatoo Public Foundation and the University of Central Asia, with the support of the Open and Collaborative Science in Development Network (OCSDNet: www.ocsdnet.org).

The goal of the project is to promote the application of Open and Collaborative Science approaches in Kyrgyzstan and to foster skills in proper use, visualization and dissemination of the information collected.

Main objectives:

1. Generate locally relevant environmental data on high mountain socio-ecological systems using a citizen science approach, involving students and teachers in pilot schools of Naryn, Kyrgyzstan.
2. Contribute to improving environmental education and awareness about the local environment in rural Kyrgyz schools.
3. Improve the access to environmental knowledge and information in marginalized mountain regions of Kyrgyzstan.
4. Promote innovative, participatory and open research principles in Kyrgyzstan.

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- I. Introduction of the project team
- II. Catalogue of the exhibition «Through Water: Citizen Science in Naryn's Schools»
- III. Project participants
- IV. Photo gallery of the project's history

Welcome note by the school children and teachers of the participating schools in Naryn

We, schoolchildren and teachers from ten schools of three districts of Naryn province, have conducted research in our villages. We are keen to communicate the results of our work. Of course we could have done this in the form of articles or presentations, but we decided to create an exhibition. For several reasons, all participants of the project liked the idea of translating the findings of our citizen science investigations into the language of art. First of all, it involved all of us in a creative process; and it was a kind of a challenge - to talk about science with the help of visual art tools. Secondly, we realized that much more people would learn about our studies.

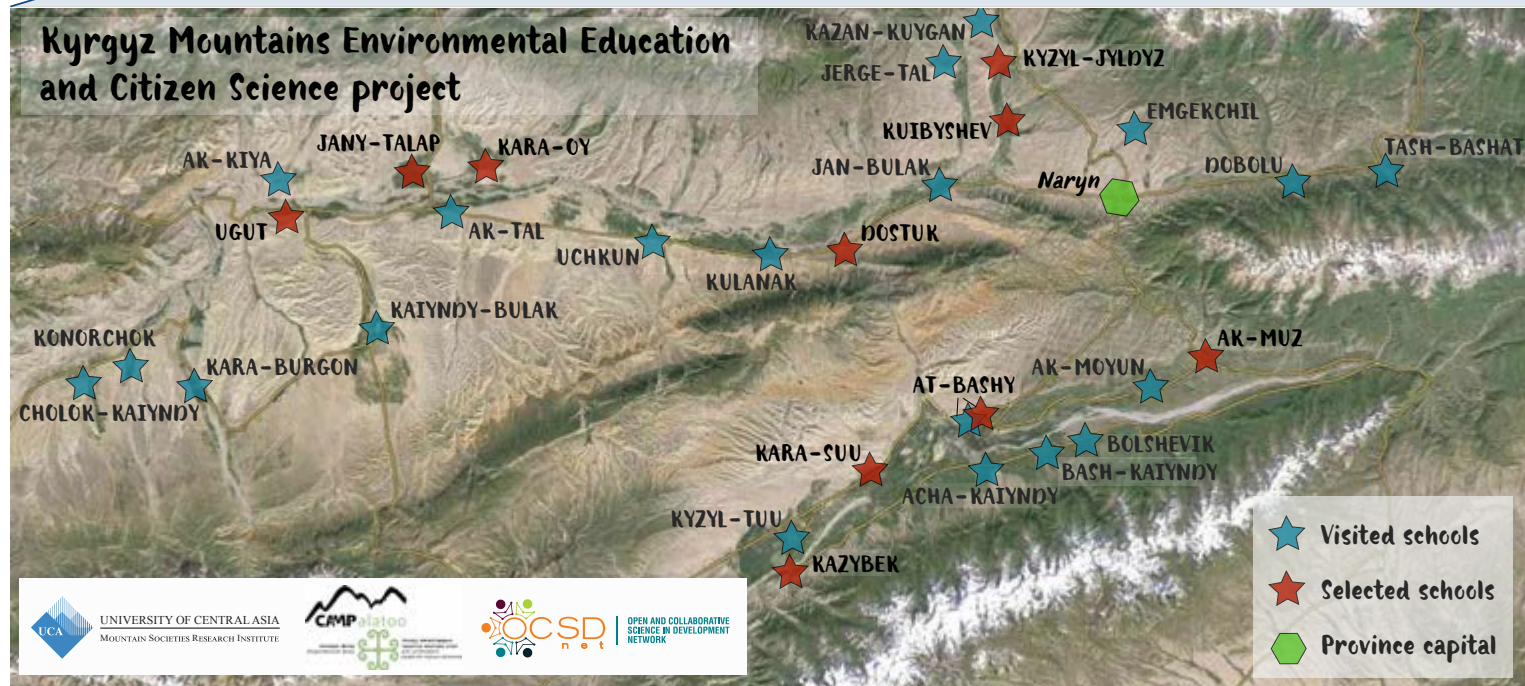
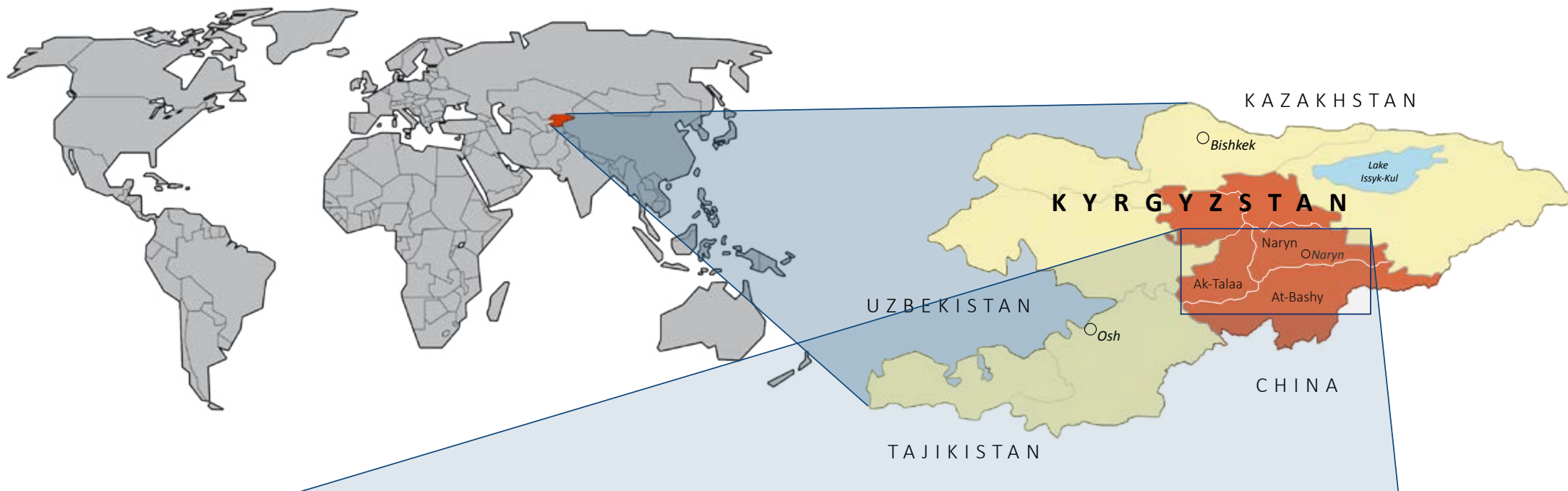
Thus, the exhibition became a visualization of the research process and its findings. Each school performed experiments. We used various ways of showing our results, ranging from mockups, models, short videos and photos to diagrams, maps, installations, objects, and even land-art. You can look at all of them in this eBook.

While presenting the results of our work to exhibition visitors, we realized that our experiment was successful. The creative visualization of our study findings proved to be very effective for communicating with our audiences. Our exhibition generated great interest among a broad range of visitors - children, teachers, scientists, art specialists, and journalists. Now we are happy to share all our observations obtained during experiments through this eBook.

The exhibition participants



Photo: Participants and working group of the "Kyrgyz Mountains Environmental Education and Citizen Science" project



Map of Naryn province with participating schools

I. Introduction

I. Introduction

Dear reader!

In this eBook you can get acquainted with remarkable exhibits and pieces of work that will surprise you in their creativity, innovative approach and artistic performance. These materials - models, installations, short films, maps and photos - were prepared by children from the mountain region of Naryn province in Kyrgyzstan, with the participation of their teachers. The exhibits were created for the socio-educational exhibition “Through Water: Citizen Science in Naryn’s schools”, held from 6 to 10 December 2016 in Bishkek, and on December 15, 2016 in Naryn.

Despite the fact that water is the “source of life” for all living beings in the world, we do not know much about it. Therefore, the exhibits presented help us to learn more about some of its properties by getting to know the findings of the amazing research conducted by pupils on their local water resources. This activity was carried out within the framework of the “Kyrgyz Mountains Environmental Education and Citizen Science” (KMEECs) project, implemented in cooperation between CAMP Alatoo Public Foundation and the University of Central Asia, with support from the Open and Collaborative Science in Development Network (OCSDNet). The main participants in this project are 10 schools of Ak-Talaa, At-Bashy and Naryn districts in Naryn province.

The project goal is to contribute to environmental education in the mountainous regions of Kyrgyzstan by providing methods and tools for studying the local environment. Pupils and teachers get involved in citizen science, they share their findings with other interested citizens, scientists and decision-makers, which helps communities to take informed decisions about their environment at the local level. In the case of our project, local research is being conducted using the approach of citizen science, which works through ordinary people - pupils, farmers, teachers and local government officials – for collecting, analysing and interpreting scientific data.

Given the limited availability of environmental data at the local level (especially in remote regions), this opportunity is very valuable for the citizens involved, as they can enhance their knowledge of their environment and can, at the same time, create a scientific basis for discussing and responding to local environmental changes. For example, many participating children and their parents didn't trust in the quality of their drinking water. Conducting some of experiments themselves helped them to get their questions answered.

In their exhibits, the project participants visualized some findings of their research, covering such topics as:

- Poor condition or lack of water infrastructure;
- Social and health problems associated with littering and water;
- Gender, work load and social issues around water;
- Pollution of drinking water;
- Water borne infectious diseases.

Besides, the exhibits were also linked to science education in general, since the children touched upon the following topics:

- Chemical composition of water, including properties in its various states;
- Biological composition of water;
- Molecular structure of water and other substances;
- Water cycle in the environment, including transpiration and filtration;
- Use a drop of water as a microscope.

I. Introduction

It is important to note that all the exhibits were designed with much love, diligence and a great desire to share the findings of their citizen-science-based research projects. The children were able to display their talents, including constructing various designs and models, conducting interviews with kids and adults, drawing, visualization, acting and storytelling, recording and making short films.

As a result, the exhibition was very successful and aroused a keen interest among its visitors, ranging from 2 years old children to youth and elderly people. Each visitor could vote for two exhibits that he/she recognized as the best ones. After the exhibition, the project team counted the votes, and the participating schools received small scientific and educational prizes in several categories of eco-nominations. In addition, the exhibition was assessed in social networks (Facebook, Odnoklassniki etc.). Besides, several newspapers and many news agencies released articles about this “unique exhibition” and motivated people to visit this educational and informative event.

Feedback about the exhibition:



It seems that we are raising our own Galvani, Ampères and Faraday, and maybe some of these young talents will even surpass them in their discoveries. And the most important thing that children will understand, is that water is not just H₂O, but also information about life in the universe. They will learn what water means for the planet and humanity, learn to love nature and treat it respectfully”

– article “Not just H₂O” in the national newspaper “Slovo Kyrgyzstana”, author Galina Mikhailina.



It is amazing to realize what intelligent children are growing up in our remote villages! This is the way to conduct lessons in school. Only this way one can make others be interested, motivated, captivated ...»

– Elena Voronina, Mediatrainer and journalist

We decided to develop this eBook because of the great interest from civil society and the numerous requests to extend or re-conduct the exhibition. Thus, every person interested can look at the displayed projects, even if the original exhibits have now been handed over to their original creators and rightful owners. We decided not to produce just a simple publication, but an eBook, reflecting on the format of the innovative and experimental exhibition “Through Water”, while allowing us to present films as well.

On behalf of the pupils, their teachers and the working group, we sincerely wish you a pleasant time with our eBook and hope that it will be fascinating, informative and very interesting for you!

If you like our eBook and you want to carry out such experiments, please, use our practical manual “Studying Water through Experiments”, which describes in detail how to conduct your own scientific experiments on water and what simple tools to use for doing so.

