TRANSBOUNDARY ENVIRONMENTAL PROBLEMS OF MIDDLE ASIA: APPLICATION OF THE INTERNATIONAL LEGAL MECHANISMS FOR THEIR SOLUTION

Proceedings of the International Conference

2010

Tashkent

Ecological Movement of Uzbekistan

INTERNATIONAL CONFERENCE "TRANSBOUNDARY ENVIRONMENTAL PROBLEMS OF MIDDLE ASIA: APPLICATION OF THE INTERNATIONAL LEGAL MECHANISMS FOR THEIR SOLUTION"

November 16-17, 2010

Tashkent

Distinguished participants of the Conference!

It is with sincere gratitude that I welcome you our esteemed guests - the authoritative representatives of the international environmental organizations, scientists, analysts, experts - and express the feeling of sincere gratitude for your participation in the international conference on “Transboundary Environmental Problems of the Middle Asia: Application of the International Legal Mechanisms for Their Solution”.

At the turn of the millennia, the world encountered unprecedented problems, and challenges caused by abnormal nature changes. These changes now threaten our lives and activities and the existence of both flora and fauna throughout vast regions on Earth.

Unfortunately, these threats are compelling across the Central Asia, where the unreasonable regulation of the large trans boundary rivers and construction of ecologically unsafe industrial enterprises (in the second half of the past century) have put our region on the verge of ecological disaster.

This has been demonstrated in recent years, by the catastrophe that has arisen through the drying Aral Sea. One generation has witnessed the devastation of how a once beautiful inland sea has now become a drying out reservoir. Its bare bottom is rendering an adverse effect on population health and the gene pool, as well as causing degradation of agricultural lands, flora and fauna.

Today, we have set an important goal to be achieved: to help preserve our nature for present and future generations. Our aim is to protect it against dangerous projects which could have greater effects to the living conditsions of the population and wildlife in our and other regions.

Thus, it has now been demanded that an Ecological Movement was established in Uzbekistan. The aim of this movement is to take into consideration the expectations of our people actively joining, with the cooperation of international environmental organizations for the activities on the preservation of nature and environmental protection.

We express great value in this cooperation, which is about scaling-up and also by taking various integrated forms of interaction. We pledge for a clean environment which we know is a common struggle for all countries and for the people living on this planet.

I am convinced that in partnership with the experienced environmental organizations as well as the attendance of those experts, analysts and the guidance of the relevant Conventions of the United Nations, conference participants will develop constructive proposals on the protection of our region, against the attempts to implement new and potentially dangerous projects fraught with catastrophic consequences that might spread beyond Central Asia.

I strongly believe that our voices as a global community will be heard by those international institutions and organizations which make decisions on the protection of the environment for our present and future generations against the tragic fate of ecological disaster.

I would like to wish all participants of at this Conference success in their important and noble activity.

Islam Karimov,
the President of the Republic of Uzbekistan

INTERNATIONAL CONFERENCE
"TRANSBOUNDARY ENVIRONMENTAL PROBLEMS OF MIDDLE ASIA: APPLICATION OF INTERNATIONAL LEGAL MECHANISMS FOR THEIR SOLUTION"

AGENDA

Day 1. November 16, 2010
Visit to the ecological disaster areas

Trip to the Republic of Karakalpakstan (Nukus, Muynak)

Visiting places exposed to the Aral Sea crisis: the former shore of the Aral Sea, Ship Cemetery

Visit to the Fish Cannery in Muynak

Trip to the Surkhandarya province (Sariasiya)

Visit to Sariasiya District: pipe inspection of SUE TALCO

Observation of the adverse effects of SUE TALCO on vegetation at farm "Hasnobod", Sariasiya district

Observation of the adverse effects of SUE TALCO on domestic animals in the veterinary section of the village Sariasiya

Day 2. November 17, 2010
International Conference in Tashkent

Visiting the rural medical facility "Babur"
Opening Ceremony

Welcoming speech on behalf of the President of the Republic of Uzbekistan **I.Karimov** to the participants of International Conference "Trans-boundary Environmental Problems of Middle Asia: Application of International Legal Mechanisms for Their Solution"

M. Gopalakrishnan, Secretary General of the International Commission on Irrigation and Drainage

Plenary Session I:

«Ecological Problems and Challenges in Middle Asia: Application of International Legal Norms for Their Solution».

Chairperson: G.Saidova, the First Deputy Minister of Economy of the Republic of Uzbekistan

Co-chairperson: A. Kodderman, Director of the Center for Clean Ecological Technologies Development, Professor of the New York State University, USA

Speakers:

B.Alikhanov, Vice-Speaker of the Legislative Chamber of Oliy Majlis (Parliament) of the Republic of Uzbekistan, Chairman of the Executive Committee of Central Advisory Panel of the Ecological Movement of Uzbekistan:

«Environmental Problems and Challenges In the Context of Global Cooperation in Ensuring Ecological Sustainability and Stability in the Region»

Parviz Morewedge, Director, Center for Global Scientific Publications, Professor of Philosophy and Social Sciences, State University of New York:

"Uzbekistan Meets the Ecological Challenges of the 21st Century"

Chad Dobson, Executive Director of the Bank Information Center, USA:

«Experience of Use of Trans-boundary Waters of Central Asia»

Bo Libert, Regional Environmental Advisor, UNECE:

«UNECE Environmental Conventions»

Plenary Session II:

"Experience of Transboundary Water Use in Middle Asia"

Chairperson: B.Alikhanov, Vice-Speaker of the Legislative Chamber of Oliy Majlis (Parliament) of the Republic of Uzbekistan, Chairman of Executive Committee of Central Advisory Panel of the Ecological Movement of Uzbekistan

Co-chairperson: Bo Libert, Regional Environmental Advisor, UNECE

Speakers:

Sh.Khamraev, Deputy Minister of Agriculture and Water Resources of the Republic of Uzbekistan:

«Measures for Rational Use of Water Resources and Solution of Transboundary Water Use Problem»

Sh.Salikhov, President of the Academy of Sciences of the Republic of Uzbekistan:

«Transboundary Water Wroblems: Application of International Legal Mechanisms for Their Solution»

Manfred Tichy, Editor, Austrian magazine "Business, Culture, Sport":

«Transboundary Environmental Pollution Problems in Middle Asia»

S. Zhigarev, Director of Hydroproject Public Corporation, Uzbekistan:

"Construction of Hydro-electric Power Station on Trans-boundary Water Streams in Middle Asia: Problems and Risks"

F. Ziyautdinov, Director of the Institute of Seismology of the Academy of Sciences of Uzbekistan:

"Seismic Risk Related to Construction of Large Hydro-electric Power Stations in Middle Asia"

I.Abdullaev, GTZ, Germany:

"Experience of Trans-boundary Water Use in Middle Asia"

Pak Chung, Sookyoung Han, representatives of the Korean Ecological Movement Federation:

"Conflict Situation at the Dam on the Han River between South and North of Korea"

Parallel Session 1

"Impact of the Environmental Challenges on the Population's Health, Flora and Fauna of Middle Asia"

Chairperson: A. Mavlonov, Deputy Chairman of Executive Committee of Central Advisory Panel of Ecological Movement of Uzbekistan

Co-chairperson: Kazushi Hashimoto, Advisor of the Japanese Water Forum

Speakers:

Kazushi Hashimoto, Advisor of the Japanese Water Forum:

"Improvement of Trans-boundary Cooperation: Integrated Water Management in the River Basin"

D. Fayzieva, MP, the Legislative Chamber of the Oliy Majlis (Parliament) of Uzbekistan:

"Problems of Water Supply to Population in Environmentally Unfavorable Regions of the Amudarya River basin"

N. Umarov, Chairman of the State Committee for Nature Protection of Uzbekistan:

"Issues of Trans-boundary Environmental Pollution in Middle Asia: Monitoring and Assessment"

Yu Hongjun, Extraordinary and Plenipotentiary Ambassador of the PRC to Uzbekistan:

"Experience and Policy of China in the Area of Nature Protection and Water Resources Development of Trans-boundary Rivers"

V. Chub, General Director of the Center for Hydro Meteorological Service under the Cabinet of Ministers of the Uzbekistan:

"Climate Change and rRsks for Sustainable Development in the Aral Region"

R. Kulmatov, Professor of the National University of Uzbekistan:

"Modern Environmental Problems of the Trans-boundary River Zarafshan"

Parallel Session 2

"Problems of Trans-boundary Environmental Pollution in Middle Asia"

Chairperson: S. Sanginov, Deputy Chairman of Executive Committee of Central Advisory Panel of the Ecological Movement of Uzbekistan

Co-chairperson: Laura Rio, Senior Manager, Environment and Security (ENVSEC) Initiative, UNEP

Speakers:

A. Ikramov, Minister of Health of the Republic of Uzbekistan:

"Impact of Activities of the SUEnterprise "TALKO" on People Health in Surkhandarya Province"

Darcey O'Callaghan, International Strategic Director, Food and Water Watch, USA:

"Fresh Water Global Crisis: Activity, Tendencies and Alternative Models"

Momoko Chiba, University of Juntendo, Japan:

"Environment and Children Health in the Aral Region"

Hans-Guido Mucke, Officer, Collaboration Center for Air Quality Management and Air Pollution Control, WHO:

"Health Protection and Monitoring of Trans-boundary Air Pollution Aspects"

David Carpenter, Professor of University of Albany, New York, USA:

"Impact of Persistent Organic Pollutants in Middle Asia"

S. Sanginov, Deputy Chairman of Executive Committee of Central Advisory Panel of the Ecological Movement of Uzbekistan:

"Problems of Biodiversity Conservation and Negative Impact on Flora and Fauna Gene Pool in Environmentally Unfavorable Regions of Middle Asia"

R. Khakimov, Director of the Uzbek Scientific Research Institute of Vegetables, Melon & Gourd Crops and Potatoes:

"Impact of Environmental Pollution in the Area of Activity of State Unitary Enterprise "TALKO" on Vegetables Crops Yield and Quality"

Final plenary session of the conference

Reports of Chairpersons of parallel sessions,
Adoption of Tashkent Ecological Declaration

Chairperson: G. Saidova, First Deputy Minister of Economy of the Republic of Uzbekistan
Co-chairperson: Bo Libert, Regional Consultant of the UN Economic Commission for Europe

ABSTRACTS AND ANNOTATIONS
OF THE SPEECHES PRESENTED BY THE PARTICIPANTS OF THE INTERNATIONAL CONFERENCE "TRANSBOUNDARY ENVIRONMENTAL PROBLEMS OF MIDDLE ASIA: APPLICATION OF INTERNATIONAL LEGAL MECHANISMS FOR THEIR SOLUTION"

M. Gopalakrishnan

International Commission on Irrigation and Drainage, India

OPTIONS FOR AN EARLY RESOLUTION OF DISPUTES IN WATER SHARING

Increasing scarcity of water resources is posing more challenges to the humanity in the way 'water' has to be managed. This gets more complex in respect of 'Transboundary Rivers' particularly in closed basin situations. The scale of complexities in the basins and watersheds differ from one to another depending upon the past practices, social and cultural situations, agreed allotments if any, and shares formal or otherwise. This is nevertheless a highly dynamic process. New and emerging drivers particularly new political situations emerging out of creation of new Stats by division of an existing system introduce fresh complexities. More often than not, this results in a new parochial approach that focuses on individual states' interests that might acutely conflict the riparian interests, as it obtain. This is seen more prominently in respect of sharing the Central Asian Rivers - Syr Darya and Abu Darya soon after the collapse of USSR. The earlier allocation rules and practices in these basins stand challenged. The environmental c consequences to the Aral Sea (and its basins as a whole) are to be seen in the light of this perspective.

Even within a country's administrative units problems exist in respecting the time tested practices and allocation rules and the riparian rights. Their relevance and importance are questioned with an increasing pressure for the use of water by upper riparian states. The prime factor for such differences, though normally attributed to the new political systems, lie perhaps in an ever reducing will for cooperation, amongst the basin users. Societal perceptions and accommodativeness are changing to the worse in a few cases and the moral value to 'share and care' is losing its significance!

Water sharing or allocations between users even within a nation (considered for long as good practices), are being subject to hard test, in recent decades. Time tested agreements that were legally binding the party states in India, for example, stood reopened in a few Indian river basins. Some illustrative examples in India are seen in 'The Cauvery Basin Dispute', 'The Krishna Basin Dispute' etc in the peninsular India and sharing of waters of Ravi, Beas and Sutlej in the North, consequent new political states emerging with Indian Union since Independence in 1947. The splitting up of the States within Indian Union and reshaping the administrative / political boundaries had created new dimensional problems in water allocation, usage and reusage. Such cases were easier to deal with for any solution as a basin, holistically but for the political splits . This applies to not only the water quantity but also water quality as well.

Though conventionally, cooperation between upper and lower riparians were feasible by suitable provisions and other mechanisms - such as

(i) Negotiated and accepted water sharing agreements with all the basin states,
(ii) Principles in Water Sharing Agreements with a broader aim of respecting the priorities of usage (for example, Indian Water Policy sets priorities for,
    (a) Water Use for drinking,

(b) agriculture,
(c) industry and energy etc.

(with a further proviso that the States of the Union can have their own that can modify the order), over a period of time, the dynamics in the basin (politics, people, changing perceptions and priorities etc) posed new challenges to the robustness of the legal instruments evolved after sufficient sweat.

In the new era, the conventional solutions as evolved and options based on good hydrologic and land use practices are compelled face a fresh review. Technical and hydrological / hydraulic solutions evolved based on optimal basin planning have to bracket in certain new drivers, for example: climate change, land use change, the threat to environment seeking a different allocation than the one earlier evolved where it had not been given sufficient importance. Multi objective, multi purpose planning of water resources of the basin as a whole are advocated by technocrats but this is not so easy but politics plays a crucial role. In all such cases, constraints can be taken in as limits within which optimization can be evoved. However, since there can be some problems in adjudging the scale in respect of certain objectives, such solution options themselves are facing obstacles for acceptance. Assumptions made in the analyses may be subjected to question!

The natures of different factors that were central to the agreements *(if one is in place, when a basin water allocation was evolved and agreed upon)* do need a proper acknowledgement and relook, before legal options or remedies are to be resorted to by the parties, for solving their differences. The ever changing nature of them influences the legally accepted water allocation principles. In such cases, evolving workable solutions necessitate a '*step by step*' attempt. These may have to take recourse to different pathways and at different levels with a subsequent attempt of convergence. Efforts in this regard could call for many rounds of getting together, involving institutions of knowledge and a complete understanding / perceptions of the basin. Notwithstanding the inherent tediousness, this might prove superior to a 'lingering judicial remedial process' that sometimes frustrate one or more parties and a vast number people affected by the water deficits. The unavoidable procrastination in a legal remedy often results in an ever increasing mistrust between basin states and people. A direct dialogue, one can call it as 'parallel initiatives in second track, between players other than the States (directly) may yield a better understanding for a solution path finding.

Basic for making progress in all such cases is the spirit of cooperation between the stakeholders; a better appreciation of each others compulsions; scoping opportunities to maximize benefits for the region to be shared by all in a new spirit of "give and take". The need to try for a 'negotiated settlement' that is in the best *'overall'* interest, could be expectedly durable for a reasonable future time horizon.

There is an increasing recognition of the inevitable role that power asymmetry plays. This is persistent in all disputes and particularly in water sharing. In fact, it significantly impacts in a few cases, any possible progress in mutual dialogues, initiated with great efforts from outside.

Shifting focus from "water allocation" to 'benefit sharing' is worth a trial. This can, sometimes, play a balancing role to correct any 'power asymmetry'. Many recent (perhaps successful) examples demonstrate the superiority of Benefit Sharing. The stepwise estimation and moving towards optimizing the "win- no- lose" solutions is seemingly an option worth attempting where other options could not yield some success. Including some global objectives like achieving MDG also provide a scope for interventions supported externally. There are quite a few good examples on opting for the benefit sharing approach already. But one must accept that the Central Asian situation is unique and stands on its own.

The expansion of the horizon for benefits sharing to all the resources – not only water but also oil, gas etc in cases like the one we face in Central Asia is but a necessity. Besides land is a factor,

crucial to be taken on board, as it is increasingly important to ensure food security of the region, a benefit that can be shared and exchanged. The role of energy sharing which is a definite driver outside water sector can solve, if properly addressed, some of the vexing water allocation issues. Crucial to bring in any such analysis attempt is the food and livelihood security of basin farmers besides the environment in an appropriate form, acceptable to all stakeholders while appreciating the problems resulting in relegating its importance.

Nevertheless sustainability principle must be the cardinal thread if one has to have a global acceptability and the general acknowledgement to save Planet Earth. The decision facilitation process is going to be increasingly complex when one has to take on board multiple interests to be coupled with optimal goals without relegating the importance to protect the environment of the basin and Aral Sea.

The call for increasing riparian cooperation can be the first step and if states could agree on the dire necessity for a united efforts, other questions about the implementation and effectiveness of can be taken up sequentially on water cooperation . Efforts to develop a deeper understanding of the consequences of energy sharing and water cooperation, their causal effects are important for illuminating opportunities. Improving institutional design and tailoring strategies to enhance the positive impact of riparian state interactions can follow, quickly thereafter.

There could perhaps be no denial that the transboundary water sharing cannot be durable without necessary political will when it comes to further adjustments to accommodate changing scenario.

Dynamic transboundary relations have to acknowledge that there is nothing like a perfect solution option. Varying intensities of conflict and cooperation can co-exist, not only in respect of water but also in respect other external factors. An example is seen in Indus Basin water sharing (Pakistan – India). Once the co-existence of conflict and cooperation is recognized as an inevitable factor to live with, it might be possible to escape any misleading expectation that transboundary water solutions can emerge straight from an undesirable conflict to a perfect cooperation on a single axis.

Multi- track diplomacy between nations is ideal and worth an attempt to begin with. All factors impacting the land water resources can be collectively looked into and evolving a reasonable ‘win-win’ for all can be attempted. This requires patience. The untiring efforts of fair minded people from riparian states and other well wishers can pave way for evolving a better foundation for conflict resolution, narrowing the differences and avoiding any ‘zero game’. Basic is to accept that such solutions are difficult and time taking. Bold and small steps are worth a trial as these will be efforts positive, and make the processes succeed in the long run in a sustainable way yielding the best ‘gain-gain’ for all concerns.

B.Alikhanov

Executive Committee of the Central Advisory Panel of the Ecological Movement of Uzbekistan

ENVIRONMENTAL PROBLEMS AND CHALLENGES IN THE CONTEXT OF GLOBAL COOPERATION FOR ENSURING ECOLOGICAL SUSTAINABILITY AND STABILITY IN THE REGION

Sustainable development of any state is based on the three components: economic growth, social protection and environmental security.

Meanwhile, environmental sustainability plays the key role in the system of measures ensuring national security.

In September of this year at the United Nations Summit on the Millennium Development Goals the President of the Republic of Uzbekistan Islam Karimov for the next time called the world community for joining efforts to solve the problem of the Aral Sea area which is one of the main ecological threats in the global scales.

The Aral Sea is one of the most ancient lakes in the planet and was the fourth lake in the world by its size; it was famous for the richest natural resources not so long time ago, and the area of the Aral Sea was considered to be prospering and biologically rich natural environment.

Till the 1960s the area of the Aral Sea is 68.9 thousand sq. km, the water volume was 1083 cubic km and the Sea was supplied with water of the rivers Amu Darya and Syr-Darya. The fish fauna of the Aral Sea amounted to 20 types of fish, in vast areas of the Aral Sea region inhabited several species of ungulates, which are now included in the Red Book of Uzbekistan. The floristic structure of the delta of the river Amu Darya consisted of 638 kinds of higher plants.

