

Women Transform the Mainstream

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Introduction

*Women do not want to be mainstreamed into the polluted stream.
We want to clean the stream and transform it into a fresh and flowing body.
One that moves in a new direction- a world at peace, that respects human rights for all,
renders economic justice and provides a sound and healthy environment.
-Bella S. Abzug (1920-1998)*

Clean, accessible water -- aqua vita - is essential to the existence of our planet and to the health and livelihoods of human beings and other forms of life. The Universal Declaration of Human Rights and other international instruments have recognized the rights of everyone to a standard of living adequate for their health and well-being, including food and medical care, housing and the necessary social services. So do human beings have a right to safe water? If so, how -do they realize this right? Is water simply another commodity?. If so, how will the market price be determined-and how will the product be allocated? What is the public sector role and responsibility in ensuring universal access to safe water?

At every UN conference from Rio to Rome, governments agreed to ensure universal access to safe sufficient quantities by the year 2000. Yet, the world's water resources are under siege, from contemporary predators who despoil and exploit seas, rivers, lakes and land for profit in the name of technological progress.

According to the 1996 WHO/UNICEF Water Supply and Sanitation Sector Monitoring Report, one billion people lack ready access to safe water supplies, and

two billion live without sanitation facilities. Unfortunately, no data is available for over 70 countries so the real extent of the problem is unknown. Other UN sources estimate that one quarter of the world's 5.9 billion people have no access to clean drinking water. Industrialized countries are assumed to provide more than 90% of their populations with access to safe water.

As water quality is declining in many industrialized countries, the market has responded. Entrepreneurs have been quick to capitalize on the profit-earning potential in cleaning up environmental disasters. Increasing numbers of private firms have entered the market to supply bottled water as a consumer product. The market share for bottled waters of all kinds -- mineral spring, flavored, etc.-- has exploded in the last two decades. Bottled water is now regularly exported and imported by a growing number of countries.

The market for water filtration devices has also increased dramatically over the last decade as consumer confidence in the quality of publicly provided tap water has declined. A majority of the people in industrialized countries, particularly those with low incomes, continue to rely on the public sector to provide safe drinking water piped into their homes and places of work- The majority of people in developing countries still rely on shallow and deep tubewells as well as low-cost means of purifying surface water.

What are the public policy implications resulting from the commodification of water? The 84 countries attending the March 1998 international conference on water and sustainable development held in Paris discussed this very question. Government delegates appealed to market forces to manage the world's water supplies. Governments agreed that water should be paid for as a commodity rather than treated as an essential staple to be supplied free of cost Delegates concluded that costs of water should remain "low and that the poor must be assured of access," but they did not construct a formula to find this delicate balance between the capacity of each category of user to pay for access.

The World Bank and International Monetary Fund have been promoting the concept of user fees for social services as part of their market-oriented, structural adjustment reforms. Indeed the market is extremely useful in determining the consumer's willingness to pay for goods and services. Unfortunately, there are many market "externalities" and "imperfections." Inequalities and injustices abound.

The UN estimates that some 80 countries, comprising 40% of the world's population, are suffering from serious water shortages and that, in many cases, the scarcity of water resources has become the limiting factor in economic and social development. Only 0.3% of the total fresh water reserves on earth are found in rivers and lakes,

which along with ground water form the bulk of the water for drinking (10%), industry (21%) and agriculture (69%).

While many industries pollute and pillage water resources for private gain,, countless women around the world work in their local environments to protect and preserve water sources for their families, communities and regions. In their traditional and modern roles in society, workplaces and communities, most women have a strong interest in conserving and utilizing water resources. Of necessity, most women develop their own methods to purify and manage scarce water supplies and often serve as "environmental educators" for their families and the community at large to better manage water supplies. In the context of fresh water management women also bear the greatest impacts of water misuse, water contamination, and water scarcity. Most importantly, women, as critical stakeholders in deciding courses of action, are constantly overlooked by policy-makers.

While women's participation and representation in governments around the world has been increasing in many countries, there is still a serious participatory democracy deficit. Gender-inequitable governance and decision-making structures do not produce the most effective and sustainable solutions to the water crisis and other critical problems.

In the 1992 Earth Summit Agenda 21 and subsequent international conference agreements, including the comprehensive 1995 Women's Conference Platform for Action, governments have agreed on the need for gender analysis to reflect the differential impact that policies and programs have on both women and men. Beyond this rhetoric, "mainstreaming a gender perspective into policy-making" and acceptance of women as equal partners in decision-making remain largely unrealized. However, as we near the 21st century women's participation is increasingly being recognized as the key to sustainable development and a healthy, equitable and peaceful planet

Disparities between the ways in which men and women use and control natural resources are a key indicator of gender inequality. Traditionally, women have been responsible for managing basic resources because of gender-based roles that assign women responsibility for household care. Of the basic resources, water has been crucial for survival. But water is increasingly a scarce resource, and difficult choices are being made regarding its use among industry and agriculture, personal health and development opportunities. These are political questions. The tradeoffs are choices that governments are making by their action or inaction. In such situations, the lack of attention to the needs and capabilities of women in their public, economic and family roles contributes to reinforcing and increasing gender disparities.

Effective gender analysis does more than assure women's participation in creating environmentally-sound development. It reflects how resources are allocated between men and women, highlights constraints imposed by women's socially constructed and confined roles, and proposes women-empowering policies. Failure to include gender analysis in policy-making has often resulted in recurrent cases and widespread suffering among women, men and children.

For example, the World Bank has pioneered the use of social assessments as part of its project development process. But it has not yet succeeded in having these assessments adequately use the potential power of gender disaggregated data collection and gender analysis as evidenced in the recent social assessment of the Aral Sea region. One is left with the impression that the report is not simply gender neutral but gender blind. Survey research teams interviewed "the adult in the household" in almost 1,000 homes but the reader has no idea whether men or women were interviewed.

Using gender analyses will provide a framework for understanding local cultures by exposing differences in the way women and men cooperate, share and control resources. Getting to know how decisions are made; who is involved in what type of activities; and the overall cultural context of a given community will influence the establishment of broader mechanisms for democratic participation.

Governments at every level should take into account women's expertise and experience to ensure environmentally sound policies and programs. The following case studies illustrate the value of women's holistic approach in dealing with a range of environmental crises and in creating sustainable communities.

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Cause of the Environmental Crisis

During the International Drinking Water Supply and Sanitation Decade of the 1980's, governments and international agencies made considerable progress to ensure safe water for billions of people. In addition to agreeing to ensure universal access to safe drinking water in the Earth Summit Agenda 21, governments highlighted the need to conserve and maintain water resources in the face of gradual destruction and pollution. Alarming, new threats to achieving these goals continue to emerge.

