

PN-ABP-616
ISN: 83517

WASH Field Report No. 395

CENTRAL ASIAN REGIONAL WORKSHOP ON ENVIRONMENTAL HEALTH

Tashkent, Uzbekistan

March 1-5, 1993

Prepared for the Office of Health, Bureau for Research and Development
U.S. Agency for International Development
under WASH Task No. 440

by

Daniel B. Edwards

April 1993

Water and Sanitation for Health Project
Contract No. DPE-5973-Z-00-8081-00, Project No. 936-5973
is sponsored by the Office of Health, Bureau for Research and Development
U.S. Agency for International Development
Washington, DC 20523

CONTENTS

ABOUT THE AUTHOR	iii
ACKNOWLEDGMENTS	iii
ACRONYMS	v
EXECUTIVE SUMMARY	vii
1. INTRODUCTION	1
1.1 Background	1
1.2 Issues Framing the Workshop	1
1.3 Scope of Work	2
2. PREPARATION	3
2.1 Preparatory Assessment	3
2.2 Other Preparations	5
3. WORKSHOP PROGRAM AND DELIVERY	9
3.1 Workshop Goals and Objectives	9
3.2 Workshop Participants	10
3.3 Logistics	10
3.4 Workshop Design	12
3.4.1 Technical Program	13
3.4.2 Workshop Agenda	16
4. RESULTS AND RECOMMENDATIONS	21
4.1 Participant Evaluations	21
4.2 Summary of Outcomes	22
4.3 Lessons Learned: Technical Staff Observations	23
4.3.1 Planning for Workshops Requiring Translation and Including Participative Processes	23
4.3.2 Advance Work	23
4.3.3 The Technical Program	24
4.3.4 Workshop Management	24
4.3.5 Participants	25
4.3.6 Small-Group Work	25

4.4	Lessons Learned: Interpretation Staff Observations	25
4.5	Conclusions and Recommendations	26

APPENDIXES

A.	Participant Directory	29
B.	Full Text of Evaluative Comments by Interpretation Staff	39
C.	Welcoming Speeches and Reports from Country Representatives	43
D.	Full Text of Participant Evaluations	61
E.	Bibliography of Reference Material Handed Out	69

FIGURE

1.	Linkages Between Environment and Health	16
----	---	----

ABOUT THE AUTHOR

Daniel B. Edwards has been with Training Resources Group since 1981. He has over 25 years of experience as a training and organizational development consultant in Latin America, Asia, and the Middle East. He has worked on numerous WASH assignments over the past nine years, primarily in the area of training and institutional development. Mr. Edwards speaks fluent Spanish, has been heavily involved in projects in Central Europe, Ecuador, Egypt, Sri Lanka, and Thailand and has lived in the Dominican Republic and Panama.

ACKNOWLEDGMENTS

The workshop described in this report was prepared and delivered under the direction of Ms. Julie Klement of the U.S. Agency for International Development, Bureau for Research and Development, Office of Health. Dr. John Borrazzo of the Office of Health assisted in supervising the work and participated extensively in preparations for and delivery of the workshop.

The workshop was requested by Ms. Paula Feeney of the USAID Regional Mission to Central Asia (USAID/Alma Ata) and Ms. Pamela Pearson of the USAID Newly Independent States Task Force. The Environment and Health Foundation of Uzbekistan (ECOSAN) served as host-country sponsor for the workshop. We appreciate the assistance provided by Mr. Yusuf Shadimetov, President of ECOSAN.

The workshop would not have been successful without the continuing, expert, and cheerful involvement of Ms. Sylvia Babus, Political Officer of the U.S. Embassy in Tashkent, Uzbekistan. Ms. Babus coordinated official interactions between the U.S. Government and ECOSAN and was a consistent supporter of the workshop, even when arrangements were difficult.

The assistance of Ms. Dilya Zupharodjaeva, who served as Administrative Manager and was responsible for all logistical preparations in Tashkent, was also critical to the success of the workshop. Thanks are also due to Ms. Ann Hirschey and Ms. Teresa Sarai of the WASH Project staff and to Ms. Melissa Stone and Mr. Istvan Gyenis of Kompass Resources, International, all of whom shared responsibility for coordinating the production and translation of the written workshop materials.

ACRONYMS

A.I.D.	U. S. Agency for International Development (Washington, D.C.)
CARs	Central Asian Republics
ECOSAN	Environmental and Health Foundation of Uzbekistan
FSU	Former Soviet Union
GTZ	German aid agency (<i>Deutsche Gesellschaft für Technische Zusammenarbeit</i>)
NIS	Newly Independent States
USAID	U.S. Agency for International Development (overseas missions)
WASH	The Water and Sanitation for Health Project, Arlington, VA
WHO	World Health Organization

EXECUTIVE SUMMARY

A five-day environmental health workshop was conducted for the Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, on March 1-5, 1993, in Tashkent, Uzbekistan. The workshop was sponsored by the U.S. Agency for International Development (A.I.D.), Bureau for Research and Development's Office of Health, at the request of the Newly Independent States (NIS) Task Force and the USAID Regional Mission for Central Asia and in cooperation with the Environmental and Health Foundation of Uzbekistan (ECOSAN). The Water and Sanitation for Health (WASH) Project provided the workshop planning and implementation staff.

The workshop addressed the following broadly defined themes, which were developed during an early-December field assessment visit to Kazakhstan, Uzbekistan, Turkmenistan, and Kyrgyzstan.

- Linking environmental pollutants and human health
- Prevention versus treatment
- Economic development and environmental health
- Methods for selecting and implementing interventions
- Sectoral organization for environmental health
- Intersectoral communication

These themes were explored through plenary technical presentations, small-group discussions, and demonstrations of relevant computer software.

Workshop participants included a cross-section of staff from policy, management, and implementation levels in both the environmental and health agencies. Participants included key staff from parliamentary committees and presidential staff, the higher levels of management in ministries (deputy ministers and ministers), and the implementation level at institutes and ministries (chief epidemiologist, environmental epidemiologist, and environmental engineers). In addition to the 26 participants from Central Asia, representatives from the World Bank, the World Health Organization (WHO), The European Community, and GTZ (*Deutsche Gesellschaft für Technische Zusammenarbeit*) attended portions of the workshop. Staff from the NIS Task Force, A.I.D.'s Bureau for Research and Development's Office of Health, and the USAID Regional Mission for Central Asia also attended and helped deliver the workshop.

The technical program was designed to introduce participants to a set of methodologies that are useful in identifying, understanding, and resolving environmental health problems, while addressing the themes listed above and communicating lessons learned in the last 20 years of experience in environmental protection in the United States. The technical program included presentations, small-group exercises, and plenary presentations on the following topics:

- how to use a general model for describing links between environmental conditions and health conditions;
- how to use epidemiological investigations to establish the existence of links (causal relationships) between specific environmental conditions and specific health conditions;
- how to use risk assessment techniques to quantify the potential effect of hazardous environmental conditions on public health;
- how to use risk estimates and other information to set priorities among environmental health problems;
- how to develop options for interventions for addressing environmental health problems; and
- how to evaluate the economic costs and benefits of alternative strategies for addressing environmental health problems.

Summary of Workshop Outcomes

One important outcome of the workshop was the introduction of new ideas, methods, and technologies. Participants viewed the most important result of the workshop as the introduction of new methodologies for linking environment to health, namely, risk assessment and environmental epidemiology.

Another important workshop outcome was an increase in the participants' awareness that achieving practical solutions to environmental health problems requires the active involvement of a range of human resources from different disciplines and agencies. The workshop brought together environmental professionals and medical/health specialists and demonstrated the effectiveness of discussion focused on common problems. Participants were very enthusiastic about working on concrete problems in small, interdisciplinary discussion groups. Important groundwork was laid for future work that requires intersectoral collaboration and recognition of the relationship between environmental and health issues.

A third workshop outcome was the establishment of a dialogue between A.I.D. and the participants, and of dialogue within each country group about what can be done about environmental health problems. In their workshop evaluations, participants commented on the need for follow-up staff training. Many expressed a desire for the opportunity to study further the materials handed out during the workshop, and also mentioned the need for equipment, particularly computers and software. Key individuals and organizations at both the national and institutional levels have expressed interest in further collaboration with A.I.D.

Chapter 1

INTRODUCTION

1.1 Background

The Central Asian Republics (CARs) face a variety of serious public health problems that are caused or aggravated by severely degraded environmental conditions. The most important and widespread health and environmental problems in the CARs can be classified in four general areas: problems related to infectious agents and water (water supply for rural populations, water quality for drinking and irrigation, and water quantity and water resource management); agricultural pollutants and health (improving pesticide management and alleviating the overuse of fertilizers, particularly in the cotton monoculture, and protecting food supplies from contamination during processing); airborne pollutants and health (managing industrial and transport-related air pollution); and solid and hazardous waste (management in urban and industrial areas).

Based on an initial needs assessment arrived at by A.I.D.'s Office of Health in the fall of 1992, A.I.D. identified environmental health as one of the three priority areas for assistance in the Central Asian Region (the other two were health finance and maternal child health care).

In October 1992, the Regional USAID Mission in Alma Ata, the health office of the NIS Task Force, and the Office of Health, Bureau for Research and Development requested that WASH present a five-day workshop to address a variety of serious public health problems that are caused or aggravated by severely degraded environmental conditions in the CARs.

WASH sent a four-person team to Central Asia in December 1992, for a sixteen-day assessment. The team—composed of specialists representing the skill areas of environmental engineering, with a specialty in air pollution; environmental assessment, legal/regulatory issues and workshop design; epidemiology and health assessment; and institutional assessment and workshop design and management—visited Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan. Based on the needs assessment, workshop objectives were developed, and the workshop was designed accordingly.

Workshop preparation, including preparing participant invitations, planning logistics, recruiting technical presenters, translators, etc., and developing technical presentations, was carried out between December 21, 1992 and the end of February 1993. Implementation of the workshop took place March 1-5, 1993.

1.2 Issues Framing the Workshop

A population's risk of developing environmentally related diseases can be reduced by either decreasing the levels of environmental contamination to which people are exposed or the duration of their exposure, or both. As the risk of developing a disease decreases for a

population the number of people who develop the disease falls. The efficacy of a specific environmental health program—e.g., reducing discharges of a carcinogen in industrial wastewater—is generally measured in terms of the number of cases or deaths avoided. The economic benefit of such a program is realized by preserving the productive capacity of the people it protects and avoiding the cost of health care interventions that would otherwise be necessary.

The essential tools of an environmental health program are risk assessment and risk management. Because many diseases attributable to environmental exposures are manifested long after the initial exposure, a procedure is needed to predict the long-term public health consequences of present environmental conditions. Risk assessment enables public health officials to evaluate and compare present environmental conditions in terms of their long-term impact on public health and, thereby, to identify objectively the highest priority environmental health problems. Risk assessment also enables analysts to evaluate the effects of environmental conditions on especially susceptible populations, such as mothers and children. Risk management strategies may then be employed to address these problems, reducing the severity and duration of exposure to harmful environmental conditions.

1.3 Scope of Work

The scope of work called for designing and conducting a five-day workshop on environmental health in the Central Asian Republics.

The following were the key activities carried out:

- Gathering background information and identifying key documents on environmental health in the Central Asian Republics
- Planning and conducting a needs assessment which focused on surveying the perception of environmental health problems, approaches which have been tried, available data on environmental health problems, and receptivity to new approaches
- Assisting in identification and selection of participants
- Planning and arranging logistics for the workshop
- Preparing technical background materials for workshop sessions
- Preparing and translating into Russian all workshop materials including technical resource materials
- Managing and implementing all on-site pre-workshop logistics
- Conducting a simulation of the workshop in Tashkent
- Conducting the workshop

Chapter 2

PREPARATION

2.1 Preparatory Assessment

A preparatory assessment was conducted in December 1992 by a four-person team that gathered information for designing and managing a workshop in environmental health for five Central Asian countries. During that trip interviews were conducted with government representatives at policy levels (parliamentary committees and executive committees), at upper management and policy levels in ministries (ministers and deputy ministers of health and environment), and with operational staff (heads of departments, chiefs of epidemiology stations and research institutes, and technical staff) in ministry departments and institutes in Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan to identify perceptions of environmental health problems, to review existing available data on the environment and health, and to identify appropriate institutions and individuals for participation in a five-day workshop. Another goal of the preparatory assessment was to identify suitable workshop management and to make logistical arrangements in Tashkent, Uzbekistan, the workshop site.

After conducting its field work, the assessment team identified a number of key problems and issues that would be important to begin to address, and for which the workshop could serve as an introduction. These are outlined below. (More detailed results of that assessment were reported in WASH Working Paper No. 105, "Preparation for an Environmental Health Workshop for Central Asia, April 1993.")

Methodology of Environmental Health

- Establishing linkages between environmental conditions and health: Individuals interviewed were not always able to describe the relationships between specific environmental conditions and specific diseases accurately. Data are collected frequently and are often replicated by different groups, many of which produce monthly, quarterly, or annual reports that are not used appropriately or to their full advantage.
- Prevention versus treatment: Emphasis has been on treatment strategies with little awareness of the costs, benefits, and strategies required for preventing environmental and health problems.
- Need for reestablishing information linkages: Because the political system in the FSU was centralized with a network of institutes for both health and environment, there were built-in mechanisms for sharing technical information and publications. Journals were frequently translated, read, and circulated. Since the breakup of the FSU, this system has broken down and many of those interviewed felt they were isolated from the West and from former colleagues.