Unfortunately all of these had been left in the past.

Today the Aral Sea has already lost over the half of gene pool of its flora and fauna.

In the past 45-50 years, a whole sea's death has been witnessed by one generation. The sea continues to shrink, due to intensive evaporation, causing deterioration of environmental conditions and aggravation of the crisis everywhere.

Today its volume is over 13 times less and the area is 7 times less. The water level has decreased to 26 meters, the coastal line has receded to hundreds kilometers. In the western part, salinity of water has reached 120 gram per litre, in the east par, it is 280 gram per litre.

Consequences of the ecological disaster have affected living conditions of millions of people living in the basin of the Aral Sea. Seasonal droughts have increased. The number of days with temperature above 40°C has doubled in the Aral Sea area. According to the forecasts of experts, the air temperature in the region can increase by 1.5o - 3° C in 2035-2050.

The large territory of white salty fields covered by sand has formed on the dried part of the Aral Sea that turned into a new desert, so called Aralkumm, with the area of over 5.0 million hectare. Dust and salt storms rage from time to time, carrying million tons of salt, dust and sand to hundreds kilometers.

Now in Southern part of the Aral Sea, many small lakes became shallow or dried up. It has led to disappearance of about 90 % of existing reeds and bushes in the area of 800,000 hectares, and hence, death of their inhabitants. The forests along the rivers were lost due to lack of humidity, hundreds lakes in the delta disappeared.

As a result of anthropogenic desertification, the biological productivity of the soil has become 10 times lower.

Reduction of pastures and a decrease in soil efficiency have caused loss of over 100 thousand jobs in the areas directly adjoining to the Aral Sea.

These are only some of the results of the Aral catastrophe.

After declaration of independence, Uzbekistan has undertaken enormous efforts for alleviating the Aral ecological disaster.

The President Islam Karimov initiated establishment of the Charitable Public Foundation on preserving the gene pool of the Aral Sea area.

The International Conference on the Aral Sea was organized on the initiative of Uzbekistan on March, 2008 in Tashkent which gave considerable impetus to the wider consideration of this acute problem in international format.

The forum adopted the Tashkent Declaration and Action Plan, which provide for the implementation of projects totaling about $ 1.5 billion, which can be effectively used to develop the third phase of the Programme of Action to assist the region of the Aral Sea in the framework of the International Fund for Saving the Aral Sea (IFAS), intended for 2011 -2015 years. We look forward to a significant increase in the coordination role of the UN and the EU in this work.

In April 2010, UN Secretary General Ban Ki-moon visited the Aral Sea region, who noted that what he had seen left lasting impression. He pledged that the UN stands ready to assist Uzbekistan in addressing environmental problems.

Ban Ki-moon welcomed the adoption at the framework of the UN General Assembly in 2009, a resolution to grant the International Fund for Saving the Aral Sea status of observer at the GA.

The magnitude of the problems existing in this sphere demands consolidation of efforts of both the governmental bodies and public associations, as well as institutes of civil society in the activity focused on the comprehensive solution of the problems and improvement of environmental conditions in the country and the region as a whole. Preservation of the environment should become the goal of the Government, the goal of the society and of each citizen.

Important task in overcoming the consequences of drying of the Aral Sea and the ecological rehabilitation of the Aral Sea basin, we see primarily in the following actions:

- Establishment of local reservoirs to reduce dust and salt storms, restore biodiversity and ecosystem of the delta;

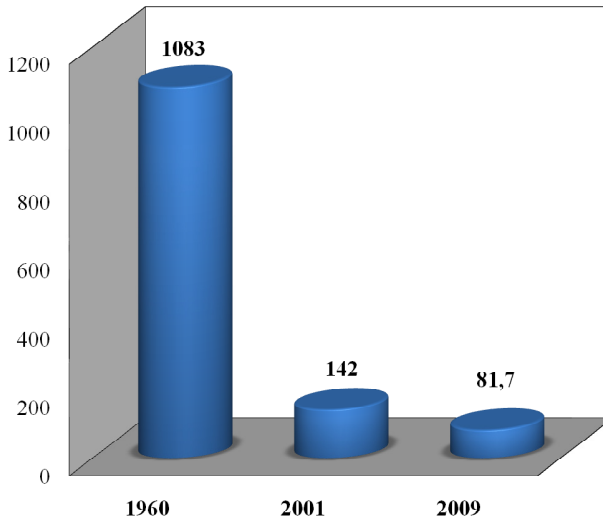
- Carrying out tree planting, strengthening of mobile sand, reducing the removal of toxic aerosols from the dried bottom;

- Provision of potable water;

- Systematic study of the impact of growing environmental crisis in the Aral Sea area on the health and gene pool of the population, prevention of dissemination of various specific risks of disease for the region, accelerated development of social infrastructure.

For implementation of these projects and programs in Uzbekistan only in the last 10 years more than $ 1 billion was spent.

THE DYNAMICS OF ARAL SEA AREA REDUCTION IN 1960-2009



As part of the introduction of water saving technologies in 2009, on the area covering more than 2200 hectares, drip irrigation was introduced. Developed a comprehensive program for widespread implementation of water saving technologies in 2020.

At the expense of state budget in 2005-2009 88 km of new channels were constructed, 1,120 km of irrigation systems were rehabilitated increase of water supply of irrigated lands was achieved, in the area of about 53 thousand hectares.

At the expense of reclamation fund in 2009 in Uzbekistan carried out reclamation work at the amount of 93 million dollars.

We are now preparing to implement a number of projects totaling 372 million U.S. dollars.

Aral problem is directly related with the rational and reasonable use of water and energy resources in the region, especially the major waterways of Central Asia - Amu Darya and Syr Darya.

We believe that a careful and efficient use of water resources of Transboundary Rivers must be under the constant attention of the UN.

Uzbekistan stands firm on the need for mandatory conduction of international expertise by the UN of all hydropower projects on rivers.

Uzbekistan stands firm on the need for mandatory international expertise by the UN of all hydropower projects on rivers. When it comes to construction in the upper basin of the Aral Sea such large hydroelectric power stations as Kambarata and Rogun, to make an examination must be included absolutely independent authoritative experts, which will be guided not only by principles of objectivity, but also the relevant UN conventions.

The conclusions of international experts should be clearly reflected a number of fundamentally important points:

First, compliance with the current level of design and engineering solutions based on the possible consequences of disaster, natural and man-made disasters;

Secondly, the measure of damage that can be caused to ecology;

Third, the preservation of water balance in the region and ensure the existing regime of river runoff.

Due to the consistent and principled position, today virtually all involved in this process in the region, as well as the States and organizations that can influence this issue (Russia, China, European Union, World Bank, Asian Development Bank and others) understand and recognize the need for concerted decisions and actions for the realization of such large projects.

Construction of hydroelectric power station similar to Rogun hydroelectric power station will lead to aggravation of the present unfavorable environmental conditions in the region and appearance of numerous social, ecological and humanitarian disasters.

Designing the huge hydroelectric power station was conducted by the same standards as other large hydro-constructions within the CIS which do not include ecological examination and environmental impact assessment. For example, the effects of last year's accident at the hydro

power station Sayano-Shushenskaya in Russia so far removed.

Construction of the hydro-electric complex in the late 1980s and early 1990s was conducted with considerable deviations from the design. The building suspension in 1992 was done practically without any conservation. The tunnels and other constructions have already been seriously destroyed by powerful mud stream.

By the time of making decision on continuation of the construction many building fragments of the dam have been damaged.

Construction of a massive dam in the seismic active zone can provoke new earthquakes and will create immense danger for life of hundreds thousand people.

In case of dam failure after completion of construction of Rogun hydroelectric power station in the designed parameters, the wave 245 - 280 meters high (depending on the water reservoir filling) in the area of Nurek hydroelectric power station (the start-point) and 6 - 7 meters high in the Republic of Karakalpakstan (the end-point) will destroy the whole cascades of 6 hydroelectric power stations, the area of 1.3 – 1.5 million hectares of land will be flooded, and over 700 settlements in the territory of Tajikistan, Afghanistan, Uzbekistan, Turkmenistan populated with 5 million people, including 3 million living in Uzbekistan.

Moreover, construction of Rogun water-reservoir will lead to reduction of the cultivated area and a decrease in land productivity, dramatic deterioration of potable water supply for about 18 million people living in downstream areas of the river, deterioration of the gene pool, and sharp reduction of biodiversity.

Another considerable environmental problem is the effect of activity of Tajik aluminum company (the State Unitary Enterprise TALCO), the largest one in the CIS countries and the sole aluminum manufacture in Central Asian.

This enterprise has been constructed on the basis of out-of-date and ecologically “dirty” technology for aluminum manufacture.

The State Unitary Enterprise TALCO is located in the territory with mountain-valley relief where the wind-rose, the stream of underground and surface waters have primary direction downwards the valley that promotes distribution of pollution on frontier areas of Uzbekistan.

Further increase of the capacity of the State Unitary Enterprise TALCO will worsen population health, increase development of endocrine, oncological and other system diseases. For women of fertile age, the risks of pathology of pregnancy and childbirth are enhancing, children disease, mortality rate, as well as congenital malformations are increasing.

Under the conditions of aggravation of ecological problems and increasing threats to environmental security of the country, the urgent requirement of time was creation of the Ecological Movement of Uzbekistan, united over 220 NGOs acting in the field of protection of environment and public health.

The introduced quota election system, on the basis of which for the first time in the world practice 15 parliamentary seats in the Parliament of Uzbekistan were given to the Ecological Movement, which allows to solve tasks at the Parliament level and to carry out parliamentary control over execution of laws on environment protection.

Supporting the requirements of the public ecological organizations of the country, we call the international community, governmental and non-governmental organizations for:

1. Assist in formulating and implementing measures for international cooperation to mitigate the impacts of the Aral Sea crisis, accepting a negotiated solution to this global problem.

2. Pay special attention to the fact that the construction of new large hydro plants upstream of transboundary rivers will lead to further depletion of water resources in the Central - Asian region. In this connection there is a need for mandatory environmental impact and technical expertise of projects of construction of such facilities with the participation of international experts, including for compliance with their principles and norms of international law on the use of transboundary watercourses.

3. Supporting the initiative on carrying out the unbiased ecological examination of the impact of industrial emissions of the State Unitary Enterprise TALCO on the environment and population health in southern regions of Uzbekistan.

We are sure that joint efforts will allow us to prevent ecological misbalance in the Central Asian Region and to alleviate consequences of negative influence of anthropogenic factors on the environment and population health.

Parviz Morewedge

State University of New York, USA

UZBEKISTAN MEETS THE ECOLOGICAL CHALLENGES OF THE 21ST CENTURY

The globe, in the first decade of the 21st Century, is experiencing the harvest of a crisis in both economics and ecology where the seeds of disaster were planted - in the mid 20th Century. These include an exponential depletion non-renewable natural resources (The USA uses about 7 billion tons a year of NRNR), rapid population growth (we anticipate the addition of another roughly 3 billion people in the mid-21st century), irresponsible financial and other "supply side" economic risk taking, especially in the West (3.5 million more houses will undergo foreclosure in the USA from now to 2012), and ignorance of the seriousness of the ecological crises as shown by spending the precious labor of human beings on an arsenal of war, rather than ecology – (World military expenditure in 2009 is estimated to be $1.531 trillion dollars; USA's share is about 46.6% of the total, France and England each 4.5 %); there are ample alternatives- e.g. only 3% of the available water on the earth is usable – the rest is frozen or salt water – We, as global citizens, need to develop new and affordable technology.

As wise Uzbek poets sing: Necessity is the Mother of Action. To this end, and to encounter these challenges, the present and the next decade may be called- to borrow a phrase from a previous Uzbek conference- "The Age of Anti-Crisis Strategies in Economics and Ecology,". In this arena, The Uzbeks have achieved remarkable headway. Note the universal praise of Uzbekistan's "so-called economic miracle," guided by President Karimov, and the much discussed environmental projects that are coordinated by the "Ecological Movement of Uzbekistan", with clearly defined goals and international outreach.

President Karimov remarked in his address to the United Nations, 9-20-2010. "The tragedy of Aral which practically during a lifetime of one generation has turned from once one of the unique and most beautiful seas into a drying and vanishing water reservoir stands as a vivid example and evidence of our irresponsible attitude towards the environmental problems. For forty years the water area of the Aral Sea shrank for more than 7 times, the volume of water decreased for 13 times, its mineralization increased for tens times, having made the sea improper place for living organisms. As

a result, practically all kinds of flora and fauna fully degraded and disappeared."

Also in 2008, in a conference in Kazakhstan, President Karimov, warned that "The sea is dying before the eyes of the whole of mankind." As a person of action, he added that Uzbekistan -- up to that day- two years ago- had spent $1 billion in the last decade, from its own resources and including funds made available via international loans, on programs related to the sea and living conditions around it.

Uzbekistan has successfully attempted to bring the issue to the world community. To that end, on 4 April 2010, UN Secretary General Ban Ki-moon visited the shrinking Aral Sea and urged regional cooperation to tackle what environmentalists describe as one of the worst man-made ecological disaster. President Karimov stated that "We appreciate the cooperation with UN in ensuring peace and stability in our region, strengthening security, combating drug trafficking, transnational organized crime and other threats, addressing environmental concerns and efficient use of water and energy resources."

The short range vision of non-Uzbek policy makers and the lack of ecological concern in the past

The main reason for Aral Sea ecological catastrophe is to ignore environmental and short-sightedness of greed to instant profit. This story is well known. However, Uzbekistan is not the only country in Central Asian region that has suffered from the political process.

The same type of ignorance of ecological concern affected making Kyrgyzstan a dumping ground for military hardware and Kazakhstan a testing ground for nuclear arsenals. For example, Kazakhstan is faced with the threat of environmental disasters because of the crisis in the former Semipalatinsk nuclear test site, where more than 460 nuclear tests were conducted until 1989. The presence of uranium tailings in Kyrgyzstan also creates great danger to the ecology of the region.

Radioactive dust, contaminated groundwater and toxic landslides and floods threaten more than a million people in Central Asia. The radioactive threat stems from 92 toxic waste sites in Kyrgyzstan that contain waste from uranium mining during the Soviet era. The waste sites are relics of the time when the former Soviet Union mined the uranium for use in its nuclear arsenal. The above mentioned small town of Mailii-Suu, in the south of Kyrgyzstan, is marred by two million cubic meters of radioactive waste buried alongside a river flowing through the Ferghana Valley, the most populated and fertile area in Central Asia.

Uzbekistan - a world treasure of precious flora and fauna that need to be protected

The biological diversity of Uzbekistan includes more than 27 000 species, among these animals are represented by over 15 000 species, while plants, fungi and algae total about 11000 species. 20% of plants are endemic (cannot be found in other places); a major part of them grow in mountains. Uzbekistan is a valuable habitat for endemic animal species of Central Asian origin. Several species originated and evolved in the area between the Amudarya and the Syrdarya and expanded to other Central Asia regions. Natural vegetation and the forests currently occupy 85 % of desert and steppe area, 13 % of mountains, and in valleys and on flood-land areas, which originally were well covered, only 2% remains.

Uzbekistan **is** indeed the world's treasure of the most precious flora and fauna that deserve to be protected; these gifts of nature make Uzbekistan and the rest of our planet suitable for a healthy living.

The ecological disaster, that is especially hazards to the health of the population,

flora and fauna

The natural sources of wealth that permitted commerce have been diminished.

Of the region's 500 species of birds, 200 species of mammals, and 100 species of fish most have perished over the past four decades; these included carp, bream, pike-perch, and sturgeon. The fishing industry, muskrat farming, and businesses related to hunting were cut to 75% by 1975 and totally eliminated by 1982. In fishing alone, 60,000 workers lost their source of livelihood. In fact the economic disaster extends beyond the Aral Sea region, water and soil contamination, and polluted air, for the sediments crippled much of the agriculture in areas beyond the Aral Sea.

Wetlands along the shore disappeared as the lake receded, and falling water tables destroyed oases. The shrinking Aral Sea has also had a noticeable effect on the region's climate. The growing season there is now shorter, causing many farmers to switch from cotton to rice, which demands even more diverted water. The dust contains an unhealthy mixtures of chemicals including sodium chloride and sodium sulfate that are especially toxic to plants, particularly during flowering. Polluted water runs down into lowland reservoirs affecting the irrigation of contaminated regions.

A Special Concern: Industrial Sites Next to Water

Environmental pollution by industrial enterprises in many other countries, especially developing countries, leads to a decrease in soil fertility, land degradation and desertification, a deterioration of air quality, surface water and groundwater. Together, this leads to the disappearance of entire ecosystems and species from the face of the Earth, the deterioration of public health and a reduction of life expectancy. About 85% of all diseases of modern man are associated with adverse environmental conditions that arise due to the mismanagement of industrial activities.

All observers agree that industrial plants located near settlements have a negative impact on human health and the environment. Ferrous and nonferrous metals, coal and processing industries are powerful sources of harmful emissions into the atmosphere, which have different toxic effects on the human body.

In the United States, as is the case in most industrialized countries, the greatest source of pollution is the industrial community. According to the 2000 Toxics Release Inventory (TRI) of the U.S. Environmental Protection Agency (EPA), over 2.95 million metric tons of toxic chemicals from about 2,000 industrial facilities are annually released into the environment, including nearly 45,360 metric tons of recognized carcinogens.

It is recognized that the biggest polluters are producers of chemical pesticides, as well as metallurgical industry, petroleum refining, petrochemical, and even the food industry.

An example of Trans-boundary Ecological Disputes and a recommendation for the establishment of "the extended effect zone"

International authorities should establish what may be called "the extended effect zone" of an industrial plant that is located in one country but whose effect extends to another country; we need to establish a clear legal guideline governing ecological responsibility.

For example, many in Uzbekistan claim that aluminum processing plants in a neighboring country of Uzbekistan have negative effects in their "extended effect zone," that is on Uzbek land. They point to the contaminated substances in the air, in the soil, among livestock and agricultural products that exceed international standards several times. The plant's system of water consumption disposes of all the industrial wastes drains into the river Karatog, which flows into the basin of the Surkhandarya River, the source of drinking water in many regions of this area. The increased levels

of fluoride elements in plants, trees and soil in areas near the plant add to high levels of disease to the endocrine and immune system, along with blood diseases, stomach, respiratory and intestinal diseases, bone disease and mineral vitamin dysfunction.

Trans-boundary problems will continue to fuel international tensions for decades to come, calling for a feasibility study to regulate this type of disputes. Permit me to recommend the following steps to process these types of claims. The country that makes the claim should submit documents to the neighboring country and demand a response.

Conclusion

People of the global village are likes sailors in troubled waters. Indeed, we all are destined to continue to live or sink together. In the case of economic troubles, President Karimov's government has turned a successful page. In a similar tenor, let us combine efforts to assist the Ecological Movement of Uzbekistan in its honorable task of saving humanity from the present ecological disaster. We have nothing to lose but poisons and pollution; there is the possible gain of a safe planet for our children and for future generation.

Chad Dobson

Bank Information Center, USA

EXPERIENCE OF USE OF TRANS-BOUNDARY WATERS OF THE CENTRAL ASIA

The issues raised here today are directly relevant to BIC's mission of encouraging public consultation and transparency in international financial institutions. We understand several of these organizations, including the World Bank Group, are currently considering what types of infrastructure and reform projects will best meet the needs of Central Asians. Your region faces many challenges, some unique and some shared by countries around the world, such as development of your agricultural sectors, access to reliable energy, and continuing reform of private industry and utility infrastructure. As international financial institutions partner with your government and the governments of many of your regional neighbors to develop socially and environmentally responsible solutions to these problems, it is important that all affected parties have access to timely information and that their views be taken into account.