This practical manual is available on the websites of CAMP Alatau Public Foundation www.camp.kg and the University of Central Asia www.ucentralasia.org. Besides, you can request hard copies of the manual at the office of CAMP Alatau Public Foundation or the University of Central Asia (in Russian and Kyrgyz, as long as copies are available).

With love,

The working group of the “Kyrgyz Mountains Environmental Education and Citizen Science» project

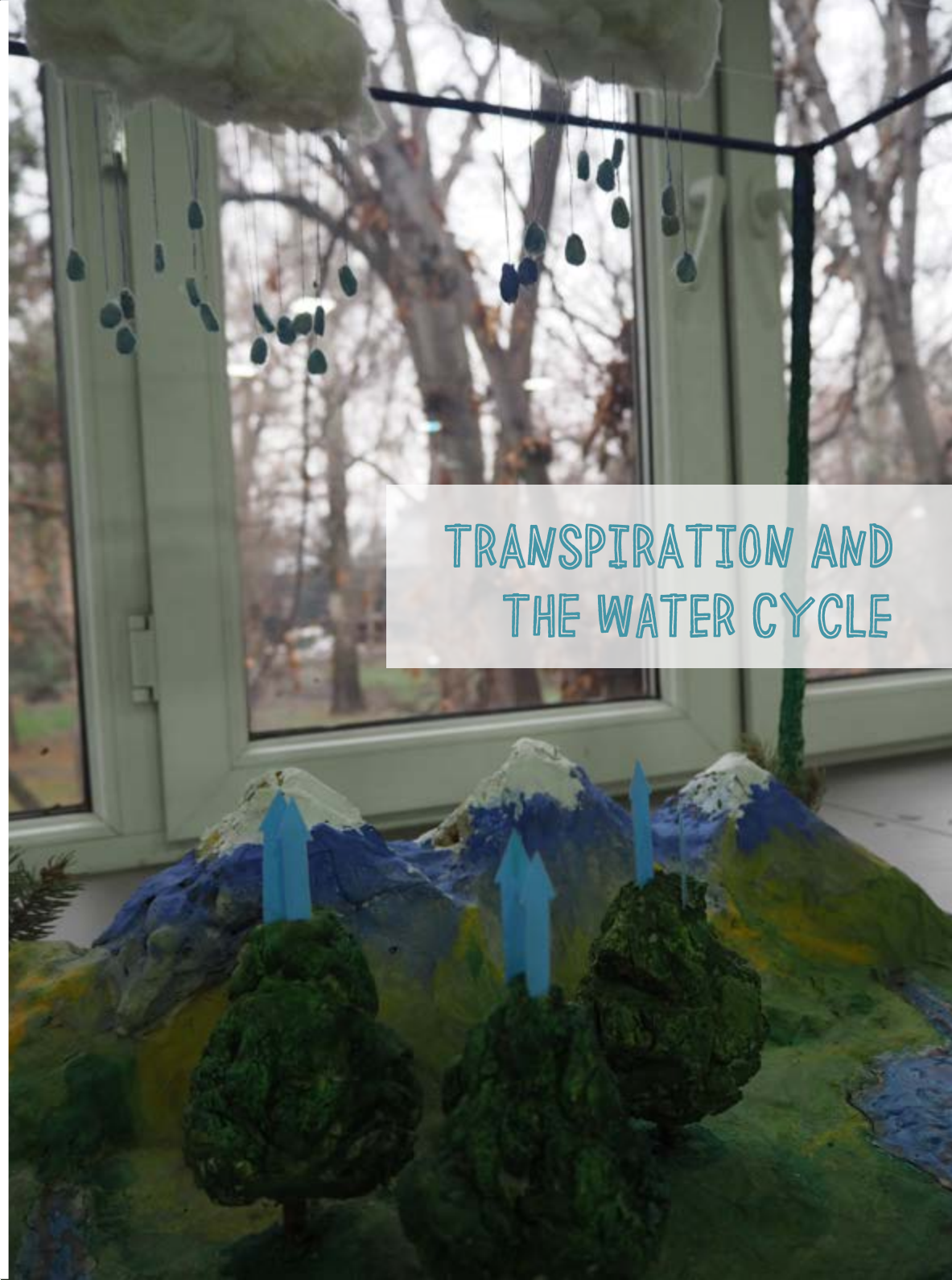
II. Catalogue of the exhibition «Through Water: Citizen Science in Narayn's schools»

A handcrafted model of a cloud, made of white cotton or wool, is suspended by a thin wire. From the bottom of the cloud, several thin blue threads hang down, each ending in a small, teardrop-shaped blue object made of clay or plasticine. These represent water droplets falling from the cloud. The background is a blurred view of a window looking out onto a street with trees and buildings.

TRANSPIRATION AND THE WATER CYCLE

This exhibit illustrates the water cycle and the role that plants play through transpiration. The project participants of this school wanted to demonstrate visually how plants interact with the atmosphere and contribute water vapour to the water cycle. Transpiration is the movement of water through the plant and its evaporation through the pores on the outer organs of the plant, such as leaves, stems and flowers. Water is essential for the life of a plant, but only a small part of the liquid that enters through the roots is used directly for growth and metabolism of the plant. The rest is fed back into the global water cycle.

– Secondary school named after Karybek Karpekov,
Kara-Suu village, At-Bashy district,
Naryn province



TRANSPIRATION AND
THE WATER CYCLE

A round glass terrarium containing wheat plants growing in soil. The plants are green and have long, thin leaves. The soil is dark brown. The terrarium is sealed and has some condensation on the inside walls.

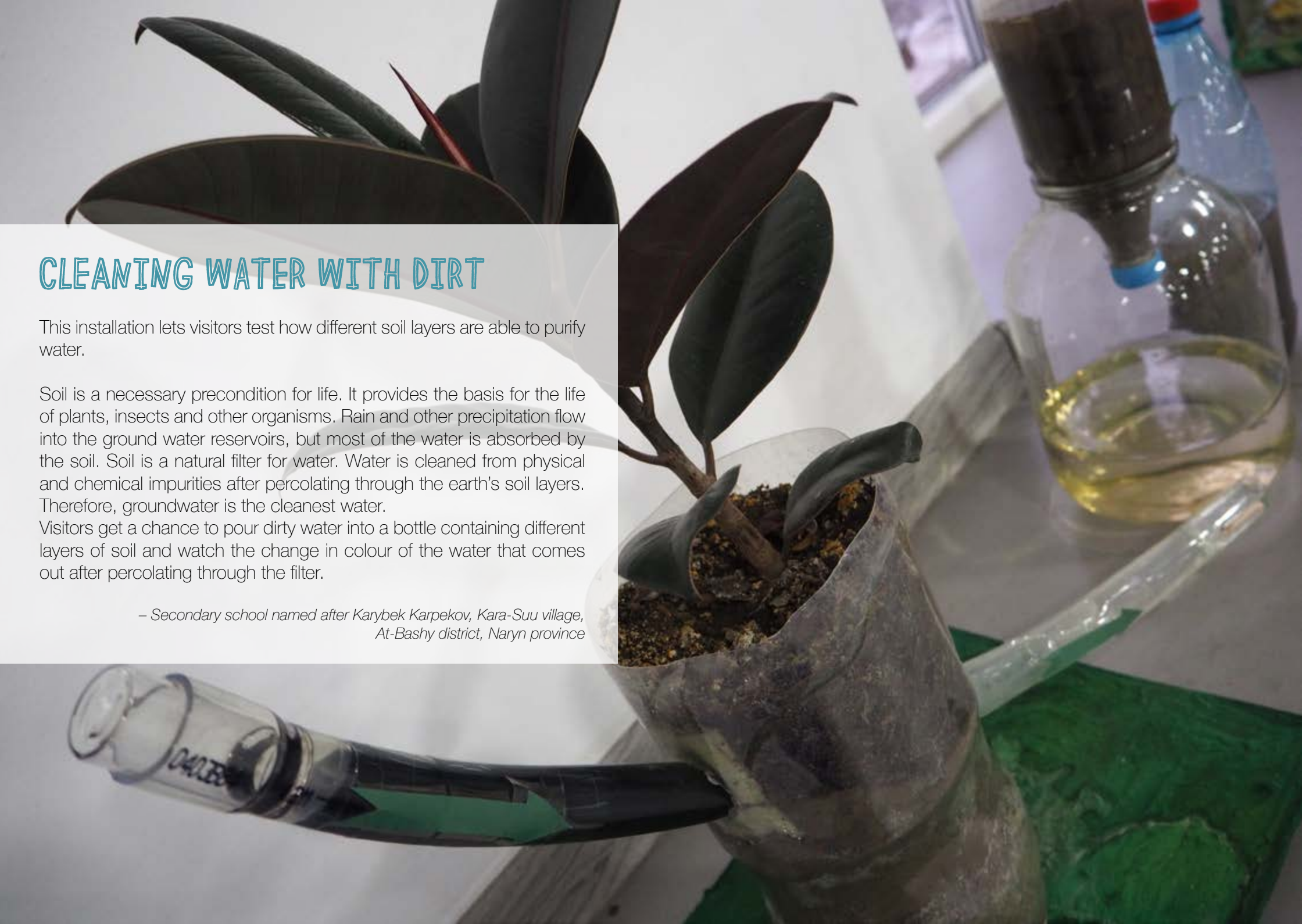
AQUARIUM WITH WHEAT

A self-sufficient ecosystem with its own microclimate was created in a regular round aquarium. The aquarium was sealed hermetically during the wheat growing process. Initially, a small amount of water was added while planting germinated seeds. After this, the aquarium was located in a sunny place.

The sprouts in the aquarium absorb sunlight and water and release oxygen. Together with this, the plant releases water vapour into the air through the pores - a process called transpiration. This water vapour condenses on the lid and walls of the aquarium and flows down, simulating natural precipitation - a small water cycle.

This shows that life on Earth is possible without humans, but people cannot exist without the ecosystems that provide them with food, oxygen, water and much more.

– Secondary school named after Baiymbet,
Jany-Talap village, Ak-Talaa district, Naryn province

The background image shows a science experiment setup. A potted plant with dark, glossy leaves sits on a green surface. To its right, a clear plastic bottle is inverted, with a tube leading from its neck into a larger, clear plastic container. The tube is submerged in a yellowish liquid. In the foreground, a clear plastic tube is shown, containing a dark, granular substance, likely soil or a filter medium. The tube is labeled with the number '04023'.

CLEANING WATER WITH DIRT

This installation lets visitors test how different soil layers are able to purify water.

Soil is a necessary precondition for life. It provides the basis for the life of plants, insects and other organisms. Rain and other precipitation flow into the ground water reservoirs, but most of the water is absorbed by the soil. Soil is a natural filter for water. Water is cleaned from physical and chemical impurities after percolating through the earth's soil layers. Therefore, groundwater is the cleanest water.

Visitors get a chance to pour dirty water into a bottle containing different layers of soil and watch the change in colour of the water that comes out after percolating through the filter.

– Secondary school named after Karybek Karpekov, Kara-Suu village,
At-Bashy district, Naryn province



WATER AND RED CABBAGE

This installation demonstrates acidic, alkaline and neutral water environments.

Red cabbage can be used as an indicator for the pH value of liquids. The pH value of water depends on the proportions of H^+ and OH^- ions it contains. In neutral water, the number of H^+ (hydrogen) and OH^- (hydroxide) ions is equal, which results in a purple colour when mixed with the red cabbage solution. In an acidic environment, the amount of hydrogen ions H^+ exceeds the amount of OH^- , and the red cabbage solution turns red. In an alkaline environment, the amount of OH^- exceeds H^+ , and the red cabbage solution turns blue.

– Secondary school named after Musa Baetov, Ugut village,
Ak-Talaa district, Naryn province

MOLECULAR MODELS OF SUBSTANCES IN WATER

The teacher and pupils from the school in Jany-Talap village created molecular models of water and different substances contained in water. Here you can see the models of phosphorus, magnesium, calcium and other basic substances that are often found in local water. These models were made for illustrating the results of analyses performed on different local water sources.

– Secondary school named after Baiymbet,
Jany-Talap village, Ak-Talaa district, Naryn province





AK-MUZ: WATER AND LIVESTOCK

As part of this project, schools conducted different chemical analyses using simple reagents for measuring pH levels and concentrations of phosphate, nitrate, nitrite, ammonium and total hardness of different water sources around their villages.

In the first analysis of drinking water, conducted in September 2016, pupils from the school in Ak-Muz village found a slightly elevated concentration of ammonium, but the second analysis conducted in October 2016 showed that the ammonium levels did not exceed the norm. The pupils assumed that the elevated concentration of ammonium in water occurred due to the high number of livestock grazing near the river in September, while in October they had already left. Organic residues and waste form compounds of ammonium salts, which at high levels can adversely affect human health.

