

The expedition program on glaciers and goaf lakes research and observations in Karatag, Vakhsh, and Zeravshan river basins

Almost $\frac{3}{4}$ of the biggest Central Asian Amudarya river runoff, constituting of the main part of the snow and glacier resources, are formed on the territory of Tajikistan. Snow and glacier melting period appears to be the main water source for the whole region during the agricultural vegetation.

Glaciers occupy 8% of the whole territory of the republic. There are 14509 glaciers in Tajikistan; and its total area constitutes 11 146 sq. km, thus, leading to the interest raising of the Central Asia, in particular Tajikistan's glaciers and snow resources allocation observation and study.

Observations of glaciers' surface change show that the glaciers tongues reduced by 15-20 m in the ablation zone within the last 20-25 years. The massive ice loss of the biggest glaciers are observed as well, for instance, Fedchenko Glacier lost 1,8 m³ (approximately 3 m of the whole glacier volume) of ice just in its glacier-table.

Glaciers' volumes reduced more intensively than their square areas. Some of the glaciers lost 20-30% in volume, while the area kept permanent. In this regard, all small glaciers are concerned being most vulnerable to climate change adverse impacts.

The process of glaciation degradation affects on the rivers' water content with glacial flow high part (40-50%), however, if climate change develops in a way predicted due to the modern scenarios with regular temperature rise, the adverse impacts of this phenomena for the majority of the Amudarya basin rivers are expected. On the other hand, if the rainfall increases in the Central Asian region, glaciation mass will be increased either. Therefore, the process we have to deal with is very complex and may be predicted in two various ways that urgently needs conduction of the permanent observations.

Implementation of any ecological and hydroeconomic projects in the Aral Sea basins requires the long term prediction of the Amudarya and Sirdarya rivers' water content that, in its turn, needs systematic control and observation of the snow and ice resources of the Tajikistan's territory in particular, where the biggest glaciation knot is accumulated.

The Expedition Program on glaciers and goaf lakes research and observations, including environmental monitoring of the mountainous lake conditions is elaborated by the Executive Committee of the International Fund for Saving the Aral Sea (IFAS) cooperatively with the Regional Centre of Hydrology (RCH) of the Agency on hydrometeorology of the Republic of Tajikistan to implement the decisions of the International Action Decade "Water for life" and "The Programme of the specific actions aimed at the ecological and economic situations improvement in the Aral Sea basin for 2003-2010". The main objective of the expedition is to visit, inspect and observe the lakes and glaciers of the Hissar range, Fedchenko Glacier and Zeravshan river's glaciers.

Field works of the expedition programme

I. Hissar range lakes and glaciers		
1.	Immediate objective:	Monitoring, observation and control of the Hissar range glaciers' degradation stage and the Karatag river basin lakes conditions within the last 15 years
2.	Other objectives:	<ul style="list-style-type: none"> - topography survey of the ends and cross-cut profiles of the glaciers, including the "GGP" glacier in the Iskanderkul basin and Diahandara glacier in the Karatag basin; - monitoring of the Timurdara and Pairon lakes in the Karatag basin; analysis description, including changes of their levels, outlines and sizes; - photography of the glaciers, lakes, etc.; - analysis description of any changes occurred within the last 15 years
3.	Staff:	6-7 persons
4.	Transport device:	Vehicle
5.	Duration:	<p>12 days totally, including:</p> <ul style="list-style-type: none"> - arrival at the Hydrometeorological Station (HMS) Iskanderkul (1 day); - inspection of HMS Iskanderkul (1 day); - excursion and observation of the "GGP" Glacier (1 day); - photography of the "GGP" Glaciers' end and cross-cut ranges, video shooting and analysis description of the glaciers' changes (1 day); - hiking through the Mura Pass to the Karatag river basin; analysis description of all glaciers come across with (2 days); - photography and analysis description of the Timurdara and Pairon lakes (2 days); - photography, video shooting and analysis description of the Diahandara glacier' end and cross-cut profiles (2 days); - inspection of the Hydrological Station (HS) Karatag and arrival in Dushanbe (2 days).
6.	Equipment:	Tripod, lath, theodolite, camera, tent, cauldron, teapot, axe, matches, provision, sleeping-bags, etc.
7.	Date:	August, 2006

II. Fedchenko Glacier		
1.	Immediate objective:	Monitoring, observation and control of the Fedchenko Glacier's degradation stage within the last 15 years
2.	Other objectives:	<ul style="list-style-type: none"> - helicopter survey of the whole glacier, from the tongue up to the firn zone, - topographic survey and photography of the glacier's end, - topographic survey of one/two cross level ranges, - photography of separate glaciers' parts, - analysis description of any changes occurred within the last 15 years.
3.	Staff	5-6 persons
4.	Transport device:	Helicopter
5.	Duration:	10 days totally, including: <ul style="list-style-type: none"> - arrival and camping at the Bivachiy Glacier (1 day); - video shooting and photography of the cross-cut range (4 days); - descending and observation of the glacier tongue (1 day); - video shooting and photography of the Fedchenko Glacier's end (3 days); - arrival in Dushanbe (1 day).
6.	Equipment:	Tripod, lath, theodolite, camera, video camera, tent, cauldron, teapot, axe, matches, provision, sleeping-bags, etc.
7.	Date:	September, 2006

III. Zeravshan river glaciers		
1.	Immediate objective:	Monitoring, observation and control of the Zeravshan river glaciers' degradation stage within the last 15 years
2.	Other objectives:	<ul style="list-style-type: none"> - video shooting and photography of Zeravshan, Rama, Tro and Dihadang glaciers' ends and cross-cut profiles; - photography of the glaciers' specific parts, analysis description of any changes occurred within the last 15 years; - inspection of the HMS Sangiston, Madrushkent and Dehauz.
3.	Staff:	5 persons
4.	Transport:	vehicle
5.	Duration:	22 days totally, including: <ul style="list-style-type: none"> - arrival at the HMS Sangiston (1 day); - inspection of the HMS Sangiston (1 day); - arrival at the HMS Madrushkent (1 day); - inspection of the HMS Madrushkent (1 day); - arrival at the HMS Dehauz (1 day); - inspection of the HMS Dehauz (1 day); - excursion and observation of the Zeravshanskiy Glacier and

		camping (2 days); - video shooting and photography of the Zeravshanskiy Glacier' tongue and cross-cut profiles, analysis description (3 days); - video shooting and photography of the Rama Glacier's tongue and cross-cut profiles, analysis description (2 days); - video shooting and photography of the Tro Glacier's tongue and cross-cut profiles, analysis description (2 days); - video shooting and photography of the Dihadang Glacier's tongue and cross-cut profiles, analysis description (3 days); - arrival at the HMS Dehauz (2 days); - arrival in Dushanbe (2 days).
6.	Equipment:	Tripod, lath, theodolite, camera, tent, cauldron, teapot, axe, matches, provision, sleeping-bags, etc.
7.	Date:	October, 2006

List of expedition members:

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F. Gafforov, Engineer of the Geology and expedition department of the Agency on hydrometeorology;

K. Vosidov, the Head of the HMS Maihura;

K. Mallaev, the Head of the HMS Dehauz;

M. Kazakov, Representative of the IFAS Executive Committee;

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Kh. Ibozoda, Representative of the IFAS Executive Committee