BIC and its partners, including many in Central Asia, have campaigned to make the World Bank more transparent and accessible to civil society. First, we have encouraged the World Bank to engage civil society from all affected regions and/or countries before approving projects. BIC encourages these dialogues to be open, so that the voices of people whose livelihoods or homes may be affected can express their concerns or even reject the project if it does not have broad community support. We advocate for public and transparent World Bank consultations on proposed projects.

Secondly, we have pushed for the publication of clear project information on the World Bank's website, to be posted in a timely manner, and in a language that is understandable to the affected community. For example, our civil society partners in Kyrgyzstan and Tajikistan have been seeking additional information on a potential energy exporting project, CASA-1000. They have reached out to the country offices and international headquarters of the World Bank to ask for more frequent project updates in Russian, so that civil society and communities are informed of the status of the proposed project. We believe that the Bank has the responsibility to provide reliable, regular project

information to affected populations in order to avoid rumors and misinformation.

Thirdly, BIC encourages the World Bank to carry out critical assessments of the social and environmental impacts of projects before they are approved; ensuring that the Bank's investments support the institution's mandate to decrease poverty. This means that if the World Bank is considering funding a large hydropower dam project, the rights of downstream communities must be considered as well as the potential beneficiaries within the host country.

This brings us to the specific topic of this conference. Regarding the concerns of the Ecological Movement of Uzbekistan about proposed dams within the borders of its upstream neighbors, BIC encourages the World Bank to follow global best practices. Before any large dam is built, it is our view that the World Bank or any other potential funder should complete unbiased assessments of the impacts on affected communities and ecosystems in all potentially impacted countries, both upstream and downstream. The Bank should also hold public consultations with civil society and affected communities, ensuring that the voices of civil society are heard along with those of government officials. BIC believes that in order to make potential World Bank projects open and transparent, and ensure civil society engagement, access to information is critical. Project information, even in the pre-feasibility and feasibility stages, must be made available to all impacted countries in a standard, spoken language, such as Russian, and updated regularly. This is why we support the recommendations of the World Commission on Dams for hydropower projects. They are:

a) Prioritize investments that directly increase energy access for the poor;

b) Focus on the cutting-edge technologies that reduce social and environmental costs;

c) Work with countries to choose the best energy options through a comprehensive and participatory needs and options assessment that also considers efficiency measures;

d) Only support large hydropower projects if they have been selected through a comprehensive options assessment process and comply with the recommendations of the World Commission on Dams.

e) All stakeholders should have the opportunity for informed participation in decision-making processes related to large dams through stakeholder fora. Public acceptance of all key decisions should be demonstrated. Decisions affecting indigenous peoples should be taken with their free, prior and informed consent.

f)The project should provide entitlements to affected people to improve their livelihoods and ensure that they receive the priority share of project benefits (beyond compensation for their losses). Affected people include communities living downstream of dams and those affected by dam-related infrastructure such as transmission lines and irrigation canals.

h) Effected people should be able to negotiate mutually agreed and legally enforceable agreements to ensure the implementation of mitigation, resettlement and development entitlements.

The project should be selected based on a basin-wide assessment of the river ecosystem and an attempt to avoid significant impacts on threatened and endangered species.

I know there are concerns in your region about many potential projects of international financial institutions such as the World Bank. The best way to ensure that the needs of Central Asians are met is by having open, transparent processes where all impacted communities and ecosystems are considered. We encourage the World Bank to have widespread consultations within affected communities in all relevant countries. We also call on them to provide regular timely information in

Russian on project feasibility progress and how they have involved affected communities in reaching important decisions.

Thank you again for your kind invitation to speak to you today. I hope to work with you in the future to ensure that the Bank's processes in Uzbekistan and all of Central Asia are as transparent and public as possible. Sustainable economic growth will only occur by taking into account the needs of not just governments and corporations, but also the affected communities who are the focus of the Bank's mandate. In order to legitimately and constructively engage such stakeholders, public information, consultations, and transparency of decision-making processes are an undeniably fundamental.

Bo Libert

United Nations Economic Commission for Europe

UNECE ENVIRONMENTAL CONVENTIONS AND ACTIVITIES IN CENTRAL ASIA

The Convention on the **Protection and Use of Transboundary Watercourses and International Lakes (Water Convention, 1992)**, in force since 1996, strengthens national measures and transboundary cooperation for the protection and ecologically sound management of transboundary surface waters and groundwater. The three-pillar normative cornerstone of the Convention is based on (a) the no significant harm rule; (b) the equitable and reasonable utilization principle; and (c) the cooperation principle, as the catalyst for the realization the prior two. The Convention obliges Riparian Parties to conclude specific bilateral or multilateral agreements providing for the establishment of joint bodies, and to enter into consultations upon request. The Water Convention has served as a model for transboundary cooperation agreements throughout the UNECE region, and has an important role to play in Central Asia by providing framework for interstate institutional and legal cooperation. The 1999 Protocol on Water and Health, in force since 2005, aims to protect human health by better water management. Parties are required to establish national and local targets for the quality of drinking water and the quality of discharges, as well as for the performance of water supply and waste-water treatment.

The Convention on the **Transboundary Effects of Industrial Accidents (Industrial Accidents Convention, 1992)**, in force since 2000, is designed to protect people and the environment against industrial accidents. The Convention aims to prevent accidents from occurring, reduce their frequency and severity and mitigate their effects if required. The Convention encourages its Parties to help each other in the event of an accident. The Assistance Programme has been developed to enhance the capacities of countries in Eastern Europe, Caucasus and Central Asia, and South Eastern Europe in implementing the Convention. In the first phase of the Programme countries need to express commitment at high level to work on implementing the Convention and to prepare to receiving assistance through implementing basic tasks under the Convention. In the second phase assistance is provided to help countries with more complex tasks required under the Convention. The Convention and its Assistance Programme could play an important role in improving the industrial safety in the region and foster bilateral and multilateral cooperation between the countries.

The Convention on **Environmental Impact Assessment in a Transboundary Context (Espoo Convention, 1991)**, in force since 1997, requires that an environmental impact assessment be carried out for an activity planned in the territory of one Party that is likely to have a significant environmental impact within an area under the jurisdiction of another Party. It lays down the obligations of the Parties concerned to notify and consult each other and the public of such an activity. The Convention does not diminish a State's power to decide on development activities in its territory. The Convention requires only that the outcome of the environmental assessment of an

activity, and comments received from the authorities and the public in any affected Party, are taken into due account. The Convention has been applied successfully to hundreds of projects, facilitating the flow of information, consultations between States, the avoidance of disputes, and strengthened environmental protection. The Convention could play an important role in Central Asia by settling differences and preventing disputes between the countries in various areas where developmental activities and projects are planned. A pilot project between the two Parties in the Central Asia, Kyrgyzstan and Kazakhstan, demonstrates the usefulness of the procedures of the Convention. The 2003 Protocol on Strategic Environmental Assessment, in force since 2010, requires its Parties to evaluate the environmental consequences of their official draft plans and programmes that set the framework for subsequent development activities.

The Convention on **Long-range Transboundary Air Pollution** (LRTAP Convention, 1979), in force since 1983, commits Parties to gradually reduce and prevent air pollution including long-range transboundary air pollution. Parties shall by means of exchanges of information, consultation, research, and monitoring, develop policies and strategies which shall serve as a means of combating the discharge of air pollutants. The Convention is extended by eight legally binding protocols covering a range of harmful pollutants including sulphur dioxide, persistent organic pollutants, volatile organic compounds, lead and mercury, amongst others. In 2004-2008, the project Capacity Building for Air Quality Management and the Application of Clean Coal Combustion Technologies in Central Asia (CAPACT Project), was implemented to strengthen the capacity of air quality management institutions in Kazakhstan to implement the LRTAP Convention and its protocols as well as to promote the application of appropriate clean coal combustion technologies for heat and power generation from solid fuels. Since this project concluded, the Convention's Executive body recognized furthered cooperation with Central Asia as a key priority.

The Convention on **Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters** (Aarhus Convention, 1998), in force since 2001, links environmental rights and human rights. The Aarhus Convention grants the public rights and imposes on Parties and public authorities' obligations regarding access to information, public participation and access to justice. The 2003 Protocol on Pollutant Release and Transfer Registers, in force since 2009, is the first legally binding international instrument aimed to enhance public access to information through the establishment of coherent, nationwide pollutant release and transfer registers (PRTRs). Although regulating information on pollution, rather than pollution directly, the Protocol is expected to exert a significant downward pressure on levels of pollution.

Sh. Khamrayev

Ministry of Agriculture and Water Resources of the Republic of Uzbekistan

MEASURES FOR RATIONAL USE OF WATER RESOURCES AND ADDRESSING ISSUES OF TRANSBOUNDARY WATER CONSUMPTION

The use of transboundary water resources as a result of unilateral action by the countries located in the upper reaches, in modern conditions can be further enhanced environmental crises, to create an artificial shortage of water and devastating floods.

In a speech on Sept. 20, 2010 at the UN Summit meeting the Millennium Development Goals in New York, the President of Uzbekistan Islam Karimov noted that "any reduction in the flow of the Amudarya and Syrdarya - is a fundamental violation of the already fragile ecological balance in the whole vast region. In these circumstances, any attempt to implement projects that have been developed 30 - 40 years ago, during the Soviet period, to erect in the upper reaches of these

rivers, large-scale hydro dams with huge, especially considering that the seismicity of the upcoming construction zone is 8-9 points - all of which can cause irreparable environmental damage and will cause the most dangerous man-made disasters, we have been witnessing in recent years".

The main water resources of Uzbekistan is the surface runoff formed by cross-border rivers the Amudarya and Syrdarya. Its limitations do not allow full use of land resources in irrigated agriculture. Water of the Republic consists of 180 km of canal network, over 800 large waterworks and pumping stations in 1,588 with annual capacity of 8.2 billion kWh, 55 water reservoirs with total capacity of 19.8 billion m^3 and more than 4,100 wells.

Uzbek President Islam Karimov and the Government of the Republic have repeatedly demonstrated the areas in which our country is going to walk the path of water survival and development. During the years of independence, there have been radical changes in the water sector towards the transition from administrative-territorial principle of water management to the basin principle. The country successfully functioning water user associations in 1,711, bringing together more than 80 thousand water users, covering a total area of about 4 million hectares, the republic has started a lot of work to diversify agricultural production from the first days of independence. Planting of less water-holding capacity crops - corn, melons and other crops have been increased instead of water-holding capacity of crops such as cotton, rice and alfalfa. As a result of withdrawals throughout the country, compared to 80-mi has decreased from 64 to 53 billion m^3 per year.

The country focuses on reclamation of irrigated lands through the Land Reclamation Foundation and the State Program on Land Reclamation for the period of 2008-2012. For the construction, reconstruction and rehabilitation of drainage systems, an annual allocation of more than $100 million. In order to update the reclamation of the park established a state leasing company UZMELIOMASLIZING. Also set up 48 state-owned unitary enterprises, specialized in the execution of irrigation and other water activities.

All this has improved the reclamation of 346 hectares of irrigated land, to reduce the area of severely and moderately to 42.0 hectares of land and an area of 127 hectares to achieve reduction of groundwater level to elevations conducive to agricultural crops.

Funded by international financial institutions over the past 10 years in the water sector has been allocated about 1.0 billion dollars on the rehabilitation of irrigation and drainage systems, upgrading of water facilities and pumping stations.

A complex set of eco-climatic, socio-economic and demographic problems of a planetary scale has arisen today in the Aral Sea. In the speech, given at the plenary meeting the UN Summit in September 20, 2010, the President of Uzbekistan Islam Karimov noted that the problems of the shrinking Aral Sea is the problem of millions of people living in the Aral Sea region.

The main causes of ecological crisis became reckless economic activity in the past, irrational and unreasonable use of water resources in the region. This caused imbalance ecosystems, increased water scarcity. For fifty years the water area of the Aral Sea has shrunk by more than 7 times the volume of water 10 times, ten times increased water salinity.

In order to improve the environmental situation in the Aral Sea and Aral Sea area, from the republic are working to create local and flooding of deltaic reservoirs, restoration of biodiversity and ecosystem of the delta, carrying out tree planting.

Uzbekistan, more and more concerned about the growing aspiration of the upper catchment to conduct its hydropower line dictates of the rivers - instead of the required irrigation and environmental on the energy regime that leads to artificial flood in the winter and increased water scarcity in the

summer, although Toktogul, Nurek Kairakkum and reservoirs were built for expense of the Union for long-term and seasonal regulation of river flow for irrigation.

Low-water situation in 2008, when the volume of water in Nurek reservoir on April 1 amounted to 5.9 billion m^3, and on September 1 - 9.7 billion m^3 is an example,. During the peak growing season of 2008, only for June and July months, inflows to Nurek reservoir was 7.2 billion m^3, and releases - only 5.0 billion m^3. Nurek hydroelectric works to the detriment of vegetation flow and irrigated lands of Uzbekistan and Turkmenistan.

Another example is Kairakum reservoir. In dry 2008, beginning with the month of April, Kairakkum before August 1, no Doda 700 million m^3 of water, and in September, has worked over the plan 200 million m^3 of water. The same pattern was repeated in 2009, when the total inflow to the reservoir at 1.1 billion m^3 more water than planned, had worked only 0.8 billion m^3 more. At the same time in November, when the need water for cereal Kairakkum again was closed tightly. At the planned 225 m^3/sec and sanitary water discharge 100 m^3/sec actually from 6 to November 20, release was 70 m^3/s, which leads to the risk of disappearance of species of flora and fauna, especially fish. During the peak growing season abounding in 2010 in the third decade of July, water releases from Kayrakkum reduced by more than 150 m^3/s on the needs that led to the dire situation with irrigation of crops in Uzbekistan and southern Kazakhstan.

Analysis of the mode of operation Toktogul hydroelectric shows that prior to 1990 average annual releases of water in non-vegetation period amounted to 3.1 billion m^3 and in the vegetation period 8.5 billion m^3. After winter releases in 2000 it was increased to an average of 8.7 billion m^3 in non-vegetation period against discharges in the vegetation period of 5.3 billion m^3, increased by more than 1.7 times in non-vegetation period. In 2010 this abounding in the growing season when natural inflow to the reservoir is 16.5 billion m^3 of water, the release was 5.3 billion m^3, or only 32% of the inflow. Despite an adequate amount of water in Toktogul - more than 16.5 billion m^3 in June when inflows to the reservoir 4.2 billion m^3 of water, release was only 450 million m^3 or 11% of the inflow. We do not understand such actions of our neighbors.

During the recent European Conference of the International Network of Basin Organizations the experience of the European Water Framework Directive was demonstrated where all the hydropower construction is the subject of a thorough technological expertise and a broad public discussion of all possible consequences. Serious warning was arisen during the Congress “Hydro 2010” in Lisbon in September 2010, when the sad experience of the Sayan-Shushenskaya catastrophe must put a barrier hydropower monopoly. Are the Kambarata, Rogun and other large hydro projects do not pose the same threat given their location in a seismic zone?

There were raised several questions: on what basis is changing the natural hydrologic regime of the transboundary river? Why use water for their own benefit without the consent dumped into the territory of other states? Who will compensate the damage from man-made floods and droughts? Although the problems of energy development is completely solved at the expense of small hydropower plants, which do not alter the flow regime of rivers, and the costs and construction time more economically attractive.

It is obvious that the international instruments developed and adopted by the international community can provide answers to these questions. Uzbekistan joined the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 03/17/1992, and the Convention on the Non-navigational Uses of International Watercourses from 21.05.1997, and has demonstrated its respect for and commitment to the norms and principles of international water law. The interests of both “downstream” and “upstream” countries that can use water resources based on the principles of equitable and reasonable utilization of transboundary water resources, as well as

the principle of “not to cause harm” within their own territory taken into account in the Conventions.

I would like to emphasize - Uzbekistan stands for independent international assessment of the planned construction of huge hydropower projects in the region. Uzbekistan has always favored cooperation and understanding, and directs its efforts towards a reasonable and equitable use of water resources in the Aral Sea basin.

Sh. Salikhov

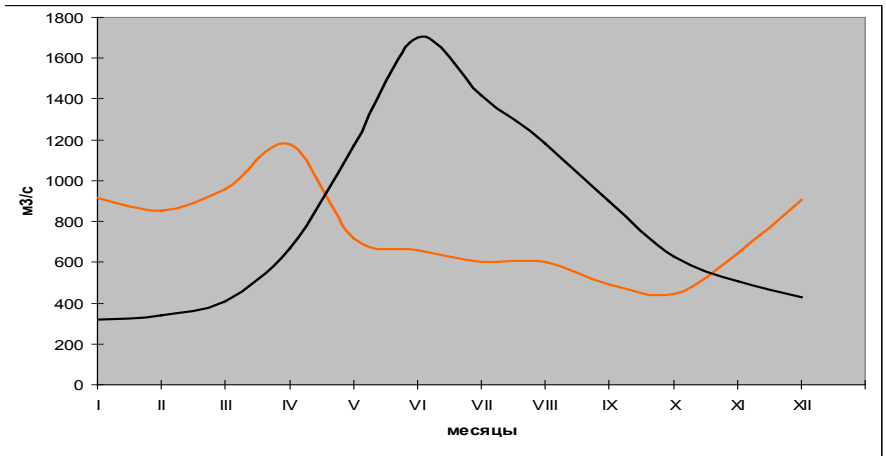
Academy of Sciences of the Republic of Uzbekistan

TRANSBOUNDARY WATER PROBLEMS: APPLICATION OF INTERNATIONAL LEGAL MECHANISMS FOR THEIR SOLUTION

Uzbekistan is arid (dry) country and water resources limit the social, economic and environmental development and, consequently, it is the strategic resource. However, the problem of water of transboundary rivers is becoming more acute in the Central Asian region, especially in Uzbekistan. This problem affects the vital interests of our country. Therefore, adopting one of these solutions, not taking into account the interests of the neighbors, can lead to catastrophic consequences. With this in mind, the President of the Republic of Uzbekistan Islam Karimov took the initiative of acceding to international legal norms regulating the water relations between states on transboundary rivers. In this regard, the Republic of Uzbekistan became the first country in the region, which joined the UN Convention:

1. “The UN Convention on the Protection and Use of Transboundary Watercourses and International Lakes, adopted in 1992. Major component of transboundary waters - suitable for use in the economy of water in rivers, lakes, canals, reservoirs, seas and oceans, groundwater, soil moisture, water (ice), glaciers and snow cover priority environmental aspects - compliance with obligations to prevent, reduce any transboundary impact, joint monitoring and assessment of transboundary waters.

Hydrological risk for Uzbekistan in Surkhandarya basin



2. “The UN Convention on the Law of the Non-Navigational Uses of International Watercourses, adopted by the UN in 1997, is dedicated to sound and rational management of water resources. The signatory countries are committed to use the transboundary waters within its territory fair and reasonable manner.

However, neighboring countries located in the zone of transboundary rivers Amudarya and Syrdarya not become parties to the fundamental for the regulation of water relations documents of the UN and unilaterally without taking into account the interests of neighboring states, have a negative impact on the hydrologic regime of the transboundary rivers. In particular, translation Toktogul long-term management of the energy regime changed the hydrological conditions in large parts of

the upper and middle course. Syrdarya-influenced features of operation Kairakum and Shardara reservoirs has led to the resumption of discharges of river water in Arnasai depression.

The maximum cost of water in the middle flow. Syrdarya began to form in winter and spring, but not the growing season, although it was typical for the natural river regime. Winter highs well above the summer and only in wet years their values are comparable. Previously, filling reservoirs and increased inflow during the winter months have caused flooding of more than 350 hectares in Uzbekistan. Together with the construction of Kambarata lead to an increase of reservoirs on the River. Naryn to 25,1 km3, which is 2.2 times larger than the average annual flow, which can be formed on a river. The results of such impacts on river flow, water which was originally intended for irrigation, and on this basis to create a culture and traditions of the people, to predict without a thorough examination is not possible.