The children showed the analysis visually in the form of a model of water sources around their village and added information flags illustrating the content of chemical elements in the water.

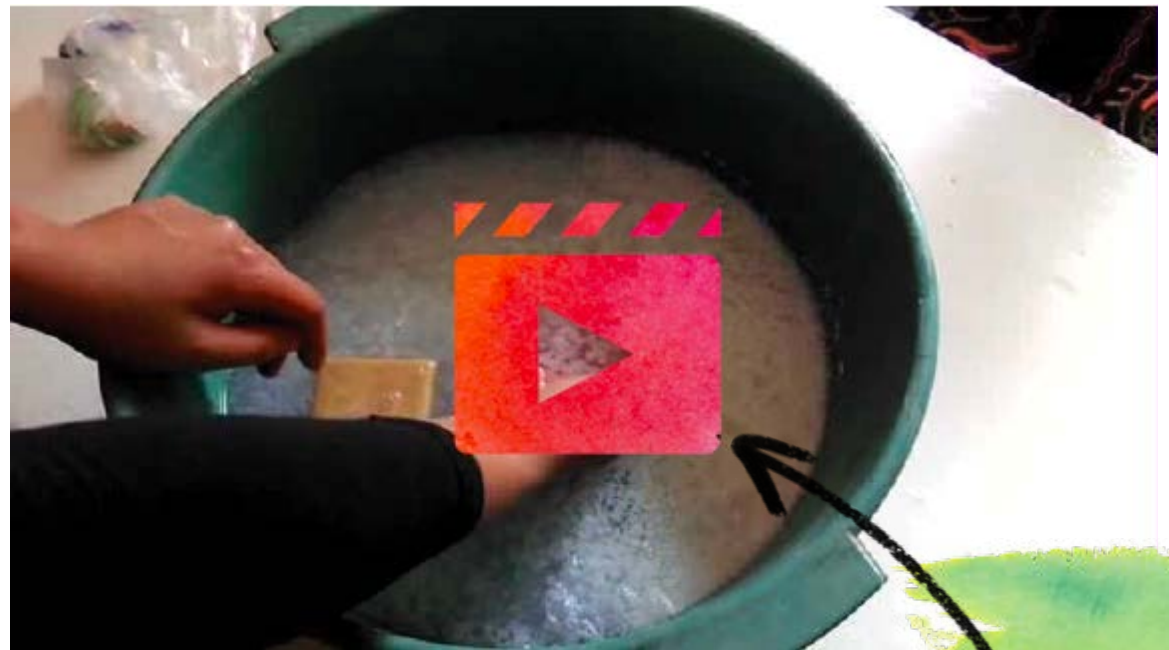
– Secondary school named after Jakypbek uulu Boogachy, Ak-Muz village, At-Bashy district, Naryn province



LAUNDRY DAY

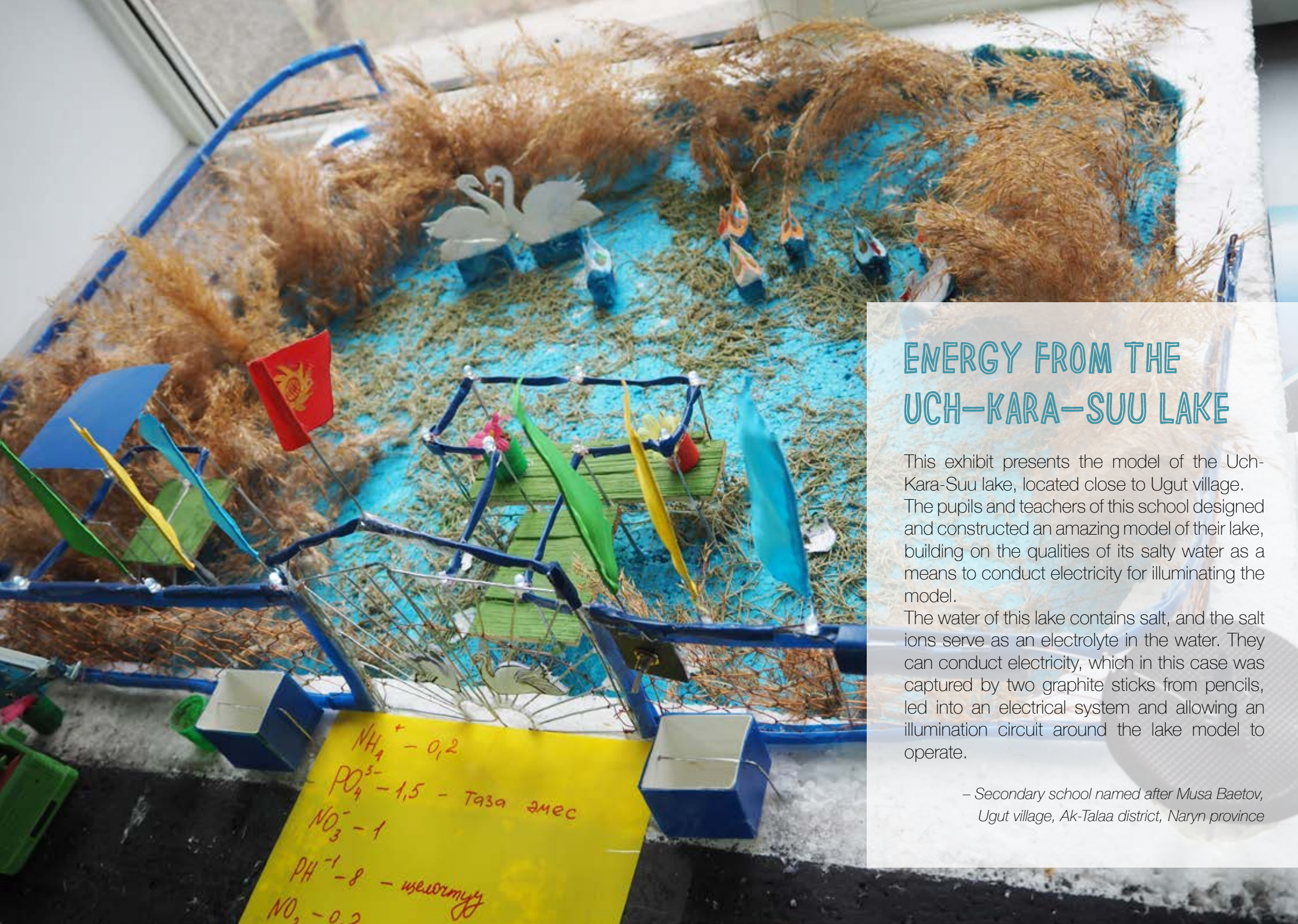
Laundry in Ugut village is predominantly done by hand, using water and soap. The villagers however face difficulties due to the scum that is formed when soap reacts with the high concentration of minerals in the water (very hard water, above the acceptable limits for drinking water). This water is not suitable for such household tasks, so people have to harvest rainwater to wash their clothes. The installation presented a washbasin filled with soapy water from this village. Even with a slight movement of the uppermost layer of water with sediment, one could see almost transparent water at the bottom of the washbasin. Additionally, a video demonstrated the effect of water with high concentrations of minerals on the washing process in Ugut.

– Secondary school named after Musa Baetov, Ugut village, Ak-Talaa district, Naryn province



This is a video. Make sure you are online and click on the play button to watch it!





ENERGY FROM THE UCH-KARA-SUU LAKE

This exhibit presents the model of the Uch-Kara-Suu lake, located close to Ugut village. The pupils and teachers of this school designed and constructed an amazing model of their lake, building on the qualities of its salty water as a means to conduct electricity for illuminating the model.

The water of this lake contains salt, and the salt ions serve as an electrolyte in the water. They can conduct electricity, which in this case was captured by two graphite sticks from pencils, led into an electrical system and allowing an illumination circuit around the lake model to operate.

– Secondary school named after Musa Baetov,
Ugut village, Ak-Talaa district, Naryn province

$\text{NH}_4^+ - 0,2$
 $\text{PO}_4^{3-} - 1,5$ - Таза суус
 $\text{NO}_3^- - 1$
 $\text{PH}^{-1} - 8$ - мезормуу
 $\text{NO}_2 - 0,2$

SCALES FOR WATER INDICATORS

The scales were used as an exhibit explaining the relative number of bioindicators in water that was taken from a pond located near the school in Kara-Suu. Macroinvertebrates serve as bioindicators of the water quality, that is, they help us understand if the water is polluted or not. For example, the presence of insects such as stoneflies (Plecoptera), mayflies (Ephemeroptera), caddisflies (Trichoptera) in the water suggests that the water is of good quality, as these are extremely sensitive to pollution.

The pupils detected more indicators of clean water in the test samples, as opposed to less indicators of polluted water. Therefore, on the scales, the plate containing bioindicators of clean water was heavier than the opposite one. The scales in this experiment served as a visual presentation of this situation.



– Secondary school named after Karybek
Karpekov, Kara-Suu village, At-Bashy district,
Naryn province



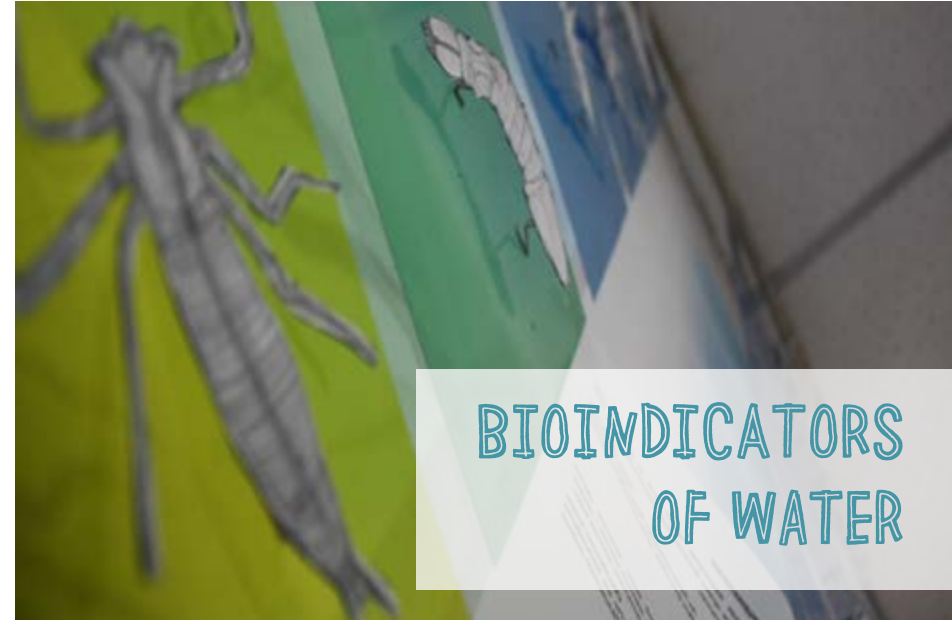
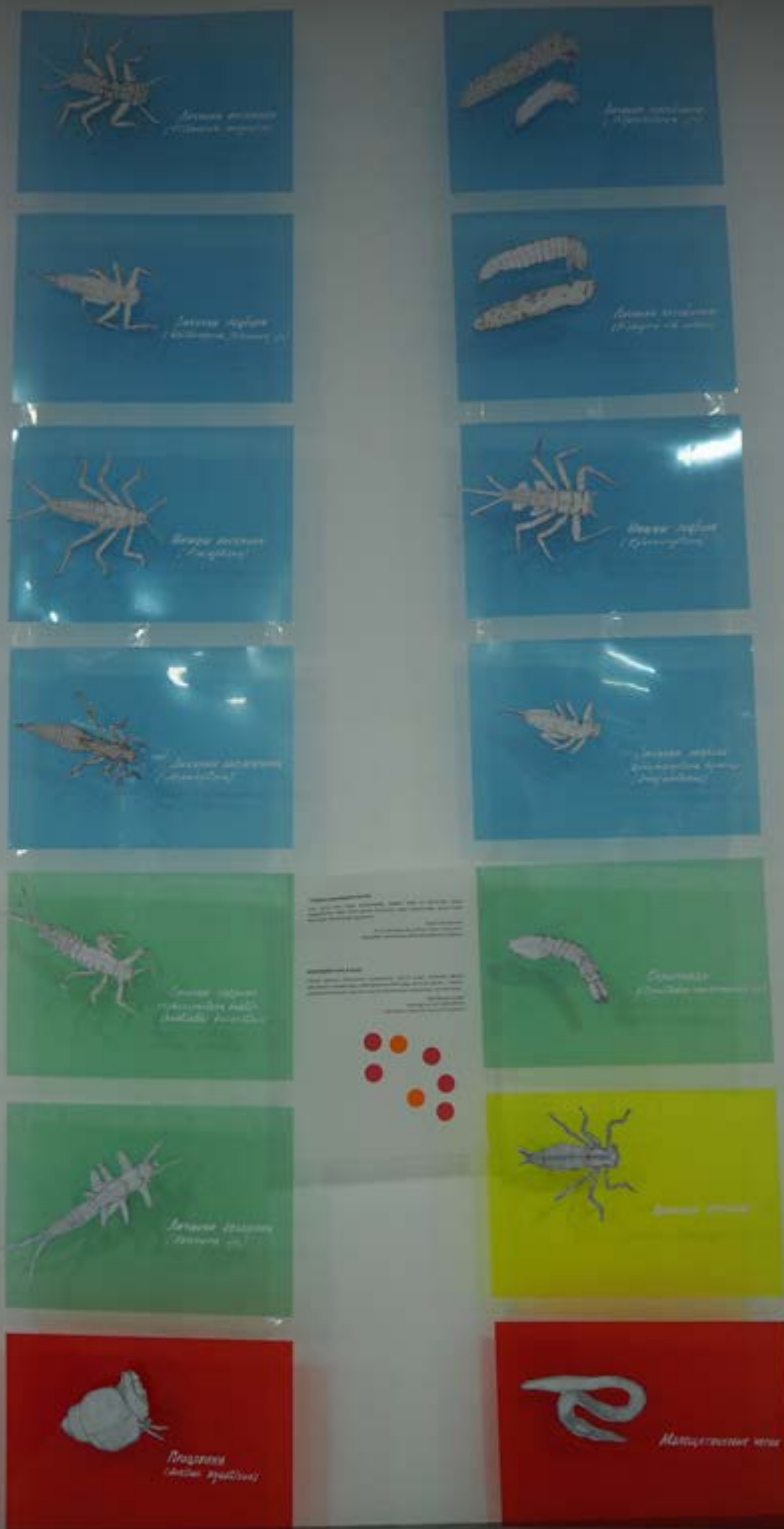
BIOINDICATORS OF WATER