- **Need for decision-making and selection of appropriate interventions:** In the past, decisions had been based on a very hierarchical and highly centralized approach, with decisions being delivered from the top down and reports from the bottom up. Even republic-level officials took extensive direction from central Soviet institutions and had little control over the allocation of resources or their institutions' agenda.

Institutional and Management Issues

- **Sectoral organization:** The organization of the health and environmental sectors is as follows. Policy decisions are centralized at the parliamentary and executive committee levels and management decisions at the ministerial level. The lowest level is the district, where a small three- or four-person office operates and reports to the regional institute. National institutes and their regional (*oblast*) offices are charged with implementation. The Central Asian countries visited are beginning to question these institutional arrangements because of the need for coordination of overlapping activities. The structure invites turf battles for staff and equipment.
- **Communication between environmental professionals and the health community:** While data may be shared, in practice people in the health and environmental sectors tend to live in separate worlds. At higher levels, such as in parliamentary and presidential positions, there is more integration and interdisciplinary focus than exists in the ministries. At operational levels, according to younger staff interviewed, there was a desire to build linkages and to communicate.
- **Public access to data:** The public's right to know was strongly endorsed by most of those interviewed; however, specific, effective public education and information mechanisms are not yet in place. Many of those interviewed pointed proudly to the fact that a great deal of environmental information is now available publicly in newspapers.
- **Environmental health and economic growth as compatible goals:** Some people interviewed said that economic growth and environmental health are competing goals and that growth is a higher priority. When asked if growth requires tolerating pollution, many responded that the priority is first to become economically advanced, then deal with the environment. Others said both goals are essential, but that they do not know how to integrate or establish balance between them. Economic growth seems to be a top priority at the most senior levels of government. Establishing the concept that economic growth and environmental health are compatible goals, with progress possible at the same time on both fronts, appears to be a necessary prerequisite to any real progress in environmental health.

A local workshop manager was identified and hired to arrange site logistics, travel, transportation, invitations, Russian language interpreters and simultaneous translation equipment, and office equipment and staff. The assessment team wrote a workshop

management plan and a workshop development plan, which established time lines and defined specific tasks regarding technical and administrative preparation, leading up to the workshop, which was planned for the first week of March 1993.

The team, assisted by the U.S. Embassy in Tashkent, also established a collaborative relationship with the Environment and Health Foundation of Uzbekistan (ECOSAN), a governmental foundation for the environment that would co-sponsor the workshop with A.I.D. ECOSAN was established in 1992 by the president of Uzbekistan in order to attract donor investments and coordinate responses to environmental problems.

ECOSAN welcomed the opportunity to work with A.I.D. and agreed to set up a local coordinating committee. An official request from the U.S. ambassador to the Uzbekistan president through the executive director of ECOSAN set in motion the request process for governmental approval and sponsorship and access to a workshop site (a residential facility belonging to the governmental Council of Ministers, called *Durmen Dacha*) in suburban Tashkent.

2.2 Other Preparations

After the assessment additional preparations for the workshop included selecting presenters, developing the technical program design, producing and translating materials—during January and February 1993—and preparing the final on-site simulation, logistics, and management during the week prior to workshop delivery. The time frame for workshop preparation was very short, and the schedule was demanding. A final decision on whether the workshop would be held in Uzbekistan or another country was not made until the third week in January. Final selection of the presenters was not complete until the first week in February.

Based upon the initial workshop design, the technical program presenters conducted a meeting to refine a technical program that would integrate the themes of environment and health. The workshop design required the content of the technical presentations to be produced as overhead transparencies in English and Russian, and also in hard-copy form for inclusion in the workbooks given to each participant. Additionally, background and reference materials were selected and included in the workshop workbooks in Russian. This material is available from the WASH Operations Center library.

Simulating the full workshop technical program provided team members an opportunity to evaluate the presentation, to improve its quality, and to get feedback from colleagues. Additionally, the team monitored total presentation time and made adjustments accordingly. Conducting the simulation also ensured that small-group tasks were clear, realistic, and properly translated and gave interpreters a chance to review voice inflections, accents, and to refine technical vocabulary.

During the simulations, technical presenters found that they could not cover all of the material they had prepared and that substantial portions of the program had to be simplified, revised, or eliminated. The technical presenters worked continuously throughout the workshop to

revise their materials. These materials were redesigned and produced, in English and Russian, using available word processing software and copy machines.

In addition, workshop staff designated to serve as small-group facilitators were trained in how to establish norms, manage speech-making, and use silence effectively; how to summarize points succinctly, clarify tasks, and record proceedings on flipcharts; and how to engage everyone, ask questions, and intervene in the discussion. Small-group tasks related to the technical presentations were structured into each technical session. Each small group consisted of 8 to 10 people and had a facilitator and two interpreters assigned to it for the duration of the program.

The workshop preparation schedule was as follows:

Tuesday, February 23

- 9:30 a.m. Arrival at Tashkent; breakfast
- 11:00 a.m. Logistics review with administrative staff
- 2:00 p.m. Status review: participants; arrangements for transportation, materials, packets, translations, room arrangements, and equipment

Wednesday, February 24

- 9:00 a.m. Team preparation meeting: assess translators and administrative staff and available technical staff; review background, introductions, workshop schedule; define roles and responsibilities
- 1:00 p.m. Meet with ECOSAN and the review committee

Thursday, February 25

- 9:00 a.m. Workshop simulations: arrange plenary room and breakout rooms; simulate Steve Esrey's presentation; and simulate Tayler Bingham's presentation

Friday, February 26

- 9:00 a.m. Prepare workbooks
- 11:00 a.m. Review management logistics
- 12:00 p.m. Staff meeting with newly arrived presenters
- 2:00 p.m. Simulations

Saturday, February 27

- 9:00 a.m. Simulate Steve Esrey's presentation**
- 11:00 a.m. Simulate Irva Hertz-Picciotto's presentations**
- 2:00 p.m. Simulate Eugene Brantly's presentations**
- 4:00 p.m. Simulate A. James Rutenber's presentation**

Sunday, February 28

- 8:30 a.m. Roles: facilitator training with interpreters**
- 3:00 p.m. Simulations and practice (using the interpreters as group members); resimulate specific, redesigned sessions**
- 4:00 p.m. Meet and prepare all Central Asian presenters**

Chapter 3

WORKSHOP PROGRAM AND DELIVERY

3.1 Workshop Goals and Objectives

The field assessment visit in December 1992 revealed that environmental and health professionals in the Central Asia region are operating under some misperceptions about the linkages between specific environmental conditions and specific health conditions, and that the most current and powerful methodologies for discovering and characterizing such linkages are not being used in the region. The trip also revealed other obstacles to addressing environmental health problems in the region, including: a professional focus on treatment approaches (technology for cleaning up pollution and clinical treatment for affected persons) rather than prevention; a lack of awareness of certain types of interventions for environmental problems; the absence of methodologies for setting priorities among environmental health problems, developing and comparing a range of intervention options, and selecting the most cost-effective option; poor sectoral organization, including overlapping responsibilities, duplicated work, and poor communication among agencies; and competition between the emerging environmental ministries and the more established health ministries for the leadership role in environmental health.

These observations led the team to articulate six workshop goals.

- Illustrate methods for linking environmental pollutants and human health
- Illustrate methodologies for prioritizing interventions
- Define key concepts to facilitate communication
- Demonstrate computer software that will facilitate access to data
- Discuss the structure of environmental/health programs
- Discuss, illustrate, and apply selected methodologies to region- and country-specific problems

The following outcomes were identified as desirable and intended for the workshop:

Participants should leave the workshop with:

- A heightened or newly developed awareness of the environment and health linkage
- A belief that environment and health are interrelated and for purposes of policy and program design should not be separated into scientific disciplines and treated in isolation from each other
- A reinforced, expanded or new awareness of several methods for assessing environment and health linkages

- An awareness of how environmental health problems are addressed elsewhere and of the methodologies used to set priorities and take action
- A practical understanding of how to access information internationally
- An understanding of the link between economic growth and environmental health and an awareness that they are compatible goals
- A sense that ideas presented in the workshop are relevant to participants' needs and a belief that individuals have been heard and have had a chance to express what is important to them
- An awareness that interdisciplinary problems require the active involvement of a range of human resources in an open forum without excessive control from above
- An increased awareness of the meaning of public access to information and its role in producing environmental improvements

3.2 Workshop Participants

Eight participants were invited from each of the five countries, as were six international donor agency representatives, five A.I.D. staff members, and one EPA staff person. Of the 52 invitees, 26—including 21 from Central Asian countries, one from an international donor agency (WHO), and four A.I.D. staff members—attended. The numbers were less than anticipated because the Kyrgyzstan delegation encountered transportation problems and some representatives from Turkmenistan were unable to attend.

A serious effort was made to invite individuals who had been interviewed by the team and who met the criteria established by A.I.D. Criteria were designed to achieve balanced selection from among three levels: the policy initiation and approval level (parliamentary committees and presidential staff); the higher levels of management in ministries (deputy ministers and ministers); and the implementation level at institutes and ministries (chief epidemiologists, environmental epidemiologists, and environmental engineers). Also, a balance of participants from among those in the environmental sector and the health community was sought.

See Appendix A for a directory of participants.

3.3 Logistics

Workshop staff included the WASH team that conducted the field assessment and preparation, which served as technical presenters and facilitator. This core group was enhanced by additional technical presenters and small-group facilitators (A.I.D. staff and consultants) and was supported by administrative and interpretation staff. A total staff of 22 people was required to produce the desired results using an interactive format and translated materials and sessions.

The local coordinating committee, formed in cooperation with ECOSAN, officially welcomed international invitees at the airport and was responsible for organizing the opening and closing ceremonies, press coverage and publicity, and the evening cultural program scheduled for the workshop's last night.

Staff Responsibilities

The roles and duties of staff were as follows:

- The **team leader** was responsible for the overall management and coordination of all areas. This entailed ensuring the quality of workshop design; managing the quality of technical presentations and the competency of small-group facilitators and administrative and language coordinators; and managing clients. The team leader also served as primary workshop facilitator during the opening and closing sessions, introduced presenters, and managed program timing and sequencing.
- The **technical program coordinator** was responsible for designing the technical program and coordinating the content and preparation of the technical presentations. He was also responsible for managing the on-site production of revised written materials.
- The **administrative manager** coordinated logistical and physical site preparations for the workshop, including: distributing invitations and pre-workshop information to participants; working with the U.S. Embassy and ECOSAN to arrange meeting facilities for the workshop; arranging lodging, meals, and local transportation for participants; hiring office staff and interpreters and renting office equipment; reimbursing participants for their travel expenses; supervising office support staff during the workshop; serving as liaison with the meeting facility to resolve problems during the workshop; managing a cash fund for expenses; and accounting for all expenses associated with these duties.
- The **interpretation manager** coordinated the work of the simultaneous and sequential interpreters, including their preparation for specific technical sessions and their assignments during sessions, breaks, and meals; supervised the interpreters' work and provided quality control; assisted with the translation and production of workshop materials; debriefed interpreters to document participants' reactions to the workshop; and translated the participants' workshop evaluation forms.
- **Technical presenters** prepared and presented the workshop's technical content, served as small-group facilitators when not presenting, participated in daily staff meetings designed to review the success of the program content and make observations about the workshop process, and assisted in workshop management where possible.
- **Small-group facilitators** reviewed tasks and schedules of small-group assignments. They also were responsible for the following small-group-related activities: establishing group norms, intervening to move things along and keep norms operating, ensuring full group participation and note-taking, creating an open atmosphere in which people could freely examine and discuss subjects without being pressured into giving predetermined

answers, managing time effectively, giving clear instructions, clarifying tasks, and paraphrasing and summarizing as needed.

The facilitators also provided a liaison function for participants, arranging to have materials typed, obtaining necessary supplies and equipment, and ensuring sufficient work space, tables, and reading materials.

- **Interpreters** provided simultaneous interpretation for the technical presentations and discussions in plenary sessions and sequential interpretation for small-group working sessions and informal periods (breaks and meals). Interpreters had specific assignments for all periods during the workshop. Their duties included attending session simulations prior to the workshop, reading background materials and becoming familiar with the language needed to convey the technical content of the workshop, and meeting to review progress during the workshop and to evaluate the workshop at its conclusion.

3.4 Workshop Design

A preliminary workshop design was produced based upon the team's field work during the December 1992 planning and preparation visit. The preliminary design was developed into a full draft program design in Washington and reviewed with the Task Force on Newly Independent States, the A.I.D. Office of Health in the Research and Development Bureau, and the general development officer for USAID Central Asia Regional Mission.

The workshop was designed to present technical materials in large-group sessions and to engage the participants in smaller working groups in which they could then apply the materials to specific situations within an integrated, thematic framework organized around a few key concepts. An interactive workshop design was developed for 50 to 60 participants.

The intent was to engage participants with interesting and challenging material and ideas using a combination of interactive presentations in which the presenters held conversations with the participants and presented ideas, ask questions, and challenge the participants; structured small-group tasks to develop further the ideas presented, and feedback from small groups to the plenary session. Opportunity was also provided for the participants to present ideas, materials, and examples of their work in evening sessions. Linking environmental pollutants and human health was the theme used to integrate the subjects covered in the workshop.

The small-group format was an important element of the workshop design, as it enabled participants to discuss ideas directly. Each small group consisted of approximately 8 to 10 people, with a facilitator and two interpreters assigned to each. All group sessions were conducted in Russian. The interpreters at each table were used primarily during the small-group discussions but also were available to translate participants' questions for presenters. Groups were composed of persons from a number of countries with diverse skills and remained intact throughout the workshop.