The Republic of Tajikistan, ignoring the basic requirements of international conventions, is building a hydroelectric Sangtuda 1 and 2, has also resumed construction of the Rogun on the Vakhsh. There is also a high probability of the start of construction of even larger hydropower sites and on the River. Panji (the main tributary of the river. Amu Darya).

Rogun, which by its design capacity of 3600 MW with the world's tallest earthen dam in the 335 meters was to become one of the largest hydroelectric power stations on the globe. Rogun, Sangtuda HPP 1 and 2 p. Vakhsh existing capacity reservoir (= 10.5 km^3) is expected to reach 25 km^3. A construction of Rushan, Dashtidzhumskiy, Upper Amu Darya hydroelectric facilities on the River. Panj create regulatory capacity ≈ 39,0 km^3.

Construction of hydropower facilities of this magnitude cause a significant change in the hydraulic and morphological parameters of the river system. Due to changes in hydraulic parameters of river flow, quantitative indices of liquid and solid runoff, there is the threat of erosion of the coast, which creates a risk of safety of hydraulic structures and other economic projects in Uzbekistan along the Amudarya River.

Together with those of Tajikistan is also planning to build 10 hydropower complexes with reservoirs of varying degrees of regulation on the River. Zarafshan (Amudarya basin). Proceeding from the purpose of these structures change significantly in r.Zarafshan mode discharges, the major releases will be held in the winter. Winter releases will only create problems in environmental terms, because of flooding in Uzbekistan, since the channel r.Zarafshan deadlock, with no conditions to the merger of the Amudarya. Under the scheme of using hydropower p. Zarafshan, Tajikistan planned to create a tool to influence the water situation in Uzbekistan in the basin of the river, where more than 7 million of our population.

Water resources of transboundary rivers, the Syrdarya and Amudarya were meant for the sustenance of people living in the basins of these rivers, and nobody has the right to meet their needs at the expense of others and of nature itself, which we all must be preserved for future generations. This provision of international legal norms, implementation of which the duty of any UN member states.

Manfred Tichy

BCS, Business, Culture Sport, Austria

TRANS-BOUNDARY ENVIRONMENTAL POLUTION PROBLEMS IN MIDDLE ASIA

In Central Asia, and Uzbekistan in particular, there is a significant environmental problem associated with the lives of millions of people. Its consequences go beyond the environmental crisis

by creating the challenges of socio-economic development and demographic problems. Aral Sea and Aral Sea area - is a crisis of planetary scale.

It's necessary to take into consideration that the area around the Aral Sea is supplied with water at the expense of the watercourses of the two main rivers – Amudarya and Syrdarya. Any decrease of the watercourse of these rivers means a radical disturbance of the existing fragile environmental balance in the entire vast region.

There are a row of facts to improve the water-situation of the two big rivers, mentioned above, preventing further hygienic deficiencies, diseases and epidemics for the Uzbek population and stop the ecological and economic disaster.

Some of Austrian and International companies such as AIT (Austrian Institute of Technology GmbH), civil engineers, special universities (Joanneum), Andritz AG, PROSPECTIUNI S.A**.,** had many experience in water and waste management in different countries of the world.

Afterwards you can find some proposals:

1.) Drill for ground-water in consideration of geo-physic and qualified measuring instruments to find drinking-water

2.) Phytoremediation techniques to provide ground-erosion and to decontaminate the ground/ earth from salt and other poison and toxic agent.

3.) Decontamination of the Aral-sea from salt and other poison and toxic agent

4.) Implementation of other fruits, not only cotton (mixed fruits)

5.) Reconstruct the irrigation canals of the cotton fields by using drain pipes

6.) Starting projects for using alternative energy

A bigger problem is the irreparable damage to the environment, drafted by attempts to implement 30-40 years old projects from the former Soviet period, constructing in the upper stream of the Amudarya large-scale hydropower facilities with gigantic dams.
One of them is the existing Nurek-dam. After a reconstruction or a change of the non-efficient turbines there, Tajikistan can produce electricity more than 3000 mega-watt, a capacity which supplies the whole country. Also in this case Austrian engineers can help a lot.

The most dangerous man-caused catastrophes over the last years, the planning of the Rogun Hydroelectric Power Station with a 335 meter high dam, the biggest barrage in the world, should be stopped immediately, because it was designed about 40 years ago on the basis of outdated designing, engineering and technological decisions. The extent of the project's protection from anthropogenic risks, firstly, from a threat of powerful earthquakes since the planned construction area of the Rogun Hydroelectric Power Station is in high seismicity zone on the tectonic break line, where the trembles with a magnitude up to 10 occurred more than once. It is hard to conceive the scope of a humanitarian disaster which could be caused by a dam breach with losses of hundred of thousands of people.

As many international ecological organizations and respected experts recommend, it would be much more rational to switch to building less dangerous, but more economical small Hydropower Stations to have on these rivers the same energy power generating capacities. Austrian engineers, with their world-wide experience of building hydropower stations, can help to realize such projects in

different parts of Tajikistan.

The problems of the drying up Aral Sea are the problems of millions of people living in this region, who hope for assistance and appeal to such a high-profile organization as the United Nations and other authoritative international organizations (European Union).

Only a summit of all Central Asian States under the aegis of the UN as such as mediators from different countries can help to find a solution suits to both sides.

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CONSTRUCTION OF HYDROPOWER STATIONS ON TRANSBOUNDARY WATERCOURSES IN CENTRAL ASIA: PROBLEMS AND RISKS

The Aral Sea basin is closed, cut off from the oceans mountain region with an area of about 2.5 million square km. In its contours stir five now independent states: fully Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Kazakhstan partly. Geographically, the pool attracts a range of the northern provinces of Afghanistan and Iran.

Aral Sea region is a typical arid zone, where farming is possible only on the basis of artificial irrigation. Therefore, historically, water resources are used in irrigation, in the twentieth century - in the irrigation and energy regime.

Modern water situation in the Aral region can be described as very tense.

Water resources available for use, given the regulation in reservoirs, are about 105 km^3/year, and allocated to irrigation, 92.0 km^3/year (in the basin of the Syrdarya - 29.5, the Amudarya - 57.5, undrained rivers - 5.0).

Actual use of flow has already reached these values, i.e. approached, the so-called limit the exhaustion of water resources, where water flows in excess of the limits of the water balance, regardless of the dryness of the year, no longer exists.

The most dangerous change in domestic river flows to the transition to the energy mode of operation that requires a uniform for months, the runoff (and even larger in the winter) to generate electricity.

Construction of a single Rogun hydroelectric reservoir will significantly affect the seasonal and long-term regulation of river runoff. Vakhsh - the main tributary of the Amu Darya. Problems can be disastrous in the construction of hydroelectric Dashtidzhumskiy on the border river of Afghanistan - Pyanzhe, if it works in the energy mode.

If you are working on energy requirements even in the regular all-year-long power generation, with the introduction of Rogun Dashtijum and medium-run deficit requirements of middle and lower reaches of the. Amu will increase (from 7,129 to 12,467 million m^3), while the maximum may reach 16,210 million m^3, and in dry years, approximately 80% of the deficit will account for the growing season.

For water users and consumers in Samarkand and Navoi regions of Uzbekistan, using water

of the Zarafshan, you may have catastrophic consequences in connection with possible construction in the upper river. Zarafshan (Tajikistan) cascade of large reservoirs.

N	Наименование ГЭС	Установ. мощ–ность МВт	Кол–во агрег.	Выработка эл. энер. млн. кВтч	Высота плотины м	Емкость полная млн. м³	Емкость полезная млн. м³
	р. Амударья						
1	Туя–Муюнская ГЭС	150	6	470	–	–	–
	р. Вахш						
2	Центральная ГЭС	15	2	114	–	–	–
3	Перепадная ГЭС	30	3	247	17	–	–
4	Головная ГЭС	240	6	1150	50	95	18
5	Сангтудинская ГЭС–2	220	4	932	34	66,5	5,0
6	Сангтудинская ГЭС–1	670	4	2733	75	258	18
	р. Вахш						
7	Байпазинская ГЭС	600	4	2900	75	220	20
8	Нурекская ГЭС	3000	9	11440	300	10500	4500
9	Шуробская ГЭС	850	3	3100	83	77	5
10	Рогунская ГЭС	3600	6	13300	335	13300	8600
	р. Пяндж						
11	Даштиджумская ГЭС	4000	6	15600	370	17600	10200
	р. Обихингоу						
12	Сангворская ГЭС	800	4	2000	250	2300	1500
13	Урфатинская ГЭС	850	4	2400	40	20	10
14	Штиенская ГЭС	600	4	1520	62	20	10
15	(Нурабадская ГЭС ?2) Евтачская ГЭС	800	4	2000	40	30	20
16	(Нурабадская ГЭС ?1) Кафтагузарская ГЭС	650	4	1670	40	20	10
	р. Кафирниган						
17	Нижне–Кафирниганская ГЭС	20	4	480	72		
18	Яврозская ГЭС	400	4	1120	170		
19	Рамитская ГЭС	450	4	1370	205		
	р. Сарбо						
20	Сарбоская ГЭС	250	4	770	270		
	р. Сардай–Миона						
21	Вистонская ГЭС	200	4	626	290		
	р. Варзоб						
22	Сиамская ГЭС	250	4	620	140		
23	Пугусская ГЭС	400	4	1000	84		
24	Гусхарская ГЭС	220	4	550	46		
25	Варзобский каскад	25	4	190			

When the cascade is operated in energy mode the water shortages increase enormously - an average of 1,930 million m^3, maximum - 2,328 million m^3. Kambarata hydropower stations do not affect the releases of Toktogul and the perennial irrigation regime. Therefore, any benefit from their construction for irrigation in the states located in the lower reaches (Kazakhstan, Uzbekistan, and Tajikistan) have been predicted.

Conversely, when switching to energy mode a significant impact can be predicted, i.e. increased frequency and volume of deficits during the growing season. Water deficit will become an annual event, and its volume can increase three-fold. Excessive water releases during the winter for electricity production will, as shoen by the practice of the recent years, flooding across the large areas on the territory of Uzbekistan and Kazakhstan and relevant economic, social and environmental damages.

Thus, not only irrigation but also the livelihoods of all six regions of Uzbekistan, a region of Tajikistan, the three regions of Kazakhstan with a total population over 20 million people in today's environment is completely dependent on the mode of regulation of water flow, implemented by Toktogul hydro from the territory of Kyrgyzstan.

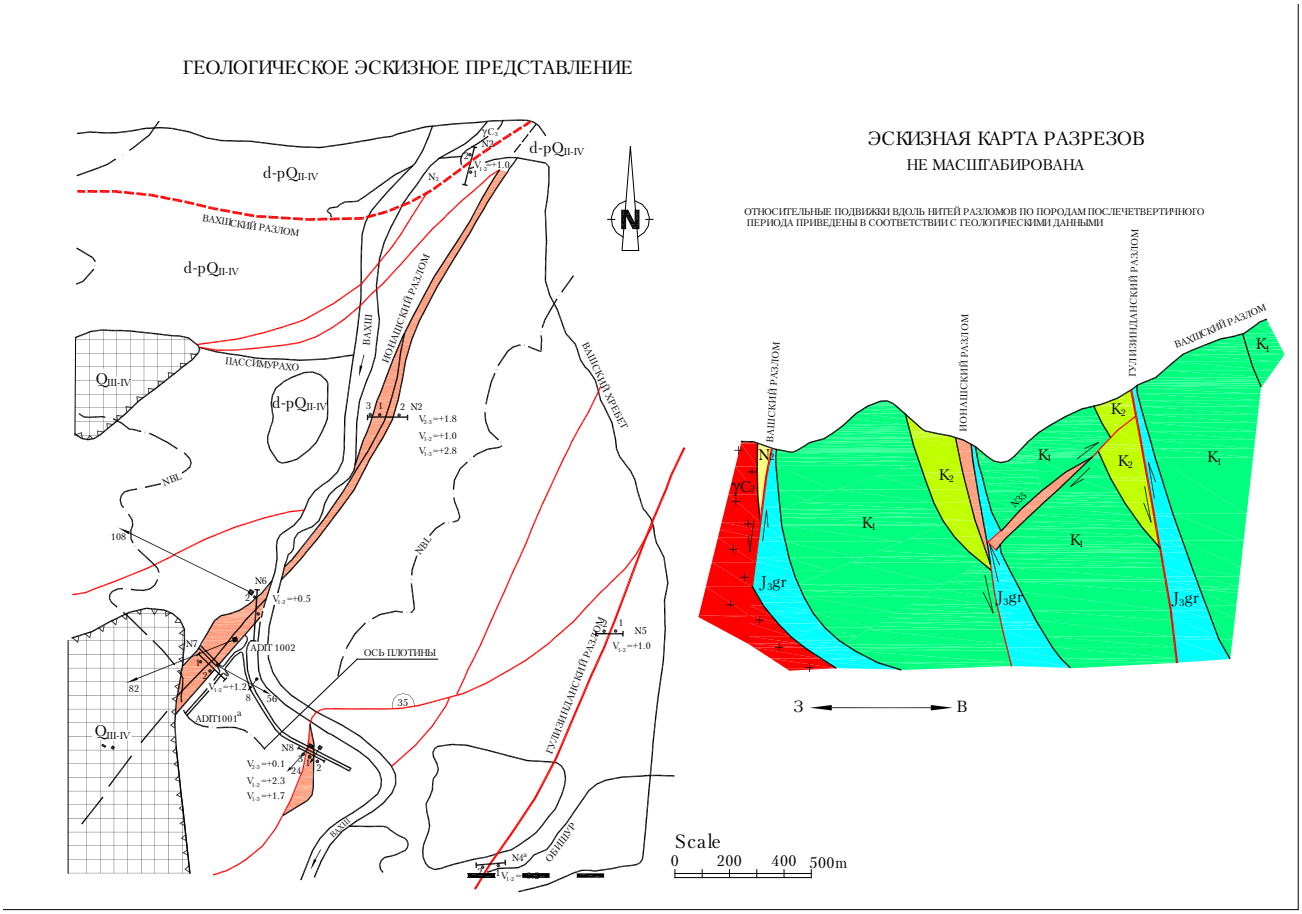
On the territory of one of them - Ilyaksko-Vakhsh fault the Rogun is being constructed. The site is classified as seismically dangerous. Under certain conditions, the launch of the new capacities can lead to tremors more than 9 points, which can cause catastrophic consequences, especially if the earthquake is shallow.

Unique in its size underground machine hall is designed to a height of 35 m, while the initally designed was - 78 m. The convergence of the walls of the machine hall has already reached 300-320 mm in sandstones and siltstones in the 450-470 mm.

In the area where Kambarata-1 is constructed and operated specific geological processes are

undergoing which does not guarantee safe operation of the cascade waterworks.

At the site of Kambarata-1 faults there are traces of (Late Pleistocene and Holocene) displacements, severely affecting the state structures, intersected by these discontinuities.



Analysis of discontinuous tectonics and manifestations of a landslide, landslide processes in the Kambarata-1 led to the conclusion about the nature of modern geological processes and their impact on the geotechnical conditions the alignment of the tunnels and tracks that are very unfavorable for the construction and operation of high dams as Kamabaratanskaya HEP-1. When filling the reservoir activity manifestation of landslides and rockfalls may increase.

The site where the Rogun is currently being constructed has always been considered as very complicated and geomorphology relief, the expression of exogenous processes, high seismicity, active not fully understood undergoing tectonic processes.

The completed studies, including the recent ones, give no answer to the most important, fundamental question: is it possible to implement the basic construction solutions provided by the technical documentation. First of all this relates to the continued convergence of the walls of machine hall into the site folded siltstones.

Along the fault #35 tectonic movement are recorded, which clearly leads to the destruction of the hard shorings of the tunnel.

Specific risk is cretaed by a salt layer, located in the base of the dam.
Due to high vulnerability and unavailable mud dams there is a risk that the Vaksh river bed in

the tail water can be blocked up with the mud flow with subsequent overflow of water through earthen partition off the buildings up to their complete destruction.

Given the intention of the higher administration to ensure implementation of the planned steps as scheduled, we can assume that the number of expensive and long-term types of work will simply be immited. This can greatly increase the likelihood of accidents at the facility.

Considering the above, we continue to insist on stopping construction activities at the facility and conduct an independent international assessment.

Destruction of waterfront Rogun dam may lead to the formation of waves with a breaking power in the alignment from 2.35 up to 1.56 million m^3/s (depending on the water volume at the reservoir), which will move down the Vakhsh and cause destruction of the Nurek dam.

The downstream hydro Vakhsh cascade wave will pass with a large excess over the ridge that will give them full and virtually instant destruction.

As a result of the wave passing from the Rogun reservoir inundation and destruction will cover large areas of land, villages, bridges, water intakes and canals, waterworks, population will suffer great damage and losses. The major and minor hydraulic structures along the wave passing wil be damaged or even destroyed.

There are over 700 settlements wholly or partially located in the risk area. Destruction and flooding will cover such cities as Nurek, Sarban, Kurgantyube, Termez, Mukry, Kirk, Turkmanbashi, Urgench, Nukus. Fracture subjected to all the major and minor hydraulic structures along the path of the wave motion.

As a result of adverse conditions (strong earthquakes or acts of sabotage) catastrophic consequences of failure of Kambarata-1 and subsequent Toktogul are possible scenario for Central Asia.

The total number of flooded settlements is 476, including 600 thousand hectares of land and 10 car and railway bridges.

World Bank, with all the commitments to Tajikistan, carries a civilized approach to implementing such projects.

The main conclusions of experts, independent French company «Coyne et Bellier» on the examination of feasibility study of the Rogun performed on the instructions of the company “RUSAL”, are as follows: According to experts of the «Coyne et Bellier», construction of a dam with a height of 175 meters (1.2 cubic volume of the reservoir. kms, including useful - 0.85 cubic km.) is optimal, taking into account many factors, including environmental concerns, as well as the needs of downstream countries in the irrigation period.

The Government of Tajikistan did not agree with the conclusions of the three companies and put pressure on independent engineering company in choosing the parameters of waterworks.

Most of the existing dams are operated 30-40 years, and require careful monitoring of the technical condition and conduct repair work.

Development of the project should be undertaken in accordance with the requirements of modern national and international regulatory documents, and based on careful study of the natural environment areas for siting of structures (hydrology, geology, seismicity, mudflows, landslides).

We should ban to begin construction of hydropower facilities on obsolete projects, as is the case in Tajikistan, the continuation of Rogun, and Kyrgyzstan on the construction of Kambarata 2. Moreover, the newly developed projects must undergo an independent international assessment.

The current state of construction is even worse, and not controlled by international organizations, but the weak point of all dams, as it is known is the foundation which is currently being constructed. An accident on such a dam, after filling the reservoir, do not promise anything good neither for Tajikistan nor for the downstream countries. Breakthrough waves can sweep away the underlying power plant and destroy the population of the Vakhsh valley, and then the Amu Darya. The organization of such control can be provided only by such organizations as the World Bank and the UN.

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SEISMIC RISK RELATED TO CONSTRUCTION OF GIGANTIC HEPs IN CENTRAL ASIA

Transboundary ecological threats by exploitation and building of huge HES on Vakhsh and Narin Rivers located in high seismicity zones with magnitude more J0 =9-11 balls (by Scale MSK-64) was studied.

This problem was noted by the President of Republic Uzbekistan Mr. Islam Karimov on Plenary Meeting of UN Summit “Aims of Development of Millennium“, New-York, on 20 September 2010.

