FINAL REPORT
NATO/CCMS Pilot Study Meeting

Environmental Decision-Making for Sustainable Development in Central Asia

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*Participant discussion/comments have been edited for appropriate integration into the report.
Section I
Executive Summary

On 16-20 March 2002, a meeting was conducted for the NATO/CCMS Pilot Study on Environmental Decision-Making for Sustainable Development in Central Asia in Brussels, Belgium at the Belgian Nuclear Research Center Headquarters (SCK-CEN). The purpose of this meeting was to convene environmental experts and representatives from NATO countries and EAPC Partner countries, in order to discuss the environmental problems of Central Asia and, specifically to evaluate the current processes and mechanisms used for making environmental decisions in these countries. Prior to the meeting, papers were prepared by selected experts in each of the primary Central Asian countries. Based on these papers, presentations were also made by these experts on the following topics:

- The quantity and quality of data available in these countries for making environmental decisions.
- Scholarly research activities in these countries involving environmental issues.
- Procedures and regulatory processes in these countries for making environmental decisions.
  - Description of the agencies (Including interagency cooperation) in these countries involved with environmental decision-making.
  - Descriptions of the processes available in these countries for involving the public in environmental decisions.
  - Training levels and the availability of training for environmental personnel in these countries pertaining to environmental decision making.

These papers and presentations served as the basis for in depth discussions concerning how this pilot study could assist the countries of Central Asia in their efforts to attain sustainability through sound environmental decision making.

During this meeting, a number of presentations were made on the use of landscape sciences for conducting a variety of environmental assessments involving land use, watershed management, ecological assessments (e.g., wildlife preservation, protection of habitat). There was extraordinary interest in these landscape science tools on the part of the Central Asian participants as tools that could be used for making long-term evaluations in Central Asia on issues pertaining to water resource allocation and the environmental problems associated with agricultural practices. Based on these presentations, a decision was made to participate at the Pilot Study Meeting on “Landscape Sciences for Environmental Assessment” (3-5 April 2002) in Las Vegas, Nevada.
The participants ended the meeting with a decision to focus future meetings on water resources management and related agricultural problems in Central Asia.

The next meeting for the pilot study will be a working group meeting in Almaty, Kazakhstan in September of 2002. The working group will focus on three inter-related topics: Water resources management, environmental problems resulting from unsound agricultural practices and landscape sciences as tools for environmental assessment in Central Asia.
Section II
Summary of Istanbul Planning Meeting

On 26 February - 1 March 2001, a planning meeting was conducted for the NATO/CCMS Pilot Study on Environmental Decision-Making for Sustainable Development in Central Asia. The purpose of this meeting was to convene environmental experts and representatives from NATO countries and EAPC Partner countries, with an emphasis on the countries of Central Asia, in order to determine the most effective manner in which this Pilot Study could address the key issues related to environmental decision-making from the perspective of Central Asia. The representatives from Central Asia actively participated in and made substantial and important contributions to the meeting discussions and work sessions. As a result of this input, as well as the active participation by the NATO and other EAPC countries, this initial planning meeting was highly successful.

Based on the Pilot Study presentations and discussions, including specific requests made by the participants from Central Asia, it was concluded that the Pilot Study could be most effective in working with the countries of Central Asia in the areas of education, training and technical assistance. In particular, the Pilot Study could facilitate access to expert technical assistance available through the NATO/CCMS Program in the areas of sustainability and environmental decision-making.

The two working groups, which were formed on the final day of the meeting, arrived at the following "action items" for the Pilot Study:

- Conduct an "inventory" of the decision making processes used in Central Asia;
- Identify the gaps and deficiencies of the current decision making processes in Central Asia;
- Organize and conduct seminars, workshops, and training courses and utilize environmental experts in the following areas:
  - Decision Support Systems
  - Cost-Benefit Analysis
  - Risk Assessment/Analysis/Management
  - Integrated Management Planning
  - Structural and Functional Analysis
- Disseminate the results of the Pilot Study through the Internet, informational/educational brochures and reports, workshops and other means available to the Pilot Study;
- Coordinate Pilot Study activities with the Regional Environmental Center for Central Asia (CAREC); and
- Utilize the Rio+10 / Agenda 21 reports as important input/guidance for selecting specific Pilot Study projects.
There was also considerable interest in having additional NATO and EAPC countries actively participate in the Pilot Study in order to broaden its base of expertise and increase opportunities for future collaborations with the countries of Central Asia.
Section III
Meeting Structure and Format

The meeting consisted of presentations and discussions on the issues related to the environmental decision-making process in the region of Central Asia. Representatives from Central Asia, other Pilot Study directors, invited CCMS experts and fellows made detailed presentations addressing key environmental issues.

The combination of different views presented by experts from the region and scientists working on similar projects from other parts of the world allowed a fruitful exchange of information and experiences, all focused on the improvement of the environmental decision-making process.

A special panel was led by other Pilot Study directors in order to allow them to share their experiences and knowledge and apply it towards the success of this Pilot Study. On the last day of the meeting, a field trip to a water treatment demonstration site was organized.

The agenda was adjusted as the meeting evolved in order to provide maximum opportunities for the participants to provide their input, views and comments, as well as to allow for discussion among the NATO and EAPC representatives.
Section IV
Opening comments and overview of the CCMS Program:
Mission, Organizational Structure and Activities

Dr. Deniz Beten, Director of the NATO/CCMS programme, gave the opening remarks. She emphasized the importance of this Pilot Study, and its focus on environmental issues of the region of Central Asia, to the entire CCMS program as well as to the NATO Science Committee. Mr. Jean Fournet, who serves as CCMS Chairman, was scheduled to make comments during the opening session. Due to his late arrival, he addressed participants of the Pilot Study on Tuesday.

Dr. Beten presented the key objectives of the Committee on the Challenges of Modern Society (CCMS), which are the following:

- reducing the environmental impact of military activities;
- conducting regional studies including cross-border activities;
- preventing conflicts in relation to scarcity of resources;
- addressing emerging risks to the environment and society that could cause economic, cultural and political instability;
- addressing non-traditional threats to security.

The Committee is now thirty-three years old. CCMS carries out its work through pilot studies which are funded by nations. Subjects for these studies are proposed by government agencies in member countries of the EAPC, and a decision on the proposal is taken by the Committee in plenary session. The country which proposes the study becomes the pilot country, and that country is responsible for developing, conducting and disseminating the results of the study. Co-pilot countries and other countries may volunteer to participate and share the workload according to their interests. Workshops, seminars or international conferences are also held as part of the activities of the pilot studies.

The objective of CCMS is to attack practical problems already under study at the national level by adding the expertise and technology available in other EAPC countries, so as to arrive fairly rapidly at valid conclusions and make recommendations for action to benefit all.

There are 65 Pilot Studies and 5 Short-Term Projects that have already been completed. Current CCMS activities include 12 Pilot Studies and 5 Short-Term Projects. Over 270 publications reflect the cooperative effort of many scientists from NATO and Partner Countries.

Divided by categories, and listed below, are examples of ongoing Pilot Studies and Short-Term Projects:

- Defense Related Studies:
  - Sustainable Building for Military Infrastructure (The Netherlands/Canada)
Forms of Environmental Education in the Armed Forces and their Impact on Creation of Pro-Environmental Studies (Poland)

- Pollution Control (air, water, etc.):
  - Evaluation of Demonstrated and Emerging Remedial Action Technologies for the Treatment of Contaminated Land and Groundwater (USA)
  - Ecosystem Modeling for Coastal Lagoons for Sustainable Management (Phase III) (Turkey)
  - Modeling Nutrient Loads and Response in River and Estuary Systems (USA/Lithuania)
  - Regional/Transboundary Transport of Air Pollution (Greece)

- Quality of Life and Planning:
  - Advanced Cancer Risk Assessment Methods (Italy/USA)
  - Assessment of Natural Hazard (Canada)
  - Clean Products and Processes (USA)
  - Environmental Impact Assessment (Belgium)
  - Future Trends of Concentration of Migratory Movements in Large Cities (Spain)
  - Using Landscape Science for Environmental Assessment (USA)
  - Management of Industrial and Toxic Wastes and Substances Research (Greece)
  - Technologies for the Study, Preservation and Management of Cultural Resources (Greece)
  - Vulnerability of the Interconnected Society (Norway)

- Regional Studies:
  - Environmental Decision-Making for Sustainable Development in Central Asia (USA)
  - Environmental Security of the Transportation of Hazardous Substances in the Black Sea and Caspian Regions (Turkey/Georgia)

The CCMS website provides access to information and online publications on environmental problems and is hosted on the NATO server at the following url: http://www.nato.int/ccms/
Section V
Role of the Regional Environmental Center for Central Asia in the Pilot Study in the Context of RIO + 10 Needs

The countries of Central Asia have authorized the Central Asia-Regional Environmental Center (CAREC) to be their “executive agency” for this NATO-CCMS Project. The CAREC was legally registered as an international organization on August 16, 2000 and in November of 2000 was provided a building free of charge.

The overall mission of the CAREC, as stated in its charter, is to assist in the solving of environmental problems in Central Asia through the promotion of cooperation at the local, national and regional levels among NGOs, governments, businesses, local communities, and other environmental stakeholders, in order to develop a free exchange of information, offer assistance to environmental NGOs and other stakeholders and increase public participation in the decision-making process, thereby assisting the Central Asian region in the further development of democratic civil societies.

The charter also states that the CAREC shall:

- assist in the exchange and dissemination of information on issues of environment and sustainable development;
- provide access to national and international databases, making use of already existing structures and facilities;
- produce newsletters and other publications;
- provide support for education, training and capacity building;
- provide support wherever possible for initiatives aimed at increasing environmental awareness;
- establish and implement a grants programme for regional and transboundary projects, which maintains a balance between small and large grants;
- promote public participation in the decision-making processes of society, which relate to the environment;
- provide a forum for discussion of environmental issues; policy analysis relating to environmental issues and sustainable development, and interactions among governments, NGOs and other stakeholders;
- provide a framework for regional co-operation at the governmental and non-governmental levels; and
- provide a link with the business community and industry on environmental issues.
Section VI
Panel of CCMS Pilot Study Directors:
Transferring the Experience and Knowledge of NATO/CCMS on Issues Related to Environmental Decision-Making to this Pilot Study

With an understanding that knowledge accumulated over many years could improve and enhance the success of this Pilot Study, several directors of other pilot studies and short-terms projects were asked to described their experiences. In particular, their expertise can be used to better design the flow of work and projects associated with the environmental decision-making process and coordinated by the current group of experts.

- Prof. Rudi Verheyen, University of Antwerp (Belgium)
  Director of the Pilot Study on the Methodology, Focalization, Evaluation and Scope of the Environmental Impact Assessment

- Prof. Ender Okandan, Middle East Technical University (Turkey)
  Director of the Short -term CCMS Project on Hazardous Substances Involved in Oil and Gas Transportation in the Black Sea and Caspian Regions

- Dr. Frederick W. Kuts, U.S. Environmental Protection Agency (United States)
  Director of the Pilot Study on the Use of Landscape Sciences for Environmental Assessment

Professor Rudi Verheyen's Pilot Study was initiated in November 1991 by the Belgian Office for Scientific, Technical and Cultural Affairs (DWTC). The two key objectives are to discuss and improve aspects of Environmental Impact Assessment and to make recommendations to the EIA process. Over the years, the Pilot Study has completed more then a dozen workshops, each lasting one to two years long. Thanks to the involvement of many countries and the rather informal work atmosphere, the Pilot Study has developed into an efficient, borderless network of experts sharing the same interest.