3.4.1 Technical Program

In planning the workshop, the technical team made three key decisions. First, the content of the workshop sessions would be designed to introduce participants to a set of methodologies they would need for addressing environmental health problems. The workshop served as an introduction and overview of several methodologies, not as an opportunity for learning and practicing the details of any of the methodologies. Second, the workshop would communicate how these methodologies fit together into an comprehensive, logical pattern that could be used to address environmental health problems, namely, to identify, characterize, and quantify the potential consequences of an environmental health problem; set priorities among environmental health problems; develop a range of intervention options; and evaluate the economic costs and benefits of the range of options and develop an intervention strategy. Because identifying and accurately characterizing problems is an essential first step, the team decided to allocate half of the technical program to such topics. Third, the team decided to communicate a set of key "lessons learned" that were based on the U.S. experience in environmental health protection over the last years. These lessons were the motivation for using several of the methodologies presented, and thus provided the rationale for the technical program. These lessons appear in the box below.

TWENTY YEARS OF ENVIRONMENTAL HEALTH IN THE UNITED STATES: LESSONS LEARNED

- 1. Environmental problems are generally not addressed until scientists can demonstrate a possible link to human health.**
- 2. Environmental programs should use cost-efficient solutions to reduce genuine risks to public health. This means focusing on problems that pose the greatest risk and using interventions that maximize the ratio of benefits to costs.**
- 3. Preventing environmental health problems is more effective and less expensive than trying to clean up the environment and treat people who are harmed by pollution.**
- 4. Better technology will not solve problems by itself. Improving environmental health also requires capable institutions, appropriate policies, and public education.**
- 5. Government must do more than command people to meet standards. Effective regulatory programs include a mixture of command regulations and financial incentives.**
- 6. The United States has made the greatest progress on problems about which the public is most concerned and active.**

The technical program was presented in six sessions, each requiring a half day. The general pattern of each session included one or two introductory lectures followed by a discussion period; a small-group exercise; a discussion period to share and explore results from the small group exercise; and a final, summary by the session leader to articulate once again the key messages of the session.

The participants were divided into five small groups for the exercises. Each group included participants from several countries and from several technical disciplines. Each group selected an environmental health problem of interest to the group and worked on that problem throughout the workshop.

The following is a brief summary of the technical program.

Session One Environment-Health Linkages: The Causal Chain
Steven A. Esrey, McGill University

Dr. Esrey described examples of environmental health problems and introduced the themes of the workshop. He presented and illustrated the "causal chain," a model for describing links between specific environmental conditions and their health consequences (see Figure 1 for the generic model). Dr. Esrey also discussed the difference between showing an association between two variables and showing a causal relationship between the variables. He presented Hill's Postulates as the criteria for demonstrating the existence of a causal relationship between specific environmental conditions and specific health conditions. In the exercise, small groups used the causal chain model to diagram the environment-health linkages that characterize the particular problem they were addressing.

Session Two Environment-Health Linkages: Epidemiologic Methods
Irva Hertz-Picciotto, University of North Carolina at Chapel Hill

Dr. Hertz-Picciotto described how epidemiological studies may be used to establish the existence of causal relationships between environmental conditions and health consequences. She described various types of study design for epidemiologic investigations and the circumstances under which each type of design is most appropriate. Dr. Picciotto also described the factors that should be considered in interpreting results from an epidemiologic study. In the exercise, small groups determined which of Hill's Postulates are satisfied by information of which they were aware, identified the additional information that would be needed to demonstrate causality, and identified the type of study design that would be most appropriate for collecting the needed information.

Session Three Environmental-Health Linkages: Risk Assessment Methods
A. James Ruttenger, Univ. of Colorado School of Medicine

Dr. Ruttenger described methods for quantifying the exposure of a specified population to a particular environmental hazard and for estimating the risk, to the population created by the exposure. Quantitative exposure assessment is a component of risk assessment studies and of rigorous epidemiologic investigations. He also presented a model from systems ecology that can be used to diagram the transfer of pollutants among environmental compartments (e.g.,

soil, water, air, flora, fauna, etc.) and is useful in representing exposure pathways. In the exercise, small groups diagrammed how the particular environmental hazard about which they were concerned in transported through the environment to a point at which people are exposed.

Session Four Methods for Taking Action: Setting Priorities
Eugene P. Brantly, The WASH Project

Mr. Brantly described how estimates of health risk from several environmental problems may be compared to set priorities and identify the most important environmental health problems, for which intervention is warranted. He presented the methodology for conducting a comparative risk assessment and described the factors that should be taken into account in comparing different problems. In the exercise, each small group considered three environmental health problems and ranked them in importance. The discussion following the exercise revealed the factors each group was taking into account in establishing its rankings.

Session Five Methods for Taking Action: Developing Intervention Options
Eugene P. Brantly, The WASH Project

Mr. Brantly described several types of interventions for environmental health problems and a methodological process for developing a set of alternative interventions for a particular problem. He also described how a successful intervention must include measures to improve institutional capabilities, establish appropriate policies, and educate the public, as well as introducing technology when appropriate. In the exercise, small groups developed a large set of alternative interventions for the problem they were addressing.

Session Six Methods for Taking Action: Economic Issues
Taylor H. Bingham, Research Triangle Institute

Dr. Bingham addressed two topics. He first described evidence from many developed and developing countries on the relationship between environmental protection and economic development and discussed ways in which participants might think about the trade-offs between improving environmental health and increasing rates of economic growth. He then described the general principle that government regulatory actions should maximize the ratio of economic benefits to costs and, in general terms, the methodology of cost-benefit analysis. Dr. Bingham concluded by describing a range of market-based mechanisms for addressing environmental health problems. In the exercise, small groups used different sets of rules to auction or allocate pollution rights. The discussion following the exercise compared the degree of cost-efficiency achieved by groups using different allocation rules.

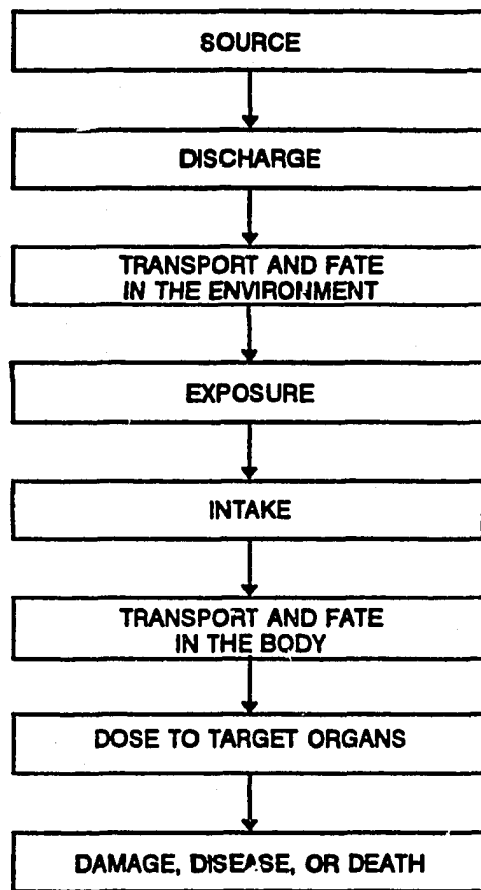


Figure 1
Linkages Between Environment and Health

3.4.2 Workshop Agenda

Monday, March 1

Morning Session

- 8:00-10:00 Registration
- 10:00-10:30 Official opening
Welcome speech by the Yusuf Shadimetov, President of the Ecological and Health Foundation of Uzbekistan (ECOSAN), and also by Henry Clark, the U.S. Ambassador to Uzbekistan (see Appendix C)
Comments by:
Muhammajan Karabaev, Deputy Prime Minister, Uzbekistan
Craig Buck, Director, USAID Regional Mission for Central Asia
- 10:30-12:30 Reports from country representatives on current environmental health problems and issues (see Appendix C)
Raisa Kadyrova, Director of Scientific Research Institute of Labor, Hygiene, and Occupational Diseases, Kazakhstan

Toily Choreklev, Deputy Prime Minister of Nature Exploration and Environmental Protection, Turkmenistan
Rustam Djurnaeu, Head of the Epidemiological Department, Ministry of Health, Tajikistan
Tulkun Iskandarov, Deputy Minister of Health, Uzbekistan

12:30-2:00 LUNCH

Afternoon Session

2:00-4:15 Introductions and workshop start-up activities including presentation of issues, goals, and agenda
Facilitation by Daniel Edwards, Workshop Team Leader
4:15-5:30 Overview of Environmental Health
Presentation by Steven Esrey
6:30-7:30 Welcome reception
Hosted by USAID Regional Mission for Central Asia

Tuesday, March 2

Morning Session

8:30-12:30 Environment-health linkages: the causal chain
Presentation by Steven Esrey
Small-group exercise: Describe the environment-health linkages for a specific problem, Identify hypotheses to be tested.

12:30-2:00 LUNCH

Afternoon Session

2:00-6:00 Environment health linkages: epidemiologic methods
Presentation by Irva Hertz-Picciotto
Small-group exercise: Illustrate the application of criteria for establishing causation.
Evening Informal country presentations on environmental health problems and research
Videos on environmental health topics

Wednesday, March 3

Morning Session

8:30-12:30 Environment-health linkages: risk assessment methods
Presentation by James Ruttner

Small-group exercise: Identify the types of methods (epidemiologic, risk assessment) most appropriate for testing various hypotheses concerning the selected problems.

12:30-2:00 LUNCH

Afternoon Session

**2:00-6:00 Methods for taking action: setting priorities
Presentation by Eugene Brantley
Small-group exercise: Define the scope of a comparative risk assessment appropriate to each country and identify sources of available data.**

**Evening Resource panel: organization of environmental health institutions in the United States
Videos on environmental health topics
Permanent display on information sources**

Thursday, March 4

Morning Session

**8:30-12:30 Methods for taking action: developing intervention options
Presentation by Eugene Brantley
Small-group exercise: Identify intervention options for selected problems.**

12:30-2:00 LUNCH

Afternoon Session

**2:00-6:00 Methods for taking action: economic issues
Presentation by Tayler Bingham
Small-group exercise: Applying alternative approaches to regulation to achieve environmental targets at the lowest cost.**

**6:00-7:00 Presentation of computerized data base software in environmental health
John Borrazzo, USAID AAAS Fellow, Office of Health**

Evening Banquet and Cultural Presentation, ECOSAN and Ministry of Culture

Friday, March 5

Morning Session

**8:30-9:00 Conference technical summary
Eugene Brantley**

**9:00-10:00 Next steps: future applications of workshop information to country settings
Daniel B. Edwards, Workshop Facilitator
Small-group exercise: Individual and group tasks**

10:00-12:00 Presentation by country groups of workshop results

11:00-11:30 Presentation by A.I.D. representative on next steps for A.I.D.
Paula Feeny USAID General Development Officer, Central Asia Regional Office

11:30-12:30 Official closure
Closing remarks:
Daniel Edwards, Workshop Facilitator, WASH
Raisa Kadyrova, Representative of the Participants
Paula Feeny, USAID General Development Officer, Regional Office for Central Asia
Official closure: Yusuf Shadimetov, President of the Ecological and Health Foundation of Uzbekistan (ECOSAN)
Award of certificates of participation

Chapter 4

RESULTS AND RECOMMENDATIONS

4.1 Participant Evaluations

Evaluations that asked participants to answer four open-ended questions and to rate each of the stated goals of the workshop were distributed among participants; however, because the delegation from Turkmenistan departed on the last morning they were unable to complete the forms. For the full text of all translated evaluation sheets completed by 18 respondents, refer to Appendix C.

When asked to describe the most important results of the workshop, most of the respondents (12) mentioned the discussion of a new approach to solving environmental problems. The aspects of the new approach that participants found most useful included: epidemiologic methods, Hill's postulates, economic formulas, and the causal chain.

Five respondents focused on the importance of the realization that the environment and health should be viewed together and are interdependent.

Which were the most important issues discussed?

- Prevention v. treatment
- The causal chain
- Integration of environment and health
- Risk assessment and priority setting
- The link between economics and the environment
- The need for coordinating practical applications
- Benefiting from the experience of others and from U.S. experience

What will you need to do in order to be able to implement the results of the workshop?

- Change the structure and methods of the environmental health sector.
- Learn more, study the materials given.
- Learn about the use of computerized programs and train people about them.
- Train staff in new methods.
- Provide public education.
- Acquire financing for projects.

- Hold more workshops.

What criticisms do you have about the workshop?

- No criticism. Job well done. Everybody was very friendly, presenters were sincere, approachable and open.
- One may only envy the excellent organization of the workshop and consider it an example.
- I would like to see a workshop that targets specific organizations and moves at a slower pace.
- More information on the drafting and setting of standards.
- More time for more examples and specifics, especially concrete examples on economics and current statistics.
- The workshop was very helpful...every detail was carried out with great professionalism...excellent!...No criticism...I would just like to express my appreciation. Thanks.

4.2 Summary of Outcomes

One important outcome was the introduction of ideas, methods, and technologies. The workshop was highly successful in meeting its stated objectives. Participants viewed the most important result of the workshop as the introduction of new methodologies for linking environment to health. In the post-workshop evaluations, participants rated goal achievement very close to 5 on a 1 to 5 point (low to high) scale. Some highlights, in terms of important issues discussed for the participants, were:

- the importance of the causal chain,
- the link between economics and the environment, and
- the importance of prevention and methods for setting priorities.