Most of the environmental hot spots highlighted in these cases are the result of serious democratic deficits, power struggles and conflicts over the direction and nature of development. Competing interests involving multiple sectors run through every story. Each story highlights debates over critical principles and asks each of us to decide what are the core principles that should guide our economic system, which is but a subset of our larger ecosystem.

In all parts of the world, expansion of industrial activity has saddled communities with multiple environmental problems, including rivers and lakes overloaded with industrial discharges, agricultural run-off and radioactive wastes, resulting in poisoned drinking water supplies. Progressive encroachment of incompatible activities is one of the main challenges in water planning and management.

The following compilation of case studies illustrates the multiple effect of increasing globalization of the economy on women and their families. As the influx of multinational corporations into previously pristine environments has occurred without regulatory safeguards or appropriate environmental planning and management, the environment has suffered and human health has deteriorated. In three decades, from Rachael Carson's pioneering 'Silent Spring' to Theo Colburn, Dianne Dumanoski, and John Peterson Myers' powerful, 'Our Stolen Future,' we have increasing evidence that we are threatening the survival of many species, including our own, as well as the survival of life on this planet.

In many communities there are simultaneous releases of hazardous materials into the air and water leading to environmental changes so great that local populations are completely overwhelmed. In cases of water pollution, there are far reaching consequences no matter what kind of water body is involved. The case studies highlight environmental problems related to a range of water bodies that include a sea bounded by several countries, a lake, several rivers, and communities with polluted groundwater. They illustrate the multiple challenges to women in environments where complex inter-relationships exist between local economic activity, agriculture, recreation, water supply, and military and industrial activity. Industrial sources of pollution include military and non-military nuclear facilities, mining and metallurgical operations, agro-industry and the petrochemical industry. The cases document the problems resulting from discharges of both organic and inorganic effluents into rivers, which are the main drinking water sources for local communities.

Environmental contamination is often cumulative, building up incrementally over long periods of time in local ecosystems. This is clearly demonstrated in the case study of the petrochemical industry in Ogoni, Nigeria. Evidence of environmental links to cancer and damage to women's reproductive health is mounting. In most cases, multiple substances have been released by a variety of industries, often with inadequate testing and identification of releases into the environment. Three case studies, including the Mediterranean sea, Chelyabinsk in Russia and the Kelly Air Force base outside San Antonio, Texas, focus on military facilities that are sources of complex mixtures of potentially dangerous substances. Volatile organic compounds, hazardous and radioactive wastes, solvents and munitions are released from these

locations, endangering regions far beyond their original source. Mining and metallurgical industries release an array of heavy metals including copper, iron, zinc and cyanide with long-term impacts on ground and surface water sources. Agro-industry, highlighted in the Aral Sea region, can be a source of dangerous pesticides, buildup of nitrogen, phosphorous and phenols as well as lead to arsenic poisoning.

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Impact of the Crisis on Women and the Community

Eleven case studies provide a sampling of threats to the health of our vulnerable planet. Damage to local communities varies in degree and form. Health problems result from consumption of polluted drinking water, swimming in polluted water supplies and consumption of contaminated food and fish. Assessment and identification of the health effects has often been difficult, with a number of the cases demonstrating conflicts of interest and interpretations between official organizations and agencies and local community groups. These discrepancies may be due to difficulties in pinpointing effects of long-term cumulative buildup of pollutants from industrial facilities in the region or because the health effects are a result of multiple causes, including poverty, inadequate nutrition and diet in affected populations.

Women are disproportionately affected not only by high mortality and morbidity rates in the cases described, but also because increasing health problems in the communities place a particular burden on women given their traditional role as caregivers and healers. Communities in the Essequibo River region of Guyana, Chelyabinsk, Russia and the Black Mesa region of Arizona in the United States, faced with heavy metals and cyanide releases from the metallurgical and mining operations, report increased immune system responses, skin rashes and irritations, respiratory illnesses and elevated cancer rates. Lead contamination is shown to increase blood diseases and brain damage. Radioactive exposures in Chelyabinsk, Russia, in the Ukraine and in the Mediterranean are associated with higher birth defects, cancer increases and gene mutations. Military facilities such as the Kelly Air Force Base in Texas, where various volatile organic compounds are stored, appear to increase multiple illnesses, including neurological diseases. Ear, nose and throat irritation, and immune system, skin, digestive, respiratory and learning disorders are also on the rise. Arsenic exposures in Bangladesh from agricultural activities have lead to conjunctivitis, skin cancers, nervous system disorders and damage to internal organs.

Several case studies report multiple sources of contamination: for example, drinking water quality in the Karakalpakstan region of Uzbekistan bordering the Aral Sea was affected by toxic chemical releases from both agro-industry and by releases from chemical weapons factories. These communities show exacerbated morbidities such

as increases in birth defects, infant mortality, hepatitis, kidney failure and higher levels of anemia in pregnant women. Long-term exposure to persistent organic pollutants from agro-industrial use of DDT and lindane results in chemical transmission through the food chain to mothers who in turn expose their children to risk while still in the womb and through their breast milk. Aquatic life, domestic animals and wildlife can also be harmed by pollution from these industrial activities as shown in the Ogoni region of Nigeria and the Essequibo River area of Guyana.

The cases also document changes in traditional economies and lifestyles. Depleted fish stocks and reserves are devastating for women and families heavily dependent on fishing as a source of income. Unplanned and unsustainable industrial practices have resulted in relocation and disruption of longstanding spiritual practices and tourism activities as well as shifts in traditional balances of power, in several cases to the detriment of women. The economic and class disparities among women result in primarily victimizing those who are poor and uneducated. And the breakup of the former Soviet Union has deprived large numbers of women of paid employment and inclusion in government decision-making bodies.

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Women's Response to the Crisis

Each of the case studies in this report is a tribute to the creative energy of women in the face of a range of ecological disasters and difficult trade-offs about the quality of life in their community. Women in various parts of the world have responded by increasing their self-sufficiency, empowerment and capacity in the face of threats to their families and communities. Women have played an active role in mobilizing the community to become aware of the problems and respond appropriately. In some cases resistance by local authorities to conducting more comprehensive health analyses has galvanized women to mobilize their own resources for more systematic analysis of health effects.

By coming together and forming strong support systems, women have helped people affected by the crisis more effectively to: (1) identify and document the health impact, (2) interface with and put pressure on government agencies responsible for responding to the problems, and (3) educate and reach out to focus attention on the issues. Local governments and international agencies are described as slow, bureaucratic, and often ineffective in coping with such community concerns. They tend to have a more conservative approach, acting without an appropriate level of consultation with the affected communities and without incorporating the precautionary principle adapted as part of Agenda 21's statement of principles.