Professor Ender Okandan described the cooperation between Turkey and Georgia in co-directing this short-term project. She talked about the key needs in the process of transporting oil and gas, the dangers associated with it and the objectives of this working group. Professor Okandan indicated that important recommendations came out of the project, despite limited time and resources. "Risk assessment in relation to railroad and motorway transportation"; "The use of remote sensing as a tool of management"; and "The establishment of long term monitoring programs for petroleum pollution along oil and gas transportation corridors on land and in the sea" are some examples of the
recommendations. The similarities between this short-term project and the Pilot Study could be seen in the involvement of the same countries and also through the approach to some of the environmental issues. Sustainable development achieved through well planned decision-making processes, public participation, legislative and international cooperation seem to be the goals of both. Professor Okandan has been part of the working group of this Pilot Study from the very beginning. With her reputation as a recognized scientist and an experienced director of CCMS projects, there is a great deal of confidence in a successful outcome.

**Dr. Frederick Kutz** serves as the director of the Pilot Study on the Use of Landscape Sciences for Environmental Assessment. In his presentation he demonstrated the use of satellite imagery and aerial photography combined with high tech tools such as geographic information systems (GIS), computer technology, databases and spatial statistics in environmental assessment. Participating countries are divided into two categories: full participants and those with observer status. Objectives of this Pilot Study include: demonstration of the use of landscape sciences for environmental assessment, illustration of the utility of this approach in public health and environmental decision-making, planning and ecological preservation/restoration projects and, last but not least, each participating nation or partner is to select a project of most utility. As a proposed immediate outcome, Dr. Kutz suggested the following products: Working Group meetings, NATO/CCMS report on each project, publication of book. The idea of creating Working Groups may find it's reflection in this Pilot Study. There has been a great interest among the participants from Central Asia in expanding Dr. Kutz's research into the region of Central Asia. Like many other projects developed elsewhere, this could successfully be applied to the region and compared with already existing domestic results.

Dr. Bulat Yessekin, the director of the Regional Environmental Center for Central Asia, established a relationship with Dr. Kutz during the meeting. Dr. Yessekin was invited to the Pilot Study Meeting in Las Vegas in April 2002.
Presentations and comments were made by the Central Asian Representatives describing the procedures used, and the mechanisms which are in place, or being developed, for making environmental decisions in the Central Asian Republics.

These presentations identified the gaps and deficiencies of the current decision-making processes used in Central Asia, and also helped to identify how this Pilot Study could be of assistance to the individual Central Asian countries and the region as a whole, to ensure that the concept of sustainable development is integrated into the decision-making process.

Kazakhstan
Ms. Kulyash Bolatbaeva
Mr. Alexander Miroshnichenko

Methods and Methodologies of Environmental Damage Assessment

Existing Methods for Assessment, Analysis, and Prognostication in the Field of Environmental Protection (officially endorsed or being introduced)

*The Assessment of Environmental Damage (AED)*
The AED is a structural process for taking into account the ecological aspects of the decision preparation and decision-making process.

*Ecological Expertise and Assessment*
Ecological assessment can be used as an instrument for decision-making by the initiator, regulators, investors, and other involved parties. Ideally, the decision should take into consideration not only the results of the ecological assessment, but also the socio-economic and other potential advantages and losses that may result because of the planned activities.

*Ecological audit*
An ecological audit is an independent review of the ecological impact of the economic activities of organizations and private citizens.

*Economic analysis*
In the past, economic analysis did not go beyond technical support analysis. Under the best circumstances, the cost effectiveness was analyzed when necessary to compare alternative measures and associated costs to reduce contamination.

*Risk Assessment*
A statement by the The World Health Organization (1978) defines risk as “an expected frequency of unwanted effects emerging from the activities of the given contaminant”.

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Section VII
Presentations and comments by the Central Asian Representatives
Risk assessment is one of the foundations of decision-making on prevention of the harmful influence of ecological factors on public health. This methodology was utilized in the Republic of Kazakhstan for the development of scientific and practical recommendations for environmental protection and for marking the regions of Kazakhstan most susceptible to risk. There was an attempt to quantify public health risk from environmental factors for the people of Kazakhstan, including the concentration of hazardous materials in drinking water.

The Legal Mechanism of Methodologies Assessment and Prognostication in the Field of Environmental Protection

Ecological expertise
Ecological expertise is utilized with the goal of preventing possible damage from certain activities on the environment and the social, economic and other consequences connected with such activities. Therefore, ecological expertise is a form of preventive ecological control.

Ecological audit
The statute on conducting an ecological audit is included in the Law on Environmental Protection.

Economic analysis
The existing system of rational utilization and protection of the environment is far from perfect. Two of its basic elements – the norms on emissions and the environmental contamination fees – are not configured properly to induce enterprises to start paying for environmental protection. The environment will continue to be endangered if economists do not fully participate in the analysis and policy development.

Risk assessment
In Kazakhstan, the notion of risk assessment in environmental and public health methodology does not exist. In some legal statutes, notions of risk are only addressed if there is a safety issue.

The Existence and Accessibility of Databases on Environmental Protection

Environmental protection is not permissible without complete and accurate data on the environment (monitoring). At present, the assessment of the environment is conducted on the basis of the following information:
- Kazgidromet data on the contamination of water;
- Statistical data on emissions, volume of waste and its deployment;
- Random monitoring of the analytical control services;
- Data acquired through research and development activities;
- Data acquired through the monitoring of sanitary services;
- Data from local hydrogeological services.
The National Ecological Center of the Ministry has its own website with information on the ecological situation in Kazakhstan and operative news on environmental protection. The website address is: www.neapsd.kz.

**Information on the Existing Statistics Used for Decision-Making in the Sphere of Water Protection in The Republic of Kazakhstan**

Presently, there are no State statistics on water resources in the Republic of Kazakhstan. There are only departmental statistics presented in two forms: “2TP – vodkhoz” and “1 Voda”.

**Procedures for Inter-Agency Coordination of Projects and Decision-Making in the Sphere of Water Protection**

In 1997, the Law of the Republic of Kazakhstan “On Ecological Expertise” was adopted. This law presented a legal instrument for the objective assessment of economic (or other) activities during the planning stages for possible negative consequences associated with these activities. The law provided a mechanism to continue the assessment of the associated risks throughout project construction and implementation. The introduction of this law ensured the toughening of preventive control over the activities of economic entities. However, provisions of this Law are often violated. The most common violation is non-presentation or late presentation of expertise materials to the department of state ecological agencies.

**Personnel Training and the Existence of Centers for Teaching Assessment and Prognostication Methods**

One of the major priorities until 2010 is ecological educational training. Its main tasks are:
- Ensuring access to ecological information through centers of ecological information, scholarly and popular publications, and the media;
- Forming a system of ecological education;
- Creating a system of professional ecology specialists;
- Creating a legal normative base for ecological education and training.

**Examples of Decision-Making: Getting Permission for Water Utilization**

In accordance with the Rules of Coordination and Permission Granting on Water Utilization, permission for special water utilization are given for:
- Surface waters
- Subsurface waters
- Timetable of watering the agricultural soils
- Plan of water consumption
- The calculation of water delivery from inter-economic sources
- Report (form 22a) on the irrigated areas and its distribution among cooperatives
- Planned measures for dealing with emergency situations
• Schematics of the water reservoirs.
• Schematic of the irrigation system.
The Water Management head office examined the entire package.

Kyrgyzstan
Ms. Tatiana Filkova
Dr. Emil Shukurov

At present, mining industry wastes represent a significant ecological danger for Kyrgyzstan. There are 130 mining sites in the country. The volume of waste exceeds 620 million cubic meters and is spread over a territory of 1,950 hectares. The most dangerous are tailing deposits (49 in number) and mountain fall-off deposits (28). Within these numbers, there are, respectively, 29 and 21 uranium deposits, and 15 and 7 poly-metal deposits. The state of these deposits is alarming.

Residential waste deposits also present a danger. Currently, there are 52 waste sites, with a total volume of 1.2 million cubic meters, without counting the city of Bishkek. In Kyrgyzstan, there are no solid waste processing facilities.

The problems of industrial waste collection and utilization are not being addressed. No sites exist for toxic waste burial. Industrial waste is kept at special sites of some enterprises. There is one site for radioactive waste burial that is situated 28 kilometers away from the city of Bishkek.

On August 4, 1997, the Security Council of the Kyrgyz Republic signed Directive No. 3 that introduced the Concept of Ecological Safety. This document came within the framework of “Agenda 21” as a priority problem. It listed alternatives for dealing with this emerging ecological crisis. Apart from this concept, the government worked out the National Action Plan for environmental protection. The plan mapped out the steps for dealing with waste burial and utilization. In accordance with this Plan, international grants and investments were attracted to the Republic. Within the framework of waste reduction, the government oversees the introduction of cleaner technologies through conducting the state ecological expertise on proposed technologies for new projects. Decisions are usually made in favor of reduced waste technologies. The government is regularly informed on the volume of emissions, dumping and waste storage through statistics and annual national reports, on the ecological situation prepared by the Ministry of Ecology and Emergency Situations.

Methods and Methodologies of Environmental Damage Assessment

At present, risk characteristics, such as the index of harm, used for the assessment of various negative factors influencing a human being, is employed to legitimately compare safety in various branches of economy and types of work. It is also used to determine social privileges and advantages for some categories of individuals. Such a methodology of risk definition is included into the curriculum for the subject of “Life
In the practical work of the Ministry of Ecology and Emergency Situations and the Ministry of Public Health, this methodology is not widely used.

In 1992, these Ministries recommended a document on the “Criteria for the assessment of ecological situation on different territories for determining the zones of harmful ecological situation and zones of ecological disaster”. The Main Scientific Directorate of the Ministry completed the document for Environmental Protection and Natural Resources in 1992. That document provides medical and demographic criteria to define the state of public health and it is used for the assessment of the ecological status of a territory.

**Existence and Accessibility of Databases on Environmental Protection**

Environmental protection is not possible without complete and accurate data on the environment. At present, the assessment of the environment is conducted on the basis of the following information:
- Kyrgyzgidromet data on the contamination of air and surface waters;
- Statistical data on emissions, dumping and waste deposits;
- Random monitoring of analytical control services;
- Data acquired through individual orders (case-by-case basis);
- Data acquired through the monitoring of sanitary;
- Data from local geological services;
- Data from the Ministry of Agriculture and Water Economics.