During 70 million years highly seismic Central Asian (CA) region, includuing the Tien-Shan and Pamir is in the active orogenesis stage. The region has high seismicity level with destructive earthquakes magnitude M=8.5 (by Scale Richter) with seismic intensity J0=9-11 balls (by Scale MSK-64) shaking earth surface with morphologic changes of territories are characterized. Scientific–fields of geologic investigations on the territory of Central Asia from the middle of the 19 century were conducted. Geology, tectonics were under detailed study and compiled Catalogues of strong earthquakes in the region. When conducted special engineering investigations (for constructed HES) already had the first seismic zoning maps, where it is obvious that large part of territories of CA states are located in the J0=9 balls zones with destructive earthquakes. The strongest earthquakes in the CA region as: Verniy (1887) M=7.3; Chilik (1889) M=8.3; Andijan (1902) M=7.3; Kashgar (1902) M=8.1; Kemin (1911) M=8.2 and others were done description.

Further scientific investigations and instrumental seismologic observations by seismic networks of CA countries in 20-21 centuries confirmed the seismic danger on CA territory.

In the mid 50-s of the last century engineering investigations were conducted in CA and in 70-s several largest hydroconstructions with water reservoirs were built including Toktogul (Kyrgystan) with volume 20 km^3; Nurek (Tajikistan) 10 km^3; and still dozens HES with volume water reservoir under 10 km^3 of water. In the continuing cascade those gigantic hydroconstructions in present time building a new HES on the rivers Vakhsh (Tajikistan) and Narin (Kyrgyzstan) in high seismicity J0=9-10 balls zones.

It should be noted that during the exploitation of hydroconstructions in the areas of Nurek, Toktogul and Charvak (Uzbekistan) many local and foreign scientists emphasized sharply changed (increasing) local seismicity wich took place earthquakes magnitude M≥5.0 were marked.

After catastrophe on Sayano-Shushensk HES (Russia) on 17 August, 2009 when 74 people

died and enormous damage was cuased it became obvious that similar catastrophes on other HES built more than 40 years ago may happen. In spite of above noted data about seismic danger of the CA region in present time on the territories North, Central Tien-Shan and South Tien-Shan - Pamir 2 neighboring countries continue building 2 largest hydrocon-structions Tajikistan (Rogun HES) and Kyrgyzstan (Kambarata-2 HES).

Rogun HES with volume of water reservoir 13.3 km is 6th the very upper step Vakhsh cascade, that located near Obigarm village on the distance 110 km from the capital city of Republic Tajikistan Dushanbe city and in 70 km from Nurek HES upper flow current of Vakhsh river. Basin of Vakhsh river is located in the highest part of the CA region, on the territories of the biggest mountain systems: Tien-Shan and Pamir-Alay with altitude of ranges from 2,000 to 5,500 m., with a separate peak to 7,000 m. Construction of Rogun HES is implemented in Gissar-Kokshaal and Ilyak-Vakhsh faults. Range of the Rogun HES dam is located in 2.5 km away from Ilyak-Vakhsh deep fault, right in the zone of dynamic influence of faults, in other words Rogun HES is being constructed above “alive” tectonics faults. Gissar-Kokshaal deep regional fault with length more 700 km is the main boundary zone between Tien-Shan–Pamir, which controlled modern geodynamics processes and seismic activity of the South Tien-Shan – Pamir.

In this Gissar-Kokshaal seismogenic zones were occurred catastrophic earthquakes as:
- Karatag, 1907, M=7.3 and M=7.5 (2 shocks);
- Sarez, 1911, M=7.4;
- Khait, 1949, M=7.4 and others

The magnitudes of earthquakes registered by seismic stations in this zone reach M=7.5, but taking into account geological-tectonical peculiarities of faults zone their seismic-tectonic potential has been estimated as M=8.0. Western part of Gissar-Kokshaal fault zones is disposed on the territory of Uzbekistan. Among all the seismogenic zones of South Uzbekistan that zone is the most seismoactive and has high seismic-tectonics potential with M=7.5.

In cascade HES on the Naryn river now Kambarata-2 HES is being constructed above Toktogul HES. Hydrotechnical construction of Toktogul HES, Kambarata-2 HES located in the Talas-Fergana transform deep tectonic fault zone that is the biggest controlled structure, one of the highly active fault of Tien-Shan. In this fault zone most strong earthquakes in the CA region with magnitude M≥8.0 took place. In the zone of Talas-Fergana deep tectonic fault according GPS data high speed shortening of Earth’s crust of Tien-Shan upper 20 mm/year was marked. Strong development of landslides processes, especially stony landslides that in case will be occur strong earthquakes can be able come to movement and blocked rivers and says (small rivers).

In connection with that need marked, according maps of seismic zoning different years (1951-2008) now built Kambarata-2 HES located in seismic danger J0=9-10 balls zone. As show last publications Kyrgyz seismologists, scientists of Joint Kyrgyz-Germany Central Asia Institute investigation of Earth by Mikolaychuk A.V., Kalmeteva Z.A. was present scientific report “About Map of Seismic Risk on the base PGA (peak ground accelerations)” on Symposium Europenian Seismological Commission in Davos, spring 2009. Conclusion of this authors having one, Toktogul HES and adjacent territories also Kambarata-2 HES are zone where possible earthquakes with M=7.7 with seismic intensity J0=10 balls. Authors noted about unexpectedly appearance Suusamir earthquake, 1992 M=7.4 with intensity J0=9-10 balls.

In mountain regions Central and North Tien-Shan have also some geologic processes, whcih do not allow safeguarding security of cascade hydrotechnical constructions including:

• High probability recurrence of earthquakes with M≥7.6 (by Scale Richter) with seismic intensity J0=9-10 balls (by MSK-64 Scale);
• High activity of landslides, collapse, landslip, scree, talus connecting with unstable of slopes;

- Rocky collapse (with volume mln m3);
- High speed of modern movements more 10-12 mm/year.

In conclusion it should be noted that changed (increase) tensions in the Earth crust connection with building and exploitation gigantic HES on Central Asia territories are realized in the forms deformation in the fault, this increase significantly seismic risk, risk of recurrence catastrophic earthquakes.

In generally, massive of mountains rocks in the areas where gigantic Rogun HES and Kambarata-2 HES are being constructed are characterized by dynamic equilibrium. But after filling water reservoirs geologic-tectonics conditions will be complicted thus increasing the seismicity of the region. Building and exploitation hydroconstructions must be implemented under monitoring of geologic environment on the territories of the gigantic HES in Central Asia. With that marked probabilistic influence of building and exploitation gigantic HES to seismicity of Central Asia region will be next:

1. Threat of strong earthquakes with M≥6.0 (by Scale Richter). Earthquakes will be occurring not spontaneous, more than once. Consequences of earthquakes can be unforeseen especially in chalice of water reservoirs, where is high probability appearance high waves (analogy of tsunami), that can be gush over of dam, this will entail serious consequences on dam.

2. Erosion (wash out) of layer of stone salt under Rogun HES dam. Collecting water in reservoir and further suffusion-filtration processes can be wash out of stone salt in conditions of active tectonic movements of Ilyak-Vakhsh fault.

3. Strong earthquakes in Toktogul region, will entail significant shaking ground in Ferghana and Tashkent, as already that was 63 years ago. In 1946 there was the strongest Chatkal earthquake with M=7.6 with intensity in epicenter J0=9-10 balls. On the distance of 270 km in Tashkent city the intensity was J0=7 balls. According the evidence of eye-witness (observers) in 1946 on the asphalt surfaces were appearance cracks with width 2-4 sm. Focal source this earthquake was located on the distance 35 km from Toktogul water reservoir.

4. Swarm of earthquakes. Collecting and discharge water in water reservoirs be able to bring redistribute of tectonics tensions in the region and possible appearance swarm of earthquakes with magnitude M≥5.0 (by Scale Richter) that also can be bring uncontrollable processes in complicate high mountains regions.

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CONFLICT SITUATION AT THE DAM ON THE KHAN RIVER BETWEEN SOUTH AND NORTH OF KOREA

The Khan river is the 3-rd largest river in territory of the Korean peninsula. Waters of northern and southern parts of the river the Khan meet in the central part of peninsula. Main current of the river the Khan is necessary on territory of South Korea, but the part of inflows of the river originates in territory of the North Korea. One of inflows of the river the Khan originating in territory of the North Korea, - the river Imdzhin. Till now the party (South Korea and the North Korea) have not reached the agreement concerning regulation of volumes of water in a high water. As a result in South Korea on which territory the bottom watercourse is necessary, human losses take place.

The dams established for regulation of a water level in a high water on the river Imdzhin, is

a North Korean dam of “Hvangang” and a South Korean dam to “Gunnam”. The multipurpose dam of “Hvangang” has started to operate since 2007. The volume of a water basin of this large-scale dam makes 300 million tons. Opening of a dam of “Hvangang” and water stream from a water basin in a high water makes considerable impact on a water level in the bottom watercourse Imdzhin on territories of South Korea. Till now the North Korea preliminary informed the South Korean party in case of opening of a dam of “Hvangang”. Therefore South Korea had possibility to undertake corresponding preventive measures. But after deterioration of diplomatic relations in 2009 the North Korean party carries out opening of a dam without preliminary informing, as a result in territory of the bottom watercourse Imdzhin took place human a victim – 6 persons were lost. For prevention of consequences of similar actions of the North Korean party, water level regulation on a case of an unexpected exit of water from a dam of “Hvangang” and the subsequent flooding in South Korea the dam to “Gunnam” has been constructed. However the dam to “Gunnam” can’t carry out up to the end the function because of insufficient capacity of a water basin.

The conflict round dams between ideologically divided states differs from usual transboundary conflicts a little. Therefore for the decision of this problem more difficult political mechanisms are required.

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IMPROVEMENT OF TRANS-BOUNDARY COOPERATION: INTAGRATED WATER MANAGEMENT IN THE RIVER BASIN

In much of the region, governance at the basin level is weak because political and natural boundaries do not coincide. Rights over water are not clear, and the deterioration of water quality has proven difficult to control. However, there has been much progress in establishing river basin organizations which strive to manage resources at levels appropriate to the hydrological cycle and the functions of water-based ecosystems. These must be replicated.

Enhance trans-boundary collaboration through more open and informed dialogue and adopt and implement regional frameworks to reduce ecological and social threats. The Asia-Pacific governments must further commit to engaging in meaningful dialogue, institutionalizing protocols and mechanisms for information sharing and consultation on joint development and action plans on trans-boundary issues, while making monitoring information available to society at large. International and regional cooperation bodies should support these efforts. Where large-scale water management schemes (such as hydroelectric power and irrigation) may have trans-boundary impacts, institutions in shared basins need to address the political complexity of international water and the trans-boundary tensions created.

Integrate Principle 10 of the Rio Declaration into water resources policy and enhance coordination by increasing stakeholder representation and participation in decision making processes. National decision makers should provide the legal and policy framework for a diverse range of institutions - including river basin organizations, networks, coalitions, and dialogue platforms - that can provide necessary inputs from the different sectors of society and improve coordination among stakeholders.

Re-invent and invest in agricultural water management to raise the productivity of water and decrease the environmental footprint of agricultural production. Policy-makers can avoid conflict between agriculture and competing sectors by providing direction and incentives for the reform of irrigation management and the upgrading of infrastructure, while delivering direct benefits for a

rapidly growing population and to farming communities.

Modernizing irrigation systems' management to enhance the welfare of farming communities, environmental sustainability of irrigation, and allowing reallocation of water to other uses and users. Create a platform of scientific information to support decisionmaking:

There is a fundamental mismatch between the scales of information management and decision-making. Most data indicators of water availability and scarcity are collected at the national level, and feed into national development planning. But water availability and quality are tangible at the ecosystem level, be it in sub-national or transboundary basins. Policies to address these issues at the relevant level need to be informed by data on a corresponding scale via indicators that integrate the water required by an ecosystem to maintain the flow of goods and services.

Importance of transboundary dialogues at all levels including parliamentarians, water professionals, private sectors, farmers and civil societies as well as existing regional coordination framework

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PROBLEMS OF POPULATION WATER SUPPLY IN ECOLOGICALLY ADVERSE AREAS OF THE AMU DARYA RIVER BASIN

The rational use of water resources was, and will ever be, of great importance for sustainable development of all countries and normal life of people. The water basin of Middle Asia is an integrated body providing well-being of the population of all countries upon condition of accessibility and safety of water supply.

Owing to the whole complex of factors, the issues related to reasonable use of water resources became one of the most serious problems of the region. When defining approaches to their solution, it is necessary to take into consideration that water by its importance for people, nature and society is an irreplaceable substance of vital importance. At the same time, energy can be received from many various sources. Impairment of the natural complex, the basic element of which is the water system, inevitably leads to ecological disasters of huge scale, non-comparable to benefits from separate projects. All above-said is confirmed by dessication of the Aral Sea occured due to unreasonable, one-sided, predatory attitude to water resources. As it was emphasized by President of the Republic of Uzbekistan I.A.Karimov in a number of sessions of the United Nations General Assembly, the Aral crisis became one of "the severest environmental and humanitarian catastrophes in the mankind history; tens million of people living in the sea area are exposed to it".

Lack of water resources in the area of the Aral ecological disaster has resulted in degradation of water bodies and deterioration of water quality in surface and underground sources. The basic source of the centralized potable and household water supply of the population of Khorezm province and the Republic of Karakalpakstan is the Tuyamuyun reservoir. Its hydrological status, hydro-chemical and hydro-biological characteristics, including microbiological indicators, completely depend on the flow of the transboundary river Amu Darya. At the same time, over one third of the population of Khoresm and Karakalpakstan drink water from the underground sources of water including open wells and wells with manual pumps (the decentralized sources). Frequently, water of surface and underground sources in the Aral Sea area does not meet the State standard of Uzbekistan (UzSt 950: 2000), as well as the requirements and recommendations of the WHO on potable water. Much higher values

of the indicators of mineralization (more than 1.5 g/L) and the general hardness of water (more than 10 mg-eqv./L), in particular in the decentralized sources of water supply, have increased the risk of formation of stones in the urinary system and gallbladder. Rather high concentrations of sodium in the water, several times exceeding 200 mg/L – the WHO recommended level for potable water – raise the risk of development of hypertension and other diseases accompanied by an increase in arterial pressure. Quite probably that this factor among others contributes essentially to rather high values of cardiovascular and renal pathology rates in the Aral Sea area. Majority of diseases of both somatic and infectious character became severer under the influence of more frequent drought periods.

Implementation of the projects imparing the historically developed pattern of water-use and influencing the balance of water resources, e.g. construction of the Rogun Dam, will inevitably lead to aggravation of problems of providing the population with both irrigation and potable water due to systemically repeated drought. Reduction of nutrition resources and access to safe potable water, as well as water used for public and personal hygiene, can affect the basic indicators of health care raising the need in health care services, in particular due to growth of the rates of intestinal infectious diseases resulting in aggravation of the epidemic conditions and development of emergency situation. In this case, the countries of Middle Asia, where over 50 million people are living, will face dramatic deterioration of even now difficult ecological situation fraught with crisis sanitary-and-epidemiologic situation.

It is also necessary to stress that the environmental conditions are aggravating due to the climate change with negative consequences for public health services and sanitary-and-epidemiologic situation in the region. No doubt, the climate change in turn will affect health status of people in parallel with the various factors connected with water resources. The change of the water ecosysem status resulted from the climate change will affect well-being of the communities that is fraught with impairment of the nutrition status and food structure and creats new problems for health care services.

Of course, an imperative in making any decisions on use of transboundary rivers, including the building of hydraulic engineering constructions, should be taking into account the interests of all countries of the basin, ecological validity of the projects. It enables to avoid any damage to environment, well-being and health of the population. Thus, of special value is strict observance of the international laws regulating protection and use of transboundary water flows. The first of them to be mentioned is the Convention on protection and use of transboundary water flows. In June 1999, the international community decided to take measures to ensure water related health. This was followed by the 3rd Ministerial Conference on environment and health in London where the Protocol on water and health problems was approved. The Protocol is the first international agreement specially adopted to provide the link between water resources management and health problems, ensuring adequate supply of potable water and sanitary-and-hygienic conditions for everyone. In accordance with the principles of the Convention on transboundary water resources and the integrated water resources management, the Protocol protects water bodies including those which are sources of drinking water supply. The Protocol Preamble stresses the advantage of “the harmonious and properly functioning water environment” and importance of water resources for sustainable development. “Water resources should, as far as possible, be managed by complex methods based on the area of the catchment basin for the purpose of the linkage of social and economic development with protection of the natural ecosystem … “. It proceeds with the statement that “Such an approach is to be applied in all the water catchment territory, whether it is transboundary or not, including the coastal waters connected with it, the entire zone of aquifers recharge or an appropriate part of such catchment or aquifers recharge areas”.

It should be noted that in past 30 years, the increasing attention was paid to recognition of human rights to water. The last changes in the system of human rights made by the United Nations

strengthened this recognition having defined execution of the right to water as the basic problem. The Protocol on Water and Health illustrates and creates a close connection between human rights, health, preservation of environment and sustainable development. The document supported the idea that when implemeting projects on usage of any water-way, whether it is a transboundary one or not, the irreparable ecological consequences arising due to impairment of the developed balance of water bodies use should be prevented first of all.

N. Umarov

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TRANSBOUNDARY ENVIRONMENTAL POLLUTION ISSUES IN CENTRAL ASIA: MONITORING AND ASSESSMENT

A number of transboundary environmental problems exist in Central Asia. One of the serious problems among them is the deterioration of the environmental situation in Surkhandarya region under the impact of the Tajik Aluminum Company (TALCO). The annual atmospheric pollutant emissions of the company are about 22 000 tons a year, of which hydrogen fluoride accounts for 120 tons that continue affecting the population health and deteriorating the environmental and economic situation in the northern areas of Surkhandarya region. The monitoring results showed an excess of hydrogen fluoride in air in Sariasiya district, water-soluble fluorine in soil, and water-soluble forms of aluminum compounds in water channels in the zone affected by TALCO.

According to the researches carried out in the period 2007-2009, the high concentrations of hydrogen fluoride in atmospheric air and water-soluble fluorine in soil have an adverse effect on growth and development of plants that leads to decrease in yield and quality of vegetable crops.

The environmental-economic damage over the period 2005-2008 in four districts affected by TALCO emissions has been estimated by Uzbek specialists at over US$ 282 million.

The large-scale activities for extraction and processing of uranium ores in Central Asia resulted in the formation of a huge amount of radioactive waste placed in mountain mine dumps and tailings, which represent a real threat to the main watercourses and population (Mayluu-Suu, Sumsar-sai, Shakhimardan).

According to estimates, in case of catastrophic destruction of some uranium tailing dumps in Mayluu-Suu located in a high seismic zone in Kyrgyzstan, the total amount of radioactive materials (tailings) washed out to the Fergana Valley may reach up to 1 million cubic meters, and the total activity of radioactive nuclides spread by water flows in the valley (Kyrgyzstan) and in the cone of the Mayluu-Suu river (Uzbekistan) may constitute to 10,000 Curie, while the total area of radioactive pollution of agricultural lands would be 300 sq. km.

The Mayluu-Suu river is also polluted by oil products and zinc (up to 2 MAC), iron and copper (up to 6.6 MAC) and mercury (up to 4.1 MAC).