Macroinvertebrates and other insects were studied in the course of the training on experiments for assessing the quality of water through bioindicators. These bioindicators are helpful for conducting easy assessments of the degree of water contamination, since more sensitive insects are not able to live in water with even a light degree of contamination. The methods for this assessment are described in the manual described at the beginning of this eBook.

A young girl from Jany-Talap presented several bio-indicators in a 3-D model and categorized them according to the level of water purity in which they occur. Thanks to this exhibit, visitors were able to learn about the helpfulness of bioindicators living in water and discovered a new side of these insects. Some people are afraid of such small animals or try to avoid them, thinking that their presence indicates water contamination. But actually some of these bugs show us that it is the other way round!

The indicators of clean water were presented in blue colour; slightly polluted water – green; medium-polluted water – yellow; and dirty water - red.

– Anara Obolbekova, a pupil of the secondary school named after Baiymbet, Jany-Talap village, Ak-Talaa district, Naryn province



BIOINDICATORS OF WATER



EARTH

The main topic of the exhibition being water and the environments, the participants decided to also focus on global environmental challenges, including human pollution with garbage, which also impacts water quality.

Chomuraeva (teacher of biology and geography) and her pupils constructed a model made out of household garbage and vinyl gloves, reflecting on the message to youth around the globe "The future of our earth is in your hands".

According to the votes collected and the guests' reviews, this exhibit had a great success among the exhibition visitors. Most importantly, it made visitors think about the (un)sustainability of our modern way of life and the permanent impact we have on our planet, day by day.

– Secondary school named after Baiymbet,
Jany-Talap village, Ak-Talaa district, Naryn
province





WATERS OF MY VILLAGE

The model shows different water sources in Jany-Talap village.

The authors of this model were remarkably creative. The original manufactured model is decorated with cotton threads of blue and green colours, illustrating grasslands and water, as well as natural stones and rocks. Along with this, the interactive model allowed visitors to examine macroinvertebrates with the help of a magnifying glass. The pupils also placed a cup on the model, containing the insects they found in nearby ponds.

– Secondary school named after Baiymbet, Jany-Talap village,
Ak-Talaa district, Naryn province



WATERS OF MY VILLAGE



SOURCES OF DRINKING WATER

The exposition included a variety of exhibit items, including combined results of a sociological survey and bio-chemical analyses conducted by pupils of At-Bashy.

The model is made in the form of a yurt - the traditional home of the nomadic tribes of Central Asia. It also presents the percentage of people depending on certain water sources in At-Bashy:

- 50% of the local population take their drinking water and water for other household purposes from wells that they drilled in the yards;
- 30% of the residents drink water from natural springs near the village;
- 20% of villagers drink water from water pipes, where the water comes from the local reservoir.

They presented the results of their chemical analysis of the abovementioned water sources, as well as some bio-indicators (including unknown species of macroinvertebrates found in some of the drilled wells) that were found in each of the three water sources.

– Secondary school named after Kasyke Mambetaliev, At-Bashy village, At-Bashy district, Naryn province



WATER ALL AROUND, BUT NOT ACCESSIBLE TO PEOPLE

The villagers of Dostuk reflected on the problem associated with water supply infrastructure.

During the Soviet Union, this village was categorized as an urban-type settlement (UTS), as it was in charge of the At-Bashy hydroelectric power station located next to the settlement. This means that the population of this strategic place was provided with supplies and infrastructure, including piped water, central heating system and canalisation. After the collapse of the Soviet Union, the village did not have funds to maintain the water supply and canalisation system, which led to severe deterioration of the infrastructure. The catchment reservoir is not filled up fully and can't provide access to water and heating in winter, when there is not even enough water for the primary needs of the population. In winter, the villagers can only collect water in one place. Thus, there is a long line for water collection in the mornings and evenings. At the same time, the village is surrounded by water resources: the Naryn River, The At-Bashy reservoir formed by the At-Bashy hydropower dam, and springs.

The second problem related to water is the sewage system - the purification plant has long been out of order and has not been repaired. All the sewage is discharged into the ditch and then flows down to the At-Bashy River.

The children showed the urgency of the problem through a two-level model of their village, showing the different water sources around the village, the results of their water analyses and, underground, the leaking water pipes.

– Secondary school in the village of Dostuk,
Naryn district, Naryn province





WATER ALL AROUND, BUT NOT ACCESSIBLE TO PEOPLE



This is a
video. Make
sure you are
online and click
on the play
button to watch
it!



INSECTS DANCING UNDER THE MICROSCOPE

— Secondary school named after Karybek Karpekov, Kara Suu village,
Naryn province