Another important outcome was an increase in the participants' awareness that achieving practical solutions to interdisciplinary problems requires the active involvement of a range of human resources from different agencies. The workshop was successful in bringing together those in the environmental sector and medical/health specialists and demonstrating the effectiveness of a discussion focused on common problems. Participants were very enthusiastic about working on concrete problems in small, interdisciplinary discussion groups. Important groundwork was laid for future work that required intersectoral collaboration and the realization of the relationship between environmental and health issues.

A third outcome was the establishment of a dialogue between A.I.D. and the participants and within each country group about what can be done about environmental health problems. In

their workshop evaluations, participants commented in the evaluations about the need for follow-up staff training. Many expressed a desire for the opportunity to study further the materials handed out during the workshop and also mentioned the need for equipment, particularly computers and software.

4.3 Lessons Learned: Technical Staff Observations

Immediately after the workshop, a staff meeting was conducted with the workshop presenters and facilitation staff. A parallel meeting was also conducted with the interpretation staff. In both meetings, the staff were asked to reflect on their own observations about successes and improvements. Positive and corrective feedback from these meetings are presented below.

4.3.1 Planning for Workshops Requiring Translation and Including Participative Processes

A.I.D. should set up a planning time frame of at least six months for a workshop of this nature. The effective time frame allowed for this workshop was three months from the start of the needs assessment (field work) through the first day of the workshop. This affected almost all of the steps in program development and delivery.

4.3.2 Advance Work

The advance work done by WASH program staff in Washington and in the field proved to be essential to the success of the workshop. The needs assessment conducted in December by the same core group of individuals that planned the workshop provided continuity; helped motivate participants who saw suggestions they made in interviews incorporated into the workshop; and it allowed the workshop staff to become more familiar with the technical program and the process agenda.

The advance team's arrival in Tashkent one week before the workshop allowed time for important adjustments and additional preparation that otherwise would have been impossible. Logistics, for the most part, worked well, in part due to the pre-workshop preparation in-country conducted by the local manager and the pre-workshop team formation of the administrative and interpretation staff organized by WASH.

Conducting the simulations in advance was very important in the success of the workshop because the technical program was refined. Through the simulations, interpreters were able to understand what topics the workshop would address, how the workshop would be organized, and how to form a team. Many of the interpreters worked in complete partnership with workshop staff, and they anticipated needs and took initiative to improve the quality of the program.

Training the facilitators for small-group work in advance was very important. Judging from the enthusiastic comments related by the staff and participants, the small working groups were considered a success.

4.3.3 The Technical Program

The use of the causal chain concept integrated all of the information included in the workshop and the application of small-group tasks proved to be very effective. Though the first conceptualization of the technical program (prior to simulations) included too much material to deliver and absorb during a five-day workshop, the final content of the technical program was in accordance with participants' needs.

While the participants received a well integrated program and all of the appropriate materials were available in Russian and English, one lesson learned was the importance of selecting the technical presenters well in advance. For this workshop, the lead time was so short that at least three of the presenters arrived only two days prior to the workshop, leaving little time for the technical presenters to meet. The consequences were that the integration of the technical program continued to take place well into the workshop (during evening sessions) and that last-minute production and translation of materials occurred.

All visual aids used in presentations at workshop of this nature should be ready for translation and reproduction at least six weeks before the start of the workshop.

4.3.4 Workshop Management

When conducting a workshop overseas, it is important to have a strong office and administrative manager who understands U.S. office systems. Much frustration was felt in working with an inexperienced office staff who did not understand formatting, who did not know how to anticipate needs, and who required intensive oversight. Despite the frustration regarding professional training, the workshop administrative staff was extremely dedicated, working at times until 4:00 a.m. Given the limitations, workshop administration produced outstanding results, completing all required work.

It also is important to have access to computers and office machines. The e-mail link and fax machine proved to be very useful for communicating internationally; however, an alternative word processing or print driver setup is needed for future work in Russian. At this workshop, a significant number of the technical materials was revised, and since WordPerfect read all Russian characters as if they were graphics, it took up to 15 minutes to print a page of text.

4.3.5 Participants

Conducting interviews in the field during the needs assessment phase and resisting the tendency to send only politically important people was important to the outcomes of the workshop. Those persons who were identified in advance and attended proved to be effective participants. Future workshops might require planners to make personal contact with potential participants, in addition to contact through official letters.

A big factor in the success of the workshop was the presence of participants from a cross-section of levels and professions. While some of the participants would have preferred to be in a room with only professional- and administrative-level peers, a diverse mix participants required cross-communication and collaboration in order to solve problems.

The absence of the Kyrgyzstan delegation and the arrival of only two of the eight persons invited from Turkmenistan was unfortunate.

4.3.6 Small-Group Work

One important component of the workshop's success was the use of a facilitated small-group format for discussing problems. It will be important in future workshops to ensure that small groups have a balanced representation of the many disciplines which fall under the rubric of environmental health. At the Tashkent workshop, one of the groups were composed primarily of persons working in the medical field, and one of those in the environmental field.

During the last morning's small-group session when the country groups planned workshop applications it became evident that the participants did not have enough experience in small-group communications to work well without a facilitator. The results of this session might have been enhanced if these had been facilitated discussions.

4.4 Lessons Learned: Interpretation Staff Observations

The interpretation staff consisted largely of individuals who worked at universities, often as language instructors or professors. Many also had worked with World Bank and International Monetary Fund commissions. They were asked to give observations on the workshop process and results—from a larger perspective, not merely as language specialists—and their impressions of how participants reacted (see Appendix B for full text of interpreters' evaluative comments).

Interpreters noted that while A.I.D. said it was interested in environmental health and had sponsored a workshop, the Agency did not seem to communicate any specific or concrete steps regarding the development of projects. The interpreters believed that many participants came to the workshop expecting to hear about project development and A.I.D.'s project agenda. The absence of such a discussion, in the interpreters' views, left ambiguity about intentions to invest in the Central Asian region.

Many of the interpreters often remarked to the workshop staff that they were impressed by the professionalism and high quality of the workshop and the dedication and seriousness of the workshop staff.

The interpreters estimated that about 70 percent of the participants were impressed by the workshop's organization and design. They believed that the small-group work was the biggest success. Discussion and task groups were totally new to the Central Asians, and judging from evaluations they liked the process.

According to some of the interpreters, participants were surprised by and remarked very favorably about the number and quality of the written handouts. They remarked that so many good handouts had not been available in the past.

Comments by interpreters revealed that participants were accustomed to slower-paced workshops with more free time for excursions and interactive time than allowed during the Central Asian Regional Workshop on Environmental Health, which was viewed as a very intense, fast-paced activity.

4.5 Conclusions and Recommendations

The workshop activity achieved the following desired outcomes:

All available anecdotal and written data indicate that the participants left the workshop with:

- Heightened or newly developed awareness of the linkage between environment and health
- The belief that environment and health are interrelated and an awareness that practical solutions to interdisciplinary problems require the active involvement of a range of human resources from different agencies
- Reinforced, expanded, or new awareness of methodologies, namely risk assessment and environmental epidemiology
- Knowledge that a link exists between economic growth and environmental health and that the two are compatible goals

For the U.S. Agency for International Development:

- A baseline that will permit follow-on work has been established.
- A.I.D. has begun to demonstrate its interest in long-term involvement in environmental health issues in the region.

Now that the important step of initiating a dialogue with the primary actors in the field of environmental health in the participating countries has been taken, it is crucial to follow up with each participant, to involve participants and their agencies in discussions leading to a

project in environmental health. The following conditions make the region a prime target for project development:

- Interest in and opportunity for an environmental health project at national and institutional levels
- The need to strengthen institutions (through introduction of new epidemiologic methods, economic analyses, sectoral structures, and management development)
- The need for addressing specific health and environmental problems relating to water quality, water quantity, and atmospheric pollution and to pollution from solid and hazardous waste
- The identification of many of the key individuals and organizations that have expressed interest in such a project

The project development process should take advantage of the momentum established at the workshop and involve the same people from the workshop in small project conferences in each country. These conferences should include some of the same staff that have been involved with this workshop process to maintain continuity and to carry on the dialogue that has been established. The timing is very important because environment and health are topics of national public interest in each of the republics.

Appendix A

PARTICIPANT DIRECTORY

Kazakhstan

Janalik Abdrahmanov

President of Kazakh Cancer Control FUND

Director of Kazakh Research Institute of Oncology and Radiology

Chief Oncologist of Republic of Kazakhstan

Abai st., 91 Alma-Ata 480072

Republic of Kazakhstan

Shaviden Bashenov

Deputy Chairman, Supreme Soviet Committee of Ecology and Nature Exploration

House of Parliament, Alma-Ata

Republic of Kazakhstan

Raisa Kadirova

Director of Scientific Research Institute of Labor Hygiene and Occupational Diseases

Akademgorodok, Alma-Ata 480032

Republic of Kazakhstan

Madi Kireev

Deputy Minister, Ministry of Ecology and Biological Resources

Panfilov st., Alma-Ata 480

Republic of Kazakhstan

Victor Kosarev

Deputy Minister, Ministry of Agriculture

Republic Square, Alma-Ata

Republic of Kazakhstan

Tolebai Rahipbekov

Deputy Chairman Supreme Soviet Committee of Public Health and Social Protection

House of Parliament, Alma-Ata 480091

Republic of Kazakhstan

Maidan Spataev

Deputy Chief State Sanitary Physician

Auezov str., 84 Alma-Ata 480091

Republic of Kazakhstan

Tajikistan
Sirajiddin Aslov
Deputy Department Chief, Ministry of Ecology
Dushanbe 734025 Bohtar sr.,12
Republic of Tajikistan

Ildar Burnashev
Control Department Chief, Ministry of Ecology
Dushanbe 734025 Bohtar st.,
Republic of Tajikistan

Rustam Jumaev
Epidemiology Department Chief, Ministry of Health
Shevchenko st., 69 Dushanbe 734025
Republic of Tajikistan

Farhod Odinaev
Chief Physician of Ministry of Health
Shevchenko st., 69 Dushanbe 734025
Republic of Tajikistan

Mahdi Orzuev
Director of Scientific Research Institute of Epidemiology and Hygiene
Shevchenko st., 69 Dushanbe 734025
Republic of Tajikistan

Turkmenistan
Meret Annamukhamedov
Head, Department of Environmental Health
Institute of Preventive & Clinical Medicine
1 May str., 31 Ashgabat 744006
Republic of Turkmenistan

Toily Choreklyev
Deputy Minister
Ministry for the Exploration and Protection of Nature
Kemine str., 102 Ashgabat 744000
Republic of Turkmenistan

Uzbekistan

Rihsitilla Halmetov

Director, Research Institute for Sanitary Hygiene and Occupational Diseases

Tsiolkovski str., 325 Tashkent 700056

Republic of Uzbekistan

Tulkun Iskandarov

Deputy Minister of Health

Ministry of Health

Navoi str., 12 Tashkent 700011

Republic of Uzbekistan

Inga R. Klebley

Head of the Department of Medical Sciences

Scientific Research Center "Atmosphere"

State Committee for Environmental Protection

A Kadiri str., 5A Tashkent 700000

Republic of Uzbekistan

Vladimir Konyukhov

First Deputy Chairman

Deputy State Inspector for Nature Protection

Doctor of Philosophy (techn.)

State Committee for Nature Protection of Uzbekistan

Kadiri str., 5A Tashkent 700000

Republic of Uzbekistan

Nariman Muratkhodjaev

Director, Oncology Research Centre

Central Asia Department of the Academy of Medical Sciences

Farabi str., 383 Tashkent 700095

Republic of Uzbekistan

Rimma Nozhkina

Director of Epidemiology

Ministry of Public Health

Navoi str., 12 Tashkent 700011

Republic of Uzbekistan

Mannon Rahimov

General Director of Ecology and Health Foundation (ECOSAN) of Uzbekistan

Uzbekistan st., 43 Tashkent

Republic of Uzbekistan

Valentina Rizhova
Deputy Chief of the Main Department for Atmospheric Air Protection,
Deputy State Inspector for Nature Protection
State Committee for Nature Protection of Uzbekistan
Kadiri str., 5A Tashkent 700000
Republic of Uzbekistan

Djahanghir Sharipov
Chairman, Agricultural Chemicals Association
Ministry of Agriculture
Engels str., 62 Tashkent 700000
Republic of Uzbekistan

Host in Uzbekistan
Yusuf Shadimetov
President, Ecology and Health Foundation of Uzbekistan (ECOSAN)
Uzbekistan str., 43 Tashkent
Republic of Uzbekistan

International Organizations/Embassies

Olivier Allais
Team Leader, European Community
Tashkent, Uzbekistan
Tel: (3712) 398660

Rita Grochovskaya
GTZ, Embassy of Germany
Tashkent, Uzbekistan
Tel: (3712) 337698

Parvez Hasan
Chief World Bank Regional Mission in Central Asia
Tashkent, Uzbekistan
Tel: (3712) 335002

Jarcycuge Okimoto
Ambassador of Japan to Uzbekistan
Tashkent, Uzbekistan
Tel: (3712) 564633

Kees A. van-der Heijden
Director Bilthoven Division World Health Organization
European Centre for Environment and Health, Copenhagen
Tel: (31) 30295311
Fax: (31) 30294120

United States Embassy
Sylvia Babus
Second Secretary
American Embassy
Chilanzarskaya st., 82
Tashkent, Uzbekistan
Tel: (3712) 776636

Henry Clarke
Ambassador to the Republic of Uzbekistan
American Embassy
Chilanzarskaya st., 82
Tashkent, Uzbekistan
Tel: (3712) 771132