**Procedures for the Assessment of Project-Related Ecological Expertise. Procedures for Inter-Agency Coordination of Projects and Decision-Making in the Sphere of Water Protection**

Upon adoption of the Law of the Kyrgyz Republic “On Ecological Expertise”, the status of assessment of the planned activities, with the goal of preventing negative consequences on the ecology and public health, was addressed. One of the aims of ecological expertise is the assessment and coordination of nature protecting demands and the pre-planning stages of activities that may have an impact on the environment. The introduction of this law ensured the strengthening of preventive control over economic activities.

However, provisions of this Law are often violated. The most common violation is non-presentation, partial presentation, or late presentation of required data to the agencies of state ecological expertise.

The tasks of ecological expertise comprise the following:
- Definition of completeness and accuracy of the performed expert assessment of the influence of planned economic, investing, or any other activity on the environment;
• Organization of a multi-faceted, scientifically proven analysis and assessment of the influence of planned economic, investing, or any other activity on the environment and public health;
• Analysis of the negative influence of the site under review, and possible ecological, social, and economic consequences;
• Preparation of the final document comprising the ecological expertise, and its submission to the organizations making decisions on the realization of the project under expertise, and providing the information to all the interested parties and the population.
• Assessment of effectiveness, completeness, and sufficiency of proposed measures to ensure ecological safety.

**Personnel Potential and the Existence of Centers for Teaching Assessment and Prognostication Methods**

Only individuals and organizations having appropriate licenses, certificates and technical abilities can work with the problems of establishing AED procedures and ecological audits in the Kyrgyz Republic. The system of providing licenses and certificates for this type of activity exists under the auspices of the State Architectural and Construction Committee (a Kyrgyz government agency).

Specialists of the Ministry of Ecology and Emergency Situations regularly lecture on AED in various universities. The 14 state and 4 private universities in the Republic produce more than 2,000 AED-trained graduates each year.

There is a Directorate of Ecological Strategy and Policies within the framework of the state nature protection services. This Directorate trains and re-trains the personnel who provide environmental services. AED is included in the curriculum.

**Decision-Making at the Local and Federal Levels**

In addition to the Bishkek City Directorates, there are 7 regional directorates for Environmental Protection in the Republic. These Directorates deal with ecological assessment. The main functions of state ecological expertise in the Republic are given to the Department of Ecological Expertise, Ministry of Ecology and Emergency Situations. On the regional level, the Ministry has the authority to choose which locations to study, the expertise for social and cultural construction sites, district-relevant and other sites that can make negligible influence on the environment. In accordance with the Law “On Ecological Expertise”, the responsibilities of the local government consist of delegating experts to expert commissions, organizing public expertise, conducting public hearings, and informing specially designated public organizations on the planned activities potentially affecting the environment.
Methods for Assessment, Analysis, and Planning for Biodiversity Protection

The system of ecological laws in the Republic of Tajikistan (RT) related to biodiversity protection includes 4 laws and 10 legal acts. This legislation regulates a wide variety of issues related to biodiversity protection. In addition, the Republic of Tajikistan adopted 3 UN Conventions related to biodiversity protection.

The Biodiversity Protection Laws

- The Forest Code of The Republic of Tajikistan (1993)

Legal acts:

- The Act on Hunting and Hunting Economy in the Territory of the Republic of Tajikistan
- Regulatory procedure for issuing permits for “the taking” of animals and for vegetation utilization
- Regulation on Reinforcing Protection of Fish Resources and Valuable Fish Species in Fish Growing Water Reservoirs
- Regulation on State Ecological Expertise
- Regulation for stable development
- Regulation "On Measures to Complete the State Ecological Program"
- Code on Administrative Violations (2000)
- Criminal Code, Article 24 of the Criminal Codex of the RT, defines penalties for violations of ecological safety and nature
- Regulation on joining the Convention on Biodiversity (1997)
- Regulation on joining the Convention on Water and Swamp Resources" (2000)
- Regulation on joining the Convention on Migrating Wild Animals Protection" (1997).
- Regional agreements “On cooperation for Biodiversity Protection of the West Tyan-Shan Region” and “On Cooperation in Nature Protection and Its Rational Use” were signed by the heads of Uzbekistan, Kazakhstan, Tajikistan, and Kyrgyzstan in March 1998.

Informational Databases and Statistics for Environmental Decision-Making

Biodiversity Protection Information Databases and Related Information

Official Information:
Nature protection activities are not possible without complete and reliable information about ecological conditions. Biodiversity protection assessment is conducted on the basis of the following information:
• Ecological information base, including biodiversity protection information, presented in National Reports on ecology (annual publication);
• State statistical reports on forestry, nature preservation, flora and fauna, and hunting;
• The Red Book of the Republic of Tajikistan;

Other Types of Information:
• Information provided by organizations, companies, and other commercial enterprises (but not considered official as it is not endorsed by the state statistics agency);

Procedures for Ecological Expertise and Coordination of Projects and Solutions to Protect Biodiversity

State ecological expertise helps to determine the assessment of environmental and nature utilization activities in the process of decision-making on the social and economic development of separate regions, national economic branches, and enterprises. The procedure of ecological expertise is conducted according to the Decree “On ecological expertise in the Republic of Tajikistan” introduced by the government on April 7, 1994 (No. 156). After the expert review has been completed, the expert commission prepares the final document about the project on the State Ecological Expertise Findings.

The Ministry of Economics and Trade is an inter-agency organization for coordinating projects and decisions concerned with nature utilization and environmental protection, in accordance with the Decree signed by the government of Tajikistan. The Ministry of Nature Protection coordinates internal commercial plans of actions, as well as projects and decisions on environmental protection, according to the existing normative acts.

Personnel Training and Scientific/Technical Capabilities

The institutional foundation of bioresources preservation consists of institutions and organizations that deal with the research and preservation of bioresources and their components. These are state structures which include: The Ministry of Nature Protection and The “Tajikles” (Tajikforest) Forestry Enterprise. Other ministries, agencies, agricultural enterprises and tourists are also involved with bioresource preservation in Tajikistan.

The “Tajikles” employs specialists with university and community college degrees (i.e., zoologists, biologists, hunting specialists, and agricultural specialists). The majority of these specialists were educated in universities in the Russian Federation. Personnel education and training is conducted through Tajik and Russian Federation universities,
as well as periodically organized technical courses. There are no specialized centers for teaching the methods of assessment, analysis, and prognostication related to bioresources protection in the Republic of Tajikistan.

Uzbekistan
Mr. Timur Tillyaev

Methods of Assessment, Analysis, and Prognostication for Environmental Protection


Currently, there are 97 documents on atmospheric air protection on record in the Republic of Uzbekistan (RU)). Two additional documents are currently being drafted: “Regulations of the State Ecological Expertise”, and “The Ecological Audit”. There is also a plan to develop the Regulations on the Public Ecological Expertise. It is the intention that these three documents will be incorporated into the Law “On Ecological Expertise”, which is the leading document used to assess the influence of economic decisions on the environment.

The Law “On Nature Protection”

The key document on air protection is the Law of the Republic of Uzbekistan “On Nature Protection”, adopted in December of 1992, and including all of the changes and amendments of 1995, 1997 and 1999. In this document, atmospheric air is treated as an object of nature that should be protected from contamination. According to the law, the Parliament of Uzbekistan is designated as the agency of exclusive competency to define the main directions of state policies in the sphere of environmental protection, to adopt state ecological programs, and to proclaim some territories as zones of ecological emergency situation, ecological disaster, or ecological catastrophe.

The Law “On Protection of Atmospheric Air”

According to the law, adopted in December of 1996, the air is considered a natural resource in Uzbekistan, which therefore must be protected by the state. The agencies responsible for the protection of atmospheric air are the Cabinet of Ministers, the State Committee on Nature, and local governments. The Ministry of Public Health sets
sanitary norms (standards) for the public. The State Committee on Nature sets standards for environmental protection sites, climate preservation, and the ozone layer.

The Law of The Republic of Uzbekistan “On Ecological Expertise”

This law was adopted in May of 2000. It defines ecological expertise as the establishment of a correlation between planned or executed economic and other activities and ecological demands. From a technical point of view, the interesting part of this notion is the one connected with decision-making (i.e., the realization of the on-site ecological expertise). Ecological auditing is connected with the right of the site owner to make an independent decision. Public ecological expertise can take place following an NGO initiative, and it cannot be eliminated.

Other Legal and Normative Regulations

After declaring its independence, the Republic of Uzbekistan terminated the previously existing legal and normative statutes that contradicted the Declaration of Independence. However, statutes of technical and non-political order are still in force and will stay that way until new indigenous acts and statutes are introduced.

Regulations in the Decision-Making Process

The majority of documents mentioned above, and others, are of technical importance. Though technical norms do sometimes play an important role in the process of decision-making (because they prescribe parameters and values which describe threshold values), they do not, however, prescribe the procedures for decision-making or identify the responsibilities of various agencies.

For instance, when making a certain decision, the existence (or non-existence) of information about working or potential sites – sources of atmospheric air contamination – plays a very important role. In the first case, information can be collected through “documentation” of contamination sources. In the second case, it would be possible to refer to information in the text of the project where there is a special part dealing with problems of environmental protection.

State Statistical Reports

There are no state statistical reports for decision-making in the area of environmental protection and activity risk assessment. However, there is a system of internal (State Committee on Nature) reports on decision-making. Information is collected quarterly from regional subsidiaries and presented to the Committee. Information reports contain names of sites, costs of completed work, risk categories, adopted decisions, and sites where secondary expertise was conducted.
Databases for Environmental Decision Making in Uzbekistan

Such a database does not exist. However, there are libraries, information depositories on sites, and archives within various Ministeries and government agencies.

Personnel Potential and Levels of Skill

Decisions on expertise sites (final reports, etc.) are made by heads of regional subsidiaries of the State Ecological Expertise, usually at the rank of deputy directors of regional Nature Protection Committees.

There are no special centers for personnel training in ecological expertise. However, the Research and Development Institute “VodGeo”, belonging to the State Committee on Nature, conducts classes for improving the qualifications of state inspectors, local experts, and employees working in ecological departments or enterprises. Systematic personnel preparation is conducted in Universities within departments that are closely connected with ecology.

Legal Aspects of the Decision-Making Process

Decisions on the problems of normative and legal regulation are made differently, depending on their character. Joining international legal acts and law adoption demands coordination of projects with all interested ministries and other agencies. The adoption of the intra-agency act that includes compulsory norms and rules involves the necessity of legal expertise and registration in the Ministry of Justice. There are neither official nor practical procedures of inter-agency coordination for decision-making in the sphere of environmental protection. This is because the state ecological expertise makes independent decisions on the development of individual projects.
The system of decision-making for environmental protection is an important subject for discussion at various international meetings. This system plays a central role in ecological projects and programs for sustainable development. A range of multilateral agreements and regional conventions, including the Aarhus Convention, involve concrete mechanisms for implementing this system. The current systems of decision-making for environmental protection in Central Asia reflect the contemporary level of social development in the area. At the same time, it has its own purpose which is namely to understand not only the role of ecology in society, but also the degree of participation of the principal sectors of society, which include central and local governments, non governmental organizations (NGOs), business entities, international and regional organizations, in the decision-making process.