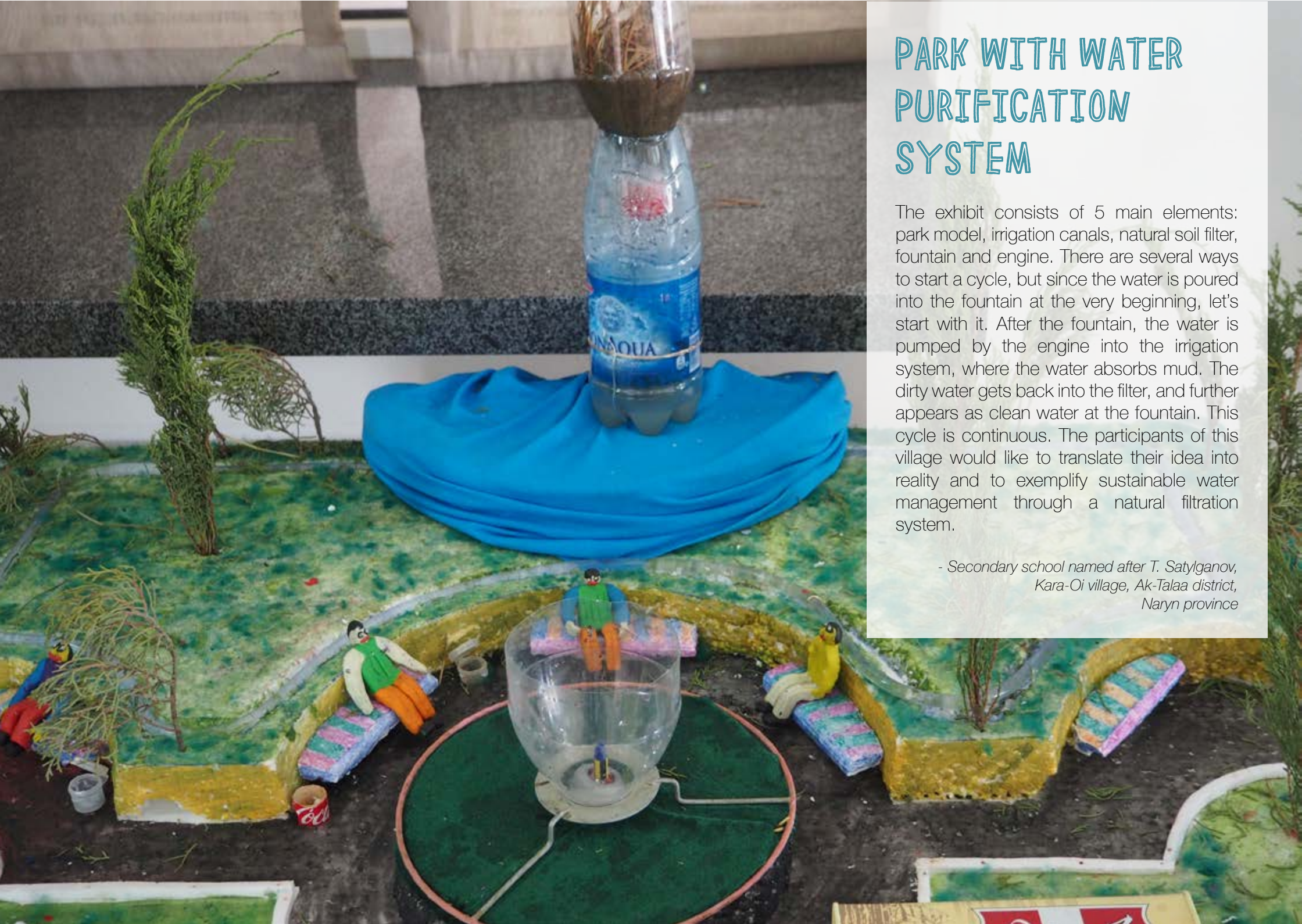


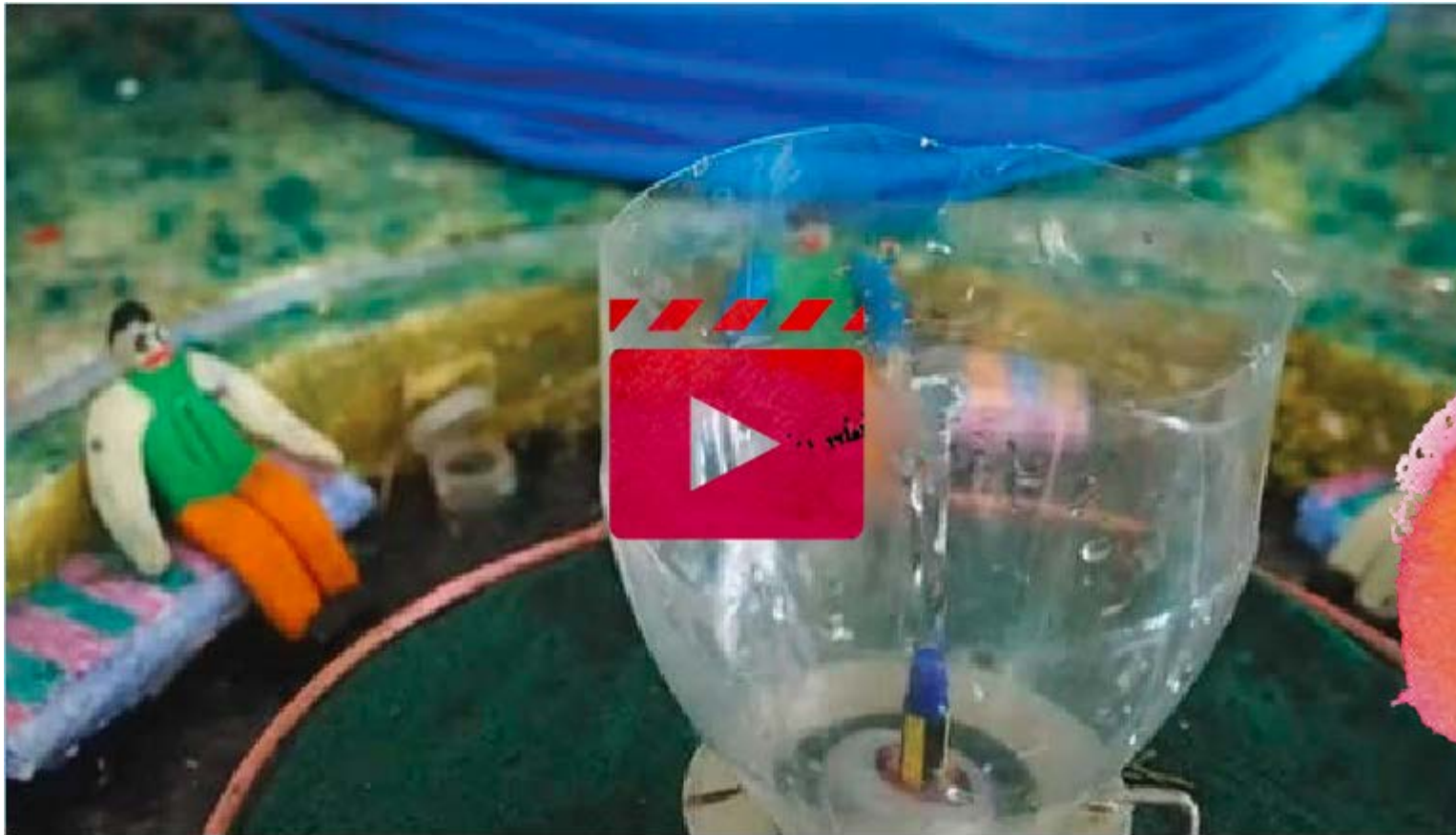
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watch it!

PARK WITH WATER PURIFICATION SYSTEM

The exhibit consists of 5 main elements: park model, irrigation canals, natural soil filter, fountain and engine. There are several ways to start a cycle, but since the water is poured into the fountain at the very beginning, let's start with it. After the fountain, the water is pumped by the engine into the irrigation system, where the water absorbs mud. The dirty water gets back into the filter, and further appears as clean water at the fountain. This cycle is continuous. The participants of this village would like to translate their idea into reality and to exemplify sustainable water management through a natural filtration system.

- Secondary school named after T. Satylganov,
Kara-Oi village, Ak-Talaa district,
Naryn province





PARK WITH WATER PURIFICATION SYSTEM

This is a video. Make sure you are online and click on the play button to watch it!

HOW FAR TO GO TO FETCH WATER?

Video and interviews with local residents.

The quick-witted students from Kazybek conducted a small survey among their fellow citizens related to the water supply and the acute issue of water shortages and in their village.

When the water supply stops, the villagers have to fetch water from the river, which is located in the distance of 1 km for some residents and for others even 2.5 km. The survey was conducted by ninth-grade students of the local school. You can see the illustrated survey results and the interviews on the video.

– Secondary school named after Usenaliy,
Kazybek village, At-Bashy district,
Naryn province





HOW FAR TO GO TO FETCH WATER?



This is a video. Make sure you are online and click on the play button to watch it!

WHICH WATER WOULD YOU LIKE TO DRINK?

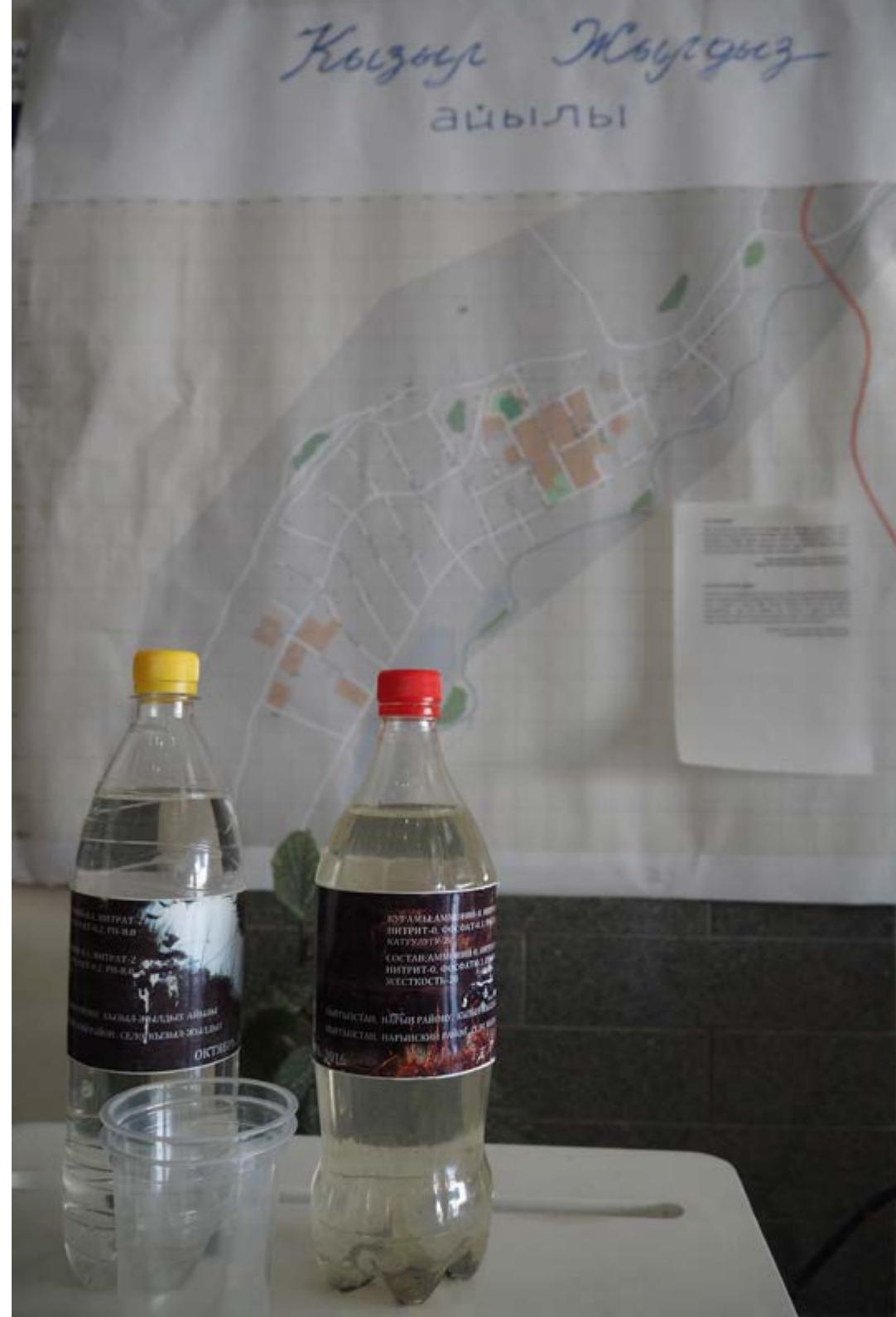
It seems we live in the 21st century, but in the UN Sustainable Development Goals (UN SDGs) there is still the goal “Ensure availability of water and sustainable management of water and sanitation for all”, which makes it clear that it is still a globally significant problem. Some villages in our country don't have access to safe drinking water and infrastructure. One of the participating schools in the village of Kyzyl-Jyldyz does not have a catchment reservoir and water pipes with pumps. Local residents fetch water for drinking and daily use from the rivers that flow in two sides of the village - On-Archa and Alysh. Upstream of the main river there is an artisanal gold mine, but there is no monitoring of water quality in place.

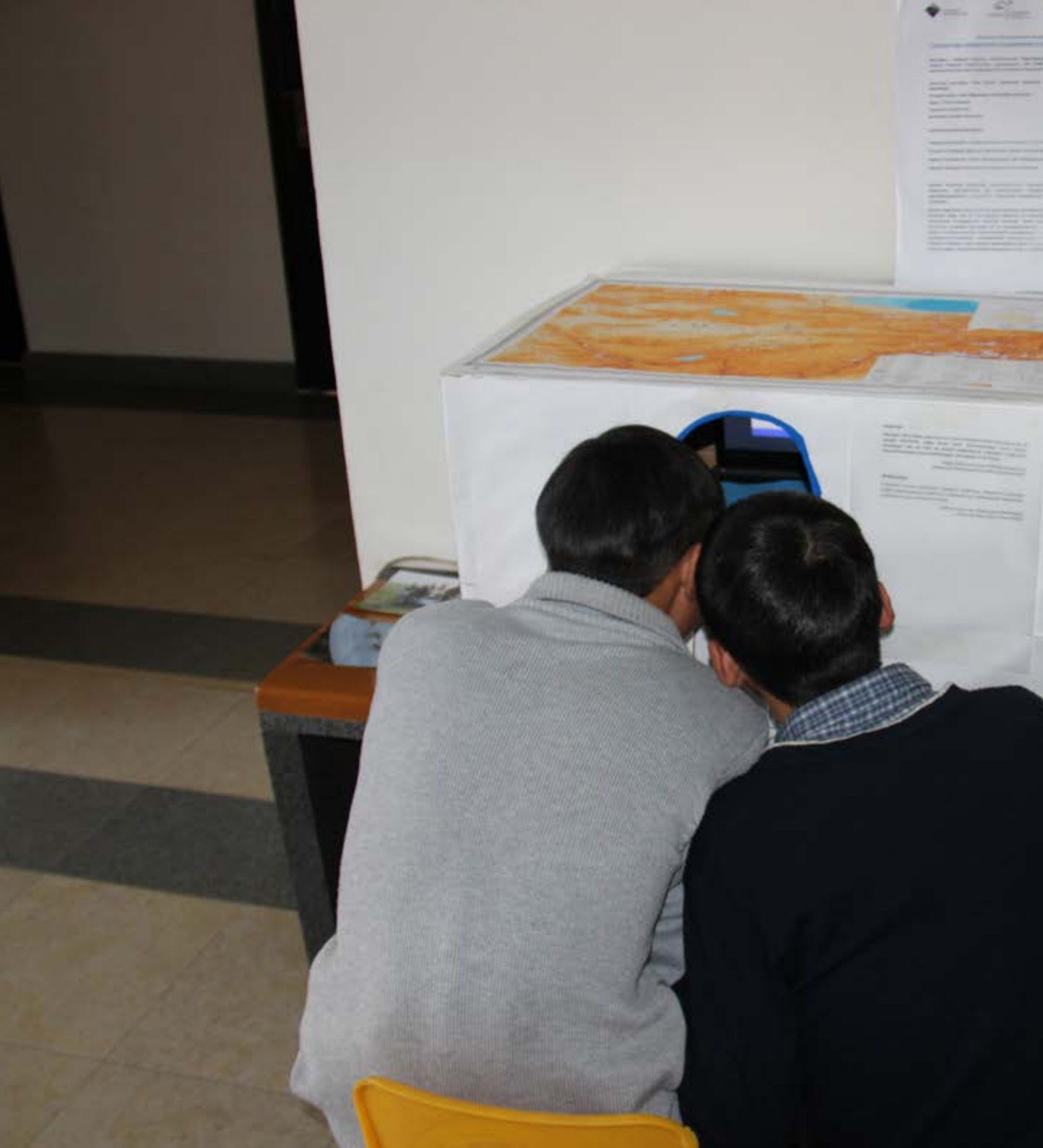
The exhibit was designed in the form of a map depicting the two rivers and two bottles with samples of water from these streams.

After a few days, the water in the first bottle (from the main river) acquired a rotten smell, and after one more day it formed a black sediment. The water in the second bottle just turned yellow. It was interesting to discover the changed structure and properties of water from the first bottle after freezing - it practically ceased to smell, and the precipitations in it were neutralized.

The children wanted to show that they have no other alternative than drinking water from the river - compared to people living in other localities of Kyrgyzstan, who have access to safe water. The label indicates the water composition and an invitation from the young researchers: “Would you like to drink our river water?” Some brave hearts poured water from these bottles into plastic cups and drank a sip.

– Secondary school named after Mamytkan Imanaliev, Kyzyl-Jyldyz village,
Naryn district, Naryn province



A photograph showing two young boys from behind, sitting on a yellow chair and looking at a digital screen embedded in a white cabinet. On top of the cabinet is a large map with orange and blue areas. To the right of the screen is a printed document with text. The setting appears to be an educational or exhibition space.