Enid Schreibman
Associate Director Business
Peace Corps of the United States
48 MIR Sulaimanova
Tashkent, Uzbekistan
Tel: (3712) 553310
(3712) 533929 (home)

United States Agency for International Development
John Borrazzo
R&D/H/CD
US Agency for International Development
Washington, DC 20523-1817 United States
Tel: (703) 875-4500
Fax: (703) 875-4686

Craig Buck
Director
USAID/Regional Mission for Central Asia
Alma-Ata, Kazakhstan
Tel: (3272) 639267
Fax: (3272) 696490

Paula Feeney
General Development Officer
USAID/Regional Mission for Central Asia
Alma-Ata, Kazakhstan
Tel: (3272) 639267
Fax: (3272) 696490

Julie Klement
R&D/H/CD
US Agency for International Development
Washington, DC 20523-1817 United States
Tel: (703) 875-4477 (JK)
Fax: (703) 875-4686

A. Dennis Long
NIS Task Force
US Agency for International Development
Washington, DC 20523 United States
Tel: (202) 736-4407
Fax: (202) 647-4756

Pamela Pearson
NIS Task Force
US Agency for International Development
Washington, DC 20523 United States
Tel: (202) 736-7246
Fax: (202) 647-4756

Technical Presenters/Resource Persons
Taylor Bingham
Research Triangle Institute
3040 Cornwallis Road
Hobbes Bldg. Room 131
Research Triangle Park, NC 27709 United States
Tel: (919) 541 6618
Fax: (919) 541 5945

Eugene Brantly
WASH Operations Center
1611 N. Kent Street
Room 1001
Arlington, VA 22209 United States
Tel: (703) 243-8200 (202) 543-6320 (home)
Fax: (703) 243-9004

Steven Esrey
School of Dietetics & Human Nutrition
Macdonald Stewart Bldg. R-2-042
McGill University
21,111 Lakeshore Road
Ste-Anne-de-Bellevue, Quebec H9X 3V9
Tel: (514) 398-7843
(514) 694-9946 (home)
Fax: (514) 398-7739

Irva Hertz-Picciotto
321 Glendale Drive
Chapel Hill, NC 27514 United States
Tel: (919) 966-7445
Tel: (919) 929-8446 (home)
Fax: (919) 966-2089

A. James Rутtenber
Department of Preventive Medicine & Biometrics
University of Colorado School of Medicine
Campus Box C245
4200 East 9th Avenue
Denver, CO 80262
United States
Tel: (303) 270-5627
Fax: (303) 270-3183

Workshop Managers

Eugene P. Brantiy
WASH Operations Center
1611 N. Kent Street
Room 1001
Arlington, VA 22209 United States
Tel: (703) 243-8200 (202) 543-6320 (home)
Fax: (703) 243-9004

Daniel B. Edwards
Training Resource Group
909 N. Washington Street, Ste 305
Alexandria, VA 22314
United States
Tel: (703) 548-3535
Fax: (703) 836-2415

Dylarom B. Zupharodjaeva
Administrative Manager
Private Consultant
Tashkent, Uzbekistan

Small-Group Facilitators
John H. Austin
Environmental Engineer
KC COURT 8B
28 SUKHUMVIT 49/4
Bangkok 10110, Thailand
Tel: (662) 3919017

Note: Tayler Bingham, Steven Esrey, and Irva Hertz-Picciotto also served as small-group facilitators.

Interpretation Coordinator
Alice Lyandres
6291 N. 15th Place
Arlington, VA 22205 United States
Tel: (703) 534-0409

Interpreters
Rafail Bikmuhamedov
Republic of Uzbekistan
Tel: 7 (3712) 330434

Liana Ibragimova
Republic of Uzbekistan
Tel: 7 (3712) 349378

Alisher Hashimov
Republic of Uzbekistan
Tel: 7 (3712) 293436

Olga Kakajanova
Republic of Turkmenistan
Tel: 7 (3632) 252552

Bahtior Kalanov
Republic of Uzbekistan
Tel: 7 (3712) 331751

Rita Kononova
Republic of Uzbekistan
Tel: 7 (3712) 532 586

Andrew Koust
Republic of Uzbekistan
Tel: 7 (3712) 331751

Inna Krilyak
Republic of Uzbekistan
Tel: 7 (3712) 679332

Talyb Samedov
Azerbaijan
Tel: 7 (8922) 936384

Eric Sievers
Republic of Kazakhstan
Tel: 7 (3272) 640357

Svetlana Sleptsova
Republic of Turkmenistan
Tel: 7 (3632) 244362

Yelena Stavitskaya
Republic of Uzbekistan
Tel: 7 (3712) 747692

Appendix B

FULL TEXT OF EVALUATIVE COMMENTS BY INTERPRETATION STAFF

Note: The following information was recorded during a group interview with the interpretation staff on the last day of the workshop. These staff were asked, what observations they had of the workshop results and process, and what information had been communicated to them by the participants regarding the workshop.

Compiled by: Alice Lyandres

Following is the information provided by the workshop interpreters, which is based on their informal conversations with the workshop participants.

The following questions were asked and discussed among the participants:

- How serious is the USAID in their plans to provide further technical assistance?
- What are the concrete measures (technical assistance, financial help, etc.) which the USAID can take?
- What is the idea behind the conference? What is its purpose?

Responses

1. A Kazakh representative:

- more concrete ideas and concrete help (often in terms of technology) are needed;
- more financial assistance (or promise thereof) was expected;
- the result of the workshop may be an offer of financial assistance in conducting the environmental programs.

2. It would be good to know in advance "who is who" in the workshop (among the Americans). It is especially important to know who to approach for financial assistance. ("I would like to sit next to the individual who handles money...")

3. More details on how specific remedial and protection programs are run in the United States were expected. More concrete examples.

4. About 70 percent thought the organization of the workshop was excellent; other 30 percent were indifferent [interpreters' estimate].

5. First day reaction: why are they teaching us? We are not college students, the style is more appropriate for pre-schoolers. Participants felt skeptical on the first day of the workshop. On the second day their opinion began to change.

6. Work in groups was the biggest success. "We can hardly wait until they let us begin our group session..." This was a totally new style for everybody, and everyone liked it.

7. Participants committed themselves to learn the new style of presentation which they referred to as a "business play" (*delouaya igra*). They would like to learn a new, American style of work as well.
8. At the first day: "We have expected more... it was just talk and speeches..." The second and the third day were expected to be the same.
9. Many expressed their view that the workshop program was too intense (Rimma Nozhkina among them). It was especially difficult to study after lunch (which was too early— in Russia lunch is usually at 2:00 or 2:30). It would be desirable to continue until 3:00 or 4:00 in the afternoon and introduce longer breaks.
10. The participants were very detail-oriented. A lot of interest to specific, concrete questions and issues, quite often by profession (doctors, economists). Several expressed their opinion that the workshop should have been split into several professional groups (headed by Tayler Bingham, John Austin, etc.) with special issues of their own.
11. Participants were very pleasantly surprised by the notebooks, the amount of material. They tried not to miss any new article, presentation printout, etc. They said that such *metodichki* (notebooks containing study material) would not have been possible here. They praised the organizational skills, the preparation, and the serious attitude of the organizers.
12. Many wanted much more informal, one-on-one, private discussions with lecturers.
13. Participants noted, that seminar programs are usually interchanged with the so-called cultural programs (such as city tours, etc.). This is especially true when there are participants from the other republics in the seminar.
14. Many noted that the workshop program was too intense. There was no time or energy after the workshop for going over the material of the day, or for doing their "homework." The evening program should have been no longer than one hour. Some suggested to move the "evening program" after lunch and skip the after lunch workshop program altogether. It was difficult to concentrate in the afternoon.
15. Several suggested that instead of the simultaneous translation of the videos, it would have been more useful and effective to provide a written summary or a script of the video in advance.
16. Daily allowances were an unexpected and pleasant surprise. Everybody liked their accommodations at the hotel.
17. Many complained that they felt "separated from: the rest of the world behind the fence." No time for the TV, no newspapers.
18. Several wanted more "entertainment." Some complained that the pool room was either closed or unavailable at night.

19. Both facilitator and presenters were very busy and "showed it." Because of this the participants felt awkward to approach them after sessions, although many wanted to have such individual conversations. Many suggested to have time specially allocated for such talks.
20. It was stated that it would have been more useful if the presentations (slides, etc.) were available before the actual session so that participants could familiarize themselves with the contents. During the session it was often difficult to follow the presenter.
21. Next time the composition of the groups should be thought out more thoroughly: at this workshop, there were several "homogeneous" tables, i.e. all doctors or all ecologists. Once the doctors' table had to "borrow" ecologist from another group to do their task (the other group was not happy). Also, because of this, some of the group tasks were difficult to do.
22. It would be nice to have music during the breaks.
23. We need more time to talk to the presenters and facilitator one-on-one. All such conversations were limited by the tea/coffee breaks. Special sessions with presenters ("office hours") must be introduced.
24. Business cards of presenters and facilitator were not readily available. One had to ask for them personally. Many wanted to get such information, but felt awkward to ask for it.
25. Too little time spent in the air, too much at the hotel. Although the accommodations were excellent, many felt restricted in their ability to go out to the city or for a walk.

Interpreters' Comments

1. When the idea of having both participants, organizers, and interpreters in one hotel was introduced, many interpreters were skeptical and thought it was not necessary. However, later they expressed their appreciation of the fact, stating that the "experience enriched them," they felt "at home" with the participants which also helped at the group sessions. It turned out to be convenient as well.
2. All welcomed simulations. None of the interpreters ever experienced or heard of simulations before; all liked the experience and found it very helpful.
3. Compiling a glossary was viewed as an excellent idea as well.

COMMENTS by Alice Lyandres

1. In order to help the interpreters, I had a glossary of environmental terms prepared. Most of this was done by Eric Sievers with my help, and with the collaboration of the interpreters. It may be useful in the future to review and include such glossary with the rest of the materials. Many of the participants know English, and some are interested in terminology. This may also help the participants translate graphs which have not been translated.

A similar workshop was conducted by the Department of Interior (fish and wildlife section) in Siberia on the preservation of wildlife. The group prepared excellent English-Russian/Russian-English glossaries (about 100 pages each), which contain many environmental terms (I can provide a copy if necessary).

2. it may be useful to let a professional interpreter select (and test) the interpreting staff ahead of time, rather than try and fix the problem afterwards. This is especially important when it comes to simultaneous interpretation.

The Translation Process

It is the interpreter who has to accommodate the speaking habits of the speaker, and not the reverse. Thus, it is OK to work on the most comfortable speed at simulations with the presenters (with their consent), but the participants should be able to speak as they like and should not be reminded to speak slower by either interpreters or facilitator.

In some instances, it backfired at the workshop when the facilitator, at their own initiative, prompted the participants to speak slower. Please do not volunteer such help.

Often, to someone who speaks both English and Russian it may seem that the interpreter cannot keep up. In fact, the interpreter leaves out some sentences, truncates others and uses paraphrase on purpose—this common technique is taught in the schools for interpretation. Even applying this technique, the interpreter, on average, has to speak about 30 percent faster than the speaker.

Appendix C

WELCOMING SPEECHES AND REPORTS FROM COUNTRY REPRESENTATIVES

WELCOME SPEECH BY YUSUF SHADIMETOV

Your excellency, assistant Prime Minister of the Republic of Uzbekistan Muhamadjan Karabaevich.

Your excellencies, ambassador Henry Clark A.I.D. Central Asia Regional Mission director, Craig Buck, Ladies and Gentlemen!

As we approach the third millennium it is becoming evident that the world in which we live has transformed, not only from the beginning of this century, but even from the middle.

The anthropogenic influence on the face of our planet has become comparable to geologic processes, and its potential in certain instances even exceeds them.

In the name of the fund for ecology and health of the Republic of Uzbekistan "ECOSAN," I have the honor of thanking you for your concrete efforts in the problems of regional ecology, problems which, thanks to the good will of our governments are becoming imperatives of international cooperative work.

I want to express particular thanks to our American colleagues for their sincere involvement in the resolution of ecological problems in Central Asia, and for the great amount of organizational work which they did in preparation for our seminar.

It is important to stress that the last meeting of the heads of the Central Asian governments outlined a common strategy for ecological policies for the region and acknowledged a cooperative path leading us out of our critical environmental problems.

The President of the Republic of Uzbekistan, Islam Karimov, attaches a special significance to the questions of environmental protection and human health. Evidence of this is shown in the formation of the fund for ecology and health, ECOSAN.

All of this goes to say that we look forward to moving into an epoch of a global culture and common use of natural resources, and there is hope that our cooperative work will mark a new decisive step towards sustained social ecological development in the 21st century.

The territory of Central Asia, has been exposed to incredible transformations since ancient times which have been brought about by widespread human industry and activity.

Even 1000 years ago, the great philosopher and poet of the Moslem world, Almzhari, wrote:

We have traveled far into our own ignorance to imagine ourselves kings over the birds and beasts.

And even since that comparatively recent time when Huckle coined the term "ecology" its essence has become used to so many deep modifications that in and of itself a search for harmony between the human and unspoiled nature has become impossible.

The era of the technosphere descended and in Central Asia took the monstrous form of merciless exploitation of natural resources, right down to its partial destruction.

A sea is dying, poisoned by the chemicals of the land and disregard for cultural traditions of resource use.

For the first time, the reasons for the fall of a great civilization are being noticed.

A high birthrate, characteristic for the region, against a background of a low standard of living and the ecologically degraded condition of the Aral Sea region has brought a rise in child and maternal mortality, and a lowering of the capacities of the immune system.