**Information for Decision-Making**

Information and data of known quality present a foundation for effective decision-making. In the Central Asian countries, the assessment of the environment and environmental decision-making are accomplished using the following technical information:

- state statistics and related data;
- environment monitoring data;
- agency reports;
- materials resulting from scholarly research; and
- other technical reports, publications, bulletins.

The information mentioned above allows for general environmental decision-making for proposed projects.

**The Scientific Foundations for Decision-Making, Methods of Analysis and Assessment**

If we take into account that the transitional period is accompanied by large-scale reforms in all spheres and that large changes in the system of planning, management, and monitoring will occur, then it becomes obvious that, without support from the state, these tasks cannot be fulfilled on an acceptable level.

Up to now, all of the countries of the region have had the same system of regulation concerning the environment. That system was based on administrative economics and
it laid the foundation for planning economic activities, state expertise, and inspection control rather than on such topics as the environment.

Generally, little scholarly input has been placed into territorial and ecological planning, the setting up of ecological limits for economic activities, the assessment of volume and potential for ecosystems and natural resources, as well as for solving inter-territorial environmental problems.

Difficulties also have emerged in connection with a lack of sufficient research in the field of “front-edge” environmental technologies and associated equipment and methods of forecasting, prediction and management of ecological risks. After the disintegration of the USSR, such research ceased to be supported at the same level. The main research centers that had been formulating scientific foundations for ecological policies on environmental protection and development stayed in Russia. Despite the fact that scientific centers and institutes located in Central Asia tried to continue their research, it has become increasingly difficult to do so without any support from the state. Small grants allocated by the state and donor programs were mostly directed at short-term or applied research.

There are significant opportunities for scholarly support of new research connected with environmental protection in Central Asian countries. But, the analysis of cost effectiveness is not yet widely used.

If one does not fully take into account the real costs, benefits and, perhaps, profits in connection with project implementation, including the influence on the environment, preference will be given to projects often damaging to the environment. In addition, governments, citizens, and international organizations will have an erroneous impression about the real effectiveness of the country’s economy.

By making decision-makers more aware of the effectiveness of environmental and public health risk assessment, this methodology could be used to greater advantage in deciding how to best utilize existing resources. The experience of using risk assessment methodology in other countries, including Russia, demonstrates that previously established foundations of this assessment in Central Asian countries will allow for this methodology utilization because the latter is logical, systemic, and will provide for obtaining clear recommendations that can be used for making management decisions.

**Expert Procedures and Associated Technical Documents Used for Environmental Decisions**

Technical materials and scientific expertise used for the assessment of environmental problems, environmental auditing, and for other related uses are the foundations for decision-making in conjunction with inspections of any planned economic (i.e., commercial) or other activity. In all of the countries of the region, there is a legal procedure referred to as “ecological expertise”.

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The legislative branch of each country also establishes provisions for “public expertise”. Decisions resulting from expert materials/opinions provided by the public are typically utilized solely as a recommendation in the review of actual cases.

The results of the public ecological expertise evaluation, as well as the results of control and inspection activities, are of a lesser value because public ecological expertise and ecological control services typically do not work together. Also they generally have an outdated technological base and insufficient data in the field of monitoring research that could provide a foundation for assessment of individual sites.

Another factor that greatly effects the results of expertise and control efforts is the weakness of general policies, less efficient planning at national, institutional, and territorial program levels, and a lack of designated and coordinated priorities, goals, and economic stimuli for environmental protection.

There are also problems with the “old-style” criteria inherited from the narrow institutional approach to environmental protection. Those criteria are still in use for conducting programs and evaluation projects. These criteria allow for assessment of the site without taking into consideration ecosystem demands and the problems of site feasibility in general. Also, the normative and methodological foundations of the expertise in the sphere of land contamination, biodiversity, climate changes, etc. are much less detailed than for atmospheric air protection. As a result, subjective factors play too important a role in decision-making, transferring some decisions from expert and technical fields to those of politics (e.g. problems associated with water protection).

**Inter-Agency Cooperation**

The issues of (1) inter-agency coordination and (2) the involvement of the public and other interested parties are very difficult problems for countries of the region, taking into account traditional (for the previous system of management) mechanisms for decision-making “from top to bottom”. Practice has demonstrated that such a system was not efficient. Also, the very character of ecological activities presupposes taking into consideration not only the interests of the public, but also those of nature itself.

In the Central Asian region, there is competition among the Ministries that have authority in the sphere of environmental protection and, despite the existence of some agreements on cooperation and associated division of functions, there is little or no cooperation.

Joint actions clearly affecting multiple agencies/ministries are possible only on the basis of common goals, (i.e., integration of goals and priorities remains to be the most important task for nature-protecting Ministries).

In the sphere of decision-making, it is important to integrate environmental, social (including health-related issues), and economic considerations into the review process for proposed projects. In countries with transitional economies, state agencies responsible for environmental protection have to make final decisions on proposed
projects. This situation cannot provide for balanced consideration of socio-economic advantages and losses connected with projects. However, transfer of decision-making functions to “non-ecological” organizations of state power often leads to a situation where important ecological issues are ignored. This happens because public interest in the environment, during a period of reform, is not very high on the priority list while socio-economic considerations for the people making decisions are extremely high. Therefore, transfer of decision-making functions from ecological to state organizations is desirable only for issues in which the main political and economic difficulties have been already dealt with, and the process of decision-making is democratic and equally considerate of both long and short-term priorities.

Public Participation

In the last several years, the countries of Central Asia have paid closer attention to public participation, both in terms of the interests of other countries and of international organizations, including donor organizations. Practically all conferences and seminars conducted in the region incorporate public participation, as well as the participation of non-governmental organizations (NGOs). Most countries within the region signed and ratified the “Orkhuss Convention”, adopted during the conference of regional ministers in 1988. This Convention requires state organizations to provide information to and take into consideration public opinion when making decisions regarding environmental protection. The Convention also gives NGOs the right to demand this involvement from state agencies, ministries, etc.

However, despite the Convention, the role of NGOs has been minor and their participation in existing programs remains relatively weak. This is connected with the generally low level of influence held by NGOs, the unstable financial and technical base of most NGOs, and the state’s lack of willingness to involve NGOs as full partners in programs at national and regional governmental levels.

Training of Environmental Personnel

Many legal instruments and political strategies in the region have established the need for ecological education and training. This includes the levels of pre-school, middle school, high school, as well as professional and higher education. At the same time, there is not always a connection between these educational institutions and the Ministries of Environmental Protection. Generally, such coordination only exists at the level of separate seminars and projects supported by donors.

Ecological education is, according to the legal statutes of all of the countries in the region, compulsory for all managers and specialists working on issues related to the environment. However, these legal statutes are not enforced.

A centralized system of personnel training in the sphere of environmental protection is practically non-existent throughout the region. During the Soviet era, there existed within USSR Ministries, a system of education to raise the qualifications of environmental experts. That system ceased to exist, and the efforts of the new
independent Ministries of Environmental Protection to re-introduce such a system have not been supported by the individual states. As a result, the former system of ecological education collapsed into separate courses or “one-time” seminars conducted within the framework of small, short-term donor projects. In most Central Asian countries, economists, environmental auditors, information technology managers, and environmental lawyers lack education on ecological management.

**Conclusions**

Reforms in the countries with transitional economies represent unique opportunities to radically improve traditional systems of education, economic planning and project assessment. It is in the case of these reforms that political will for democratic and free market changes will be consolidated, western countries’ experience followed, local legal provisions harmonized with those of international norms, and the ecological “legacy” of the former administrative system liquidated. If such political will is absent, or if this chance for reform is not taken, the new systems of ecological assessment are destined to continue to be inadequate and ineffective.

The countries of Central Asia are celebrating the 10th anniversary of their independence this year, and they are on their way to building improved systems for environmental decision-making. The continuing reformation of the environmental protection systems in these countries serves as visual proof of the complexity of this process. The mechanisms of decision-making inherited from the Soviet System, mainly oriented towards raising industrial potential and based on “command economics”, did not take into account the interests of the population and the environment, and actually resulted in barriers for future development and reform.

The integrated approach to economic planning and the realization of projects and programs for sustainable development must be based on accessible and accurate information, scholarly research and analysis, and expertise, taking into consideration the opinions of interested parties, and inter-agency cooperation.
Section IX
Presentation by Pilot Study Fellows: Focus of Fellowship Activities

Professor Ender Okandan (Turkey)
Pollution from Oil and Gas Production: Problems and Possible Solutions in Central Asia

Dr. Ender Okandan is a professor at the Petroleum Research Center at the Middle East Technical University in Ankara, Turkey. Topics covered in this presentation include a summary on the state of the world, sustainable development and the oil industry as well as challenges for the next decade.

Global Concerns

Major global concerns facing the world today include overpopulation, air pollution, deforestation, coastal pollution, biodiversity and the global climate. The greatest challenge is the current world population of 6 billion. Air and river pollution have decreased due to monitoring programs; however, coastal pollution due to agricultural runoff has increased. Global climate change also is of concern to the world today; however, human activities are not entirely to blame for the current global warming trend. Sustainability is the key to the concerns facing the world today. Current and future generations must learn to balance economic, social and environmental needs.

Oil and Gas Industry

The world's oil supply is finite and production is predicted to peak by 2010. The Middle East dominates the world in proved oil reserves, while The Former Soviet Union and the Middle East together account for more than 70% of the world gas reserves. Many problems exist in Central Asia as a result of the activities of the oil and gas industry including exploration, production, storage, refining, and transportation. Oil exploration, onshore and offshore, is a relatively short duration activity that results in waste chemicals from the drilling fluids and drill cuttings. Chemicals in drilling fluids may contain toxic components such as chromium, arsenic, and lead and must be treated and disposed of properly. Drill cuttings result from pieces of underground rocks brought to the surface and may contain heavy metals and radioactive materials. Effects of oil exploration may be minimized in two ways:
- Drilling horizontally decreases the number of wells and
- Drilling smaller diameter wells produces fewer cuttings and uses fewer chemicals.

Oil field production, onshore and offshore, is a relatively long duration activity that results in wastewater containing heavy metals, radioactive materials and hydrocarbons. Wastewater releases can be minimized by treating the water before discharge into the environment and by injection into deep underground formations.
Transportation and storage of oil also can lead to environmental problems. Oil is stored on the surface and underground and can leak into groundwater and contaminate soil. Accidents, oil spills, fires, and emissions must be considered when transporting oil by tankers, while risk assessments and safety issues must be considered when transporting by pipeline through rivers, lakes, etc. Many of these concerns also must be taken into account at oil refineries.

During the last decade the oil industry has progressed in the following ways:

- Reduction of accidents,
- Management of discharge and emissions,
- Protection of sensitive environments,
- Development of management systems,
- Development of oil spill contingency plans, and
- Stakeholder dialogue.

**Challenges**

Challenges facing the oil and gas industries in the next decade include accident elimination, discharge and emission reduction, soil and water contamination cleanup, social issue awareness improvements, dialogue development with stakeholders, cooperative health care program development and development of ethics and human rights programs within the government and communities. In summary, the planet is threatened, and companies and individuals must be a part of the solution through sustainability, adherence to strong values, and involvement.