In response, women have used a wide variety of tactics. The organizational frameworks established have facilitated their use of lawsuits and more activist status in permit hearings. Strategic alliances with activist organizations in the country of origin of a transnational corporation have been formed and partnerships with institutions such as universities and hospitals have been useful. The activism in response to these problems has given women valuable experience and expertise in NGO and legislative activity at the local, national and international levels.

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Recommendations for Action

Each of the cases described in this document proposes specific recommendations for action responsive to its particular situation. More generic suggestions, based on the lessons learned in these cases are listed below for consideration by delegates attending the Commission on Sustainable Development. Combined, these actions would serve to mainstream gender and promote gender equality, civil society participation and sustainability. But designing and making participatory decision-making processes that work effectively in different cultures and political contexts is far from simple. Many lessons can be distilled from the case studies that point us toward a new culture of working together. Among the proposed remedies:

- Give women and NGOs representing affected communities in policy and decision-making at all levels more formal recognition and greater visibility.
- Move away from the "top down" approaches (which continue to be used by government and international agencies) by using multi-stakeholder participatory processes, such as Local Agenda 21.
- Incorporate the systematic use of gender disaggregated data collection and gender analysis into all research, problem diagnosis and formulation of solutions and actions including all social assessments.
- Since the majority of all governments have honored their commitment to create a national action plan to implement the Beijing Platform for Action, the CSD should promote its use and integration into other plans.
- Prevent environmental hotspots by investing in environmental education that advocates the active use of the precautionary principle, meaning a demonstrated willingness to act even without the weight of full scientific "proof" of a problem.
- Aggressively apply the community "right-to-know" principle at all levels.

- Invest in better data collection on public health, including more long-term epidemiological studies, and more dissemination of clear and useful information about the environmental links to health problems.
- Where financial and epidemiological resources are scarce, invest in low-cost appropriate technology and community-based solutions.
- Use a gender and age-sensitive approach to train local health officials about specific environmental substances to which the local population has been or is likely to be exposed.
- Use existing community centers, health clinics, women's groups and NGOs in adversely affected communities to provide environmental information, information about what individuals can do to protect themselves and their communities, chemical testing and detoxification, where appropriate, and assistance to deal with economic impacts of the problem.
- Create "listening centers" to engage the public in a discussion about water: access, price, quantity and quality. Develop all materials and services in partnership and close consultation with community groups and leaders with particular attention to including women and ensuring their full participation at every stage.
- Support an environmental hotspot response network. Develop strategic alliances among international NGOs and UN agencies to strengthen the capacity of local and national partner organizations in heavily affected communities, particularly those which have women-initiated activities. Use these alliances to carry out a political economic analysis of the situation from a gender perspective and persuade relevant actors to take appropriate action.
- Advocate for more effective means of corporate accountability, including strategies to enforce codes of conduct at national and international levels, with priority attention given to various industrial sectors that release dangerous pollutants into the environment.
- Convene an international meeting of major corporations involved in the bottled water industry and a wide range of representatives of civil society to discuss the proposal to permit market forces to manage the world's fresh water supply and generate ideas on how best to ensure universal access to safe water, particularly for the world's poor.
- Where the right to sue does not yet exist, create appropriate legislative and judicial processes to enable affected individuals and communities to receive financial compensation from corporations that produce health hazards.
- Use technical assistance, long-term planning, technology transfer and fiscal policy to create incentives to courage the development of alternatives in industries and substances with harmful impact on communities and ecosystems.

- Advocate governments' implementation of the 20/20 Initiative to generate the equivalent of \$30-40 billion a year to provide access to basic social services for all, including access to safe drinking water in sufficient quantities.
- Urge WHO and UNICEF to give high priority to work with the remaining 70+ governments that do not have statistical information on the percentage of their population with access to safe water. This data is the essential indicator for local, national and global monitoring of the world's limited supply of fresh water.

As this report indicates, women must be fully recognized as our globe's greatest "natural" resource. Progress to heal and restore our dangerously threatened and vulnerable planet is being made... but too slowly and only in a limited number of areas. Governments and power-holders must reach out to include women in our common struggle to halt and reverse harmful practices that are despoiling our communities and sickening and killing women, men and children around the globe. Women everywhere must demand their full rights as half the world's population to work in equal partnership with men to provide a healthy and sustainable future for our one-and-only Earth.

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Karakalpakstan, UZBEKISTAN

Karakalpakstan is a semi-autonomous republic in Uzbekistan with an area of 165,300 sq. kilometers (half the size of Italy and four times larger than the Netherlands) and a population of 1.5 million. Karakalpakstan lies in the delta area of the Amur Darya river and the Aral Sea.

Abstract

The Aral Sea, once one of the world's largest inland freshwater seas, is now a shrinking sea due to unsustainable water use. The local population used to live on fishing, commercial shipping, rice growing or cattle herding, but the ongoing Aral Sea crisis has dramatically affected the health and livelihoods of the 35 million inhabitants of the region. Doctors and NGOs in the region say that there is a strong link between the environmental crisis and the health problems of women and children living in the region. Local women and children suffer from menstrual disorders, anemia, liver diseases, cancer and birth defects. Infant mortality is said to be the highest in the former Soviet Union (40 to 60 deaths per 1,000 live births in Karakalpakstan compared with 19 per 1,000 in Russia and between 7-12 per 1,000 in Europe). Birth defects are also on the increase (27 per 1,000 in Karakalpakstan compared with 3-5 per 1,000 in Europe). There has been a clear destruction to the region's economy. The Aral Sea has shrunk to almost half its original size, which has led to the loss of

livelihoods of an estimated 40,000 - 60,000 fishermen and fish-processing workers in the area. Karakalpakstan is now the poorest region in Uzbekistan and the area hardest hit by the Aral Sea crisis.

Cause of the Environmental Crisis

The arrival of Soviet developers in the 1930s heralded the destruction of the age-old system of rice-field irrigation and water pricing and the installation of a wasteful, large-scale irrigation system. Under the Soviet economic system, the entire region along the Amu Darya River (Kyrgyzstan, Turkmenistan and Uzbekistan) was designated for the production of cotton. To ensure the productivity of the cotton agro-industry, large quantities of water were needed to irrigate the fields. Thus, the Amu Darya river was dammed at several places along the river, diverting water that would have ordinarily gone into the Aral Sea, to irrigate cotton fields instead.