The preservation and development of the genetic potential of the region is in danger.

Under these conditions, research into the regional problems of Central Asia becomes particularly salient, as does finding the path away from Apocalypse and the impending environment catastrophe.

Rene Dubois correctly assessed that, "Man is introducing new forces with such speed and in such proportions, that their consequences will catch up with him before he succeeds in evaluating their effects."

One of the principal inquiries of our seminar is how to successfully assess the consequences of an expanding anthropogenic stress on the environment of Central Asia, to define the immediate measures to escape an ecological crises, a decision which should become a long term subject for international cooperative work.

In order to provide for regional environmental security and carry out corresponding ecological policies with that goal in mind it would be expedient to cooperatively work out and create intergovernmental programs and projects in the fields of natural resource use, nature protection, and ecological security, including programs of safe disposal and neutralization of chemical pollutants, toxics, and radiochemicals.

We need to form a combined regional system of environmental monitoring, including radioecological monitoring, assessing natural resources and their use in accordance with agreed upon regional principals and parameters of acquisition, storing of data, and exchanging of information.

We need to work out and bring into existence corresponding scientific/technical programs in the fields of environmental security, natural resource use, and environmental protection to carry out the coordination and application of ecological research.

It seems expedient to work out and apply regional principals and policies to stimulate nature protection efforts, ecological taxation, and sanctions for transgressing environmental protection legislation, etc.

I hope that our seminar will become a powerful factor for synthesizing the world experience in the field of environmental protection and human health and that the recommendations of this forum will be useful for the amelioration of the social ecological problems of Central Asia.

Allow me in the name of ECOSAN and A.I.D. to open the regional Central Asia seminar "Environment and Health."

**REMARKS BY
AMBASSADOR HENRY L. CLARKE**

It is a great pleasure to see all of you here this morning, particularly those of you who have travelled from other countries to participate. Your presence demonstrates that neither environmental nor health issues can be dealt with solely by individual countries. The five countries of Central Asia, especially, have numerous environmental health problems in common.

But why is the United States so interested in environmental health in Central Asia, why is it supporting this seminar? We have a humanitarian interest—the basis for our assistance in health in many countries. We consider environmental issues particularly acute here. But we also expect to learn from this seminar, and hope that what we learn will be useful to our people in America too.

Damage to the ecology—and to the people who are part of the environment—has been especially serious in the formerly Communist countries, the former Soviet Union and Eastern Europe. Not because scientists or doctors were inferior. The damage was greater because it was hidden. The combination of press and professional censorship, the absence of democratic mechanisms for debating policy issues, and the large-scale errors of central planning allowed environmental damage to be magnified. In some areas the environmental damage to human beings has been greater than anywhere else in the world.

Environmental issues have become serious in America too. We do not always know how to correct them—or to pay for correcting them. We did not start working on these problems soon enough. But we have had some successes, and we are working harder than before. Now we have a Vice President, Al Gore, who has been an environmental activist in the U.S. Senate, and whose latest book appeals for action to protect our world's ecology.

For Americans, the most powerful force for preventing and correcting environmental damage has been knowing its damage to our health: PUBLIC knowledge of how we and our children are being hurt, or will be hurt. Such facts in an open society have the power to change policies of governments, to improve the practices of private firms, and even to modify the behavior of ordinary people.

Unfortunately, those who cause damage to the environment, and damage to people's health, are not usually the first to suffer. People who design and build unhealthy plants often do not work there, or live downwind from the smokestack. Most people whose farms are upstream have difficulty believing that their agricultural chemicals cause significant problems downstream. When I visited the area of the Aral Sea, what I heard and saw was enough to convince me that people were dying due to the pollution and diversion of water from the Amu Darya River upstream. Yet soon thereafter I met a well-educated official who denied that the vast development of irrigation in this region had caused such damage.

Science and medicine are not enough to solve all environmental health problems, because people and leaders must be convinced before there is a consensus. We must at least begin with measuring and diagnosing the suffering. We must know what is actually happening when workers are gradually poisoned on the job, or the water and air and food our children depend upon are not fit for consumption. Measurement and analysis are the first step, not just for treatment, but for turning to the public and to the political system for prevention. At that point, the combination of science and pain can be very powerful.

I want to congratulate all of you who are working in this vitally important field. It is obvious that we have a long series of problems to solve that were created in the past. It is also obvious, as our world gets smaller and our economic needs grow—that the environment and health will become more important to public policy in all parts of the world, in the rest of this century and into the next one.

Without the work, and the open exchange of information, that you are beginning today, here in Tashkent, I am sure that we would all have to pay more in years to come—both in suffering, and in the costs of restoring a healthy environment. Good luck to you in your work.

**ECOLOGY AND HEALTH STATE OF THE POPULATION IN KAZAKHSTAN
REPORT BY PROFESSOR RAISA KADYROVA, DIRECTOR OF SCIENTIFIC
RESEARCH, INSTITUTE OF LABOR, HYGIENE, AND OCCUPATIONAL DISEASES**

Kazakhstan is the second largest republic among CIS countries after RSFSR. Its space occupies the territory of 2.7 million sq.km with population of 17 million in number. Slide 1.

Industrial potential of Kazakhstan is sufficiently high, it produces 90 percent of titanium, yellow phosphor, chrome, 70 percent of zinc, over 60 percent of lead, more than a half of the silver, extracted in CIS.

There are rich reserves of iron, coal, gas in the Republic. Slide 2 demonstrates the regions of the main output of non-ferrous metals (Eastern-Kazakhstan, Zheskazgan), of coal (Karaganda, Pavlodar), of phosphor (Southern-Kazakhstan, Jambul) and of oil (Atrauskaya and Mangystauskaya) oblasts.

Oversaturation of the extractive and manufacturing industry and backwardness of production technologies resulted in sharp deterioration of the environment and health, global ecologic changes, formation of bio-geochemical provinces. Thus, the Eastern-Kazakhstan industrial complex includes the enterprises of the non-ferro metallurgy and mining industry. The Ust-Kamenogorsk leaden-zinc assembly is practically situated in the centre of the town, the large lead and zinc processing factory is placed under poor air conditioning conditions in Leninogorsk.

The levels of the environmental pollution by heavy metals: zinc, lead and cadmium in the region have reached the levels which are dangerous for the health of population and are accumulated in the human organisms in high numbers.

A dangerous situation is in the Southern-Eastern Kazakhstan oblast. The environment of Shymkent is polluted by the lead and phosphor factories' wastes, the environment of Jambul is polluted by the phosphor and superphosphate factories' wastes, in the content of which there are fluorine and phosphorus, accumulating in soil outside the resource of pollution. That is why here the cases of phluorose in cattle are registered.

Aktjubinsk is famous for its factories on ferroalloy and chrome combination and a thermoelectric power station in the wastes of which there is a great amount of the chrome and baron impurity. Alga is famous for its hydrogen fluoride factory. The development of Chilisaisk phosphorate deposit is aggravating ecology.

The problem of air pollution alongside with ferrous and non-ferrous metal industry is arising in Central Kazakhstan due to the mercury, contained in air, which pollutes the town of Temirtau, the waters and ground deposit of the Nura-river, animal and plant produce in the river basin. Utilization of metallic mercury in the technological process is the cause of the situation.

The ecologic situation around Semipalatinsk nuclear test-site continues to be worrying. Though according to the official information, the radiation situation does not reach a danger point, there are still no grounds for being complacent.

The rapid growth of coal industry and energetics in Pavlodar-Ekibastuz fuel-power complex, which works on the brown coal with high ash up to 45 percent seriously aggravated ecology in the region.

In recent years the oil-gas extracting industry is intensively developing in some regions of Kazakhstan. The problems of ecological aggravation around the development of oil-gas deposits have already appeared. The air is polluted in dangerous concentrations by gas extracts, particularly when burning. The waters of the underground and surface resources have a high mineralization concentration and are additionally polluted by oil products. The high concentrations of chemical substances such as vanadium, barium, etc. are revealed in the soil and in plant-growing. The anthropogenic biochemical provinces are developing into form within the radius of 20 km in these regions.

Many Kazakhstan towns became the hostage of the fatal influence not only of the large industrial complexes, but of auto transport as well.

Apart from the above mentioned, the air is polluted by the products of burning: coal, mazut, oil particularly in the regions of oil-gas extracting industry. Simultaneously, such toxic metal as strontium, barium, lead, arsenic, vanadium, cobalt, beryllium are extracted into the environment; at mazut and oil burning vanadium is mainly extracted. Hydrogen oxide, nitric oxide, sulphur dioxide enter the air in the process of excavated fuel burning.

Thus the complicated ecological situation created in the Republic is reflected on health of population and demographic processes. Slide 3. High mortality rates are observed in such most ecologically unfavourable regions as Eastern-Kazakhstan oblast (9.9 cases per 1000 pop.), Northern-Kazakhstan oblast (9.5), Western-Kazakhstan oblast (8.6), and Alma-Ata city (8.8) at an average republican indicator 8.0. Infant mortality rate characterizes Kzyl-Orda oblast (33.8 cases per 1000 live births), Mangystauskaya oblast (33.4), Atrauskaya oblast (33.4), Turgai oblast (32.2) and Southern-Kazakhstan oblast (30.8) in comparison with an average republican indicator 27.4. So, the low birth rate and high mortality rate of population are the main causes of the low increase of population, which characterize Eastern-Kazakhstan oblast (6.1 cases per 1000 pop.), Karaganda oblast (6.9), Northern-Kazakhstan oblast (7.8), Akmolinsk oblast (10.1) in comparison with the average republican indicator 13.0.

Alongside with this, high morbidity rate of population (Slide 4) is a characteristic of the ecologically unfavourable regions. The slide shows that the population morbidity rate in the most polluted towns (Shymkent, Jambul) exceeds in 2-2.5 times this rate relatively clean town (Tselinograd). Nevertheless the diseases of respiratory organs, digestive organs and circulation organs prevail in the morbidity structure of all polluted towns, while the diseases of nervous system, sense organs, osteomuscular system and connective tissue are in the first place in the population morbidity structure of the relatively clean towns.

In the light of the above mentioned the big and severe calamity is breaking out on the territory of Kazakhstan. Information on ecologic situation in the zone of Aral is surprising. Peoples of Kazakhstan and neighbouring countries are anxious about the situation in the zone of Aral sea, as it is not only an ecological disaster. The fortunes of nations of Middle Asia and the vast territory of Kazakhstan, the fortunes of the modern civilization in this region, the region of ancient cultures are laid down at stake. As a result, the Supreme Soviet of the Republic of Kazakhstan passed the Law on "Social protection of the citizens, suffered from ecological calamity in the zone of the Aral Sea." In accordance with the resolution of the Law on "urgent measures on radical changes of population's living conditions in the Zone of Aral Sea," the Kazakhstan part of the Aral zone is declared as a zone of ecologic calamity. Taking into account the heaviness of the created ecologic situation, and the affect of the environmental pollution on population health, the territory of Aral area is divided into 3 zones: a zone of ecological calamity, a zone of ecologic crises and a zone of ecologic pre-critical state (Slide 5).

The continuing calamity negatively influences the various branches of the national economy. The situation is worsened not only by the rapid shallowing of this large reservoir, but by deterioration of water due its high mineralization, by pesticide utilization and pathogenes of intestinal infections. The level of water in the sea lowered by 14 m. as the coast line in the Kazakhstan part of the sea moved 60-80 km, in some places 100 km; the salinity of water reached 28-30 g/l, the sea turned into a lifeless salt reservoir.

Degradation of the ecologic system in the Aral zone in combination with a number of unfavourable socio-economic factors significantly aggravated the environment where people live and negatively influenced the health of population. Slide 6 shows that in almost all areas of ecologic calamity the birth rate is reduced, population mortality rate and infant mortality rate in particular are high, the main causes of which are a sharp worsening of health due to the degradation of the environment and bronchopulmonary and infectious-parasitogenic diseases.

The infant mortality rate is growing as congenital anomalies in the Region exceed the average republican rate of 10 percent. If at the end of the 1970 the Aral zone was characterized by high morbidity level of infectious and parasitogenic diseases, tuberculosis and oncologic diseases, in recent years alongside with them the number of mental disorders, suicide and many other anomalies is growing. Today the infectious and parasitogenic diseases, diseases of intestinal organs, blood and hemopoietic organs, blood circulation system and mental disorders (Slide 7) prevail in the structure of Aral population's pathology. These groups of diseases have a growing tendency in all the areas of ecologic disaster. In Aral zone, where the population is ethnically homogenous - the Kazakhs (who by tradition have a definite attitude to abortion) in recent years the number of abortions increased, more than a half of the pregnant suffer from extragenital diseases, maternity mortality rate is high.

Sanitation level of the settlements is extremely low in the region, here there is the lowest level of provision by living conditions, poor drinking water. Due to these factors the population morbidity of typhoid, virus hepatitis, salmonellosis and other intestinal infections, the levels of which exceed the average republican indicators by many times.

The largest indicators of primary invalidism are registered in the zone of ecologic disaster—Aral, the main causes of which are tuberculosis, malignant tumors and diseases of blood circulation system.

All this is echoed in the hearts of those, who is involved into the system of Aral population health care/scientific medical workers. That is why the “Temporary provision on the changes in the citizens’ status, suffered from the ecologic disaster,” as well as the established order (termination) of compensation, payment and making allowances to the population for the damage to their health and “Temporary criteria on health assessment of Aral population,” developed by the medical scientists, were approved by the medical public and population and which enable to improve social protection of the citizens suffered from ecological disaster in Aral.