*Dr. Michael Kuperberg (United States)*

**Human Health Consequences of Exposures to Environmental Contaminants: Problems and Possible Solutions in Central Asia**

This report was written to summarize contributions to the recent CCMS Pilot Study on Environmental Decision Making for Sustainable Development in Central Asia and as an interim product for a CCMS Fellowship to support the author’s participation in the above-mentioned Pilot Study.

Environmental contamination poses a number of adverse effects ranging from overt human toxicity to adverse impacts on environmental aesthetics. Included in this range of effects are impacts to non-human living receptors (ecological toxicology), economic impacts due to decreased property costs or increased operating costs, and increased administrative effort associated with the development and implementation of, as well as compliance with, environmental regulation. The decision making process is the intersection of environmental toxicology and regulation. Toxicology seeks to define the adverse effects of drugs or chemicals. Regulation seeks to determine and enforce acceptable limits on environmental emissions and contamination.
In North America and Western Europe, the decision making process whereby toxicology is brought into the regulatory framework is known as risk assessment. Risk assessment recognizes that absolute remediation of environmental contaminants is not feasible in many situations. As a result, there is a need to assess or quantify the risk associated with a particular exposure scenario and then, balancing environmental, chemical and exposure factors, determine when, where and how long to clean up.

This decision-making process has been developed over the past 30 years and is well established in many countries. A general diagram of the decision-making process is presented in Figure 1. This process is seen as having great value for countries in transition, since the system works by balancing competing factors, not by mandating a set of standards. This approach is particularly well-suited to countries that must make environmental decisions on extremely limited budgets.

The author’s goal in the current Fellowship is to better understand the environmental decision-making process in Central and to seek opportunities to provide insight to the western approach in that context. To date, this goal has been accomplished by:

- technical review of summary documents provided to the CCMS Pilot Study by Central Asian experts in support of the summary document, as well as to develop a personal understanding of the process,
- one-on-one discussions with Central Asian experts at the Pilot Study meeting,
- ongoing communications with Central Asian experts as follow-ups to past, and in preparation for future meetings; and
- development of presentations to overview the western approach to environmental decision making to interested Pilot Study representatives from Central Asia.

Conclusions
Humans are exposed to dangerous chemicals routinely and worldwide. Environmental contamination does not recognize political boundaries and must often be managed cooperatively by multiple government agencies (both intramural and extramural). Utilizing similar approaches to environmental decision-making will allow different regulatory organizations to understand and discuss the basis for and results of a specific regulatory decision. Environmental protection is a matter of balancing risks & resources. The process works independently of the magnitude of risks or resources.

By understanding the current basis for environmental decision-making in Central Asia, the NATO CCMS Pilot Study will be better able to provide a venue for discussing the basis, advantages and disadvantages of current systems.
Figure 1. Risk Assessment Flow Chart
Armenia

Mr. Samvel Baloyan

The Republic of Armenia is a highland country located in the south of Caucasus. Currently the environmental law in our republic is regulated by 15 different documents. Armenia has participated in 12 international conventions of environmental character.

Ecological problems are closely related to the economic situation. Until 1990 the following were the main issues of instability in the ecological balance of the region:

- Degradation of pasture and active erosion of soil,
- Secondary salting of soil,
- Soiling of environment as a result of increasing throws of industry and transportation, as well as different everyday and industrial soiling exponents,
- Poverty of quality of superficial waters,
- Activating of exogen geological processes (landslides, mudflows).

During 1991 – 2001 more issues came up:

- Abbreviation of the forest territories because of mass cutting of woods,
- Catastrophic activation of eutrofikating processes of the lake Sevan, because of top exploitation and soiling water recourses of the lake,
- Decrease of fertile of agricultural soil because of infringement of norms of agro-technology,
- Construction of many buildings and different objects in the green areas of cities and towns,
- Increase in agricultural pests as the system for protecting plants deteriorated

As a result, the following things happened:

- Activation of soil degradation processes,
- Decrease of agricultural production,
- Exhaustion of the quality and quantity of bio-diversity.

Sustainable development of the economy of Armenia is only possible by regulating the role of the government in dealing with the environment. In a free market economy, the use of economic mechanisms in an environmental approach is getting more and more important.

Radical changes must be done in the following fields.

Entrain usage - it is necessary to fulfill:

- Perfection of the mechanism and increasing of transparent of the process of getting entrails for exploitation,
• Accounting of the state and dislocation of reserves of mineral resources, their losses and deterioration, as well as integrated use of crude ore and empty areas. Conservation and accounting of useful components of waste of extracted and temporarily unused associated mineral resources,
• To exploit and to include guaranteed economic mechanisms for getting necessary financial means to fulfill actions for realization of restoration and reclamation of infringed plots.

**Water usage** - it is especially necessary to stop the huge losses of water resources. That can be achieved by:
• Reconstruction and strengthening of reservoirs, exploitation of collection-and-drainage nets and to provide works for regulation of regime in drill holes,
• Providing works for reconstruction of irrigation nets, hydro-technical structures, pump stations and deep drill holes,
• Construction and exploitation of new reservoirs, especially in small and local significance,
• Introduction of contemporary sewage treatment technologies,
• Permanent monitoring of water resources,
• To increase the nets of sanitary areas and to provide permanent activity of corresponding services in this field.

**Atmosphere protection** - is necessary to fulfill:
• Inculcation of modern systems of dust and gas purifies,
• Stopping further degradation and constructions in green areas of cities and in further to increase functional process of new plantings,
• Development of the National strategy, which would enable to prevent or minimize growth of total content of greenhouse gases, as well as development of absorbers and accumulators and for that to use modern technologies.

**Protection and rational use of soil** - it is very important to stop or at least decrease soil pollution as well as to stop landslides, mudflows and erosion processes.

**Protection and rational use of biological and land-shaft diversity** - radical optimization of economic mechanisms, oriented towards sustainable use of bio and land-shaft resources of the republic. First actions must be the following:
• Discovering the stocks of bio resources,
• Ecosystem monitoring,
• Radical development of work techniques in protected areas.

Those actions can be brought to life through stopping the degradation of the environment and complex scientific research, especially research of social-economical character. The development of a policy of nature protection and economic mechanisms can be achieved through the integration of national, sub-regional and regional activities.
Azerbaijan
Mr. Fikret Jafarov

In order to better assist in the decision-making process for sustainable development, the Parliament of The Republic of Azerbaijan has ratified a number of conventions covering the following issues (examples of most recent conventions only):

- **Protection of Plants and Animals**
  - The Ramsar Convention 1971 and Paris Protocol 1985 as the attachment to it - Wetlands of International Importance as the main places of Inhabitancy of Wetland Birds (ratified March 14, 2000)
  - The UN Convention - Biodiversity, 12 June 1992, Rio the Janeiro (ratified March 14, 2000)

- **Protection of Natural Environment from Pollution**
  - The UN Paris Convention, 17 July 1994, Prevention of Desertification in Countries Facing Aridity and Desertification, Focus on Africa (ratified April 24, 1998)

- **Transboundery Issues**
  - The Espo Convention 1991 - Estimation of Influence to Environment in Transboundery Context (ratified February 1, 1999)
  - The Helsinki Convention - Protection and Use of Transboundery Runoff and International Lakes (ratified November 9, 1999)

Mr. Jafarov presented the conditions of the Environment in the Republic of Azerbaijan. He talked about the situation from the perspective of the different components of the environment: landscape, air, water, soil. For example, in parts of Azerbaijan, the concentration of certain air pollutants exceeds 2 to 15 times the acceptable norm. Mr. Jafarov also shared the website that deals with sustainable development in the Caspian Sea Region (http://www.sd.aznet.org). It serves as a forum to exchange experiences and information and aims to widely increase public awareness about the region of The Caspian Sea. The site was created as a result of the international workshop held in Baku, Azerbaijan in May-June 2000. Mr. Jafarov was a member of the group that worked on launching this project.

Georgia
Ms. Nato Kirvalidze
Moldova
Dr. Victor Cotruta

Current status of Strategic Environmental Assessment in Moldova

Brief history of Environmental Assessment in Moldova
In order to prevent and mitigate the potential negative impacts of economic activities on the environment, Moldova developed its own Environmental Assessment (EA) system. It was partially inherited from the Soviet era and later updated by new features of the western model of EA. The basis of the EA of Moldova, and of several other NIS (Cherp 2001), is the State Environmental Review (SER) and the Soviet version of EIA, referred to as OVOS (оценка воздействия на окружающую среду).

Since its independence in 1991, Moldova has adopted a series of legal acts that amended the existing legal provisions of the SER/OVOS system and has formed its present EA system known as the Environmental Review (ER) of Moldova. It is regulated by two laws: the Law on Environmental Protection (1993) and the Law on ER and EIA (1996), and regulations such as the Environmental Audit of Enterprises (1998), EIA of Enterprises Subject to Privatisation (1998), Public Participation in Environmental Decision-making (2000), etc.

Legal foundations of EA
The EA system of Moldova, (specifically the ER procedure), is regulated by two laws and a series of regulations. The Law on Environmental Protection (1993) defines ER as:

"... an activity of environmental protection that aims to a) prevent and minimise the potential direct, indirect or cumulative impact of the new economic activities onto environment, its components, ecosystems, human health, and b) assess from this perspective all economic activities, separately or as a whole that could affect at present or in the future the environment, human health, population's standards of living (Art. 21)."

The law does not refer to SEA; it focuses only on assessing the impacts generated by economic activities. Nevertheless, it stipulates that the review of all new developments, PPPs, laws, and regulations (Art. 16a) listed in article 23 of the law ER is one of the main responsibilities of the Department of Environmental Protection (Art. 15b), which is the exclusive body to undertake SER. Also, the law establishes requirements for state experts, who should be well-trained professionals with at least 10 years of experience in the field. It provides some very general guidelines on ER including a time schedule for project reviews and the requirements for project documentation.

Specific stipulations regarding the ER procedure are provided by the Guidelines on Performing SER (1995), which are very comprehensive and define in detail the goal, objectives and principles of SER. The guidelines specify its structure and functions, as well as the procedure of submitting project documentation to SER, including its review and outcomes. The guidelines do not provide any specific procedures on undertaking SEA and specify only the types of PPPs that should be subject to SER.

Shortly after signing the Espoo Convention in 1995, Moldova adopted the Law on ER and EIA (1996), which defines ER as follows:
... type of activity in the field of environmental protection that assesses in advance the impact of the planned economic activity onto the state of environment, its compliance with the enforce legal acts, norms and standards (Chapter I, art. 1).

The law amends previously adopted regulations on ER and defines the goal, objectives and principles of ER and EIA and provides guidelines on their implementation. It describes the SER system (Chapter II) and Public Environmental Review (PER) (Chapter III). Article 8 stipulates the status of state experts and ensures their independence in the reviewing process. According to the same article, state experts are fully responsible for correctness in reviewing project documentation, as well as for the final resolution of SER. It also requires that any pressure on state experts is sanctioned according to the enforce legislation.