In the 1960s it became apparent that the dams and large-scale irrigation projects were drawing too much water from the Amu Darya river (which feeds into the Aral Sea), as the sea was beginning to dry up. The large cotton monoculture developed by the Soviet regime is the main reason for the dying of the Aral Sea.

Cotton production also led to toxic pollution of the region. Pesticides like DDT and lindane were used to maximize the total yield of cotton. Defoliants containing dioxin were used to make it possible for mechanical pickers to harvest the crop. The use of DDT and lindane has now been banned, however defoliants and other pesticides are still being used. The entire population continues to be exposed to chemicals. Often, pesticides are sprayed from airplanes, which fly over villages and cotton field workers, many of whom are women. These chemicals have entered the food chain where they bio-accumulate and are transferred from fatty foods, such as oil and milk, to women who then transfer the chemicals to their children through their womb and breast-milk.

Reports recently published by the World Bank, the Japanese International Development Agency (JICA) and UN agencies testify to the immense environmental pollution problem in the area, particularly water pollution and water mismanagement. At the UN international meeting on Urgent Human Needs, held in Tashkent in January 1994 an Uzbek government representative observed that 150,000 tons of toxic chemicals had entered the water over the last 10 years and that these would continue to pollute soil and water supplies. The report from the 1995 UN conference on the Aral Sea states, "Once a prime source of potable water, ground water is no longer suitable for drinking in most areas."

A 1996 JICA report attributed deterioration of water quality to the discharge of

mineralized water into rivers, highly contaminated with organic and inorganic substances (nitrogen, phosphorus, pesticides, phenols, etc.). The defoliants (used on the cotton fields) polluted underground and river water which was used as drinking water in the downstream areas. In addition ground water was also used for irrigation, leading to underground salt deposits, thus exacerbating the salinification of the soil. The 1996 JICA report describes increasing aridity, as salt crystallized on the dry bed of the sea and on the agricultural land due to surface water evaporation. Salt dust blown over the surrounding area, caused damage to agricultural land and adverse effects on people's health. More than 40% of cultivated land has suffered salt damage.

The inefficient irrigation system installed by the Soviets eventually caused declining cotton yields and infertile agricultural land. Furthermore, the region was affected by pollution from upstream, particularly from heavy metals used in mining and metalworking industries. In the Pamir mountains, dams and large industrial sites include chromium plants, which emit waste into the Amu Darya river and chemical and biological weapons factories in Kongrad and Muniak, two towns in Karakalpakstan, that tested their weapons in the Aral Sea. This toxic inheritance probably continues to pollute the area.

Impact of the Environmental Crisis

The Aral Sea case is a prime example of how unsustainable water management can lead to an economic and human disaster. The local people see more and more community members becoming ill or dying. They see their environment becoming increasingly hostile as salt crusts on the land thicken, fewer trees grow old, the growing season is shorter and harvests are lost. They see the places they used to swim in the sea when they were young, covered by sand. There are no more fish and the animals and plants are disappearing. They notice how they have less and less water and how bad it tastes.

The women of Karakalpakstan are worst hit by the environmental crisis, because women traditionally bear the burden of caring for ill family members. Often it is the women who are wrongly blamed for illnesses. Two studies (Crosslinks 1994, Binnies 1996) blamed the high level of anemia, diarrhea and consequent increase of morbidity and mortality, indirectly on women for not cooking adequately for their families and not providing their children with a balanced diet and clean water. Many women in Karakalpakstan work in the kolkhozes (state farms) or are in the service sectors (doctors, nurses, schoolteachers, etc.) In their spare time women try to grow some food in their gardens, if they have them and if they can find sufficient water, which is becoming increasingly difficult.

Health effects on women and children in Karakalpakstan:

- Maternal mortality rates are 3 to 4 times higher than the national average;
- 99% of women and 90% of children suffer from anemia;
- 16% of pregnant women have miscarriages;
- 30% of pregnant women have kidney diseases;
- there is a high level of certain elements (Mn, Cr, and Cd) in pregnant women's blood serum;
- there is a low level of essential elements (Fe, Zn) in pregnant women's blood serum
- Breast milk contains lindane and DDT;
- Frequency of birth defects is 5 times higher than in most of Europe;

A 1995 UNDP report stated that the average infant mortality rate was 4.48%, the highest in Uzbekistan, which has an average infant mortality rate of 3%. In 1996, a JICA report found infant mortality rates to be 10% in some areas. This report also found that 6.49% of children below the age of 14 years suffer from skin diseases and that children are prone to water borne diseases such as diarrhea and acute respiratory illness.

Health effects on general population of Karakalpakstan:

- Viral hepatitis has increased from 62.4 per 1,000 to 94.8 per 1,000 in the past 19 years;
- Incidence of tuberculosis is 1.5 times greater than before;
- Liver cancer incidence has increased 5 times in the last 10 years; and
- Skin disease is twice the national level affecting 9.83% of the general population.

The effects of environmental pollution on people are being played down by government and international agencies. According to these agencies, the causes of health problems are lack of hygiene and poor diet, rather than environmental pollution. The population of the Aral Sea region and particularly women and children, generally suffers from poor health. Part of this is due to a breakdown in the health care infrastructure since the dissolution of the Soviet Union. There are repeated outbreaks of infectious diseases and average lifespans are declining dramatically. This phenomenon is seen in most of the newly independent states; however, Karakalpakstan and other regions bordering the Aral Sea have been particularly hard hit. Poor drinking water quality is assumed to have contributed to documented increases of certain morbidities such as hepatitis, kidney failure, birth defects and

spontaneous abortions (Ataniyazova 1994, Abdirrov 1993).

Anemia is often disregarded since almost 50% of the world's population suffers from it, but policy makers must examine the severity of the problem, not just the occurrence. One out of seven women in Karakalpakstan suffers from severe hemorrhage (bleeding) during pregnancy which is the main cause of maternal death (they bleed to death, so to say). A World Bank report (Binnies 1996) relates hemorrhaging directly to severe anemia. Severe anemia is also found in 60% of newborn babies. The same 1996 World Bank report relates severe anemia in newborns to increased fetal morbidity and mortality, impaired language and motor development and impaired coordination.

Frequent pregnancy and poor diet were considered to be the causes of anemia among Central Asian women. Thus, programs designed to address anemia have been directed at regulating the number of births, proper diet and iron supplementation. However, Dr. Oral Ataniyazova's research has shown that the high frequency of anemia among women in Karakalpakstan is independent of pregnancy and age. The study reveals a high frequency of anemia in women who were not pregnant (92%), teenage girls (87%) and among newborn babies (85%). This research has shown that environmental factors such as high mineralization of drinking water have led to anemia amongst women in the Aral Sea region.