In the aim of improvement of ecological situation and population’s health in the areas of Aral zone as well as in the whole Republic, short, mid- and long-term measures on health improvement must be developed. Long and persistent work is in prospect, which we should undertake.

**COMMENTS BY TOILY CHOREKLIÉV, DEPUTY PRIME MINISTER OF NATURE
EXPLORATION AND ENVIRONMENTAL PROTECTION, TURKMENISTAN**

Respected Ladies and Gentlemen!

Allow me in the name of the government of Turkmenistan to express my deep gratitude to the organizers of this seminar.

It will unquestionably be a most important milestone in the work of establishing a system of collective ecological security in the region.

In our country environmental protection and the rational use of natural resources has been elevated to the rank of a primary governmental problem, as reflected in the constitution of Turkmenistan and environmental laws enacted by the President.

Furthermore, the task of qualitatively improving the environmental situation in Turkmenistan is decidedly pressing.

The extensive use of natural resources, the fiscal system of developing capital investment, and the vestigial principles of distributing revenue on the development of the social sphere and on the fulfillment of environmental protection measures caused a worsening of environmental conditions.

A not small problem has arisen in recent years related to the quality of surface and underground water.

The primary source of water for Turkmenistan is Amu-Darya River.

Unfortunately, there are high levels of pollution in its middle and lower parts.

The basic reason for this is the continued dumping of drainage water.

The dumping of drainage water with an average mineralization of about 5-10 grams per liter drastically exceeds the level of mineralization of water in the river.

At times, in the lower stretches of the river it reaches 2-3 grams per liter.

In total, for Turkmenistan, lab research on surface waters in areas of residential water use show that 26 percent of samples do not meet sanitary chemical standards, and 67 percent did not meet bacteriological standards.

Only 13 percent of village dwellers and only 26 percent of the urban population are provided with indoor plumbing.

The rest of the population drinks water from open irrigation canals and reservoirs without the necessary cleaning and decontamination.

The sewage system remains at a low level and only 57 percent of the urban population is supplied with a centralized drainage system and the rural population practically has no sewage system.

The insufficient quality of drinking water is the main reason for viral hepatitis and other severe intestinal diseases.

High levels of typhus remain.

Severe intestinal infections make up a large part of children's diseases and are one of the main reasons of infant mortality.

All of this shows the need for cooperative work in water purification equipment installation, indoor plumbing, and sewage treatment plants.

Recent tests of water quality of the main irrigation canal of the Dashxovuz region showed that the sulfate, pesticide, and petroleum by-product content is 2 to 5 times the maximum allowable concentration.

The same situation is in almost every other region.

Taking into account that over 70 percent of the rural population uses irrigation water for drinking and cooking, one can understand the reasons for the rising rates of illness and the high rates of infant and maternal mortality.

Thus, the level of child mortality in Dashxovuz in 1992 was 52.9 per thousand live births, whereas the average number for Turkmenistan is 44.2.

The Government of Turkmenistan adopted extreme measures to support the population of the region financially and socially and restore environmental balance.

In November 1990, the Supreme Soviet of Turkmenistan declared the regions of Dashxovuz and Darganatin areas of environmental disaster and established a controlled level of agricultural activity.

A special program targeted at improving the environmental situation of the region has been developed and is being implemented currently.

However, we still do not have sufficient resources or technical expertise to significantly affect the situation and to restore the ecosystem in the near future.

Therefore, we believe that the assistance of international groups and organization is very helpful in the areas of environmental protection, implementation of environmental programs aimed at helping the population of the Aral Sea area.

We are particularly concerned with the protection of our ecosystem.

Turkmenistan, as is well known, is situated in an arid and hot climate.

All this makes our environment fragile and any disturbances to the ecosystem are felt especially acutely and it takes a long time to restore the balance.

Air pollution includes particulates, carbon monoxide, and nitrogen.

The largest polluters are connected with petroleum, construction, and fertilizer enterprises.

A large amount of pollution is caused by automobile emissions.

An increasing concern on the part of environmental protection and agriculture departments of the republic are the utilization and processing of industrial and household pollution.

A special mention should be made about pesticides and chemical fertilizers; an average 8 kilograms per hectare.

The regulations for chemical fertilization are not fully observed.

Violations of regulations for storage and usage of fertilizers are the reasons for their high concentrations in water, air, and soil, as well as in agricultural products.

All this has a negative impact on the health, mortality rate, and morbidity of the population.

There is growing concern about the situation at the Caspian Sea, where since 1978 the level of the sea has been rising.

Among the Caspian Sea issues are the protection and the preservation of the natural environment and its fauna as well as the rational use of its resources.

Certain concrete measures have been taken in Turkmenistan to protect the sea, in particular the President of Turkmenistan, Nizayev, has issued several decrees.

A dam separating the Karagobazgol Bay from the main sea has been removed.

At present, about 25 cubic km of Caspian water runs into the bay each year.

The main reasons for the anthropogenic changes in the soils of Turkmenistan are the destruction of the vegetative cover and salinization of soil.

The intensification of the agriculture sector and the lack of conservation of land resources in some of the areas there are unsatisfactory.

While fully supporting the efforts of USAID, especially the ones aimed at protecting the environment, we extend a request to you to provide assistance in solving problems of environment first and foremost in the installation of and acquiring technology and equipment for water purification and for reprocessing of industrial and household waste.

Unfortunately, the list of environmental problems facing Turkmenistan is much longer than I had time to explain.

I am restricted by the time given to me for this presentation.

On behalf of our people and the government of Turkmenistan, I hope that this seminar will be a good stimulus for the launching of large scale and well coordinated efforts to protect the environment and improve the health of the population of our country.

I would like to assure the participants of this seminar that we will take all necessary measures to improve the environmental situation in the republic and promote cooperation with other countries in this area.

**COMMENTS BY RUSTAM DJUMAEV, HEAD OF THE EPIDEMIOLOGICAL
DEPARTMENT, MINISTRY OF HEALTH, TAJIKISTAN**

Tajikistan is a mountainous republic. Its territory is about 143 sq. km. Hills and valleys take about 15 sq. km. or 10 percent. Located on a small territory, the rivers of the Republic form over 50 percent of the waters feeding the Aral sea.

There are about 600 rivers, over 2,000 lakes with water supply reaching 44 cubic meters, and fresh water - 20 cubic km. Significant water resources are contained in mountain ice. They cover 5.5 percent of all territory of the Republic.

Presently, the quality of water in the majority of rivers including Vakhsh, Nandly and Amu-Darya, is within the standards established for fishing and residential water supply. However, because a lot of this water is used for irrigation, there is an increased mineralization in the Syr-Darya, Isfer and other rivers. Thus, the mineralization of Syr-Darya on the border of Tajikistan flowing from the territory of Fergana valley of Uzbekistan has doubled in the past 10 years reaching 1.4 grams/liter. Accordingly, the mineralization of ground waters of Tajikistan section of the Syr-Darya watershed has also doubled from 0.6 to 2.0 grams/liter and has rendered it unsuitable for drinking.

Another negative factor comes from an increase in the polluted sewage waste waters from industries and households.

Tajikistan is unique, because of the abundance of natural drinking water resources, therefore the Aral Sea problem cannot be solved separately from the problem of mountain valley rivers. In order to save these drinking resources and the unique mountain eco-systems, in our opinion, it is necessary to develop either a separate strategy or a strategy that includes the Aral Sea, involving organizations dedicated to nature protection and nature reserves.

I would like to go back to the problem of the 10 percent of the valleys of Tajikistan, in which up to 95 percent of all industries, cities, villages and irrigated fields are situated with all kinds of problems resulting from this.

All industrial and household waste, after insufficient purification process, finds its way back into the watersheds of the Republic, which are used for the drinking needs of the population.

Industrial atmospheric emissions likewise cover many areas of the country.

The analysis of morbidity in the Republic shows a very interesting picture, in particular a very high correlation between diseases of the intestinal system and the quality of drinking water, between fluorosis and the waste coming from aluminum processing plant. There is also a link between allergy diseases and pesticide use.

Studies of diseases in nine regions of Kurga-Tubin, in seven regions of Leninobad, and in six other regions of the republic showed a particular link between the level of pesticide concentration in the soil and their types and various diseases.

Thus, an analysis of morbidity in the same regions shows the dependence of chronic gastritis, ulcer, down syndrome and other mental disorders.

Special attention should be paid to the impact of hot climate, acting as a catalyzer for the biochemical processes associated with the early development and professional disease, associated with the adverse ecological situation which confirms the data of the comparative study of morbidity in the southern and northern areas of the Republic.

The Republic's acquisition of sovereignty creates new responsibilities, the realization of which implies the inevitable increase in industrial output and construction of new plants and factories, which will have a significant impact on the eco-system.

But reality is such, that because of the current economic crisis, the financial resources will lag behind the industrial development.

Because of this we medical professionals are concerned not only with the present situation, but also with the reality that it could get worse.

In conclusion, taking advantage of the presence of Central Asia Republics' representatives, I would like to encourage cooperative efforts in scientific research and development in the field of ecology and health.

COMMENTS BY TULKUN ISKANAROV, DEPUTY MINISTER OF HEALTH, UZBEKISTAN

Corresponding Member of the Academy of Sciences of the Republic of Uzbekistan, Professor,
Chief State Medical Doctor of the Republic of Uzbekistan, Deputy Minister of Health

"The Environment and Health" presented at the Central Asian Regional Seminar "The Environment and Health" March 1-5, 1993.

Summary:

After greeting the participants of the seminar, Iskandarov stated that the goal of this report is to provide an overview of Uzbekistan's efforts to preserve the environment and prevent infectious and non-infectious diseases and also to discuss current research being conducted in Uzbekistan in the field of public health.

According to Iskandarov, the state system of health and epidemiological services currently consists of 220 health-epidemiological stations (*sanepidstantsii*), 67 health centers, 2 anti-plague stations (*protivochumnnye stantsii*), 6 state disinfection stations (*dezstantsii*), 212 self-supporting disinfection stations (*khozraschetnye dezinfektsionnye stantsii*), and 16 centers for the fight against AIDS. For over 50 years scientific research institutes and public health departments in four-year medical schools in Uzbekistan have carried out productive work in the fields of epidemiology, microbiology and infectious diseases, virology, and parasitology. The newly independent Republic of Uzbekistan has made the study of the effects of environmental factors on the human population as well as the improvement of the environment and people's lives a top priority. Iskandarov noted, however, that work in the fields of public health and epidemiology has proceeded from the conclusion that efforts toward protecting the environment have not substantially improved ecological conditions, especially in the Tashkent, Fergan, Samarkand, Surkhandarin, Khorez oblasts and the Karakalpak Republic, and that this situation has had detrimental effects on the health of the population of Uzbekistan, as indicated in the demographic statistics.

Iskandarov discussed trends in key demographic indicators such as natural growth, average life expectancy, birth rate, infant mortality, incidence of illness, etc. for Uzbekistan. He pointed out that while infant mortality, for example, decreased in Uzbekistan between 1985 and 1991 from 45.3 to 35.5 per 1000 births, this is still higher than the rate for the former USSR—22.3—and, furthermore, significantly higher than levels observed in developed countries. In general, the incidence of illness in adults and children in Uzbekistan has increased significantly over the last 10 to 15 years, leading to the conclusion that there is a possible connection with the poor state of the environment.

The area around the Aral Sea, the Saryassikiij region in the Surkhandarin oblast and regions marked by intensive use of pesticides all show high rates of illness and disease. The incidence of tuberculosis, cancer of the esophagus, blood and circulatory disorders, and digestive disorders is several times higher in the area around the Aral Sea than the republic as a whole.

In the republic as a whole, the vast majority of agricultural and industrial enterprises do not conform to ecological and sanitary regulations and standards, and it is this catastrophic state of affairs that results in poisoning of the air, soil, and water of the republic. An estimated 18 to 20 percent of health care expenditures in Uzbekistan are traceable to the effects of air pollution alone. However, as Iskandarov pointed out, nearly 80 percent of the more than 100 thousand enterprises are subject to laboratory monitoring.

The state system of public health and epidemiological services has proposed a long-term study of the situation, especially with regard to the water-supply system throughout the country, which was constructed for the most part in the 1950s and 1960s using lower standards than are now in place. Virtually all the rivers in the country are polluted and do not meet current health standards.

A department of "Ecology and Health" has been established to collect data and analyze health conditions in the republic. Using modern techniques and equipment, public health workers are working at all levels—oblast, city, and regional—to support the goals of the new program.