Chapter IV of the law describes briefly the principles of the EIA procedure, which are stipulated in-depth in its annex called the Regulation on EIA. The regulation fails to define the term "EIA", although it covers the procedure's main aspects. Thus, it defines clearly the requirements for EIA documentation (Chapter II) and EIS content (Chapter III). Chapter IV provides for preparation and submission of EIA documentation by authorised practitioners/planners according to the methodology designed by the National Institute of Ecology (NIE). It requires an Environmental Impact Statement (EIS) to be submitted to SER, along with EIA documentation, prior to preparing project documentation. Chapter V and VI describe the modality used to inform local public administration and the general public regarding new developments, as well as the PER of EIS. Chapter IX of the regulation requires EIA for developments of a transboundary character to be undertaken according to the Espoo Convention. The list of activities subject to EIA procedure is incorporated into Chapter X. These activities are similar to the ones listed in the annexes I of the EU EIA Directive 97/11/EC and the Espoo Convention. In spite of the fact that the newly established law provides a thorough description of EIA procedure, it fails to define the term SEA and to give any perspective on undertaking this procedure.

Separate elements of SEA are represented in the Regulation on Public Participation in Environmental Decision-making (2000), which was an outcome of the Aarhus Convention, signed by Moldova in 1998. It amends previous public participation provisions, namely chapter III of the Law on ER and EIA (1996) and articles 3 and 30 of the Law on Environmental Protection (1993). Chapter II of the regulation calls for public participation in the process of decision-making regarding the new PPPs, laws, and regulations, as well as in decision-making at the local and national levels (Chapters III and IV, respectively). It also establishes a detailed procedure for public participation and consultation (Chapter V) and outlines the stages of environmental sociological investigations (Chapter VI), giving guidance on their implementation (Chapter VII).

Thus, the legal framework of the EA system of Moldova is represented by a complex set of legal acts, including two main laws that form the core of the EA system, and a series of completing provisions, as well as other legal acts that contain elements of EA. Moldovan legislation on EA does not, however, define the term SEA and provides only separate elements of this procedure, such as the requirement for mandatory SER of all
new PPPs, laws and regulations, as well as a provision for public participation and consultation in the decisionmaking process of the PPPs, laws and regulation.

Institutional Capacity for SEA

National-level developments, including new PPPs, laws and regulations, are reviewed by a group of experts in the Ecological Impact and Waste Management Division (EIWMD) of the Ministry of Ecology, Construction and Territorial Development. The division consists of two units: the Ecological Impact Unit and the Waste Management Unit. The Ecological Impact Unit has diverse functions, with its main focus on a) SER of national-level developments, as well as of new PPPs, laws and regulations, b) coordination of assessment, monitoring and management of natural resources, and c) methodological support and control of ER bodies; EIWMD employs 7 specialists together with the Head and Deputy Head. Three of them are employed in the Ecological Impact Unit. They are well-trained professionals with university degrees who have experience in environmental assessment and legislation. They review and decide upon the implementation of national-level developments, as well as new PPPs, laws and regulations.

Since the legal framework for SEA is not developed, or some separate elements are developed insufficiently, there are no guidelines for undertaking/implementing SEA. Educational institutions that teach environmental sciences largely neglect the subject of SEA, and training has not been provided by other sources. In conclusion, certain organizational structures and human resources are in place to support SEA; nevertheless, the legal framework is not developed, and there is a noticeable absence of guidelines and training resources that are necessary to adequately manage SEA.

Conclusions

Moldova has comprehensive environmental legislation on environmental assessment (EA). The procedures of environmental review (ER) and environmental impact assessment (EIA) are well established, while strategic environmental assessment (SEA) is still at an embryonic level of development. In spite of the fact that current legislation requires a review of all new Policy, Plans and Programs (PPPs), laws and regulations, and the assessment of their environmental acceptability before being put into effect, it does not provide any guidance on practical implementation, except for the inclusion of public participation in the environmental decision-making process. The fact that the procedure for SEA is not well-developed will result in certain consequences for the sustainable development of the country.

Future SEA perspective in Moldova

In November 2001, the Parliament of Moldova adopted a new environmental policy. In order to put into practice the newly adopted act, which resembles a wish list, it is necessary to set priorities and to design a realistic and affordable plan for implementation. This has been started recently by the Moldovan Ministry of Environment (Divisions of Environmental Policy, and Ecological Impact and Wastes Management) as a joint effort with the Tacis funded project on assistance in the implementation of environmental policies and NEAPs in NIS. The project aims to assist Moldova in achieving the objectives set in the policy. The initial study during the
inception of the project was undertaken by a group of local experts, including myself. One of the priorities we identified was the strengthening of environmental compliance and enforcement by improving and developing legislation and procedures related to EIA and SEA. Thus, the SEA procedure is to be elaborated in the near future in Moldova.

Russia
Professor Michael Kozel'tsev

Ukraine
Dr. Petro Pavlichenko

Decision Types

Ecological issues are regulated by the Constitution, Codes and other related laws, decrees, regulations, orders, instructions etc. All regulations can be classified as follows:

- Ecological legislation – general principles and regulations
- Legislation that regulates the usage of natural resources, which is divided into:
  - Land legislation
  - Water legislation
  - Forestry legislation
  - Fauna legislation
- Legislation that regulates air usage and protection
- Legislation on environmental protection (Legislation on natural territories and objects of special protection)
- Legislation on environmental safety
- International conventions

Laws

Decision making on the problems related to environment is managed by the bodies of different levels. According to the Article 75 of the Constitution of Ukraine, the Parliament of Ukraine – Supreme Council of Ukraine (“Verkhovna Rada”) – is the only legislative body in Ukraine.

According to the Articles 85 and 92 of the Constitution, the Supreme Council of Ukraine is empowered to adopt legislation on all types of natural resources, to approve national programs on environmental protection, problems of usage of natural resources etc.

The following legislative acts regulate the issues mentioned above:

- The Constitution guarantees the citizens’ right to a safe environment, free access to ecological information, and the fulfillment of ecological rights (Articles…);
- The Water Code of Ukraine regulates water relationships and property rights as well as determines major orientations of state policy in this sphere; The Water
Code also determines the Supreme Council of Ukraine’s terms of reference to include: 1) water relationships regulation 2) water management in Ukraine 3) adoption of national and interstate programs of water usage and protection as well as water resources renewal 4) implementation of legal regulation of water usage and water resources renewal in the zones of ecological emergency 5) regulation of funds distribution for special water usage 6) power determination of local Councils and bodies of executive power regarding water usage and protection as well as water resources renewal 7) resolution of other problems on legal regulation of water relationships;

- The Land Code of Ukraine similarly regulates the problems of land relationships
- The Forestry Code of Ukraine similarly regulates the problems of forest and forestry relationships;
- The Code of Ukraine “On the Depths” regulates mining relationships;
- The Law of Ukraine “On Environmental Protection” determines legal, economic and social fundamentals of environmental protection with respect to the concerns of present and future generations. In particular, this law determines that “environmental protection, rational usage of natural resources, provision of ecological safety of vital functions of the individual constitute necessary condition for stable economic and social development of Ukraine”;
- The Law of Ukraine “On Ecological Examination” determines the fundamentals of the ecological examination provision which is aimed at “preventing of negative influence of the people’s activities on environmental conditions and the people’s health, as well as assessment of the level of ecological safety of economic activities and ecological situation on the certain territories and objects”.

**Decisions On The Local Level**

It should be mentioned that powerful decisions are made in the oblasts (regions) and rayons (districts) by the local state administrations as well as bodies of the local self-administrations.

In particular, according to the Article 13 of the Law of Ukraine “On Local State Administrations”, the list of problems to be solved by the local state administrations includes resolution of the problems of social – economic development of the respective territories, the problems of budget, finance and accounting, as well as land and natural resources usage and environmental protection.

According to the Article 26 of the Law of Ukraine “On Local Self-Regulation in Ukraine”, bodies of local self-regulation make decisions on such ecological problems as: resolution of the problems on land relationships regulations according to the legislation; adoption of the amounts of the land taxes and amounts of the payments for natural
resources usage that belong to respective territorial communities, according to the legislation; resolution of the problems on the permissions for special usage of the natural resources of the local importance, as well as liquidation of such permissions according to the legislation; adoption of the decisions on the organization of the territories and objects of the national reserves fund of the local importance as well as other territories that are subject to special protection; making propositions to the respective state bodies on the proclamation of the natural and other objects of ecological, historical, cultural or scientific value as those that are natural, historical or cultural values that are protected by law; according to the legislation, approval of the allocation of new objects in the villages, communities and towns that are under the ecological influence of the activities of these objects within the limits of current standards. In addition, the law makes provisions for the right of the citizens in decision making.

**Supervision**

Different bodies of power see to the execution of ecological legislation. Among them are the following: 1) The Supreme Council of Ukraine 2) the President of Ukraine 3) the Cabinet of Ministers of Ukraine 4) Respective Ministries and State Committees 5) Administrations of the President in the oblasts, rayons and towns 6) Bodies of self-regulation 7) special state control bodies and 8) public associations and citizens. However, the major state body that exercises control in the ecological sphere is the State Ecological Inspection.

**Public Participation in Decision-Making**

The Constitution of Ukraine also makes provisions for public participation in the legislative process. According to Article 69 of the Constitution of Ukraine, citizens, through elections, (indirectly, through deputies of the Supreme Council of Ukraine) and through referendum (directly) may participate in legislative processes. In accordance with Article 3 of the Law of Ukraine “On All-Ukrainian and Local Referendums”, among the objects of the all-Ukrainian referendum may be the following: approval of the Constitution of Ukraine and its certain resolutions; Constitutional amendments and changes; adoption, changes or liquidation of the laws of Ukraine or certain resolutions; making of decisions that determine the basic sense of the Constitution of Ukraine, the laws of Ukraine and other legislative documents. Thus, if deputies that represent the interests of the Ukrainian citizens in the Supreme Council of Ukraine will not submit the draft law elaborated by the public for consideration by the Parliament, the public may adopt it through referendum.

