







**REPORT**  
**on the use of equipment purchased**  
**by Gorno-Altai State University**  
**under the SUNRAISE project**





Conducted end-user surveys helped us not only identify gaps in the existed curriculum and develop the list of courses to be revised or developed by GASU under the project, but also identify the equipment to be included in the project proposal that would suit our students' current needs. We are confident that to make the education process more practically oriented our students and young researches should have an opportunity to apply what they have learned in class in real life situations. In order to do that, they need good portable equipment to be used in field conditions. Such equipment should also help to take samples in the remote areas of the Altai Republic and Altai-Sayan Ecoregion in general.

The purchased equipment helped to complete equipping a portable Ecological and Chemical Laboratory of GASU:


№	Title and description	Photo
1	<p><b><i>Turbidity Portable Meter HI98703 HANNA</i></b></p> <ul style="list-style-type: none"> <li>is intended to measure turbidity, quickly determines the number of suspended particles in water</li> </ul>	
2	<p><b><i>Gas detector IGS "Kometa M-5" with forced sampling</i></b></p> <ul style="list-style-type: none"> <li>used for toxic or combustible gas detection, as well as for oxygen deficiency monitoring in confined spaces</li> </ul>	

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<p>3</p>	<p><b><i>Kit for hands-on trainings in ecology</i></b></p> <ul style="list-style-type: none"> <li>is intended to conduct educational research work on ecology at the medium and advanced level, which allows determining a wide range of environmental indicators of water, air, soil, and food</li> </ul>	
<p>4</p>	<p><b><i>Soil laboratories IbisLab-Pochva</i></b></p> <ul style="list-style-type: none"> <li>is intended to conduct soil quality assessment by 5 indicators: humic acids (range - 0-2%), pH (range - 0-12), nitrate nitrogen (range - 0-180 mg/kg), ammonium nitrogen (range - 0-90 mg/kg), mobile phosphorus (range - 0-300 mg/kg)</li> </ul>	
<p>5</p>	<p><b><i>Dust analyzer IKP-5</i></b></p> <ul style="list-style-type: none"> <li>is intended to measure the concentration of dust and its fine fraction in the air and to control the excess of their maximum permissible concentrations</li> </ul>	
<p>6</p>	<p><b>MARK-302E Dissolved oxygen analyzer</b></p> <ul style="list-style-type: none"> <li>is intended to measure dissolved oxygen concentration, DO saturation and temperature of water and aqueous solutions</li> </ul>	

<p>7</p>	<p><b><i>GMTsM-1 Hydrometric mini flowmeter</i></b></p> <ul style="list-style-type: none"> <li>is intended to measure water flow rate averaged for the period of observations at cross-section points of natural and synthetic stream flows (rivers, channels, pipelines, etc.)</li> </ul>	
<p>8</p>	<p><b><i>Snow (tube) sampler BC-43</i></b></p> <ul style="list-style-type: none"> <li>is intended to measure snow depth and water content to determine snow density</li> </ul>	
<p>9</p>	<p><b><i>ECOTEST 2000-pH-M portable ionometer</i></b></p> <ul style="list-style-type: none"> <li>is intended to analyze drinking, natural, and waste water, soil, feed-stuff, raw materials &amp; ingredients for food industry, food and beverages</li> </ul>	
<p>10</p>	<p><b><i>Weather station M-49M with a computer weather adapter</i></b></p> <ul style="list-style-type: none"> <li>is intended to remotely measure wind speed and direction, atmospheric pressure, temperature and relative humidity of the air, output and save measurement results to a computer via RS-232 interface</li> </ul>	

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11	<p>MV-4-2M (mechanical) aspiration psychrometer</p> <ul style="list-style-type: none"> <li>is intended to measure air temperature in the range from minus 25 to plus 50°C and determine the relative humidity, as well as the characteristics of humid air using psychrometric tables in the range from 10 to 100% at temperatures from minus 10 to plus 50 °C</li> </ul>	
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The Department of Natural Sciences and Geography is the authority in charge of this property. All equipment is stored at 1, Lenkin Street, room № 231. It was planned to install the weather station on the territory of the GASU summer camp at Lake Teletskoye, but due to COVID-19 the camp did not function in the summer of 2020 and was of limited use in the summer of 2021, so the station is stored unpacked in a special storage room of the Department.

The purchased equipment has been and will be used for the following courses developed (revised) under the SUNRAISE project:

1. Environmental design and expertise (3 ECTS). The course is primarily developed for BSc students in Ecology and Environmental Management, but can also be used by BSc students in Geography, MSc students in Ecology and Environmental Management, and MSc students in Geography (especially those, who came from other BSc academic major disciplines).

2. Waste management (3 ECTS). The course is primarily developed for MSc students in Ecology and Environmental Management, but can also be used by MSc students in Geography.

3. Sustainable development of mountain territories (3 ECTS). The course is developed for MSc students in Geography and MSc students in Ecology and Environmental Management. Separate modules of the course and the proposed equipment can be used by MSc students in Biology.

4. Environmental Impact Assessment (4 ECTS, to be revised in October 2020 – January 2021). The course will be intended for BSc students in Ecology and Environmental Management.

The equipment is also intended for incoming exchange students (summer schools and joint field practices), for Masters and PhD research projects in sustainable development of mountain territories, for conducting necessary research

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and further analyses on request of local stakeholders (municipal administrations, NGOs, protected areas, businesses, etc.), and for out-of-class activities to be held in the GASU adopted schools (professional orientation of potential students).

The estimated number of final beneficiaries was expected to be about 150 people a year (about 300 people during the project period). Unfortunately, due to the coronavirus restrictions it was not possible to make full use of the equipment.



In the classroom: students studying equipment manuals



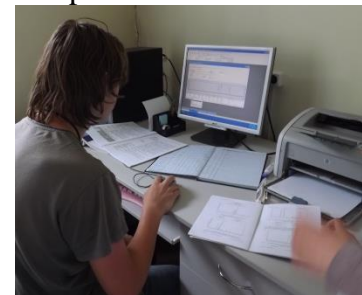
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Use of the equipment during practical trainings in the vicinities of Gorno-Altai and field practices in the regions of the Altai Republic



Joint research work of GASU students and schoolchildren from Ortolyk secondary school



Analyzing the results of field research obtained with the help of SUNRAISE equipment



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## Statistics on the use of SUNRAISE equipment



SUNRAISE equipment register & usage logbook

GASU BSc	GASU MSc	PhD/Research staff*	Other stakeholders**
2019			
126	22	3	78
2020			
67	14	3	0
2021 (January – June)			
64	5	4	7

\* Including contract-based research at the request of local stakeholders  
\*\* Schoolchildren, summer schools participants, etc.