Appendix D

FULL TEXT OF PARTICIPANT EVALUATIONS

Workshop Evaluation

- 1. Describe the most important results of the workshop:**
 - 1. a) The realization that environment and health should be viewed together and are interdependent. Currently, environmental and health issues are solved by separate institutions (ministries);**
 - b) The methodology for establishing causal chains in the environmental health field;**
 - c) The feasibility of conducting broad epidemiological studies;**
 - d) The auctioning of waste disposal [?] licenses; promotion of computer technology.**
- 2. a) The workshop broadened my knowledge of the interdependence and interrelation of environment, economics, and health;**
- b) The workshop notebooks are excellent and will be very helpful in my future work;**
- c) I have established contacts with my colleagues from other republics;**
- d) The proof, that it is more feasible and much cheaper to prevent than to treat the problem after it has happened.**
- 3. A new approach to solving the environmental problems, epidemiological methods, Hill's postulates, economic formulas.**
- 4. I have learned theoretical approaches which enable me to look differently at the problems of environment and search for the causal chain.**
- 5. The presentations were very informative and explained well the global importance of the environmental issues.**
- 6. The new information in the environmental health field; the possibility of economic analysis; forecasting.**
- 7. I view the results as positive. The workshop has introduced new methodology, which helps establish the link between economics, politics, management, risk assessment and environment.**
- 8. One of the most important results is the method of constructing the causal environmental health chain. "Intervention at selected points" approach was very interesting too.**
- 9. A new approach to environmental health studies.**
- 10. A new approach to environmental health studies.**

11. Methodology for studying and implementing environmental protection and remedial programs; convincing reasons for the implementation of such programs;
12. The approach and methodology for establishing the causal chain (the link between the environment and health); implementation of epidemiological methods for solving environmental protection problems; decision-making methodology.
13. I was most interested in new ideas, new approaches to problem-solving, methods for defining and solving problems etc., which were presented by the American scientists in a very professional manner.
14. I have understood, that the problems of the environment are one of the most important ones in the modern society, and that they have to be solved jointly by both manufacturers and consumers, and by both private and public institutions.
15. I benefitted from studying the 20-year experience of the United States in the environmental health field and from learning the methodologies used in the process.
16. The possibility to study in great detail the link between the environmental pollution and health; the importance of the cooperation among all agencies, and the coordination of their efforts in remedial and preventive environmental and health programs.
17. Methods for organizing, developing, and applying methodology for problem-solving.
18. For me personally, an important aspect was a new way of thinking and new approaches to the old problems. Another important factor was the introduction of new teaching and workshop methods, as part of my job is to conduct similar workshop for my colleagues.

II. Which issue was of most importance to you?

1. a) Prevention over treatment as a proven approach;
b) The causal chain methodology;
c) An integrated approach to environmental health assessment.
2. Environmental work should be based on the analysis of the causal chain, assessment of possibilities and setting of priorities. Priority should be given to the most important and environmentally significant problems.
3. Methods of prevention and treatment of environmental pollution.
4. The workshop taught us to be wise towards the environment so as not to repeat the mistakes of other countries. It is especially important for us, because in the current economic crisis we cannot afford to spend resources on environment unproductively.
5. The causal chain, the link between the economic development and environment, setting priorities.
6. Risk assessment, setting priorities, economic issues and their link to epidemiology.
7. The link between economics and the environment, setting priorities for the intervention to improve the environmental conditions.

8. I, as the head of an environmental protection agency, was interested in all issues, but the most important was the economic aspect, as very few managers can develop cost-efficient methods for environmental remedial projects.
 9. The causal chain, epidemiological methods, risk assessment and setting priorities.
 10. The causal chain, risk assessment, setting priorities.
 11. a) the link between the environment and health
b) the causal chain;
c) epidemiological methods of analysis
d) economic methods
 12. Hill's postulates, risk assessment, economic aspects of the prevention programs.
 13. Setting priorities, risk assessment, economic aspects of the environmental protection, many other issues.
 14. a) The solution for any environmental problem cannot be developed without medical doctors;
b) The environmental programs must be implemented by and at the expense of manufacturers under the control and with the help of the government.
 15. Establishing the causal chain to define the environmental factors which negatively impact health.
 16. The causal chain, the methods for determining the feasibility of epidemiological studies, risk assessment, setting priorities.
 17. Linking environmental problems to economics.
 18. Unfortunately, the health authorities and the environmental agencies in Tajikistan do not work together. Therefore, one of the most important things for me was the proof that the link between the environment and health may have a practical application, which will enable us to use our scarce resources effectively.
- III. What will you need to implement the methods, discussed at the seminar?
1. I will have to study the note-book papers, think it over, learn the computer program, and change the organization structure and the methods used in the environmental health field. Environmentalists and epidemiologists (medical doctors) must work together. The corresponding ministries should be merged, at least partially at the research stage.

2. I will need to train the subordinate departments and agencies, managers, ministries, enterprises; make information more accessible, educate the public more extensively, implement economic incentive approach more readily.
3. I will have to train staff in methodology and in financing.
4. Computer programs, staff training, public education, equipment, financing.
5. Data analysis and special equipment.
6. Special literature, compiling new programs based on the information provided at the workshop and new equipment.
7. To convince my management and my colleagues; to find necessary funds for the implementation of various program; to study the way the U.S. environmental protection agencies work.
8. The international data base of environmental data, equipment (computers, linotypes, equipment for instant analysis of blood, urine, and saliva).
9. I will have to once again study the documents I have received and the computer programs I have learned about.
10. To study (analyze) the documentation and programs I have received.
11. Consultative and financial aid, equipment (preferably manufactured by the country which conducted the workshop)
12. To train colleagues in ideas and approaches I have learned about at the workshop; to invite specialists from the west (USAID) to provide practical technical assistance.
13. To hold another workshop in the United States!!
14. Computers, xeroxes, etc. (office equipment); the improvement in professional training of environmental health specialists.
15. Raise the professional level of environmental professionals; joint research and development; modern equipment; financing.
16. To go back and review the workshop's materials, to be able to consult the U.S. scientists.
17. To work, work, and work.

18. The issues raised by the workshop need to be studied in more detail. It goes without saying that an economic (financial) base must be in place for the implementation of environmental programs.

IV. Any criticism?

1. **No criticism.** Job well done, everybody was very friendly, presenters were sincere, approachable, and open.

Recommendation. When assessing the impact of environment on health, in addition to humans one should look at other "objects of the environment": animals, vegetation etc. Therefore, it may be desirable to conduct a workshop which deals with such realities of the environment as well.

2. One may only envy the excellent organization of the workshop and take it as an example. Every lecture, presentation, and group-work session, as well as every detail was extremely well thought-out. The organizers were very friendly and ready to share their knowledge.

3. No criticism. I however, I have the following comment: I would like to see a workshop which targets various professions and moves at a slower pace.

4. a) A discussion on how and who drafts (promotes) the standards for environmental protection may have been useful;
b) The feasibility of setting environmental protection standards;
c) A concrete example of assessing a concrete plant's pollution levels may have been very useful.

5. None!

6. More time should be given to analyze the setting of priorities and the economic analysis.

7. None.

8. It is a very difficult task, and all of the presenters did an excellent job. I would just like to express my appreciation. Thank you.

9. None.

10. No criticism.

11. I would like to see more concrete examples from the environment and health fields, and a more recent statistical data, rather than data from the 80s.

12. The workshop was very well organized and conducted in a professional manner.

13. No criticism. I would like to conduct a similar workshop in Kazakhstan.
14. The workshop was well organized. It was overly informative, though. In the future, it would be useful to limit the scope to selected problems of the environmental health, rather than addressing all of them at a single workshop.
15. The workshop was excellent! My wish: to conduct an international environmental health conference so that we can evaluate the effectiveness of this seminar a year from now.
16. Every detail was carried out with great professionalism.
17. I would like to see more examples in each and every workshop theme, as well as the assessment of the potential results of conducting suggested programs (the reduction in the levels of waste, the improvements in health, the economic effects).
18. The workshop was very helpful.

Participants were asked to rate the following topics on a scale of 1 to 5 (5 being the highest).

V. Environment and health link

5 5 5 5 5 5 5 5 5 5 5 5 5
 Prevention vs. treatment
 5 5 5 5 5 5 5 5 5 5 5 5 5 5
 Economic development and environment
 5 5 5 5 5 4 5 5 5 4 5 5 5 5 5
 Intervention methods
 5 5 5 5 5 4 5 5 5 5 5 5 5 5 5
 Sector (?) organization
 5 5 5 5 5 3 5 5 5 4 5 5 5 5 5
 Internal and external organization
 4 5 5 5 4 3 5 5 4 3 5 5 5 5 5
 Public access to environmental data
 5 5 5 4 5 2 5 5 5 4 5 5 5 4 4 5

VI. Workshop's goals

Methodology for establishing links between environment and health
 5 5 5 5 5+5 4 5 5 5 5 5 5 5 5 4
 Methodology for determining priorities
 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
 Key concepts
 4 5 5 5 5 5 5 5 4 5 5 5 5 5 5 4

Alternative approaches

4 5 5 5 5 4 5 5 4 5 5 5 5 5 5

Public access to information

4 5 5 4 5 2 5 5 4 4 5 5 5 4 4 4

Environmental software

5 5 5 5 5 + 5 3 5 5 5 3 5 4 5 4 5 5

Environmental protection program

5 5 5 5 4 3 5 5 5 5 5 5 5 5 4

Region-specific problems

5 5 5 5 4 4 5 5 5 good, OK! 5* 5 5 5 5

* All your note-book materials will be copied, distributed, and used in the work of our epidemiological unit. Spataev, M.B. 03/05/93

Appendix E

BIBLIOGRAPHY OF REFERENCE MATERIAL HANDED OUT

Environmental Health Conditions

Blumenthal, Daniel S. and Harvey L. Ragsdale. "Air Pollution."

Coniglio, William A., Paul S. Berger, and Joseph A. Cotruvo, 1992. "Water Pollution and Chemical Contamination in Drinking Water," from *Principles and Practice of Environmental Medicine*, pages 59-79, edited by Alyce Bezman Tarcher. New York: Plenum Medical Book Company.

Esrey, S.A., J.B. Potash, L. Roberts, and C. Shiff. 1991. "Effects of Improved Water Supply and Sanitation on Ascariasis, Diarrhoea, Dracunculiasis, Hookworm Infection, Schistosomiasis, and Trachoma," from *Bulletin of the World Health Organization OMS*. 69: 609-21.

Esrey Steven A., and Jean-Pierre Habicht. 1986. "Epidemiologic Evidence for Health Benefits from Improved Water and Sanitation in Developing Countries," from *Epidemiologic Reviews*, 8: 117-28. The Johns Hopkins University School of Hygiene and Public Health. "European Community Environmental Directives," from *EC Environmental Directives*, Annex 7: 1-44.

Frisbie, R.E., and J.K. Walker. "Pest Management Systems for Cotton Insects," from *CRC Handbook of Pest Management in Agriculture*, 3: 187-201.

Hoover, Robert N. and Aaron Blair. "Pesticides and Cancer," from *Cancer Prevention*, edited by Vincent T. De Vita, Samuel Hellman, and Steven Rosenberg.

Sharp, Dan S., et. al. 1986. "Delayed Health Hazards of Pesticide Exposure," *Annual Review of Public Health*, 7: 441-71.

Sharom, M.S., F.L. McEwen, and C.R. Harris. "Movement of Insecticides in the Environment and Biodegradability," from *CRC Handbook of Pest Management in Agriculture*, 3: 143-66.

Spengler, John D. 1992. "Outdoor and Indoor Air Pollution," from *Principles and Practice of Environmental Medicine*, pages 21-41, edited by Alyce Bezman Tarcher. New York: Plenum Medical Book Company.

Tarcher, Alyce Bezman. 1992. Appendix A: "Selected Toxic Chemicals and Their Adverse Health Effects," from *Principles and Practice of Environmental Medicine*, edited by Alyce Bezman Tarcher. New York: Plenum Medical Book Company.

Environmental Health Methods

Hilli, Sir Austin Bradford. "The Environment and Disease: Association or Causation?" from *Evolution of Epidemiologic Ideas*, pages 15-20.

La Goy, Peter K., Ian C.T. Nisbet, and Carl O. Schulz. "The Endangerment Assessment for the Smuggler Mountain Site, Pitkin County, Colorado: A Case Study," from *The Risk Assessment of Environmental and Human Health Hazards: A Textbook of Case Studies*, pages 505-25, edited by Dennis J. Paustenbach. New York: John Wiley & Sons.

Pierson, Terrence K. February 1991. "The Role and Methodology of Environmental Risk Assessment: A Framework for Developing Countries," presented at the Agency for International Development Environmental Health Workshop. Washington D.C: Office of Health, Bureau for Science and Technology, Agency for international Development.

Portney, Paul R., "EPA and the Evolution of Federal Regulation," and "Overall Assessment and Future Directions," from *Public Policies for Environmental Protection*, pages 7-25 and pages 275-89, edited by Paul R. Portney. Washington D.C: Resources for the Future.

Ruttenber, A. James. "Evaluating Health Risks in Communities Near Nuclear Facilities," Denver, Co: Department of Preventive Medicine and Biometrics, University of Colorado School of Medicine.

_____. "Health Risks from Chemicals in the Environment, Part I: Evaluating Toxicity to Humans," Denver, Co: Department of Preventive Medicine and Biometrics, University of Colorado School of Medicine.

_____. "Health Risks from Chemicals in the Environment, Part II: Measuring and Interpreting Exposure and Risk," Denver, Co: Department of Preventive Medicine and Biometrics, University of Colorado School of Medicine.

Science Advisory Board: Relative Risk Reduction Strategies Committee, United States Environmental Protection Agency. September 1990. "Executive Summary" from *Reducing Risk: Setting Priorities and Strategies for Environmental Protection*, pages 1-4. Washington D.C: U.S. Environmental Protection Agency.

_____. September 1990. "Reducing Risk," from *The Report of the Strategic Options Subcommittee*. Washington D.C: U.S. Environmental Protection Agency.

Tarcher, Alyce Bezman. 1992. "Appendix E: Information Resources in the Field of Environmental and Occupational Medicine," from *Principles and Practice of Environmental Medicine*, pages 601-8, edited by Alyce Bezman. New York: Plenum Medical Book Company.

Tarcher, Alyce Bezman. 1992. "Principles and Scope of Environmental Medicine," from *Principles and Practice of Environmental Medicine*, pages 3-18, edited by Alyce Bezman. New York: Plenum Medical Book Company.