The possibilities of the public for decision making in environmental issues become greater on the levels of the bodies of executive power. Public administration of environmental issues is made in compliance with Article 16 of the Law of Ukraine “On Environmental Protection”, which provides for activities by public organizations and associations, if such activities are allowed by statute. Almost all environmental laws of Ukraine provide for public participation in decision making. In particular, Article 9 of the
Law of Ukraine “On Environmental Protection”, which provides for the following: participation in the discussion of draft laws and materials on allocation, construction and reconstruction of the objects that may negatively influence environmental conditions; submission of propositions associated with these problems to state and economic authorities; participation in the development and realization of measures for environmental protection; rational and complex usage of natural resources; access to full and truthful information about environmental conditions and their impact on the health of the population; participation in public ecological examination; the ability to bring a suit against state authorities, enterprises, institutions, organizations and citizens regarding restitution of damages for health and ownership resulting from a negative impact on the environment. In addition, the legislation of Ukraine may determine other ecological rights of the citizens. According to Article 21 of the Law of Ukraine “On Environmental Protection”, the public has the right to develop and popularize its environmental programs; create public funds of environmental protection; after agreement with local Councils, to perform works for the protection and renewal of natural resources, for preservation and the improvement of environmental conditions, at their own expense; to participate, together with authorized state bodies of environmental administration, in examinations of the fulfillment of the plans and measures by enterprises, institutions and organizations; to conduct public ecological examination, popularization of its results and their submission to the bodies empowered to make decisions; according to the defined order, have access to information on environmental conditions, sources of contamination, programs and measures for environmental protection; submit initiatives for nationwide and local referendums on the problems of environmental protection, as well as ecological safety provisions; to submit to the respective authorities propositions about organizations of territories and objects of the national reserve fund; to bring suits about restitution of damages resulting from the violation of legislation about environmental protection, including restitution of health and ownership damages; and, to participate in measures of non-governmental organizations on the problems of environmental protection.
Section XI
Invited Presentations by CCMS Experts and Open Discussion on the Decision-Making Processes for Priority Environmental Problems in Central Asia

Water Resources Management: Problems and Possible Solutions in Central Asia
Professor Kenneth Howard
University of Toronto at Scarborough (Canada)

Ken Howard is the Director of the Groundwater Research Group at the University of Toronto, Vice President of the International Association of Hydrogeologists (IAH) and Chair of the IAH Commission on Groundwater in Urban Areas. He introduced his presentation with a slide detailing the success of the NATO Advanced Research Workshop concerning “Current Problems of Hydrogeology in Urban Areas, Urban Agglomerates and Industrial Centers” held 29 May to 1 June 2001 in Baku Azerbaijan. Topics covered in this presentation include a brief introduction of the world’s water, problems specific to Central Asia, potential solutions and conclusions.

World Water
When considering the world’s water, one must remember the hydrologic cycle of water and the differences and similarities between groundwater and surface water. Two key differences between groundwater and surface water include travel time and the global water budget. Roughly 97.2 % of the world’s water budget exists in oceans or seas as saltwater while 2.8 % exists on land (i.e., ice caps, glaciers, groundwater, etc.) as fresh water. These differences have important implications on how ground and surface water should be managed and protected.

Groundwater and surface water both face similar problems of water quantity and quality. Excessive demands such as drinking, industry and agriculture are placed on water quantity. Chemicals impact water quality through sanitation, salinization, industry, mining, oil production, etc. These problems of water quantity and quality are compounded by the following four factors:

• Population growth / urban development,
• Transboundary movement of water,
• Groundwater and surface water resource mismanagement, and
• Inadequate understanding of groundwater flow in three dimensions, in the case of groundwater.

In the case of Central Asia the water quantity and quality problems have been affected in varying degrees by each of the four compounding factors as well as topographical extremes and meteorological extremes. Because of differences in precipitation across the region water balance is critical. Transboundary water movement is important in the region because downstream neighboring countries are affected by water resource decisions.

Throughout Central Asia poor decisions have been made regarding water resources. Many of the problems are related to urban water uses such as domestic water supplies and domestic waste and sewage. The percentage of the population living in urban
areas averages about 40 % and is expected to rise. Many of the current problems related to water resources in Central Asia stem from inadequate and inappropriate strategies for water management. The problems are compounded by transboundary issues and by conflicting interests of neighboring countries.

In conclusion, the water resources issues in Central Asia are complex; however, similar issues are confronted around the world (i.e., Mexico City, Nile River, Bangladesh, etc.). To resolve these common issues related to water resources, ultimately the following are required:

- Political will and commitment,
- Support of all stakeholders,
- International Cooperation,
- Education at all levels,
- Good data as well as sound science and technology, and
- Funds.

Use of Environmental Impact Assessment for Environmental Decision-Making and its Application in Central Asia

Dr. Dick Van Straaten
University of Antwerp (Belgium)

Use of Landscape Sciences for Environmental Decision-Making and Environmental Assessment in Central Asia

Dr. Frederick W. Kutz
U.S. Environmental Protection Agency (United States)

During the presentation Dr. Kutz presented a review of the scientific bases for using landscape sciences for environmental assessment / decision-making; examples of the uses of landscape sciences; and considerations for future directions.

Landscape Science

The landscape approach is useful as a basis for environmental assessment to determine patterns and trends reflecting the condition of embedded ecosystems. Some important environmental changes occur at broad spatial scales that are undetectable in localized studies; however, landscape information may be useful in local and regional assessments. Landscape indicators are based on land use / land cover information derived from satellite imagery and aerial photography. A high-tech approach involves the power of remote sensing combined with geographic information sciences, computer technology and spatial statistics. Various components of landscape science include the following:

- Landscape characterization (land use / land cover),
- Land cover change detection,
Land cover maps have been created for the United States (MRLC), Europe (CORINE) and Central Asia (AVHRR). A land cover change was detected and graphed for San Pedro Watershed (Arizona and Mexico) indicating that the number of hectares covered by grasslands and desert scrub decreased between 1973 and 1997, and hectares covered by mesquites and urban development increased between 1973 and 1997. Some examples of landscape indicators include the following: roads, forest fragmentation, wildlife habitat, riparian buffers, streams and cropland, and impervious surfaces. A landscape model can be created for each of these indicators or as a combination of many indicators. For example, one might model avian habitat. Variables of the model would include suitable forest habitat, forest interior habitat, forest patch isolation and riparian buffer width. A number of species could be included such as the warblers, ovenbird, tanagers, and brown creepers. The resulting model could predict breeding and stopover sights for area-sensitive forest birds and fall migrants.

Future Considerations
Current capabilities of landscape science can do some assessments with AVHRR data to demonstrate the landscape approach. Extensive data needs include land cover maps such as Enhanced Thematic Mapper (LANDSAT) or aerial photos and include hydrology, elevation models, accuracy assessments, etc. A final consideration is a NATO/CCMS Pilot Study concerning landscape science.

Role of Public Participation in Environmental Decision-Making: A Central Asian Perspective
Professor Louis Lemkow
University Autonoma de Barcelona (Spain)

Integration of Environmental Issues into Decision-Making, Policy Analysis and Regional Cooperation Initiatives
Ms. Susan Milner
Natural Resources Institute (United Kingdom)
Pesticides Use: Problems and Possible Solutions in Central Asia

Professor Claudio Colosio
Center for Pesticides Safety (Italy)
Mr. John Vijgen
Environmental Consultant (Denmark)

Pesticide Pollution in Central Asia
Central Asian countries deal with a variety of problems related to pesticides. In Tajikistan chemicals and fertilizers are used and stored inappropriately. A variety of spoiled, outdated or internationally illegal chemicals are exported to Tajikistan, including 500 metric tons of DDT from Afghanistan in 1996. In Kazakhstan chlorinated contaminants such as beta-HCH and HCB have been found in breast milk. Levels of beta-HCH were among the highest reported in published literature (2210 ng/g fat vs 200 in Europe). In Uzbekistan huge doses of fertilizers, pesticides, defoliants, and herbicides have been dumped onto fields and then leached into the groundwater. In the Caspian Sea region the following wastes are dumped each year:

- 60,000 tons of petroleum products,
- 24,000 tons of sulphites,
- 400,000 tons of chlorine,
- 25,000 tons of phenols, and
- 28,000 tons of precipitate waste.

Priorities must be evaluated to focus on the health effects on children, including the reduction of contaminants in breast milk, better nutrition, groundwater contamination, leaching and surface water contamination. Problems facing pesticide use in the region include outdated and illegal pesticide use and stocks of obsolete pesticides.

Possible Action Strategies
One pesticide management strategy would first assess the problems, including environmental hazards, human health risks, obsolete and illegal pesticides, water pollution and pesticide residue in food. Possible actions that may be taken include the adoption of regulatory and policy measures, monitoring activities, training and education activities and information campaigns. The key players in regulatory and policy measures are government and industry. A key role of the government should be to ensure that pesticides are used effectively for the improvement of agricultural production and of human, animal and plant health. One primary role of industry should be to supply only pesticides of adequate quality, packaged and labeled appropriately. It may be beneficial to require registration for the sale and use of pesticides.

Environmental and biological monitoring are components of the action strategy. The first and essential steps to environmental monitoring are data collection, census taking of agriculture and load estimation. The Geographical Information System (GIS) can simplify the procedure for identification of crop regions and areas at risk of pesticide pollution and can be used to create land use maps. More refined steps include models for Predicted Environmental Concentration (PEC) evaluation to follow pesticide behavior and the fate of the environment and to assess pesticide concentration in groundwater.
Biological monitoring is used to determine pesticide residues in body fluids (i.e., urine, blood, breast milk) on selected populations (i.e., workers, general population, etc.). Training and education activities directed at pesticide workers are an important component of an action strategy. Pesticide workers should be informed about health risks, personal protective equipment and first aid. Information campaigns should be organized to inform the general population about pesticides commonly used in households.

Intervention plans should be organized to assemble the information in the preventative actions. National plans for prevention of pesticide risks should be developed and revised periodically by national authorities.

**Cotton-Integrated Pest Management (IPM)**

Often the technical transfer in IPM is not working due to a lack of communication from researchers to farmers and due to the fact that recommendations are developed for large-scale, monocropped irrigated cotton in favorable climatic and soil conditions. IPM is not suitable for mixed crops in areas of low rainfall and soil fertility, where most of the cotton is grown. Farmers need to understand the justification and background of the IPM system so they can apply IPM under different conditions. The key to the success of IPM is to focus on teaching the farmer as the decision-maker and natural control of pests is the goal. Successful farmer field schools have been conducted in China, Bangladesh, and Thailand.

Integrated pest management is an important tool for minimizing pesticide use. IPM would be beneficial in this study for the following reasons:

- Simple to use,
- Easy to understand and learn,
- Low investment,
- Bottoms-up approach,
- Decisions and responsibilities by farmers, and
- Individual and common responsibility.
Section XII
Planned Next Pilot Study Meeting

The next meeting for the pilot study will be a working group meeting in Almaty, Kazakhstan in September of 2002. The working group of 8-10 participants will focus on three inter-related topics: water resources management, environmental problems resulting from unsound agricultural practices and landscape sciences as tools for environmental assessment in Central Asia. In addition, an additional focused working group meeting will be conducted in conjunction with the next meeting of the Pilot Study on “The Use of Landscape Sciences for Environmental Assessment” in Kiel, Germany in November of 2002. The working group for this pilot study will consist of 4-5 Central Asian experts and 4-5 experts from NATO countries. The NATO country experts will include landscape scientists from the US EPA and USDA.
Section XIII
Map of Central Asia and the Caucasus
Section XIV
Agenda*

(*The agenda was adjusted as the meeting evolved in order to take into account the discussion needs of the participants, and to allow maximum input from the Republics of Central Asia.)