RIVER WATER

The project participants from the secondary school named after Mamytkan Imanaliev made a short film about water challenges in their village.

The people in this village have to drink river water, as they do not have water pipes or a reservoir. This creative film clearly shows the danger to human health arising from the pollution of the river, where the villages fetch water for drinking. The attention of spectators is focused on the importance to care for the health and cleanliness of the river basin and the environment along the river banks.

Karma is a word that precisely describes the plot. The video film of the schoolchildren covers the problems associated with the occurrence of intestinal and infectious diseases due to water pollution. It is noted that such harm is caused both by the local residents and their guests.

– Secondary school named after Mamytkan Imanaliev, Kyzyl-Jyldyz village, Naryn district, Naryn province



This is a video. Make sure you are online and click on the play button to watch it!

RIVER WATER



DIRTY WIND

"Dirty wind" is an installation that reflects one some of the village's issues.

This village has a garbage dump, but the residents often simply do not carry their garbage that far and leave everything on the edge of the landfill. The wind carries all the garbage through the village, and it gets into the water that people use for irrigation, and which some of the villagers even drink. There were also cases when local households simply left their garbage on the riverbanks.

The installation was built as a separate small room within the exhibition, with the garbage scattered over it and fans imitating the wind. The garbage flies around the room and falls on the visitor of the exhibition.

The project participants ask the visitors a question: "How would you feel if you were this water?"

– Secondary school named after Aktan Tynybek, Kuibyshev village, Naryn district, Naryn province





DIRTY WIND

This is a
video. Make sure
you are online and
click on the play
button to watch
it!



FRAGILE WATER

Despite the abundance of water sources in Kyrgyzstan, residents of the majority of villages in the country don't have safe access to water because of the lack of necessary infrastructure.

Villagers are facing difficulties on a daily basis, as some family members have to walk long distances to fetch water for drinking purposes and household needs. Pupils from this school illustrated this through land-art with ice, showing that although water is abundant, it is also a fragile resource, which is not always easily accessible and tangible for people.

*—Secondary school named after Usenaliyev, Kazybek village,
At-Bashy district, Naryn province*





FRAGILE WATER





This is a video. Make sure you are online and click on the screen to watch it!



GOLDEN FISH

The fairy tale of Alexander Pushkin about “The Fisherman and the Golden Fish” was adapted to our current realities of water challenges for society. For many centuries, mankind has been valuing its material well-being most, but now slowly other values start to be relevant: how important is the purity of water in the world? Everyone who is familiar with the plot of the famous fairy tale will be surprised by the change in the characters of some heroes.

—Secondary school named after Musa Baetov, Ugut village,
Ak-Talaa district, Naryn province

WHAT DO SMALL KIDS THINK ABOUT WATER?

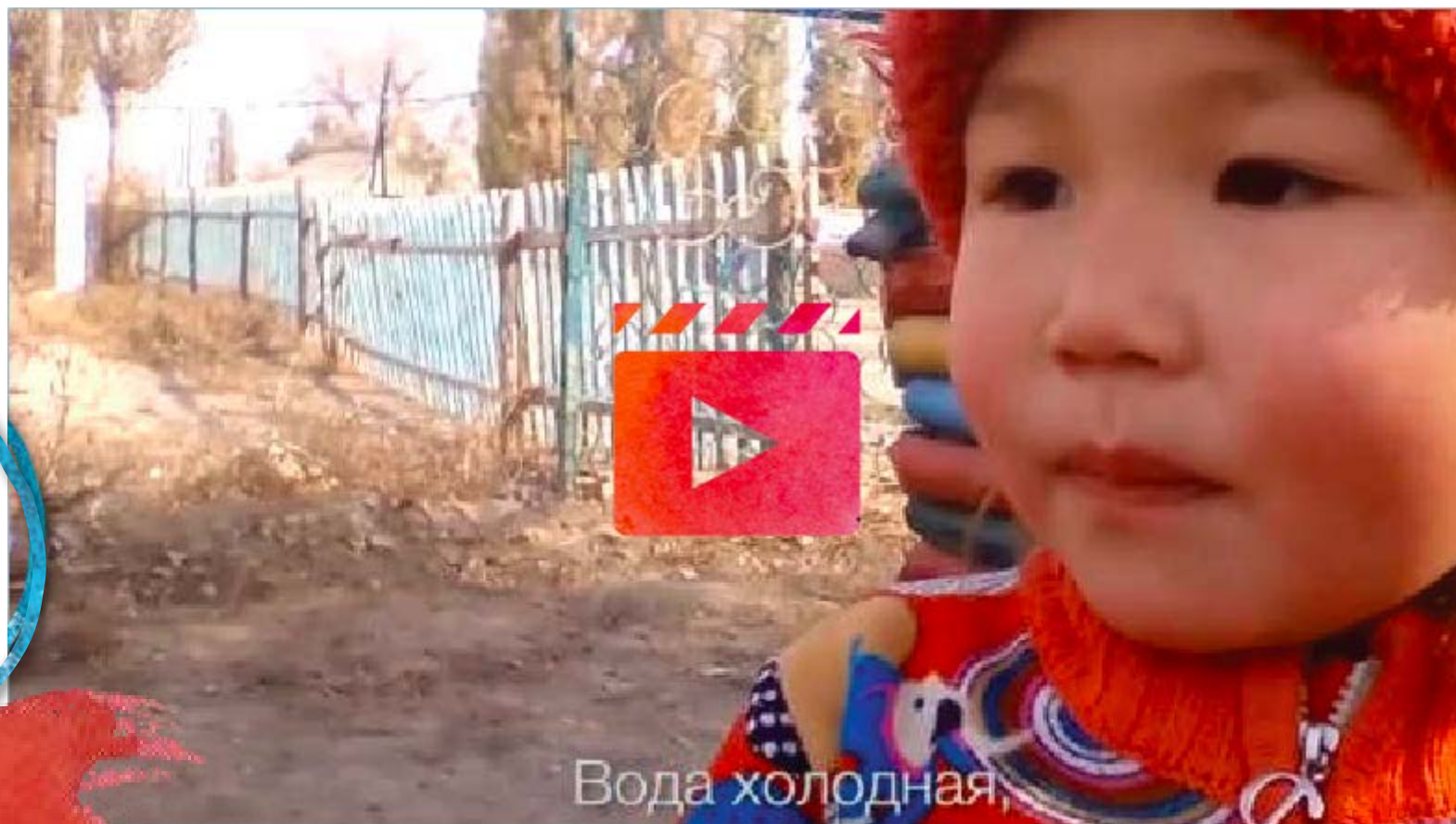
What would be an exhibition without creative exhibits?! For this exhibition, our imaginative project participants had the idea to create a short film reflecting on the thoughts of small children about water. The children are asked simple questions: What colour is water? Would you like to be water? Where do people get their water from?

The answers of three to six-year-old children were unpredictable not only for the interviewers, but they also intrigued the spectators of this amateur short film... Each exhibition visitor could dive into direct communication with the kids from rural areas. To watch this video, the viewer had to lie down on a carpet and watch the movie within a box over his/her head.

*– Secondary school named after Musa Baetov, Ugut village,
Ak-Talaa district, Naryn province*



This is a
video. Make sure
you are online
and click on the
play button to
watch it!



WHAT DO SMALL KIDS THINK ABOUT WATER?

The background is a watercolor-style wash of warm colors, primarily oranges, reds, and yellows, with soft, blended edges and some darker, more saturated areas. The overall effect is artistic and textured.

*Interactive elements of
the exhibition*

СОЦИАЛЬНО-ОБРАЗОВАТЕЛЬНАЯ ВЫСТАВКА

СКВОЗЬ ВОДУ: ГРАЖДАНСКИЕ ИССЛЕДОВАНИЯ В НАРЫНСКИХ ШКОЛАХ

6-10 декабря, 2016



UNIVERSITY
OF CENTRAL ASIA
Манастаи Университети Ўрта Осиё



Министерство образования
и науки Республики Казахстан
Нарынская область



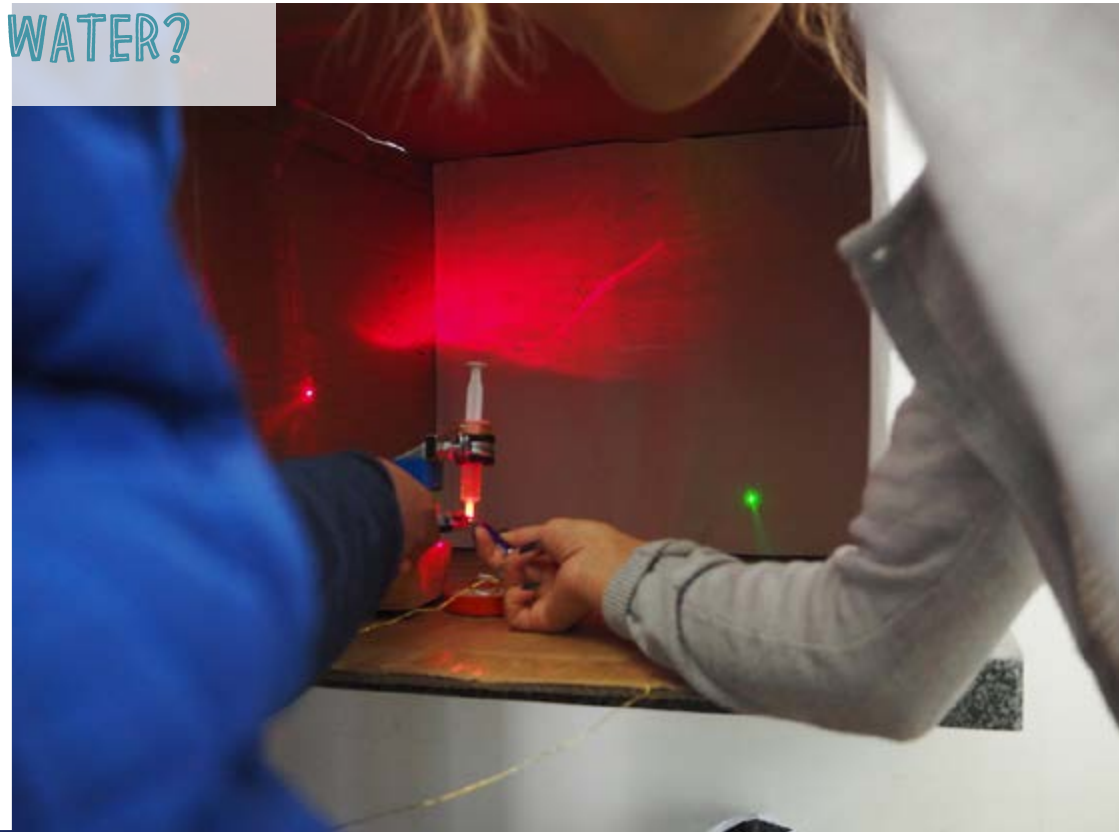
Центр социального
развития Наринского района



Interactive concept of the exhibition



WHAT LIVES IN A
DROP OF WATER?





This is a video. Make sure you are online and click on the play button to watch it!