Effects on the climate and economy

The drying up of the Aral Sea and water pollution have led to economic decline in the region, through loss of resources and productive labor. The Karakalpak tourism industry along the Aral Sea shore was abandoned in the 1980s. It is estimated that some 40-60,000 fisher people have lost their livelihoods. While fishing and related activities once provided 50% of the region's income, large fish canning industries now have hardly any fish to process. Species extinction is taking place with almost 40 fish species in the Aral Sea having become extinct. The former fish catch of 40,000 tons a year has declined to zero. The mutagenic activity of the water is 1.5 times higher than in Moscow. Great numbers of other species (i.e., mammals, birds) have also become extinct.

Under the Soviet system the entire region specialized in growing cotton, which was then exchanged for wheat and other goods from other areas of the Soviet Union. This specialization is increasingly problematic for the newly independent states of the Aral Sea Basin. The quality of Aral Sea Basin cotton is low, because it has short fibers. Although cotton exports still make up most of the country's income, cotton sales are declining and the Uzbek government has to import three million tons of wheat to feed it's people.

The greatest effects of the Aral Sea crisis are expected to hit the agricultural sector of Karakalpakstan, where local climate changes and increased salinity are starting to take their toll. The agricultural output of the region has already declined by 20-30% due to soil salinity, climate change and reduced labor productivity stemming from health problems. As a result of the shrinking Aral Sea, the Karakalpak region suffers increasingly from climate change. The climate of the Aral Sea basin used to be tempered by the moderating influence of the enormous water body. Now, temperature changes are wider and more abrupt, resulting in shorter growing seasons and higher probability of harvest loss.

Response to the Environmental Crisis

Response by Governments and International Agencies

The enormity of the ecological crisis in the Aral Sea basin became more visible following the dissolution of the Soviet Union. It also became increasingly clear that no country acting alone could stop the destruction and an interregional effort of all the riparian states - Uzbekistan, Kazakhstan, Turkmenistan, Kyrgyzstan and Tajikistan - was necessary. The Heads of State of the five riparian countries came together to form the Executive Committee of the Interstate Fund for the Aral Sea (ICAS). Each country contributed to this fund, for activities to improve the Aral Sea problems. The five countries also asked the UN and the World Bank for assistance.

In January 1994, the Aral Sea Basin Program was set up in cooperation with the World Bank, UNEP and UNDP. The objectives of the program were to:

- Stabilize the environment of the Aral Sea basin;
- Rehabilitate the disaster zone around the sea;
- Improve the management of the international waters of the Aral Sea basin; and
- Build the capacity of the regional institutions to plan and implement the above programs (ASBP progress report No. 2, p.1).

The program included seven sub-programs divided into 19 projects. The cost of implementing these planned projects was estimated at US \$470 million. The money came from donor countries including Japan, Germany, the Netherlands and Kuwait (progress report No.3, p. 1).

There was a great deal of hope and optimism in 1994, it was the first time that these five newly independent states had established international relations independent of Moscow. The governments of the five countries believed that their problems were the problems of the world and that the world community would help them solve this

crisis. In this state of euphoria, the heads of state of the Aral Sea riparian countries declared themselves committed to sustainable development and signed the Nukus Declaration on September 1995 at an UN International Conference on Sustainable Development of the Aral Sea Basin (ICAS) held in Nukus. The state leaders acknowledged the need to "Preserve the quality of life for our peoples, without compromising the life of future generations by encouraging and supporting initiatives aimed at improvement of health, income generation and preservation of cultural heritage" (UN ICAS final report, p.20). They also committed themselves to human development stating, "As representatives and supporters of the new democratic countries of Central Asia, we are committed to achieving the participation of our peoples and NGOs in the overall economic process and in the solution of their problems." (UN ICAS final report, p.21)

Several million dollars have already been spent on feasibility studies by the World Bank and more than 131 foreign missions and delegations have visited the Aral Sea area, discussed the problems, and published articles and reports. However, no epidemiological studies have been done to look at the links between the chemical pollution of the region and the health disorders. In 1997, several World Bank reports stated that it had been shown that there were no health problems resulting from agrochemicals in Karakalpakstan. The World Bank bases this conclusion on the 1996 JICA study on water quality of urban drinking water reservoirs. But the JICA report only measured treated drinking water; it did not look at untreated water used in rural areas or at other sources of chemical intake such as cotton oil, used for cooking, or milk. More than half of the test sites in the JICA report are not those closest to the Aral Sea. Other measurements are also inconsistent and show major mistakes. For example, chemical tests for lindane and the DDT breakdown product DDD are indicated in milligrams per liter, or in grams per liter, whereas they probably meant to write one-millionth of a gram per liter, as these pesticides are usually measured.

The World Bank health project's final report focuses entirely on the bacteriological health problems in the region. It states that chemical pollution is not a problem and that if water was indeed chemically polluted, "experience shows that in such incidents the water usually becomes undrinkable owing to unacceptable taste, odor and appearance and is not consumed." (Aral Sea Program 5 project no. 1 Uzbekistan Water Supply Sanitation and Health Project Final Report Health Aspects, p.5). What is omitted is that when people have nothing other than polluted water to drink, they will have to drink it, and that is what is happening in Karakalpakstan. In rural areas people even use water from the irrigation drainage ditches for drinking water.

In 1997, a change in strategy occurred. It became clear that the health dimension bothered officials at the World Bank. World Bank officials wanted to get on with their

work and look for economic projects that would promise a return on investment from which to start paying back the interests on the loans. The World Bank officially appeared all too willing to accept the outcomes of JICA water tests, a few fish analyzed for pollutants, and a graduate student's study on the causes of anemia. The World Bank transferred the responsibility for the program to a 2-person team in Tashkent, and decided to reduce the number of programs and to focus primarily on the agricultural program to improve cotton production. Health projects were integrated into the water supply program. After spending around US \$2 million, donor countries seem uninterested in giving more funds to relieve pressing human needs. The UN agency which was supposed to focus on the human needs issues, the UNDP office in Tashkent, is busy with internal problems and is in the process of being reorganized.

In Fall 1997, the heads of state of the five riparian countries came together and, following recommendations from the World Bank, decided that the sea should be left to die since there was no longer a chance of saving it. Trying to save the Aral Sea would mean making economic sacrifices that were deemed too great. This decision was taken without any input from the affected populations. It could mean that some of the populations living closest to the Aral Sea, like the Karakalpaks, will now have to leave their towns and villages. A representative of Doctors Without borders in Tashkent remarks, "Isn't it just incredible that five years and \$13 million dollars later we are still trying to find out what pollutants exactly occur in the drinking water of the Aral Sea region?" The region still does not have a good hospital; there is no diagnostic center to identify diseases; and no toxicological laboratory where environmental hazards can be studied.