The water resources of the transboundary Sumsar river are regularly polluted by flows from the tailing dumps of lead-zinc production in Sumsar and uranium mine dumps (Shekaftar village). The synergistic effect of joint influence of radionuclides and heavy metals on human organism may represent a special danger in water use for agricultural production. According to the data of monitoring at the site of water inflow to the Sumsar river from the tailing dumps, the river is polluted by lead (up to 9-11 MAC), arsenic (up to 2.5 MAC). It was also revealed to contain mercury, zinc,

barium, vanadium, selenium, cadmium and oil products (up to 2.2 times higher than the allowable norms). The pollution decreases in bottom sediments downstream, but lead and zinc are found in sufficient amount.

The Shakhimardan river is polluted by antimony (3.7 MAC), mercury (from 8.5 to 14 MAC), iron (up to 7 MAC) and oil products (up to 2 MAC), and the bottom sediments have been found to contain antimony up to 40 mg/kg.

The deterioration of the Zarafshan river water quality under the huge influence of an ore-dressing and processing enterprise located in the upper reach of the river in Tajikistan causes an alarm.

According to the data of monitoring at the entry to the Republic of Uzbekistan (Ravat-Khodja gauging station), over the period from 2003 to 2010 the Zarafshan river water resources were registered to regularly have high contents of phenol at level of 2-7 MAC, copper – 2.8-4.4 MAC, nitrite nitrogen – 1.8-2.2 MAC, oil products - up to 2.2 MAC.

The problems of anthropogenic damage to the hydrological regime of the transboundary Amudarya and Syrdarya rivers and ecological consequences of the construction of large hydro structures in the upper reaches of the river are now getting especially urgent.

The construction of Rogun water reservoir is expected according to specialists to considerably reduce of water flow during the filling of the reservoir over several years, and cause major irreversible changes in natural systems. By preliminary estimates, the damage from reduction of tugai forests and reeds as well as of areas of natural pasture lands in the Amudarya river delta as a result of these actions would amount to about US$ 46 million. Three state-owned special nature reserves (Dengizkul, Sudochie, Kara-Kir), Yangibazar natural sanctuary and dozens of hunting-and-fishing entities are expected to be under threat of disappearance.

The flow control and changes in the hydrological regime of the Amudarya river will influence river-bed evolution processes, because over-control of floods leads to deposition of suspended sediments on the river bed and to reduction of its flow capacity. Continued reconstruction of existing water intake systems will be required. In infrequent high-water years, the river channel and major delta branches are not capable to pass increased flows, because of which the area of inundations and destructions of social-economic infrastructure will increase.

The growth in water salinity and increase of water deficiency will lead to further salinization of irrigated lands. The desiccation of lakes and wetlands in the Amudarya lower reaches is already accompanied by appearance of new saline lands i. e. “solonchaks” and salted takyr soils. These territories in aggregate with the Aral Sea dried bottom are large sources of salt-dust transfer to the adjacent developed territories. Salt falls reduce soil fertility and productivity.

By expert estimations, the environmental-economic damage over the five years in Priaralie (the Aral Sea coastal zone) from the reduction in cotton yields will amount to US$ 206.2 million. The expected losses from the loss in yields of grain-cereal crops and cotton under reduction of water release for the same period will amount to US$ 5.1 billion. It will lead, in its turn, to losses in related sectors, where the cumulative damage for five years will amount to US$ 17.8 billion.

Moreover, the expected damages caused to the fish sector will amount to US$ 14.3 million without account of costs for additional need for fresh water.

Similar situations arise in the last years in the Syrdarya river basin.

At present, the operation of the Toktogul water reservoir in the continued power-generation mode has a considerable transboundary impact on the environment, which extends to the territories of Syrdarya, Dzhizak and Navoi regions of Uzbekistan, provoking irreversible negative ecological consequences, including further formation of drinking water deficiency; increase in the area of deserted zones; deterioration of water quality in the Syrdarya river basin; loss of fish resources.

The construction and launch of Kambarata II hydropower plant and Kambarata I hydropower plant project will exert even greater influence on change in the hydrological regime of the Syrdarya river that will lead to the deterioration of the complicated environmental situation in the downstream countries of these transboundary rivers.

The countries of the region carry out joint actions for ensuring development of the environmental policies and prevention of negative environmental impact in the region. At the same time, the assessment of the environmental situation in Central Asia shows that there are a lot of transboundary environmental problems, which require making of joint efforts and application of the international legal mechanisms for solving them to ensure environmental security in the region.

Yu Hongjun

Ambassador Extraordinary and Plenipotentiary, Embassy of the Chinese National Republic to the Republic Uzbekistan

EXPERIENCE AND A POLICY OF CHINA IN THE FIELD OF PRESERVATION OF THE ENVIRONMENT AND DEVELOPMENT OF THE TRANSBOUNDARY RIVERS

In process of industrialization and urbanization development such phenomena, as climate change, biovariety reduction, pollution of fresh waters and air, a soil erosion, reduction of the area of woods all over the world are observed. Preservation of the environment became the actual problem facing mankind.

As all know, China – the world's largest developing country with the population more than 1,3 billion. Last decades the Chinese government pursues a policy of all-round reforms and openness thanks to which the standard of living of the population both in material sense, and in the spiritual has considerably raised. Have seriously changed both an environment and ecological conditions with which existence and development of the Chinese nation are closely connected. According to 2009, the annual TOTAL INTERNAL PRODUCT on soul in China has exceeded 3 thousand dollars, the country already left on 2 place in the world on economy volume. However in conformity with United Nations standards below the breadline there live 150 million Chineses, the disbalance in development is still allocated. In front of China there is a formidable problem of development of economy and increase of a standard of living of the people. Now China is at a key stage of industrialization and an urbanization which differs a coal leading role in structure of power balance of the country. It is necessary to us a roundabout way on preservation of the environment. According to 2009 only 26 from 612 Chinese cities (4,2 %) correspond to state standards on quality of air. Almost 300 million countrymen aren't provided yet by pure potable water, in many cities there is a deficiency of water. Many people live in cities where the noise level exceeds admissible norms. These realities have caused special difficulties and huge pressure in the course of preservation of the environment and reduction of emissions of hotbed gases in China.

Despite all difficulties, China in development pays much attention to preservation of the

environment, proceeding from radical interests of long-term development of the Chinese people and all mankind, makes indefatigable efforts on preservation of the environment. After the beginning of carrying out of a policy of reform and openness business of preservation of the environment in China has reached appreciable successes. The system of the legislation on preservation of the environment which included the Constitution is created, the law on pollution prevention, the law on protection of biological resources, the law on prevention of acts of nature and liquidation of their consequences, etc. to support business of preservation of the environment and natural resources all over the world, has signed China and has taken part in 37 international conventions on preservation of the environment. As developing country and one of the largest emitters of hotbed gases China is ready to bear «the general, but the differentiated responsibility», making the efforts the international cooperation in a climate change solution of a problem.

China the first of developing countries has developed the national plan of struggle against global warming. China last years has reached the big successes in reduction of emissions and power savings. In 2005 emissions of dioxide of carbon counting on gross national product unit were reduced to 46 % in comparison with 1990, and by 2020 will be reduced to 40-45 % with indicators of 2005. In China the fast are observed in the world rates of increase of new kinds of the energy, renewed energy sources. China wins first place on capacity of hydroelectric power stations, volumes of the under construction atomic power stations and the area helioheater. The area of artificial gardening in China makes 54 million hectares, on this indicator it wins first place in the world.

As to use of water resources of the transboundary rivers, China spends good cooperation with neighboring countries. Insisting on a principle of long development and completely considering interests and concern of neighboring countries, China in a complex develops water resources of an upper course and lower reaches of the transboundary rivers, aspires to the building of a society caring of environment and resources economy with a view of maintenance of mutually advantageous cooperation and the general development.

We have taken into consideration that, in the Central Asia there is a serious problem on preservation of the environment. Last years on reduction of inflow of water in Aral the area of the irrigated earths in Central Asiatic the countries, in particular in Uzbekistan, gradually decreases. Deterioration of ecological conditions in pool of Aral Sea has already caused wide attention of the world. The authorities of Uzbekistan give special attention to preservation of the environment and will mobilize huge human and material resources with a view of the permission of respective ecological and social problems, continuously improving a legislative basis and the work mechanism, mobilize consciousness of the population to preservation of the environment, involving participation of the international forces in liquidation of serious consequences from degradation of Aral sea.

We also have noticed that under the initiative of President Islam Karimov Ecological movement of Uzbekistan in 2008 year which became the biggest public organization of the country in the field of environment protection is established. From the date of the creation Ecological movement of Uzbekistan makes the maximum efforts for development of business of protection of environment, distribution of such consciousness in a society, references of attention of citizens on environment problems, and also assistance to improvement of health of the population and deepening of the international cooperation in the given sphere. In the beginning of this year by deputies of Legislative chamber Oliy Majlis (Parliament) 15 representatives of Ecological movement of Uzbekistan who possess the right of direct participation in legislative work and the permission of actual problems of the state are selected. The place and organization role in political life of Uzbekistan that testifies to steadfast attention of a management of the state to environmental problems thanks to which has put environment protection in Uzbekistan has considerably raised will by all means enter a new stage.

During a yesterday's trip on Aral Sea the adviser of embassy of China in Tashkent Mr. Chan Vei with other participants of conference have personally seen the strategic changes which have

occurred for last decades around Aral sea. The Aral crisis has resulted living in pool of this sea of people in a terrible trouble, and sounds alarm for environment in region. The Chinese party sincerely hopes that the interested countries in region will be together with the world community according to a principle of mutual benefit and friendship by consultations and cooperation to search for a variant comprehensible by all for rational use of water resources of the transboundary rivers with a view of preservation of the long-term world and stability in region and achievements of the general prosperity of all countries for the blessing of all people of this region. The Chinese embassy in Uzbekistan is ready to support close contacts to Ecological movement of Uzbekistan and to make joint efforts advancement of a friendly exchange between the respective organizations of two countries in the field of protection of environment with a view of assistance to mutually advantageous cooperation between our countries and progress new successes in the field.

V.Chub

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CLIMATE CHANGE AND RISKS FOR SUSTAINABLE DEVELOPMENT IN THE ARAL REGION

Problem of climate change was put forward to the series of global challenges of XXI century. It is outside the range of the purely scientific issue and presents interdisciplinary problem which covers all key aspects of sustainable development – ecological, economical and social.

What the climate change in the Central Asian region will result in?

The revealed indicators of climate change in Central Asia have manifested that the following results of it will be:

- Extension of duration of the dry hot period
- Increase of number of days with heavy precipitation and high precipitation variability
- Reduction of snow reserves in mountains and degradation of glaciation
- More often occurrence of the extreme events
- Increase of mudflow danger
- Increase of evaporation over the plain and foothill territory
- Increase of occurrence of droughts and the extreme low water period.

Intensive climate change is being recorded over the whole Central Asia, average rate of warming for the different territories ranges from 0.1ºC (Tajikistan) up to 0.29ºC (Uzbekistan) during ten years which is more than twice of warming rate in average over the globe.

The demonstrative regional indicators of climate change are also the changes in the frequency of occurrence of the high air temperature. Thus, for example in the region surrounding the Aral Sea (Priaralje) the number of days with air temperature higher 40°C increased twice, while over the rest territory of Uzbekistan it increases 1,5 times in average.

The detected indicators of climate change show the reduction of snow reserves in mountains and degradation of glaciation, extension of duration of the dry hot period, increase of occurrence of the extreme events such as mudflows, droughts and the extreme low water period.

The trends of the reduction of snow reserves in the basins of the mountain rivers of the region are observed. Besides, the recession of glaciers continues with rate of 0,2% - 1% a year.

Future changes of water resources are determined by two main factors – climate changes and anthropogenic activities.

It is quite evident that the estimated volumes of flow and precipitation are determined by the models, scenarios and methods while the estimates of the climate impact on the river water resources for different scenarios of temperature and precipitation vary rather widely.

Perspective estimation of the water resources of the region with regard of climate change shows that none of the considered climatic scenarios envisages the increase of existing water resources. The results of calculations demonstrate that up to 2050 the volume of river flow in Amudarya river basin will be reduced to 10-15% and that of Syrdarya to 2-5%.

For the long-term perspective it is estimated that the intensive reduction of snow reserves and glaciers as well as temperature rise will cause the water deficit which results in deepening of many ecological and social-and-economical problems and can trigger destabilizing impact on the food safety. With the intensive growth of population and need of the increasing of agricultural production the expected climate warming (from 3ºC up to 6ºC) can cause the additional negative aftereffects and result in the additional deficit of water resources.

Global warming will further contribute to the increase of number of the extreme weather conditions in the region, i.e., the periods with droughts and high summer temperatures, changes in the regime of the formation of water resources which can cause the additional consequences in the basin of the Aral Sea and especially, in Priaralje.

Assessment of the changes of precipitation and air temperature in the basins of mountain rivers and calculations of snow reserves made with hydrological models show that the extreme low water period is reordered with deficit of precipitation and with the increased air temperature in January - March. In this period there is no sufficient snow accumulation which results in flow deficit in vegetation period.

In dry years the situation with water resources becomes drastic. In such years the extreme manifestation of climatic variability can cause substantial losses in agricultural production and provision of population with water. With this it is important to take into account that expected climate changes will result in the higher occurrence and severity of the extreme drought event. During the dry years the quality of surface water is deteriorated by mineralization and microbiological indices.

Assessment of the maximum deep dry water period on the base of the extreme climatic scenarios shows that vegetation flow in Amudarya and Syrdarya river basins during drought can lessen to 25-40%.

By the results of studies it follows that the warming in Central Asia is accompanied with the deepening of the extreme weather features, in particular – with the increase of occurrence of heavy precipitation. The higher occurrence of heavy precipitation is observed over the stations in the foothills and mountains. Growth of precipitation variability and the increase of number of days with the intensive precipitation will cause the strengthening of the mudflow activity and widening of zones of potential risk, especially, in the river floodplains and the foothills.

The intensive rains are the causes of formation of mudflows as well as the outbursts of the alpine and moraine lakes, often induced in the result of the intensive snowmelt. The most mudflow prone period is March - July. Often the formation of mudflows is of transboundary nature, they take their origin on the territories of neighbor countries while the negative consequences are manifested on the territory of Uzbekistan.

The conducted assessment demonstrated that:
• Foothills and mountain areas of Central Asia are mudflow and avalanche prone.
• In more than 80% cases the main factors causing mudflows are intensive rains.

According to scenarios it follows that:
• the increase of occurrence of mudflows up to 2050 to 15-20% is expected
• probability of avalanching can be reduced about 1,2-1,3 times up to 2050

Basing on the material presented above the following conclusions can be made:
• Increase of precipitation variability will result in increase of number of days with heavy precipitation. Future risks under the effect of mudflow activity on rivers will intensify.
• Dangerous zones in the river floodplains and low river terraces will be extended, the destruction of banks, deformation of river beds, deposition of mudflow masses and dam occurrence are possible.

By the calculated climatic scenarios the increase of air temperature in Central Asia from 2,8°C (Turkmenistan) to 7,1°C (Kyrgyzstan) up to the end of XXI century is expected which will result in the increase of risks in agriculture.

With climate change in the region the high natural dryness will preserve, by several scenarios possible increase of precipitation will be completely compensated with the increase of evaporation over the plain and foothill territories, the regime of watering and irrigation norms will be changed. Increase of irrigation norms up to 2050 can be 7-10% more, while up to 2080 it can be 12-16% more.

Increase of evaporation due to the intensive rise of air temperature will deepen the dryness of climate, will cause water losses in irrigation zones which result in the reduction of productivity of agricultural crops. In the conditions of climate aridization the risks in agriculture will be related to the more strict demands for water, decrease and loss of the crops' productivity caused by the air drought, irrigation deficit, land degradation, deepening of the water and wind erosion, soil salinization.

The factor which worsens the situation in the Aral Sea basin in relation to climate change is reduction of water resources which, in turn will result in prolongation of period of the dry hot span, more frequent occurrence of droughts, worsening of all kinds of the land degradation (salinization, erosion, salt-and-dust transfer from the dried part of the Aral Sea, etc.) and deepening of desertification processes.

Currently the following consequences of this ecological catastrophe are manifested:
• Zone of Priaralje has lost its capacity of nature resources for the long time. During the last decades a lot of the natural fresh lakes disappeared, the area of tugais was reduced twice. Degradation of biological diversity is still going on.
• Bared sea bottom has formed the salt desert – Aralkum from which a lot of salt and dust with the sand particles is spread by the winds every year. The mass of dry fallouts varies from 500 to 2702 kg/he a year in average.
• Intensive salt-and-dust transfer deepens salinization of arable lands and pastures

Decrease of flow of Amudarya and Syrdarya rivers will deepen the Aral crisis in future.

The Aral crisis became not only the inner problem of the region but it involves the interests of other countries. In the global scale Aral crisis is the analogue of situation which can arise in many regions of the world in the conditions of the global climate change.

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THE MODERN ECOLOGICAL PROBLEMS OF THE TRANSBOUNDARY RIVER ZARAFSHAN

The Zarafshan river begins in the territory of Tajikistan from the Zarafshan glaciers, at the altitude of 2,800 m. Length of the river is more than 870 km. The maximum water discharge is in July (250-690 m3/sek), the minimum is in March (28-60 m^3/sek).

The River is the basic source of water supply for more than 7 million population. The basic consumers of water resources of the river are first of all the agriculture, then power and the industry of region.

The analysis of a long-term water-economic situation in Zarafshan river basin shows, that at an existing level of an agricultural production, technique, technology and the organization of management by use of water, water resources of the river are completely exhausted.

The Republic of Tajikistan is going to realize the complex program of using the Zarafshan river water resources for the irrigation-power purposes and according to which building of the cascade of hydroelectric stations with volume of water reservoirs nearby 3,5 км^3 is planned.

Building of a complex of hydraulic engineering constructions can change a climate of Zarafshan river basin in the territory of Tajikistan, raise technogenic loading on the Zarafshan glaciers. Reduction of the area and volume of the glaciers will lead to essential reduction of the runoff of the river and that will naturally cause complications to the social and economic situation in the territory of Uzbekistan.

Uzbekistan, having joined the Conventions on transboundary waters, has proved the respect and adherence for norms and principles of the international water law which can be seen in the decisions regarding water questions. Hence, it is necessary to start preparation of interstate legal documents on establishment of the status of the Zarafshan River, and on conditions of joint rational use of Zarafshan river basin water resources.

Problems of protection and sustainable use of transboundary water resources of the Zarafshan River basin concerns interests of the people of two neighbouring countries having deep historical, economic and cultural relations, and these problems should be dealt with the account and application of the international legal mechanisms.

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IMPACT OF SUE TALCO ON THE HEALTH OF THE POPULATION OF SURKHANDARYA REGION

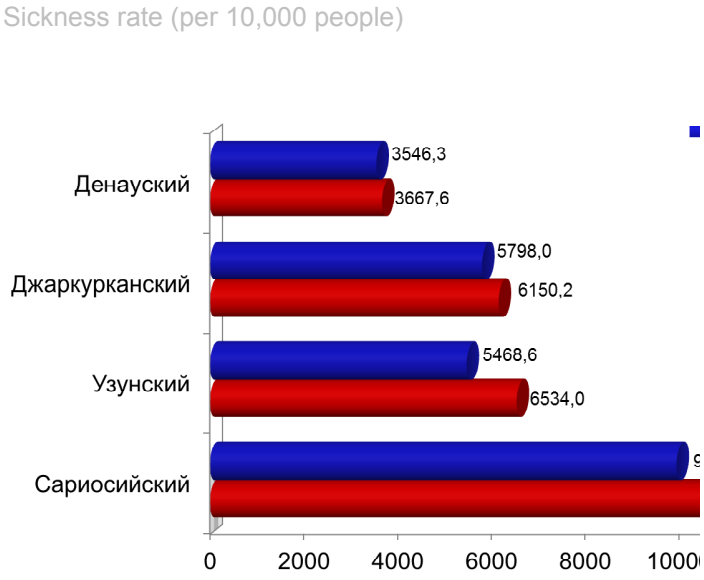
During the recent decades Uzun, Saraasiysk and Denau districts of Surkhandarya region have been facing harder and new negative impacts on the health caused by environmental challenges. It should be noted that the area affected by the emissions of SUE TALCO inhabited not only by healthy

people but those with chronic diseases as well as those predispose to chronic diseases.