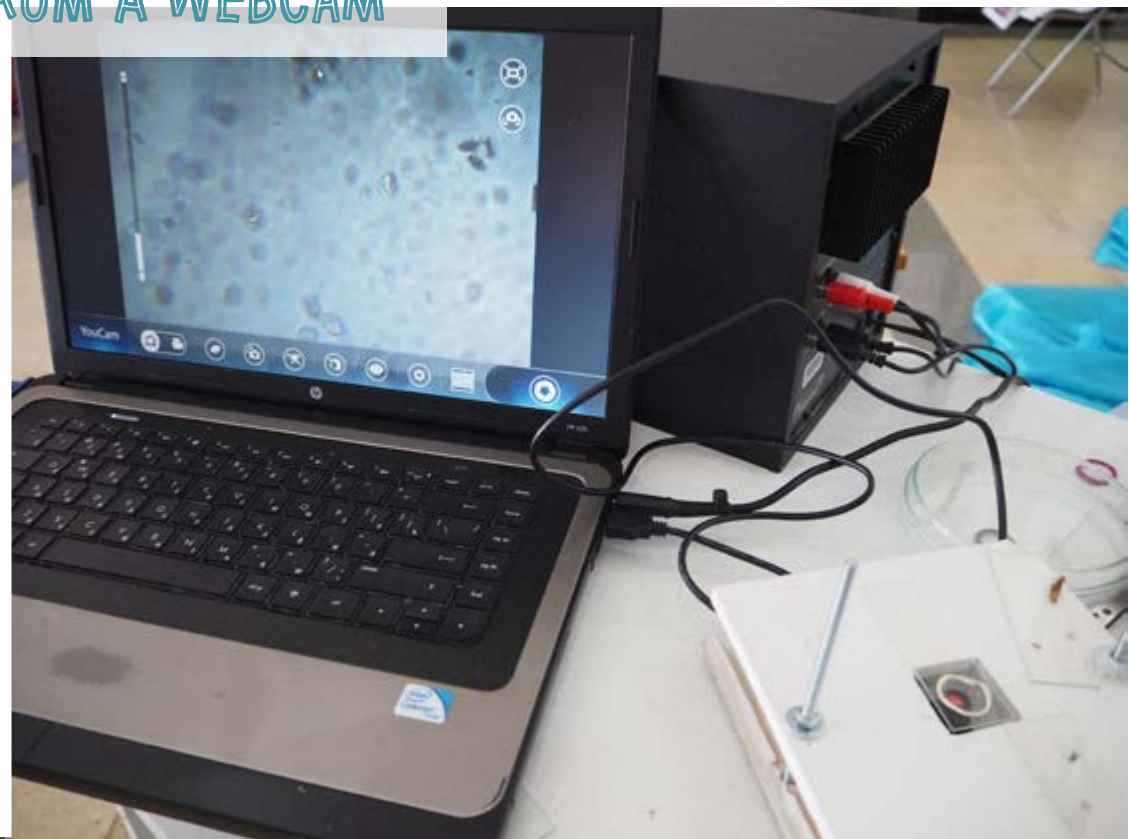
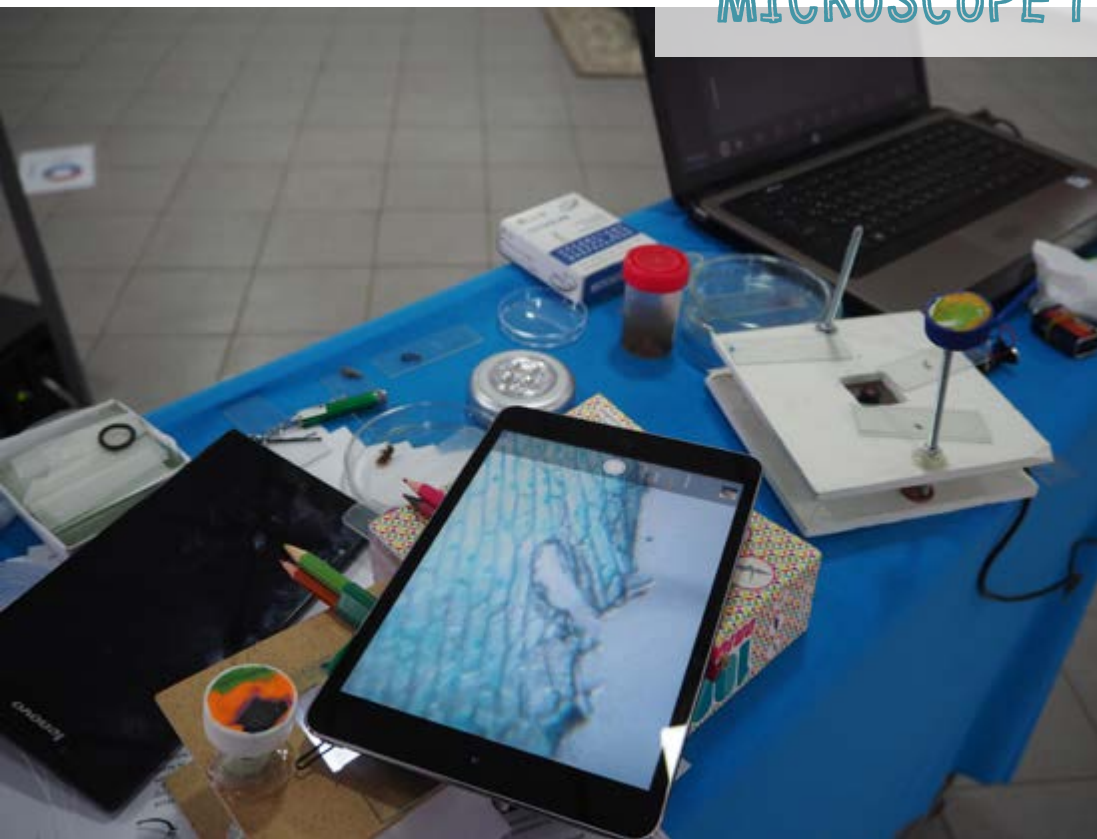


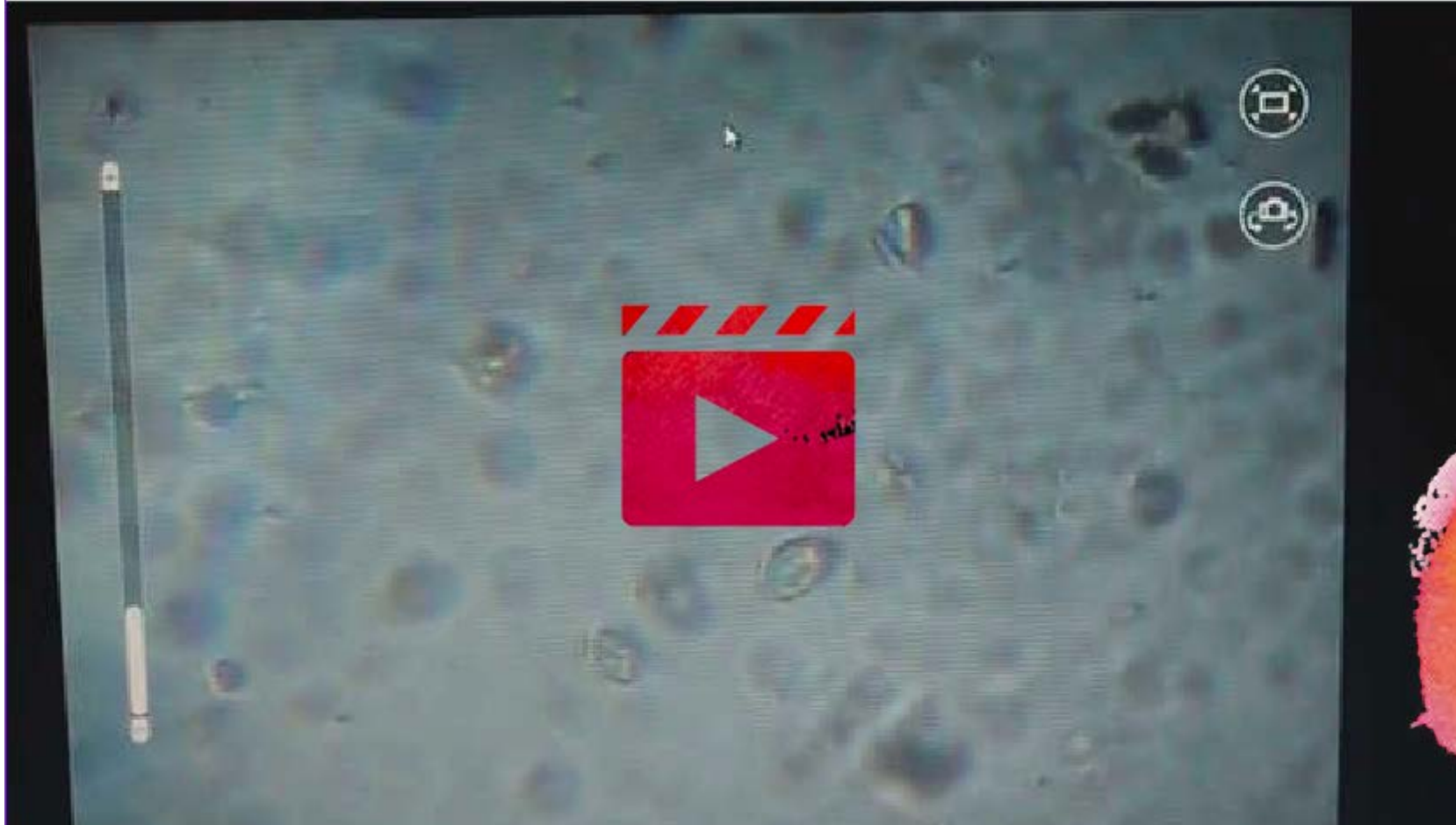
INTERACTIVE #1: WHAT LIVES IN A DROP OF WATER?

You can see the amazing world living in just one drop of water by aligning a laser and a syringe with pond water in the right position. The experiment allows us to understand that our world has many things that a person sometimes does not even think about. The movement of microorganisms in water is fascinating and easy to see. Moreover, microorganisms have no idea that someone is watching them.



MICROSCOPE FROM A WEBCAM





This is a video. Make sure you are online and click on the play button to watch it!



INTERACTIVE #2: MICROSCOPE FROM A WEBCAM

During the trainings with the schools, teachers and pupils were shown how to create their own digital microscope from a web camera. During the exhibition, it was possible to try out these homemade tools, and to see moving *Paramecium caudatum* living in pond water from a nearby park.



INTERACTIVE #3: FISHING IN GARBAGE

To ensure that the youngest children have their own tasks, the exhibition was equipped with a mini pool with plastic fish and magnetic fishing rods. To take up a much discussed topic in the exhibition – water pollution through garbage – the aquarium was filled with plastic, tin and other types of garbage, which created difficulties in catching fish. Having caught a fish, the children were happy, while the adults tried to catch fish with great pleasure too. Catching fish in littered water is not an easy task for both children and adults.