NGO Response

In most countries, women are society's most experienced and important natural resource managers. In Karakalpakstan women do most of the agricultural work, supply water, care for the ill and try to grow sufficient food for their families. Environmental degradation has added to women's low status in society by increasing their burdens in an environmentally vulnerable region. Their children are at increased risk of disease from unsafe water, nutritional deficiencies and lack of knowledge about prevention. A 1997 UNICEF report on a children's right to sustainable development states, "Environmental problems are social problems and the time women spend each day with the ramifications of environmental decline is time lost to their own development and that of their children and the wider community. Sustainable development cannot be isolated from implementing the rights of women to sustainable livelihood and equal opportunities for education, training, technology, access to credit and decision making."

With the premise that sustainable development is not possible without the direct

participation of women, the NGO Center-Perzent has initiated a number of projects in Karakalpakstan. These projects incorporate women's perspective into the research and analysis of the crisis as well as directly involve them in programs such as health education and organic food farming. The following initiatives are being undertaken by Center-Perzent in collaboration with international networks.

Research

Center-Perzent conducts research to assess the quality of environment and human health in the Aral Sea region. In collaboration with the NGO ECOLOGIA, Center-Perzent has engaged the public in monitoring water quality, made recommendations on how to improve household water quality and developed several workshops with local authorities and physicians on water quality and health problems.

In collaboration with the Russian Scientific Center of Obstetrics and Gynecology, Center-Perzent is investigating the epidemiology of reproductive pathology and reproductive toxicity. In collaboration with the Laboratory of Ecology and Evaluation at the Russian Academy of Science, Center Perzent investigated the level of pesticides in food, soil, water and nursing women's breast milk in Karakalpakstan. In cooperation with World Resources Institute, Center-Perzent is developing an investigation on reproductive health indicators. This project covers several countries including Brazil, Mexico and Uzbekistan. Center-Perzent is also receiving assistance from an international team of experts to carry out research in the Karakalpak region and to identify problem areas, thus reducing the population's exposure to contaminants.

Education and Community Awareness

There is a need for enhanced community participation, self-sufficiency, and empowerment in Karakalpakstan. Center-Perzent has chosen a strategy of education, information and training as the central components of moving towards this goal. In its first year of existence Perzent brought out a series of five booklets on women's health, providing basic information on hygiene, diet, the functioning of a woman's body, ways of contraception, the needs of pregnant women and how to take care of newborn babies. The booklets were printed in the Karakalpak language and distributed in hospitals. The NGO also publishes a women's newsletter, as well as booklets on "a safe childhood" and the relationship between health and environment.

Center-Perzent has an environmental education program for 200 children in Nukus schools. It established an ecological club "Shagala" for children and has an environmental library open to the public. In collaboration with Save the Children Fund, Center-Perzent has a program which provides water filters to kindergartens and environmental educational programs for pre-school children.

Since 1996 Center-Perzent has been running a 'women, health and environment' project with Women in Europe for a Common Future and partners in Russia and the Ukraine. As part of this project a group of 20 women from five towns in Karakalpakstan have been trained on basic health and health and environment issues. They are now conducting workshops for women in their communities and run a 'health-desk' where people can come for advice and information.

It is crucial for education and information projects to be interactive, and not to use a top-down approach. Often women have a lot of knowledge of the local environment and resources that has been handed down through the generations. The key is to revitalize that knowledge to improve the current situation.

Community Projects Build Self Sufficiency

Center-Perzent has recently set up the project 'Sustainable Chimbay,' a self-help, organic vegetable and fruit farming program to improve women's and children's diet and avoid further contamination. The local authorities in the town of Chimbay provided 20 hectares of land for the organic farm.

The goal is to use the vegetables and fruits from this farm in meals served at the school, thereby improving the health of the children. Another part of the harvest will be used to improve the women's diet, particularly pregnant women. If the harvest is good, the families of participating women will consume the surplus food and sell the rest. The income from the sales will be used for the target group's most serious needs, such as securing additional food, repairing the kindergarten's heating system, building a hand pump, filtering drinking water and obtaining medicines and syringes for the children's clinic. The project also includes plans of capacity building training for women who work on the farm. The training sessions will look at methods of organic farming and methods to reduce exposure to pollution and improve personal health including hygiene, diet and water purification.

The main aim of the Sustainable Chimbay project is to show that organic farming is a viable alternative to pesticide intensive farming. It will improve the diet of children and families in Chimbay and offer income-generating opportunities for women farmers and the staff at the training center. The project will become a training and education center for surrounding farming communities. Thus the "kindergarten-farm" will gradually become a demonstration farm where local farmers and Kolkhoz directors can see how different crops can be cultivated with good yields using organic methods. Furthermore, the demonstration farm can serve as an experimental center to test new species of plants which can regenerate the soil, adapt to saline soils and require less water. Also, the cultivation of organic cotton in rotation with other crops will hopefully become a pilot project in this demonstration center.

For the last 50 years the local population has been conditioned against undertaking any individual action. All responsibility for society's well being was the domain of the state. The local population appears to think that someone will come and solve all the problems for them. Local communities need to realize that they possess the power to improve their environment and their lives. It is in this context that projects promoting self-sufficiency, like the organic farm in Chimbay, take on a greater significance.

Recommendations for Action

Based on the experience in the Aral Sea region, the following recommendations are made:

Make Women's Health a Priority

Women and children are the main victims of the Aral Sea crisis and they cannot be expected to bear the increasingly high cost of health care. Therefore, we call on donors of international aid and credit projects to create a special fund with grants to pay for health care and monitoring programs, using a gender differentiated approach with special attention to the health impact on women and children.

Make Environmental Health a Priority

The Aral Sea case shows that there is a need to create a training program for staff of the World Bank and other international agencies on the links between health and the environment. In addition and parallel to existing expertise on bacteriological health issues, expertise is needed in toxicology and epidemiology. Therefore, we call on donors of international aid and credit projects to engage environmental health experts and dedicate funds for research on environmental health effects, as well as funds for practical projects working on ways to reduce this impact.