Current casual factor (emissions of the SUE TALCO) in many cases makes a risk of being affected by various diseases. Expeditionary studies of the impact made by SUE TALCO on population's health have been conducted by the ministry of Healthcare of the Republic of Uzbekistan and Ministry of Healthcare of the Republic of Tajikistan.

The outcomes of the studies obtained by both Uzbek and Tajik specialists are the same. People attend health facilities more often with complaints on respiratory, gastrointestinal and endocrine diseases, blood and hemopoietic organ diseases. Analysis of dental diseases in both studies revealed high extent of oral cavity diseases (teeth and jaw affected) particularly by dental fluorosis, which is a specific occurrence of fluorine.

Therefore current emissions of the SUE TALCO negatively affect health of the people living both on the territory of Tajikistan and Uzbekistan.



Complexity of the environmental pollution affecting health puts an issue of the need for reliable health indices to be used for solution of some challenges to the human ecology and environmental hygiene.

Since no similar studies have been conducted in the Republic for the retrospective analysis we used official statistical form submitted by the health facilities on appeals of the population for medical care.

In-depth analysis was conducted by three regions of Surkhandarya region most affected by the emissions of the SUE TALCO in 2007-2009. The analysis outcomes demonstrate prevailing of indicated diseases in Uzun, Sariassiysk and Denau districts. General sickness rate in those regions are different from the average one in the Uzbekistan.

The ranking of the health problems faced by the people living in Denau district demonstrates that the leading positions are occupied by respiratory diseases 21,4%, gastrointestinal 13,8%, endocrine 19,6%, blood and hemopoietic organ diseases 17,0%.

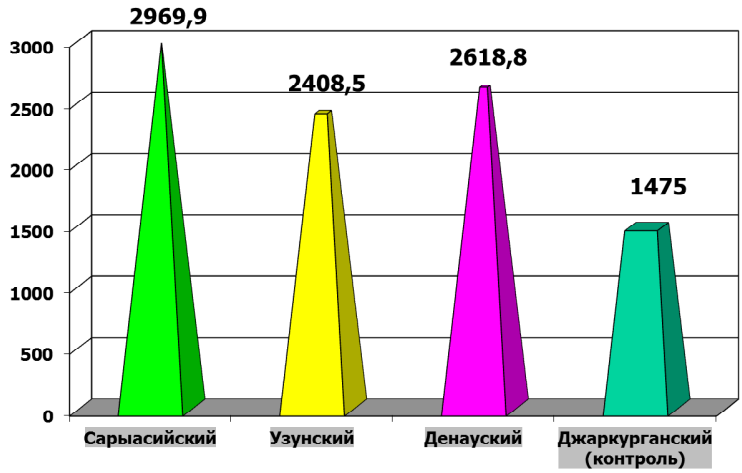
In Uzun district in 2009 respiratory diseases constituted 6.2%, gastrointestinal 8.4% , endocrine system diseases 12,5%, blood and hemopoietic organ diseases 35.3%.

In Sariassiysk district situation was almost the same respiratory diseases 27.1%, органов gastrointestinal 10.7%, endocrine system diseases 14.3%, blood and hemopoietic organ diseases 16.5%.

In 2007-2010 Uzun, Sariassiysk and Denau SEO conducted 1,000 soil tests. 637 of them contained anhydrous hydrogen fluoride, 4 of them exceeded the possible concentration (10 mg per kg).

Moreover some tests were conducted in the open-air reservoirs. Totally 1506 tests were conducted. 337 of them contained anhydrous hydrogen fluoride; of 3667 studied water samples 16 contained anhydrous hydrogen fluoride within the acceptable norms of concentration (0.75 mg per lire). Totally 3,084 air samples have been tested, 2,159 of them contained anhydrous hydrogen fluoride including 395 samples with the volumes exceeding the maximum permissible level (0,012 mg. per kg.). 4 control stations are arranged on the territories of Sariassiysk and Denaum districts, 7 stations are arranged on the territory of Uzun district. The stations identify residual volume of anhydrous hydrogen fluoride, carbon monoxide, sulfur oxide.

Sickness rate among the women at fertile age (by visits to the health facilities)



Uzun district population, especially children suffer endocrine system diseases, digestive disorders, metabolic and immunity disorders. The rating of the most serious health problems in Surkhandarya region complies with the general health problems across the country but differ by the ratio in the total structure of the sickness rate. The main nosological forms are chronic diseases of the upper air passages (tonsillitis and adenoids), chronic bronchitis, anemia by various etiological factors as well as adenoma of thyroid. Analysis of the specific pathologies in 2007-2009 in Sariasiysk district caused by fluoride compounds demonstrated sustainable spread of fluorosis among the population as a whole and within specific age groups particularly. In 2009 fluorosis among children (0-14) was 6.1%, (in 2004 - 4.2%), teenagers (15-17) -12.6%, (in 2004 – 10.3%), adults – 3.6%, (in 2004 – 3.1%), total population – 3.7%, (in 2004 – 3.1%).

The range of nosological forms of malignant neoplasms appeared during the recent years is characterized by high rates of lymphosarcoma , esophageal carcinoma and malignant neoplasms of musculoskeletal system.

Numerous impacts by fluoride is explained by the fact that fluorine ion is biologically active and binds such metals and metalloids as magnesium, manganese, copper, iron, cobalt, calcium, iodine, etc. which play an important role in most enzyme systems functionality. That is whay diseases caused by iodine deficit in the inhabitant area is one of the most widespread non-infectious diseases among children and adults. It is widely known that adenoma of thyroid can be provoked by some etiological and pathogenetic factors, particularly combination of various thyroiditis factors including the natural iodine deficit, microelement disbalance, man-caused chemical load, immunity impairment, small radiation doses.

Healthcare management and health protection of a human and the whole nation is a complicated process which is beyond healthcare system only joining economy, social policy and ecology.

In this regard current situation requires formulation of a special interstate programme on in-depth analysis of the impact made by the emissions of the SUE TALCO in environment and the

health of the population living on the territory of Tajikistan and Uzbekistan aimed at elaboration of the measures on improvement of the ecological and sanitary situation in across the region.

Darcey O'Callaghan

International Policy Director
Food & Water Watch, USA

THE GLOBAL FRESH WATER CRISIS: ACTIVISM, TRENDS AND ALTERNATIVE MODELS

Water is increasingly being referred to as the "oil of the 21stcentury" or "blue gold," which speaks to increasing global awareness of fresh water limitations. We have the technology and the know-how to solve this problem, but, we have not had the collective political will to address the complex multi-layered drivers of the crisis. They include water scarcity, population growth, pollution, misuse of water resources and long-standing economic injustices.

Climate change is causing glaciers to melt, and they store about 75% of the world's freshwater. This is predicted to not only cause the seas to rise about 230 feet, but the freshwater trapped in glaciers will become salty as it melts into the ocean. Pollution is another main driver of the water crisis of which toxic chemicals are a main source. Of the almost 10 million chemicals known today, approximately 100,000 chemicals are used commercially for agriculture, industry and household use. What's more, many poor countries are using their most productive land to grow cash crops for export, regardless of the impact on water depletion and the ability to feed the local population. This is referred to as "virtual water" trade.

We are also seeing a widening chasm between the way urban and rural water systems are managed. Multinational corporations compete to sign five- to 30-year management contracts in urban areas where population density allows them to earn a profit. They have no interest in rural areas where too much infrastructure outlay would be required to earn a profit.

In reaction to these conditions, the Global Water Justice Movement is organized as a vast web around the globe and generally coordinates through regional networks. We have the Africa Water Network, the European Public Water Network, the Red VIDA Network of the Americas, and several coordinated groups working in Asia. The strong efforts of these networks have led to the right to water being included in state constitutions and the passage of resolutions declaring water a human right at the U.N. General Assembly and the U.N. Human Rights Council. We have also successfully fought back water privatization in many localities.

The promising new trend of Public-Public Partnerships in water service provision is now gaining traction. PUPS can come in several forms but are typically developed as a contractual relationship between a well-functioning water utility company and a less efficient company for the purpose of sharing best practices in all aspects of water provision: technical capacity, management, financing, etc.

Momoko Chiba

Tokyo International University of Health and Welfare Graduate School, Japan

HEALTH CONDITION OF CHILDREN NEAR THE ARAL SEA

Water is the minimum requirement for not only human beings but also all organisms. About 11

x 10^8 people on the earth use drinking water without any treatment at present. In the south side of the Aral Sea (Uzbekistan) each house has water supplying pipe. Water samples were collected in various places in both Uzbekistan and Kazakhstan, and quality was tested. Sodium concentrations were high. It may have correlation with renal functions. Bacterial contaminations were found especially in summer. If every body can use sanitary water, prevalence of diarrhea and other intestinal diseases may reduce.

Prevalence of respiratory dysfunction was higher in children living near the Aral Sea than those in 500 km far from the Aral Sea. The results of soil analyses sodium, magnesium, chlorine, and sulfur-oxide concentrations were high, and main particle sizes were mainly 2.5 to 10 micrometers. Prevalence of anemia was high, but not so severe cases. Nutrition education to mothers was effective. It looked like according to improvement of home or regional economical conditions, the prevalence reduced.

There are characteristic climate in each region. Local residents are accustomed to natural conditions. They have cultivated living vitality. In case rapid change or large scale change of environment even it is not rapid, entire ecology is affected. In case of human beings first health problem appears in infants and old generation. Especially children at present are owing the next world. Children must be healthy, tolerable body to environmental change, strong homeostasis. Help by adult is necessary.

Reduction of the Aral Sea is not only the water problem as they know. Water problem will increase more and more all over the world. For example the down stream of the River Mekong in future, maybe. Uzbekistan faced big water problem. Ecological Movement in Uzbekistan takes the initiative in carrying out the plan of water management widely.

Hans-Guido Mücke

WHO Collaborating Centre for Air Quality Management and Air Pollution Control (WHO'CC)

HEALTH AND MONITORING ASPECTS OF TRANSBOUNDARY AIR POLLUTION

International cooperation on air pollution abatement has proven to be successful in the UNECE region –including Eastern Europe, Caucasus and Central Asia/EECCA- within the framework of the Convention on Long-Range Transboundary Air Pollution (CLRTAP). The convention is unique and covers most of the Northern Hemisphere, from Vancouver to Vladivostok. Specific obligations for pollutants such as SOx, NOx, VOC, POPs etc. are stipulated in individual protocols. Efforts need to be made to assist new Parties to implement the Convention and to make it possible for more countries to ratify and implement the CLRTAP and its protocols in EECCA.

The Joint Task Force on the Health Aspects of Air Pollution (TFH, operated by the European Centre for Environment and Health of the World Health Organization/WHO, Bonn office, Germany) supports the CLRTAP with latest scientific results, knowledge and advise on human health impacts of air pollutants, e.g. ozone and particulate matter (PM). Recent research reports on health effects of ozone, particularly epidemiological time series studies, have confirmed the association between ozone and daily mortality, independent of the effects of PM. The relation of cardiovascular effects with short- and long-term exposure to PM2.5 is causal. Those studies confirm and strengthen the conclusion of the WHO Air Quality Guidelines – Global Update 2005.

To assure the comparability of the results from air quality monitoring conducted by various national networks, intercomparison workshops of methods for assessment of concentrations of inorganic gaseous pollutants is routinely performed on an international level. Since more than a decade the WHO'CC, Berlin, Germany, conduct an international programme on quality assurance and control for air quality measurements for the 53 Member States of the WHO European Region. Responsible laboratories from EECCA countries, for example from Albania, Ukraine and Uzbekistan

are frequent participants on a routine basis.

David O. Carpenter

University at Albany, USA

HEALTH EFFECTS OF PERSISTENT ORGANIC POLLUTANTS IN CENTRAL ASIA

Usually the chronic diseases of older age, such as cardiovascular disease, hypertension and diabetes, are considered to be diseases of life style, resulting from poor diet and physical inactivity together with a genetic component. These diseases have traditionally not been linked to exposure to environmental chemicals. However we and others have now provided strong evidence for a remarkably large association between serum levels of chlorinated pesticides and risk of diabetes and heart disease, and serum levels of PCBs and rates of hypertension. These persistent chemicals have also been found to increase risk of endocrine diseases, such as hypothyroidism and sex hormone-dependent diseases. There is limited information about levels of these compounds in Central Asian residents, but reason to suspect that exposure is high and that these compounds influence rates of chronic disease.

S.S. Sanginov

Executive Committee of the Advisory Panel,
Ecological Movement of Uzbekistan

PROBLEMS OF BIODIVERSITY AND NEGATIVE IMPACTS ON THE GENE POOL OF FLORA AND FAUNA IN ECOLOGICALLY POOR REGIONS OF MIDLLE ASIA

Ecological Movement of Uzbekistan actively involved in projects aiming at the development of protected natural areas, preserving the gene pool of rare and endangered plant and animal species in ecologically disadvantaged regions. In 2009, together with the ECO Forum and the local NGOs two projects have been implemented - “The implementation of projects and programs of NGOs, aimed at protecting the health and gene pool of population, flora and fauna of the Aral Sea and Aral Sea region, the development of environmental education and training, effective and rational use water resources, land-reclamation “and” Implementation of environmentally sound renewable energy sources (solar, wind, biogas, etc.) cadastral activities protected areas, infrastructure development, eco-tourism, work on waste disposal”.

Projects have promoted the implementation of effective methods of natural resource use, resource activities, and water-saving technologies in the Aral Sea, the public in remote areas of the Republic of Karakalpakstan near protected natural areas engaged in efforts to protect populations of endangered species of flora and fauna of the region; for uninterrupted electricity supply hatchery rare and endangered species of wild birds in the nursery “Sayhun” Sayhunabadskogo district Syrdarya commissioned solar plant with capacity of 300 watts, thereby creating the conditions for stable operation of the hatchery during electricity outages from network for development of ecological tourism undertake the necessary work to create a pilot visit center in the Eco-Center “Adelia” in Bukhara district of Bukhara region, the visitor center purchased office equipment and furniture, to work on organizing ecotourism acquired optical equipment and camping equipment, developed ecotourism routes in the new territory Ecocenter “Adelia”, dedicated Ecocenter Municipality of Bukhara area. This will facilitate the development of ecotourism, not only in Ecocenter, but also in other protected areas.

In the course of the project an inventory of flora territory Eco-Center was carried out, special equipment was purchased, thus improving the efficiency of research at the center.

The results of these projects demonstrate the contribution of non-governmental environmental organizations in the preservation of the delicate balance of diversity of flora and fauna in the region

and the need to step up joint efforts of government, international and non-profit organizations in this direction.

But these efforts would not yield results if the process of environmental degradation in the Aral Sea region will progress. And one of the risk factors in this regard is Rogun, a consequence of which will be deterioration of the gene pool of flora and fauna, the disappearance of large areas of riparian forest, the sharp decline in biodiversity in the lower reaches of the Amu Darya.

This factor must be considered in conjunction with another factor - the transboundary environmental impact of northern Surkhandarya industrial emissions of the State Unitary Enterprise "Tajik Aluminum Company (SUE TALCO). It is connected with the main purpose of Rogun HEP: production of electricity for the provision of new industrial capacity in aluminum production for the company. The increase in aluminum production will increase total emissions of pollutants, including the emission of one of the most dangerous ingredient for wildlife and vegetation - hydrogen fluoride.

Accumulation of fluorides in the environment will cause an even greater violation of the balance of synthesis and mineralization, the occurrence of mutational processes in plants and animals lead to a reduction of species diversity.

In Rio de Janeiro Declaration on Environment and Development, Principle 2 states that "in accordance with the UN Charter and principles of international law, the sovereign right to exploit their own resources pursuant to their policies on environment and development and are responsible for ensuring that that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond national jurisdiction". Responsibility of each country - not only to comply with this principle, but also guarantee no damage to the environment, biodiversity and gene pool of flora and fauna on the territory of neighboring countries

R.Khakimov, V.Berezhnova

Uzbek Research Institute of Vegetables, Gourd Crops and Potatoes

EFFECTS OF ENVIRONMENTAL POLLUTION IN THE AREA OF THE SUE TALCO ON YIELD AND QUALITY OF VEGETABLE CROPS

Uzbekistan pays great attention to the stability of the ecological situation in the region. In this connection important question is the study and possibility to reduce the negative impacts caused by the performance of SUE TALCO.

Area of negative impact SUE TALCO extends to the region, where more than 560 thousand people live. The company has negative impact on the ecological situation in the region.

The results of studies conducted in 2007-2009 showed that emissions of aluminum production negatively affect the synthesis of carbohydrates in the leaves of vegetable and melon crops, resulting in the leaves decreased carbohydrate content of 10-12% and as a result - reduced their quality and productivity.

It is established that depending on the variety of cultures accumulation of fluorine in fruits varries. Thus, tomato pulp grades Dustlik contained 3.8 mg/kg of fluorine in the seeds - 1.2 mg / kg in fruits of tomato varieties Surkhan - respectively - 4,0 and 4,4 mg / kg. In the clean area, these figures were equal to 2.0 and 1.9 mg / kg.

At heavily contaminated hydrogen fluoride area yield of tomato decreased in 26,7-45,2%, cucumber - by 32,4% cabbage - by 83,6%, table carrot - by 22.3%. Estimated dates for 2009 shows that the economic damage, depending on the culture may be from 950,000 to 4,849,000 sum/ hectare.

TASHKENT ECOLOGICAL DECLARATION

adopted based on the outputs of the International Conference "TRANSBOUNDARY ECOLOGICAL PROBLEMS OF MIDDLE ASIA: APPLICATION OF INTERNATIONAL LEGISLATIVE MECHANISMS FOR THEIR SOLUTION" November 16-17, 2010

During the last 30 years the transboundary ecological problems in Middle Asia became acute which is determined not only by the objective climate changes but also by the negative anthropogenic impact on nature.

The construction of the big hydraulic works which changes the regime of the natural flow of the major waterways of Middle Asia – Amudarya and Syrdarya, as well as irrational use of water resources became the reasons of the irreversible global catastrophe in the zone of the Aral Sea which is irreversible.

Negative impact on the environment, health and gene pool of population, flora and fauna of the region is being caused by industrial enterprises using the obsolete technologies which do not comply with the international ecological standards, having been built in Soviet period and not modernized up to now.

Participants of the International Conference "Transboundary ecological problems of Middle Asia: application of international legislative mechanisms for their solution" after comprehensive discussion of issues of transboundary water courses of Middle Asia, problems of transboundary environment pollution and their impact on the gene pool of population, flora and fauna of the region have made the following conclusions and recommendations:

Conclusions:

1. Among the most important problems of provision of security of the Middle Asian states are the degradation of environment and climate changes caused by the negative anthropogenic impact on nature as well as the need in the rational use of transboundary water resources to prevent further break of the fragile ecological balance in the region are the most acute ones.

2. Irrational use of water resources followed by the change of flow regime of Amudarya and Syrdarya rivers that took place during the last decades caused one of the most crucial global ecological catastrophes – drying of the Aral Sea.