Day 1 - Saturday, 16 March 2002
Arrivals into Brussels & Transport to the Hotel  
Early morning and mid-afternoon arrivals

19:00 - 21:00  
Informal Dinner: Hotel Villa Royale - Brussels

Day 2 - Sunday, 17 March 2002

16:00 - 19:00  
Introductions  
Summary of Istanbul Planning Meeting (26 February – 1 March 2001)  
Reception & Meeting Orientation: Hotel Villa Royale - Brussels  
Dr. Christian Vandecasteele, SCK-CEN (Belgium)  
Dr. Roy Herndon (Florida State University)

Day 3 - Monday, 18 March 2002

08:15  
Bus departs for the Belgian Nuclear Research Center from the hotels

08:45 - 09:15  
Coffee in the meeting room at the Belgian Nuclear Research Center

Introductions and Opening Comments

09:15 - 09:45  
Welcome to the Belgian Nuclear Research Center Facilities  
Mr. Paul Govaerts, General Manager, SCK-CEN (Belgium)

09:45 - 10:15  
Opening Comments  
Mr. Jean Fournet, Assistant Secretary General for Scientific and Environmental Affairs (NATO)
10:15 - 10:45
Break

Pilot Study Overview and CCMS Program

10:45 - 11:00
Overview of Meeting Agenda - Purpose of Meeting
Dr. Roy Herndon, Pilot Study Director
Institute for International Cooperative Environmental Research (IICER)
Florida State University (United States)

11:00 - 11:30
Role of the Regional Environmental Center for Central Asia in the Pilot Study in the Context of RIO + 10 Needs (Overview of the RIO + 10 Planning Meeting)
Dr. Bulat Yessekin, Executive Director, The Regional Environmental Center for Central Asia (Kazakhstan)

11:30 - 12:00
The CCMS Program: Mission, Organizational Structure and Activities
Dr. Deniz Beten, CCMS Program Director (NATO)

12:00 - 13:30
Lunch, SCK-CEN Facility

Invited Presentations by CCMS Pilot Study & Project Directors

13:30 - 14:30
Panel of CCMS Pilot Study Directors: Transferring the Experience and Knowledge of NATO/CCMS on Issues Related to Environmental Decision-Making to this Pilot Study

Moderators:

Prof. Hanno Schaumburg, Hamburg-Harburg Technical University (Germany)

Ms. Wendy Grieder, U.S. CCMS National Coordinator, U.S. EPA (United States)

Panel Members:

Prof. Rudi Verheyen, University of Antwerp (Belgium)
Director of Pilot Study on the Methodology, Focalisation, Evaluation and Scope of the Environmental Impact Assessment

Prof. Ender Okandan, Middle East Technical University (Turkey)
Director of Short-term CCMS Project on Hazardous Substances Involved in Oil and Gas Transportation in the Black Sea and Caspian Regions

Dr. Frederick W. Kutz, U.S. Environmental Protection Agency (United States)
Director of the Pilot Study on the Use of Landscape Sciences for Environmental Assessment

14:30 - 17:00
Presentations and comments by the Central Asian Representatives describing the procedures used, and the mechanisms which are in place or being developed for making environmental decisions in the Central Asian Republics

- Kazakhstan (Ms. Bolatbaeva Kulyash, Mr. Alexander Miroshnichenko)
- Kyrgyzstan (Ms. Tatiana Filkova, Dr. Emil Shukurov)
- Tajikistan (Dr. Tatyana Alikhanova)
- Uzbekistan (Mr. Timur Tillyaev)

These presentations, in addition to identifying the gaps and deficiencies of the current decision-making processes used in Central Asia, also will help to identify how this Pilot Study can be of assistance to the individual Central Asian countries as well as the region as a whole to ensure that the concept of sustainable development is integrated into the decision-making process.

Moderators:

Dr. Vladimir Bogachev, Regional Environmental Center for Central Asia (Kazakhstan)

Mr. John Vijgen (Denmark)

17:00 - 17:30
A Regional Perspective on Environmental Problems in Central Asia
Dr. Bulat Yessekin, Executive Director
The Regional Environmental Center for Central Asia (Kazakhstan)

17:30
Adjourn for the Day

19:30
Pilot Study Dinner: Hotel Villa Royale

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Day 4 - Tuesday, 19 March 2002

08:15
Bus departs for the Belgian Nuclear Research Center from the hotels

08:30 - 09:00
Coffee in the meeting room at the Belgian Nuclear Research Center

Pilot Study Fellows Presentations

09:00 - 09:30
Presentations by Pilot Study Fellows: Focus of Fellowship Activities
(10-15 minutes for each presentation)
Prof. Ender Okandan (Turkey)
Dr. Michael Kuperberg (United States)

Invited Presentations by NATO Partner Countries

09:30 - 12:00
Armenia, Azerbaijan, Georgia, Moldova, Russia, Ukraine

Presentations on the Decision-Making Processes Used by NATO Partner Countries (approximately 20 minutes per speaker)

- Armenia: Mr. Samvel Baloyan
- Azerbaijan: Mr. Fikret Jafarov
- Georgia: Ms. Nato Kirvalidze
- Moldova: Dr. Victor Cotruta
- Russia: Professor Michael Kozeltsev
- Ukraine: Dr. Petro Pavlichenko

Moderators:

Dr. Mikhail Khankhasayev, IICER, Florida State University (United States)
Ms. Susan Milner, Natural Resources Institute (United Kingdom)

12:00 - 13:30
Lunch, SCK-CEN Facility

Invited Presentations by CCMS Experts and Open Discussion on the Decision-Making Processes for Priority Environmental Problems in Central Asia

13:30 - 14:00
Water Resources Management: Problems and Possible Solutions in Central Asia
Prof. Kenneth Howard, University of Toronto at Scarborough (Canada)

14:00 - 14:30
Use of Environmental Impact Assessment for Environmental Decision-Making and its Applications in Central Asia
Dr. Dick Van Straaten, University of Antwerp (Belgium)

14:30 - 15:00
Use of Landscape Sciences for Environmental Decision-Making and Environmental Assessment in Central Asia
Dr. Frederick W. Kutz, U.S. Environmental Protection Agency (United States)
15:00 – 15:30
Role of Public Participation in Environmental Decision-Making: A Central Asian Perspective
Prof. Louis Lemkow, Universitat Autònoma de Barcelona (Spain)

15:30 - 16:00
Break

16:00 - 16:30
Integration of Environmental Issues into Decision-Making, Policy Analysis and Regional Cooperation Initiatives
Ms. Susan Milner, Natural Resources Institute (United Kingdom)

16:30 - 17:00
Pesticide Use: Problems and Possible Solutions in Central Asia
Prof. Claudio Colosio, Center for Pesticides Safety (Italy)
Mr. John Vijgen, Environmental Consultant (Denmark)

17:00 - 17:30
Pollution from Oil & Gas Production: Problems and Possible Solutions in Central Asia
Prof. Ender Okandan, Middle East Technical University (Turkey)

17:30 - 18:00
Human Health Consequences of Exposures to Environmental Contaminants: Problems and Possible Solutions in Central Asia
Dr. Michael Kuperberg, IICER, Florida State University (United States)

Pilot Study Administrative Issues

18:00 - 18:30
- Venue for Next Meeting (TBD)
- Other Pilot Study Administrative Issues
Dr. Roy Herndon, IICER, Florida State University (United States)

18:30 - 19:00
Critique and Closing Comments

Moderator:
Dr. Roy Herndon, IICER, Florida State University (United States)

Panel:

Dr. Deniz Beten (NATO)
Dr. Christian Vandecasteele (SCK-CEN)
Dr. Bulat Yessekin (The Regional Environmental Center for Central Asia)
19:00
Meeting Adjournment

19:15
Bus returns to the hotels

19:45
Pilot Study Dinner – Restaurant De Ultieme Hallucinatie
Koningstraat 316 Rue Royale – 500 meters from Hotel Villa Royale toward Cathedral
(opposite side of street of Hotel Villa Royale)

Day 5 - Wednesday, 20 March 2002

Cultural/Environmental Tour
(transportation provided)

09:00
Bus departs from the hotels

TBD
Tour ends
Return to hotels
Section XV
List of Meeting Participants

Pilot Study Director:

- Dr. Roy C. Herndon, Director of the Institute for International Cooperative Environmental Research (IICER) at Florida State University.

NATO country participants:

- **Belgium** Mr. Anthony Antoine, Allied Consultants
- **Belgium** Ms. Marleen Coenen, University of Antwerp
- **Belgium** Mr. Paul Govaerts, Belgian Nuclear Research Laboratory
- **Belgium** Dr. Dick Van Straaten, Flemish Authorities
- **Belgium** Dr. Ir. Christian Vandecasteele, SCK.CEN Radioecology Laboratory
- **Belgium** Prof. Rudi Verheyen, University of Antwerp
- **Canada** Prof. Kenneth Howard, Groundwater Research Group
- **Denmark** Mr. John Vijgen, Pesticides Consultant
- **Germany** Prof. Dr. Hanno Schaumburg, Technische Universität Hamburg-Harburg
- **Italy** Prof. Dr. Claudio Colosio, International Center for Pesticide Safety
- **Spain** Prof. Dr. Louis Lemkow, Universitat Autonoma de Barcelona
- **Turkey** Prof. Dr. Ender Okandan, Middle East Technical University
- **United Kingdom** Ms. Susan E. Milner, NR Group
- **United States** Mr. Norbert Barszczewski, Florida State University
- **United States** Ms. Wendy Grieder, U.S. Environmental Protection Agency
- **United States** Dr. Roy Herndon, Florida State University
- **United States** Dr. Mikhail Khankhasayev, Florida State University
- **United States** Dr. J. Michael Kuperberg, Florida State University
- **United States** Dr. Frederick W. Kutz, U.S. Environmental Protection Agency
- **United States** Mr. John Moerlins, Florida State University

EAPC country participants:

- **Azerbaijan** Mr. Fikret Jafarov, Azerbaijan Research Institute of Fish Facilities
- **Armenia** Mr. Samvel Baloyan, NGO - Associate for Human Sustainable Development
- **Georgia** Ms. Nato Kirvalidze, The Regional Environmental Center for the Caucasus
- **Kazakhstan** Dr. Vladimir Bogachev, Regional Environmental Center for Central Asia
- **Kazakhstan** Ms. Kulyash Bolatbaeva, NGO "The Network of Experts for Sustainable Development"
- **Kazakhstan** Mr. Alexander Miroshnichenko, Ministry of Natural Resources and Environment Protection of the Republic of Kazakhstan
- **Kazakhstan** Mr. Akhmadyar Siranov, Regional Environmental Center for Central Asia
- **Kazakhstan** Dr. Bulat Yessekin, Regional Environmental Center for Central Asia
- **Kyrgyzstan** Ms. Tatyana Filkova, Ministry of Ecology and Emergency of Kyrgyz Republic
- **Kyrgyzstan** Mr. Emil Shukurov, Central Asia Transboundary Biodiversity Project
- **Moldova** Dr. Victor Cotruta, The Regional Environmental Center for Moldova
- **Russia** Prof. Michael Kozeltsev, The Regional Environmental Center for Russia
- **Tajikistan** Dr. Tatyana Alikhanova, Ministry of Economy and Trade
- **Ukraine** Dr. Petro Pavlychenko, The Regional Environmental Center "REC-Kyiv"
The NATO CCMS Programme was represented at the meeting by Dr. Deniz Beten, the CCMS Programme Director.

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