Increase Funding to Women's NGOs

"National and local NGOs are at the cutting edge of the environmental movement and no government or international agency can afford to ignore their critical contribution," according to a 1997 UNICEF report. In countries with a history of authoritarian rule, NGOs are often the only ones trusted by communities. NGOs with strong participation of women can motivate and mobilize communities to understand the health and other harmful effects of their activities and show how this can be changed. The World Bank and other international agencies working in Uzbekistan have made some attempts at working with NGOs but the proportion of funds dedicated to working with NGOs is a fraction (0.25%) of total funds spent. Therefore, we call on donors of international aid and credit projects to set apart at least 5% of total funds for grants to community-based NGO projects, with specific attention to the participation of women.

Create an International Independent Assessment Committee

The responses to the Aral Sea problem have been marked by the misallocated expenditures of funds. To prevent further misallocation, an International Independent Assessment Committee should be created to monitor and assess the international programs on the Aral Sea, involving local and international scientists and NGO representatives.

Create a UN Fund for Ecological Disaster Zones

Environmental pollution and resource mismanagement of fresh water bodies like the Amu Darya river and Aral Sea can cause the devastation of a region and its people. The UN should develop international agreements to avoid the devastation of one region's livelihoods by pollution from other regions. The UN has a role to play that is similar to its peace keeping function.

Beyond developing international conventions, the UN needs to assist the affected people in cleaning and regenerating their region. How can such regions repay loans if their resources have been severely damaged and are increasingly unproductive? We call on the UN to create a fund for grants to pay for clean-up, resource regeneration and health care in ecological catastrophe areas like the Aral Sea Region.

Integrate Agricultural, Environmental and Health Policies

After five years and such high expenditures, there still has not been any scientific analysis of the contaminants in the air, soil, water and food of the Aral Sea region. The World Bank and UNDP need to integrate their research, for example, the agricultural department has data which the health department has not looked at.

Governments must ensure that policies and programs to fulfill people's basic needs such as clean water and their right to know what is harmful to their health. It is inappropriate to place trust in a trickle-down approach and more attention must be given to UNICEF's recommendations and utilizing a bottom-up approach that involves women's NGOs.

Humanitarian Aid

International agencies, including the World Bank, UNDP and UN, need to create a fund for humanitarian aid to this region. Above all, international agencies need to treat the Aral Sea Basin with the same urgency that they would treat a war or earthquake zone. The Aral Sea region is an environmental disaster area in need of immediate assistance.

Case prepared by:

Center-Perzent is an NGO based in Nukus, the capital of the semi-autonomous republic of Karakalpakstan in Uzbekistan. The goal of Perzent (a Karakalpak word meaning "progeny") is to unite the strengths of organizations and progressive people seeking to improve the status and health of women and children by empowering local women's groups.

Contact: **Dr. Oral Ataniyazova**

P.O. Box 27

Nukus-12, Karakalpakstan, Uzbekistan

Tel: (7-361) 227-5517; Fax: (7-95) 251-7617

E-mail: perzent@center.nukus.silk.org

Women in Europe for a Common Future, an NGO based in the Netherlands, networks women working on environment and health in Western and Eastern Europe and the Newly Independent States. Its primary aims are to link European women's organizations and networks that promote sustainable development and to strengthen their decision-making power in environmental and health policies.

Contact: **Sascha Gabizon**

P.O. Box 12111

3501 AC Utrecht, The Netherlands

Tel: (31-30) 231-0300; Fax: (31-30) 234-0878

E-mail: wecf@antenna.nl

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Chelyabinsk, the capital of the Chelyabinsk province in **Russia**, is located at the eastern foot of the Ural mountains and has a population of 1.3 million. The province has a land area of 90,000 sq. km and a population of 3.6 million.

Abstract

Chelyabinsk was one of the former Soviet Union's main military production centers, which included nuclear weapons manufacturing. Accidents, nuclear waste disposal and day to day operation of the Mayak reactor and radiochemical plant contaminated a vast area of the province. In the early 1950s there were so many occurrences of death and disease from the nuclear waste dumping in the Techa river that 22 villages along the river banks in a 50 kilometers zone downstream from Mayak were evacuated. In 1957, a nuclear waste storage tank accident released radiation double the amount released by the Chernobyl accident. This accident was kept secret and 10,700 people were evacuated. The severe environmental contamination of this region led to dramatic increases in cancer rates, birth defects, and sterility. Over the past 33

years, there has been a 21% increase in the incidences of cancer, 25% increase in birth defects and 50% of the population of child bearing age are sterile.

Cause of the Environmental Crisis

During World War II, Chelyabinsk was one of the Soviet Union's major armament production centers. Entire factories on the western side of the Urals were taken apart and reconstructed on the other side of the Urals, the Chelyabinsk province.

Chelyabinsk had one of the largest tank factories in the country, as well as one of the major nuclear armament plants. Due to these "strategic industries" the province was closed to visitors until 1989. Following the political and economic transformation in Russia, the tank factory now produces tractors, and the Mayak nuclear armament plant is trying to evolve into a fast breeder recycling plant for foreign spent-plutonium (nuclear wastes).

The Mayak nuclear complex was one of the Soviet Union's main military production centers. During the last fifty years this complex has contaminated the Chelyabinsk region with highly dangerous nuclear and chemical wastes. The following is a chronological listing of the practices and accidents that caused the environmental crisis:

- 1949 to 1956: Liquid wastes from the Mayak nuclear complex were dumped into the Techa-Iset-Tobol river system

From 1949 to 1956, medium and high-level radioactive liquid wastes were dumped into the river system Techa-Iset-Tobol. During this period about 76 million m³ of radioactive wastes were released into the Techa river. Over 124, 000 people living along the banks of the river system were exposed to radiation. Protective measures finally began in 1956 when hydrological engineering measures aimed at immobilizing deposited radioactive substances in the upper reaches of the river were implemented. The river system is currently in the process of a natural deactivation that will take a few hundred years. The water downstream is nearly free of excess radioactive caesium, however the riverbed sediment and the riverbanks still contain high levels of caesium and strontium.

- 1957: Explosion of a nuclear waste storage tank at the Mayak nuclear complex

On September 29, 1957 a liquid radioactive waste storage tank exploded following a failure in the cooling system and polluted an area equal to the size of New Jersey with plutonium and strontium. The explosion formed a radioactive cloud over the provinces of Chelyabinsk, Sverdlovsk and Tyumen. A total area of 23,000 sq. kilometers was contaminated and the area is now called the East Ural Radioactive Trace, the EURT. This accident was kept secret from the outside world for military

safety reasons and 10,700 people were silently evacuated. This nuclear accident released twice the amount of curies that were released by the Chernobyl accident.