3. Irreversible damage to the environment can be caused in the context of the attempts of states in the upper reaches of the basins of transboundary rivers and by the realization of the large-scale projects developed 30-40 years ago implying the construction of hydraulic works with the giant dams planned during the Soviet period. Participants of the conference note that any decrease of the flow of these rivers will mean the radical break of the existing ecological balance on the territory of the vast region. This can lead to the enlargement of the zone of disaster, increase the areas of salinized lands not usable for agriculture and for living, the new losses of flora and fauna at the Aral Sea area, and create menace to the health and gene pool of population.

4. The effective management of transboundary water resources in Middle Asia is impeded by the condition that two states of the region located in the upper reaches of the main water ways still did not accede to international UN Conventions on transboundary water ways.

5. The conducted studies reveal that harmful industrial emissions to the environment made by the aluminum production during the last 35 years resulted in very negative effects on the health

and gene pool of population living in the northern regions of Surkhandarya province of Uzbekistan, caused negative impact on the flora and fauna, on the quality and productivity of agricultural crops, including food products.

Recommendations:

1. States of the region should strive for transboundary cooperation in accordance with the key documents of international law including UN Conventions «On the protection and use of transboundary water courses and international lakes» (1992) and «On the right of unnavigable forms of using of international water courses» (1997) which determine the main principles of the use of transboundary rivers and within their relevant territory should use transboundary rivers in fair and rational way and avoid damage to the other states of transboundary water course.

2. The construction of any big hydraulic work in upper reaches of transboundary water courses of Middle Asia should be advanced by the independent international technical and ecological expertise being performed on the transparent basis for the sake of interests of population and rational use of nature by all states in the region.

3. International ecological organizations should contribute to the public consideration and the transparent activity of the International financial institutions and organizations in all cases when they work out the decision on the financial support of the big hydropower projects in the states of the region, especially on transboundary rivers.

4. International financial institutions and organizations should facilitate strengthening of ecological stability of the region including also honest attempts for the cooperation with civil society of all countries in the zone of the project action before the approval of these projects and openness of dialogues to give possibility to people whose income sources or houses can be damaged by the project to express their concern and to reject implementation of project which did not get wide public support in the whole region.

5. None of the projects of hydraulic works construction in upper reaches of transboundary rivers or big industrial facility which affects the environment should be approved in case it worsens the life of population or has negative effect on the territory of neighboring countries. It is mandatory that not only the gains of beneficiaries from the project but also the rights of population of neighboring countries in the zone of the project impact should be regarded.

6. Before taking the decisions on the erection of facilities which have transboundary impact it is necessary to present the comprehensive and timely information in the printed and electronic mass media using clear language understandable for population in the zone of the impact of the worked out projects.

7. According to recommendations of international ecological organizations and of the World Commission on Dams it follows that for Middle Asia it is more rational to change for creation of the less dangerous but more efficient small hydropower stations which can provide the same power capacity. At the same time it is necessary to strive for the selection of alternative energy sources, including solar and wind ones.

8. Participants of Conference determine the following important directions of cooperation of international community in the solution of the following social and ecological problems of the region:

- supporting states of the region in regard to the issue of improvement of health and protection of gene pool of population, easing their access to clean fresh water, improvement of sanitary and

hygiene conditions, decrease of the sickness rate, infant and mother mortality, improvement of environment protection;

- facilitating the states of the region consuming water resources of transboundary countries for drinking and irrigation purposes, in their efficient use via the reduction of ungrounded losses, introduction of progressive technologies of irrigation, integrated management of water resources which complies with the demands of balance between the requirements in the area of the preservation and reconstruction of functions of the fragile ecosystem in the Aral Sea region and other needs including agricultural and industrial ones.

9. Participants of the conference consider that the most important tasks of the states of Middle Asia are the following ones:

- avoidance of artificial reduction of the flow volumes and regime of transboundary rivers into the Aral Sea which worsen ecological situation in the Aral Sea region, health of population and living conditions of the people in this region;

- implementation of measures on restraining desertification and soil salinization through forestation and other agrotechnical and special measures in the zone of ecological disaster;

- creation of conditions for increasinge employment and incomes of the people residing in the zone of ecological disaster through development of small business, first of all – low water-consuming industrial and agricultural production sectors, sphere of services.

10. Participants of the conference apply with appeal to ensure measures needed for installation of filtering equipment enabling accordance of emissions with international standards which will provide improvement of ecological situation in the zone of the current negative impact of aluminum production.

Participants of the conference address:

- the governments of the states and international organizations with appeal to unify their efforts in solution of the transboundary problems and mitigation of ecological menaces related to the construction of hydraulic works in the upper reaches of transboundary water courses in the Middle Asia and extension of aluminum production in the region;

- the international ecological organizations with appeal to support Ecological Movement of Uzbekistan in its activities on the environment protection considering transboundary impact as well as to contribute the involvement of wide public into this process, to encourage promotion of ecological culture, education and professional training, get involved into international cooperation for the sake of the protection of Nature and Human Being.

COMMENTS
OF THE FOREIGN PARTICIPANTS OF THE INTERNATIONAL CONFERENCE "TRANSBOUNDARY ENVIRONMENTAL PROBLEMS IN MIDDLE ASIA: APPLICATION OF INTERNATIONAL LEGAL MECHANISMS FOR THEY SOLUTION"

Radha D'Souza, Professor, University of Westminster (UK):

- We visited to the Aral Sea region - particularly Muynak area - and got acquainted with the current environmental situation there. It is a pity that the coast of the Aral Sea, once considered one of the most beautiful seas in the world, become a "graveyard of ships". Indeed, today the Aral Sea crisis has become a problem for the world. In order to prevent such ecological disasters, to provide normal conditions for living and working population of this vast territory, we must all work together. After all, nature does not mean destruction, we must live in harmony with nature.

During the trip, we were convinced that the Ecological Movement of Uzbekistan is making a worthy contribution to solving the problems of the Aral Sea and mitigation.

Uzbekistan has made an indelible impression on us with its rich culture, traditions and national values.

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Bella Krasnoyarova, Senior Researcher, Institute of Water and Ecological Problems, Russian Academy of Sciences, Doctor of Geographical Sciences:

- Today, environmental problems are becoming relevance not only for Uzbekistan but also all over the world. I consider an extremely useful and expedient to hold an international conference "Transboundary environmental problems in Central Asia: the application of international legal mechanisms to address them.

We saw for themselves the large-scale damage inflicted from the use of obsolete technology aluminum plant in Tajikistan on the population Sariasiyskogo in Surkhan. Suffered not only the ecology of the area, but also suffered heavy damage its economy. Uzbekistan to address the problem holds extensive and sound work. It is very important to draw the attention of the international community to stabilize the situation in the region.

During his visit to Uzbekistan, looking at the modern lyceums and colleges, built in even the most remote villages of your country, I sincerely admired. I am very pleased attention the government of Uzbekistan to create the conditions for deep education for young generation.

* * *

Boyko Nitsov, Director, the Center of the Eurasian "Dinu Patriciu", the Atlantic Council of the United States:

- To date, the negative impacts associated with the desiccation of the Aral Sea, have become a global environmental problem not only for Uzbekistan but throughout Central Asia. In this again I see firsthand, having been in Muinak area. Uzbekistan carries a great job to improve the situation in the Aral Sea. Implemented a number of major targeted programs and projects to stabilize the environmental situation in the Aral Sea region, the economic development of the region, improve public health and social support.

To address the implications of this global environmental disaster need to act internationally, to

involve the general public - in other words, to further strengthen international cooperation.

* * *

Ho Seck Song, Director of the National Institute for Environmental Studies (South Korea):

- Addressing serious environmental problems prevailing in the Aral Sea region is important not only for people living in this region, the Central Asian states, but also all over the world. Rising into the sky of dust from the dried Aral Sea bed has a negative impact on the global environment. Noteworthy is the fact that Uzbekistan has taken the necessary steps to address this problem. I note that there should be further enhanced international cooperation.

It is gratifying that your country's independence by a lot of work to mitigate the Aral Sea tragedy, improve the living conditions of the region, especially the health of mothers and children.

I would like to emphasize that Rogun poses a serious threat to the entire region. Before constructing such facilities, it is necessary to objectively and professionally investigate possible effects of such projects.

* * *

Wim Cofino, Director, Center for Water and Climate Wageningen University (Netherlands):

- Conference was a good opportunity to discuss such pressing issues as the crisis in the Aral Sea, toxic emissions from an aluminum plant in Tajikistan, spread by wind, ground and surface waters in many parts of the Surkhandarya region, construction of hydraulic projects in the upper Amu Darya.

Before you implement any cross-border project, each country must reach a mutual agreement with neighboring states. No country in pursuit of their interests must not jeopardize the border states. International law requires that before the construction of large structures, such Rogun in Tajikistan, the project must undergo an independent international expertise, and all its aspects - were studied in detail.

* * *

Maria Teresa Almozhuela, Diplomat (Philippines):

- Environmental problems know no boundaries and can not choose the States. We have seen that the harmful substances emitted to the atmosphere of an aluminum smelter in Tajikistan, much destroy the ecological balance in southern Uzbekistan. And it's painful impact on people's lives. Prevention of environmental problems and reduce negative impacts on the environment requires mutual cooperation and joint action.

By tracing the ecological situation in Sariasiyskom area, we noted that the toxic smoke from the chimneys aluminum plant in Tajikistan with the wind is transferred to the territory of Uzbekistan. Emitted toxic chemicals - fluoride - causes great harm to human health, especially women and children. According to livestock farmers, in cattle there is tooth loss. This problem must be addressed urgently.

* * *

Hashim Jalal, Director of the Center for Southeast Asia (Indonesia):

- A difficult situation that arose in the area Sariasiyskom Uzbekistan under the influence of emissions aluminum smelter in Tajikistan, has caused me deep regret. In such a situation can not remain indifferent. We have seen that the government of Uzbekistan is making consistent efforts to stabilize the environmental situation. However, long-term solution to this problem - it is not only in Uzbekistan. All the world must unite and find a solution. No state for the sake of their own interests has no right to endanger another country.

Reforms and the initiatives of Uzbekistan to improve the environment in Sariasiyskogo area, reducing the harm caused by an aluminum smelter in Tajikistan environment, health promotion and work to attract the international community to address these issues are worthy of high recognition.

* * *

Vittorio Giorgi, Head of the Union of Historical Areas in Europe (Italy):

- International conference “Transboundary Environmental Problems in Middle Asia: Application of International legal Mechanisms for Their Solution” has provided an important opportunity to exchange views on important global issues - environmental crises, mitigating and eliminating their consequences. Debated in this forum Transboundary environmental problems in Central Asia is a problem not only in this region and around the world. Therefore, all the international community should be involved in its decision.

I think that it is necessary to take all measures to reduce the harm caused by the Tajik Aluminum Plant in Uzbekistan, and improving the current environmental situation.

For members of the Ecological Movement of Uzbekistan 15 seats in the Legislative Chamber of Oliy Majlis of Uzbekistan suggests that in your country pays great attention to environmental issues, ensuring environmental stability, strengthening public health.

Implemented wide-ranging reforms in Uzbekistan on democratization and liberalization of the country, the rights and interests, improving the activity of civil society and political parties are an important factor in solving regional environmental problems.

* * *

Carlos Fernandez-Jauregui, Director of Global Network for Water Assessment and Counseling of WASA-GN (Spain):

- Our company consults on use of water. Today, management and efficient use of water resources are one of the most urgent issues in the world.

The actions to solve the environmental problems of the Aral Sea basin states, the use of natural water resources, including streams of Amudarya and Syrdarya, should be based on mutual consent and beneficial for everyone. Issues of joint water management in the region should be solved on the basis of international norms. National interests of all countries in Central Asia must be taken into account.

* * *

Jean-Jacques Brian, Expert on Health, Disability and Food (France):

- Human health and life depend largely on the purity of air, water and soil, as well as products rich in natural and useful microelements. However, the Aral Sea salt dust reaches even the remotest areas, and toxic substances emitted by aluminum plant in Tajikistan destroy the natural balance in southern Uzbekistan, and all this causes serious damage to human health.

The Aral Sea tragedy has been worrying the world for many years. Tashkent international conference is crucial for the future of the region. Improving the current situation depends primarily on solving the problem of water use. Successive measures taken by Uzbekistan to settle the environmental issues serve to improve the situation. Joint effort, interaction of all states in the region and of all countries are very important.

* * *

Isabelle Loh, Chairman of the Singapore Environment Council:

- The drying of the Aral Sea as a result of reduced flow of Amudarya and Syrdarya is a striking example of how disastrous the consequences can be of irrational use of water resources. It is very distressing that along with loss of economic and ecological significance of the Aral Sea, huge salt dunes have been formed on the drying seabed.

In order to solve on the Aral Sea crisis, ensure sustainable development and improve the living standards of the people and the environmental situation, joint action by countries of Central Asia and representatives of international organizations is required.

* * *

Onur Orhan, Expert of the Ministry of Environment and Forestry (Turkey):

- International Conference on Transboundary Environmental Problems in Central Asia focused on the most urgent issue of today. Uzbekistan and Tajikistan should reach a mutual agreement on the activity of the Tajik Aluminum Company, which is one of transboundary environmental problems in Central Asia and represents a threat to human life, flora and fauna.

In Uzbekistan, I was the first time. Your country has left me a lot of impressions. I was filled with a deep sense of respect for your people - very friendly, cohesive and hospitable. I admire the unique architectural monuments.

LIST OF PARTICIPANTS

International and Intergovernmental Organizations
United Nations Development Program (UNDP)
United Nations Environmental Program (UNEP)
United Nations Children's Fund (UNICEF)
United Nations Educational, Scientific and Cultural Organization (UNESCO)
World Health Organization (WHO)
United Nations Economic Commission for Europe (UNECE)
The United Nations Regional Centre for Preventive Diplomacy for Central Asia
Council of the European Union
Organization for Security and Co-operation in Europe (OSCE)
International Federation of Red Cross and Red Crescent Societies
International Society of a Red Crescent
International Commission on Irrigation and Drainage (ICID)
International Fund for Saving the Aral Sea (IFAS)
Secretary of the Ramsar Convention
Himalayan and Central Asian Studies
India-Central Asia Foundation

International Financial Organizations
The World Bank
The World Wildlife Fund (WWF)
The International Public Fund of Ecology and Health "Ecosan"
The International Female Public Fund "SHARK AYOLI"

Embassies and Diplomatic Representatives
Embassy of the Republic Belarus
Embassy of Kazakhstan
Embassy of Indonesia
Embassy of the People's Republic of China
Embassy of India
Embassy of the Russian Federation
Embassy of USA
Embassy of Turkey
Embassy of Turkmenistan
Embassy of France
Embassy of Japan
United States Agency for International Development (USAID)
Japan International Cooperation Agency (JICA)
German Technical Cooperation (GTZ)

Universities, Research Organizations & Centers

Center for Global Scientific Publications (USA)

The State University of New York (SUNY, USA)

Center for the Development of Clean Environmental Technology (USA)

The Institute of Health and Environment at the University of Albany (USA)

University of Westminster (UK)

The Center of Water and Climate (Holland)

Institute of Economy of the Russian Academy of Sciences (Russia)

Institute of Water and Environmental Problems of the Siberian Branch of the Russian Academy of Sciences (Russia)

School of the International Researches (India)

The Center of Research of South East Asia (Indonesia)

National Institute of Environmental Research (Korea)

University of Tsukuba (Japan)

International University of Health and Welfare (Japan)

University of Toulouse (France)

Institute of the International Relations and Strategic Researches (France)

Agricultural University named after S.Niyazov (Turkmenistan)

Agricultural University Aksaray (Turkey)

Institute of Ecology and Alternative Energy of Ukraine

National Academy of Sciences of Ukraine

Other Organizations

Germany

WHO Collaborating Centre for Air Quality Management and Air Pollution Control at the German Environment Agency

Environment Law Centre, IUCN (Germany)

Japan

Japan Water Forum

Austria

Journal BCS, “Business, Culture, Sport”

Greece

Biopolitics International Organization

France

Association of NGOs of Paris Region

Italy

The Union of Historical Regions of Europe, URSE

Spain
Water Assessment and Advisory Global Network (WASA-GN)

Singapore
Singapore Environment Council, SEC
Environment Challenge Organization

Turkey
Turkish State Meteorological Service
DSI (General Directorate of State Hydraulic Works)
Ministry of Environment and Forestry, General Directorate of Nature Conservation and National Parks

Turkmenistan
Society of Wildlife Management of Turkmenistan

Latvia
Ministry of Environment of Latvia

Ukraine
Secretary of the Euroasian Association of Green Parties
Protection Society “Dnepr”
Open Join-Stock Company “Ukrhydroenergo”
Consortium OJC “Ukrhydroenergostroy”
Scientific Council “All Ukraine League”

Czech Republic
Company “Prote”
Foundation “Adra”

Republic of Korea
Korean Federation for Environment Movement

USA
NGO “Food and Water Watch”
Bank Information Center

Republic of Uzbekistan

Legislative Chamber of the Oliy Majlis
Cabinet of Ministers of the Republic of Uzbekistan
Ministerial Council of the Republic of Karakalpakstan
Ministry of Health
Ministry of Agriculture and Water Management
Ministry of Labour and Social Protection
Ministry of Foreign Affairs
Ministry of Economy
Ministry of Foreign Economic Relations, Investments and Trade
Ministry of Finance
The State Committee on Geology and Mineral Resources
The State Committee on Nature Protection
The State Committee on Geodesy, Cartography and Land Cadastre
The Center of Hydrometeorological Service at the Cabinet of Ministers of the Republic of Uzbekistan
National News Agency of Uzbekistan
“SANIIRI” the Research and Production Association
Center of Economic Research
Academy of Sciences of the Republic of Uzbekistan
Institute of Water Problems of Academy of Sciences
Institute “Uzhydroproekt”
Institute of Vegetable, Melons, Gourd Crops and Potatoes
Institute “Uzvodproekt”
Institute of Strategic and Inter – Regional Researches
The Tashkent Agrarian University
Institute for the Study of Civil Society
Institute of Monitoring of the Current Legislation
Institute of Zoology of the Academy of Sciences of the Republic of Uzbekistan
Ecological Movement of Uzbekistan
National Association of the Nongovernmental Noncommercial Organizations of Uzbekistan
Ecoforum of NGO’s of Uzbekistan
Charity Social Fund for Aral Gene Pool Protection
Association of Doctors of the Republic of Karakalpakstan
The Center “Perzent”, the Republic of Karakalpakstan
Public Association on Sustainable Use of Water Resources “Suvchi”
Association for Support to Children and Families
“Olima” the Association of Scientist Women of Uzbekistan
Society of Protection of Birds of Uzbekistan
Uzbekistan Zoological Society
Association of Farmers of Uzbekistan
Society of Soil Scientists and Agrochemists of Uzbekistan

"Rodnichok", NGO
"Alpha and Omega", the Foundation of Support of Education
"Logos", NGO
"Ecomaktab", the Tashkent City Ecology – Resource Center
"Soglom Avlod Uchun" the International Nongovernmental Charity Foundation
"Oydin Hayot", the Republic an Center on Propagation of a Healthy Way of Life
Association on Reproductive Health of Uzbekistan
The Red Crescent Society of Uzbekistan
Association of Endocrinologists of Uzbekistan
Public Fund "Mekhr Shavqat va Salomatlik"
"Umid", Society of Diabetics
"Medical Express", the International Center of Assistance to Medical Education of Doctors in Central Asia
"Soglom Kelajak", NGO
The Uzbek Medical and Pedagogical Association
Association of Pulmonologists of Central Asia
Association on Fish Culture and Processing of Fish Production of Surkhandarya Area
"Ecologik Toza Fargona uchun", NGO
"Salomatlik Plyus Ecologiya", NGO
"Jonli Tabiat", the Public Bioecological Center
"Eco - Tib", NGO
"Khamdard", the Center for Support to Women and Children
"Farzand", NGO

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