BUILD YOUR OWN MICROSCOPE



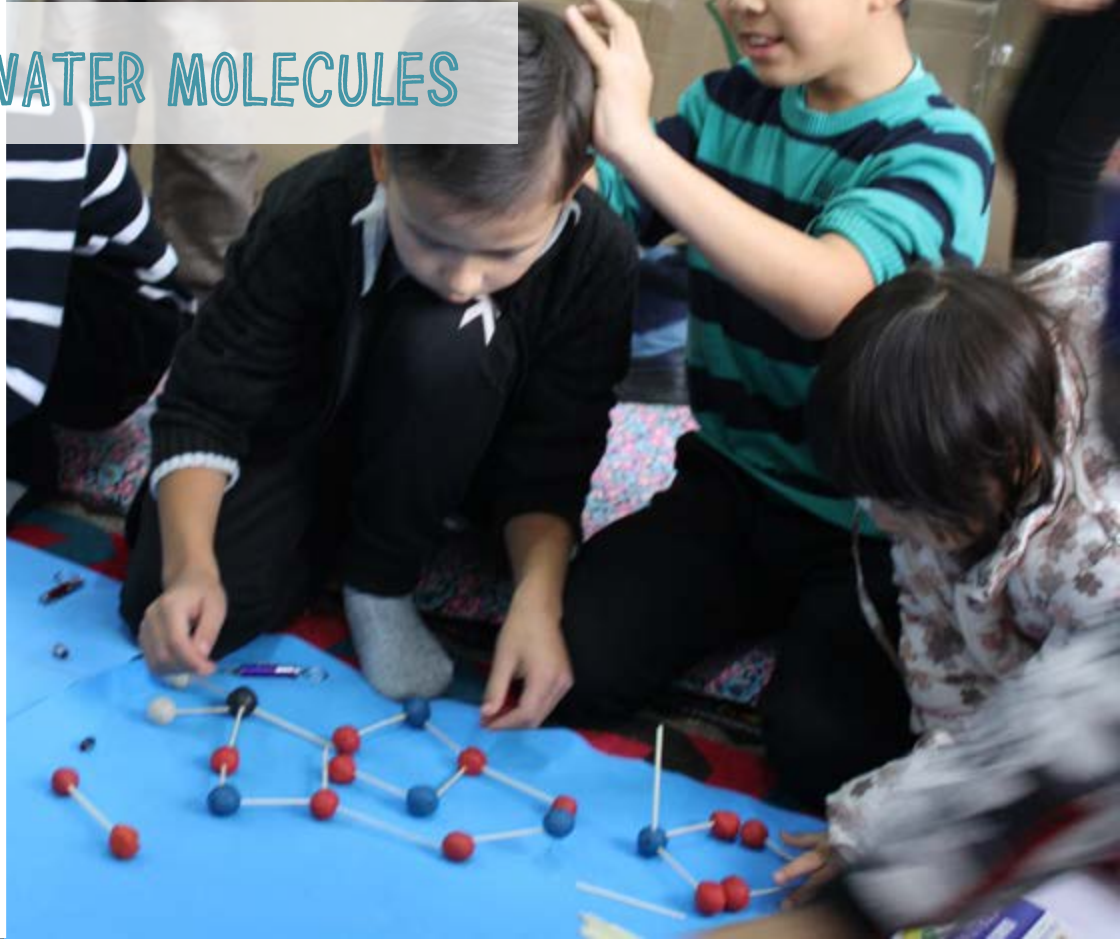
INTERACTIVE #4: BUILD YOUR OWN MICROSCOPE

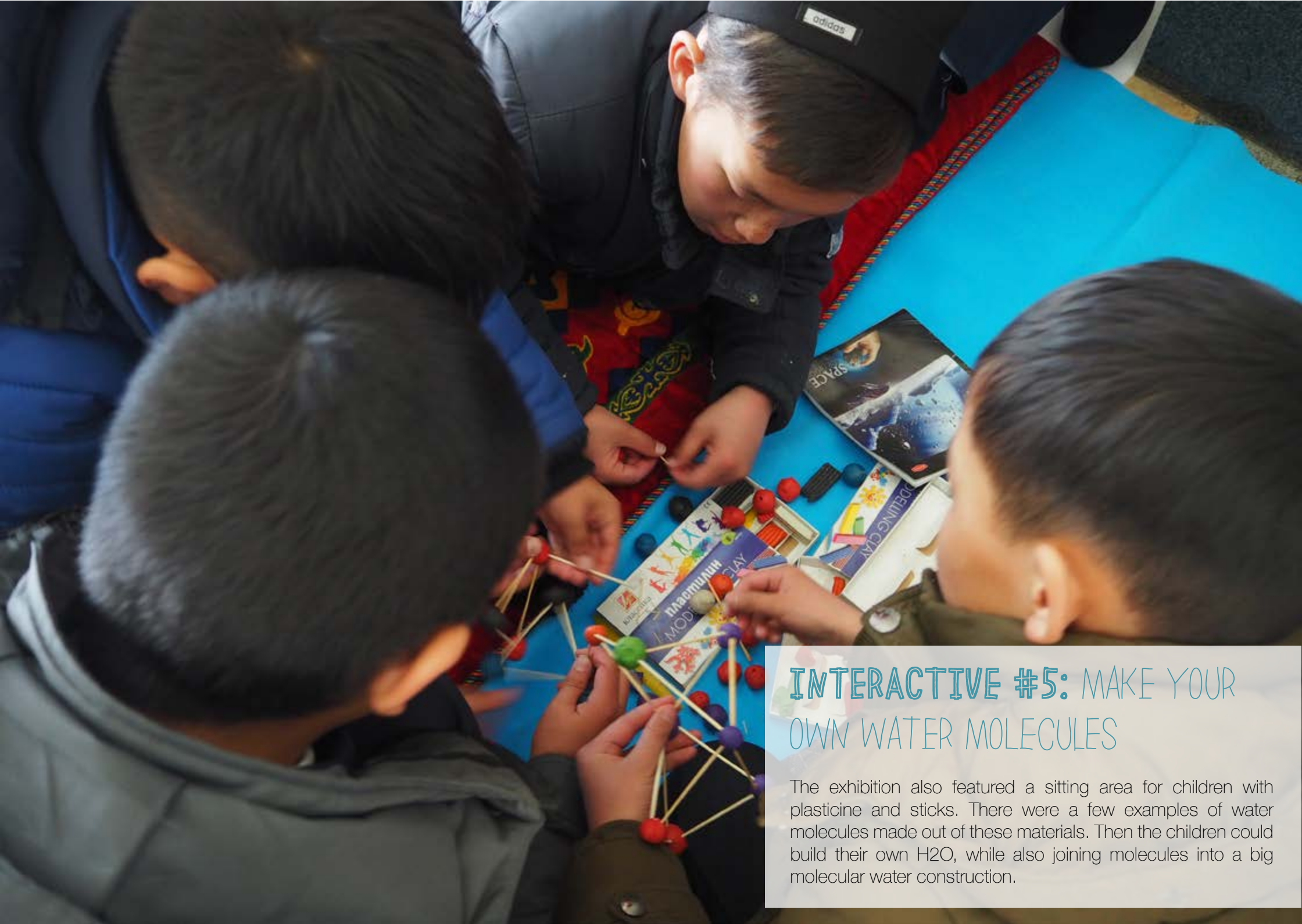
At the exhibition there were master classes for children, explaining how to make a microscope for their own mobile phone. With the help of simple materials (basic laser pointer, hair pin, tape), the children created magnifiers that allowed them to see the details of the surrounding world.





MAKE YOUR OWN WATER MOLECULES





INTERACTIVE #5: MAKE YOUR OWN WATER MOLECULES

The exhibition also featured a sitting area for children with plasticine and sticks. There were a few examples of water molecules made out of these materials. Then the children could build their own H_2O , while also joining molecules into a big molecular water construction.



AND OTHER INTERACTIVE EXHIBITS...

The exhibition had boxes for viewing short videos. The boxes had cuts in the form of a face and headphones, so that no one could prevent viewing. The map with the pupils' research data developed in the course of the project realization was placed on the floor, allowing visitors to "walk through the village".

Most of the created exhibits had an interactive component, inviting visitors to touch, try, taste, search, experience or watch.



AND OTHER INTERACTIVE EXHIBITS...



III. Project participants



AK-TALAA DISTRICT:

Secondary school named after Musa Baetov, Ugut village

Total number of pupils: 180

Participating teachers: Chynara Akimalieva (biology and geography teacher), Gulyaim Shermatova (biology and chemistry teacher).

Ученики: Akbermet Erkinbekova, Sulaiman Sagynbekov.

Winner in the category: “Best Technological Eco-perspective”

The representatives of this school stood out through their responsibility and creativity in engaging throughout the project activities. Having received a first impulse, the teachers and students led the process of selecting and preparing new experiments and projects.

A distinctive feature of the water analyses from different sources close to the village was its high mineralization, exceeding the globally and nationally accepted norms for drinking water.

Fact: In Soviet times, a salt sanatorium was located not far from this village





Secondary school named after T. Satylganov, Kara-Oi village (Togolok-Moldo)

Total number of pupils: 700

Participating teachers:

Toktogul Tokobaev (geography teacher),
Jyldyz Tayalieva (chemistry teacher).

Students: Ulan Ernisbek uulu, Erlan Toktogul uulu,
Jenishbek Almazbek uulu, Gulnur Kutmanova.

Winner in the category: “Most Active Eco-perspective”

The team from this school distinguished itself through a positive attitude and creative thinking, which was accompanied by a very active participation of teachers and pupils in the project.

Overall, the water analyses in this village showed good results, but just as in Ugut village, the mineral content was higher than the norm for drinking water. Both villages are located close to each other (in the same water basin).





Secondary school named after Baiymbet Abdrakhmanov, Jany–Talap village

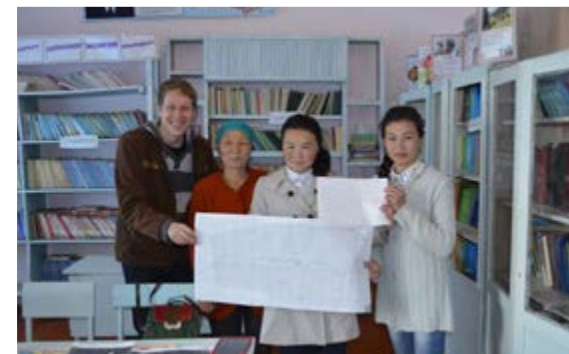
Total number of pupils: 530

Participating teachers: Kaiyrgul Chomuraeva (biology teacher).

Students: Anara Obolbekova, Uulsana Sovetbekova, Talaaigul Marsbekova.

Winner in the category: “Most Environmental Eco-perspective“

The pupils of this school touched upon the issue of the endangered purity of the world's water resources: Littering and other negative impacts of garbage on living organisms, which subsequently could lead to the disappearance of the human species.





AT-BASHY DISTRICT:

Secondary school named after K. Mambetaliev, At-Bashy village

Total number of pupils: 400

Teachers: Nuriza Tynybekova (biology teacher), Baktygul Orozobekova (geography teacher), Gulgaaky Baimatova (chemistry teacher).

Students: Nargilia Maksat kyzy, Bulana Taabyldieva.

Winner in the category: “Best Visual Eco-perspective”

The teachers and pupils of this school have distinguished themselves through a very creative approach to the activity. They used traditional motives for creating their installation. In their study they compared the water quality from three different sources (wells, springs and boreholes) revealing the presence of unidentified insects in the water from the wells.





Secondary school named after Boogachy, Ak-Muz village

Total number of pupils: 640

Teachers: Ulan Mokeshov, (physics teacher),
Mirlan Kalchaev (geography teacher).

Students:

Shambat Jumakadyrova, Aizada Akmatbek kyzy, Bakyt Abdybekov.

Winner in the category: “Most Interactive Eco-perspective”

The team from this school conducted a study on water quality in the surrounding rivers. It resulted in a slightly increased content of ammonium. Besides, the school activists organized a debate on the importance of water and water-related challenges in the world.





Secondary school named after Usenaliyev, Kazybek village

Total number of pupils: 750

Teachers: Gulnaz Shamyrbekova (biology teacher),
Adil Japarkulov (geography teacher).

Students: Dastan Moldajiev, Adilet Nurlan uulu.

Winner in the category: “Most Creative Eco-perspective”

The team from this school outstood with its creative approach to visualizing their results. It should also be noted that the pupils were highly concentrated and interested in their research work.





Secondary school named after K. Karypbekov, Kara-Suu village

Total number of pupils: 760

Teachers: Kanatbek Jakypov (biology teacher).

Students: Aichurek Sulaimanova, Elzat Torokulova, Berdibek Keldibek uulu.

Winner in the category: “Most Scientific Eco-perspective”

The teacher and pupils from this school have surprised the curators of the exhibition with their responsible attitude, as well as with the clarity and precision of their work.





NARYN DISTRICT:

Secondary school named after Aktan Tynybek, Kuibyshev village

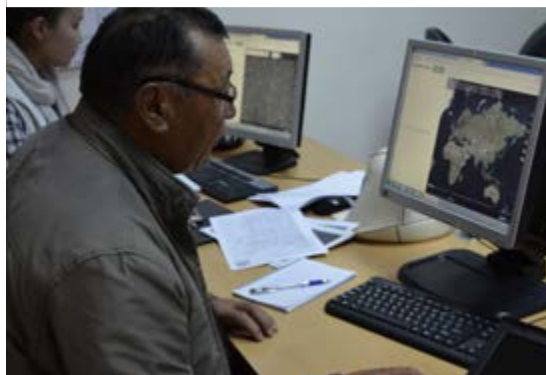
Total number of pupils: 550

Teachers: Saktur Musaev (physics teacher), Bilimbubu Ziyadinova (biology teacher), Jazgul Isabekova (biology teacher).

Students: Torobek kyzy Jibek, Turarbek kyzy Ainura, Syimyk Kubatov, Jumadil Edilbekov.

Winner in the category: “Best Citizen Eco-perspective”

The participants from this school decided to conduct a seminar for the entire population of their village based on the results of their water monitoring. The purpose of the meeting was to raise the awareness of the local residents about the connection between health and water contamination, as well as to increase their readiness to use natural resources sustainably.





Secondary school in Dostuk village

The total number of pupils: 130

Teachers: Maksat Urkunbaev (geography teacher),
Bubusabida Osmonova

Students: Jenishbek Mukanbetov, Bermet Altynbek kzy

Winner in the category: “Best Youth Eco-perspective”

The children from the school in the village of Dostuk took responsibility for creating the exhibit almost without the help of senior mentors, showing a high degree of creativity and responsibility.





Secondary school named after M. Imanaliev, Kyzyl-Jyldyz village

Total number of pupils: 300

Teachers: Nurgiza Beksultanova (chemistry teacher),
Mars Meder (geography teacher).

Students: Nazar Rahatbek uulu, Talant Toktobek uulu.

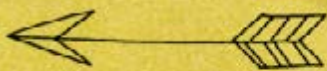
Winner in the category: “Most Innovative Eco-perspective”

The participants from this school have done a very good job - they created a short film, which conveys a profound message in a positive way. Also, they designed bottled water from their main sources of drinking water: an open channel and a river. Would you like to taste it?

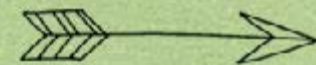




IV. Photo gallery of the project's history



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