- 1967: The Lake Karachay accident

Two self-contained natural lakes near the plant were chosen to divert waste dumping in the river-system - lake Karachay for high-level waste and lake Staroe Boloto for medium level waste. During the long, hot summer of 1967, lake Karachay dried up and radioactive waste from the exposed lake blew over an area of 2,200 sq. kilometers. Other accidents, irresponsible nuclear waste disposal and day-to-day operations of the Mayak nuclear-chemical facility have contaminated an area with a diameter of 400 km.

In addition to pollution from the nuclear complex, the metallurgical industry has heavily contaminated this region. The Ural mountains are rich in iron ore, chromium, copper and nickel and the region has an enormous metallurgical industry. The amount of lead in the air in Chelyabinsk city is equal to the total amount of lead pollution in the Netherlands (population of 15 million) in 1982, before unleaded petrol and catalytic converters were introduced. Any improvement of air quality in the Urals has been due to the economic downturn and closing of factories. Hardly any investments have been made by the government to reduce pollution levels.

Impact of the Environmental Crisis

Soon after the Mayak nuclear complex became operational, death and diseases in the region increased dramatically due to the dumping of medium and high level radioactive waste into the river system. As a result, 22 villages on the riverbanks, in a 50 km downstream zone from the complex, were evacuated. The village of Muslyumova, just outside the 50 km zone was particularly contaminated, but it was never evacuated. Muslyumova lies 45 km north west of Chelyabinsk city and has 4,000 inhabitants. The village had no wells and until recent years depended on the river Techa, for drinking water.

The villagers of Muslyumova grew increasingly ill following contamination of their water. The number of birth defects and cancer deaths soared, but the authorities refused to take remedial measures. Statistics show that gene-mutations in the villages just outside the evacuated zone were 15 times the average for the Russian Federation. The local authorities attributed the high level of birth defects among newborns and the high mortality rates to a low standard of living.

A report on the health of the people living on the banks of the Techa River was published in 1991, which showed that the incidence of leukemia increased by 41% since 1950. From 1980 to 1990, all cancers in this population rose by 21% and all

diseases of the circulatory system rose by 31%. These figures are probably gross under-estimations, because local physicians were instructed to limit the number of death certificates they issued with diagnosis of cancer and other radiation-related illnesses. According to Gulfarida Galimova, a local doctor who has been keeping records in lieu of official statistics, the average life span for women in Muslyumovo in 1993 was 47, compared to the country average of 72. The average life span of Muslyumovo men was 45 compared to 69 for the entire country.

Chelyabinsk regional hospitals were not allowed to treat the villagers and they were sent to the Ural Centre for Radiation Medicine. The medical data of the UCRM was classified until 1990. Records of the UCRM chart the decline in health of 28,000 people along the Techa and all of them are classed as seriously irradiated. Since the 1960s, these people have been examined regularly by public health officials.

According to the head of the UCRM clinical department the rate of leukemia has doubled in the last two decades. Skin cancers have quadrupled over the last 33 years. The total number of people suffering from cancer has risen by 21%. The number of people suffering from vascular diseases has risen 31%. Birth defects have increased by 25%. Kosenko carried out a small epidemiological study of 100 people selected at random. From this group 96% had at least five chronic diseases (heart diseases, high blood pressure, arthritis and asthma), 30% had as many as ten chronic conditions. Local doctors estimate that half the men and women at child bearing age are sterile.

Even today, the local population still does not know the actual levels of radioisotopes in its home grown products. German scientists who did a field study in Muslyumova in 1996 have measured some food samples in the villages and found astonishing levels of radioactivity, 17,000 becquerel per kg in fish, and 8,000 per kg in vegetables (in Europe, products with more than 600 becquerel are taken off the market). Only since 1989, the villagers have started to get information about the dangers of the radioactive contamination of their river.

After the 1957 storage tank accident, 10,700 people were permanently evacuated from the EURT. Half of these people were evacuated eight months after the accident. These people had been consuming contaminated food without restriction, since the accident and until their evacuation. The Karachay accident from 1967 affected 63 populated areas with a population of 41,500 with 3.7 kBq/sq m (0.1Ci/sq km) The 4800 residents nearest to the lake received an average dose of 13mSv. At the time of the Karachay accident, the International Commission for Radiological Protection (ICRP) had set the safe limit on radiation at 5mSv per year. At present, the ICRP standard is 1mSv per year.

According to the Russian Scientific Centre Kurchatov and the Obninsk Institute of Radiology, a total of 437,000 people have been affected by the three accidents at Mayak. Of the total 437,000 people affected, very few were ever evacuated from the area. Very often the evacuees were moved to areas not far from the contaminated zone and the people continued to use their gardens within the contaminated areas.

Other people exposed to elevated levels of radiation in Chelyabinsk region are workers of Mayak, people living in the districts in the vicinity of Mayak and participants during cleanup and restoration activities. At the beginning of operation of Mayak, the average annual exposures for reactor workers and chemical plant workers was 940 mSv and 1,130mSv respectively. (At present, the ICRP safety standard is 1mSv per year.) The workers from Mayak lived in Chelyabinsk-65 and Chelyabinsk-70, both closed cities situated about 80 km from Chelyabinsk city, and close to the Mayak complex. Chelyabinsk-65 and -70 were nicknamed chocolate city, because these cities were among the few cities in USSR where chocolate was available in abundance.

In the early 1990s, Ivan Druzhko, a Mayak plant official, told reporters from a US television show that he believed nearly 8,000 Mayak workers were exposed to doses exceeding 1,000mSv. L.A. Buldakov, deputy director of the institute of biophysics in Moscow presented data on a conference in Paris in 1991 that showed a total of 1,812 Mayak workers were exposed to at least 2,450mSv over the period 1949-1954 and another 1,286 people were exposed to at least 1,220mSv. These exposure levels are horrifying when you compare these levels with the ICRP's present safety standard, which is 1mSv per year. In the 1980s, Ural Medical Radiation Center started registering diseases caused by radiation. In 1989 a booklet was published stating that 935 workers at the Mayak complex were suffering from chronic radiation syndrome. This number later came down to 66 but was changed back to the former figure after campaigns by local organizations.

While the rural communities in Chelyabinsk suffer from the effects of radioactive contamination, the urban populations face the effects of the chemical and metallurgical industries. In 1994 the Chelyabinsk Provincial Institute for Public Health and Environment did a survey on non-infectious diseases in the cities of Karabash, Magnitogorsk, Chelyabinsk, Zlatoust, Kopeisk and Miass. The survey showed considerable increases of various diseases in the Chelyabinsk region. The results from Karabash and Magnitogorsk were so bad that the provincial Ministry for the Environment classified these cities as ecological disaster zones. (SOE rep. P. 195) Children from Karabash were found to be considerably smaller than children from the control group; they had 3.5 times more birth defects; 2.7 times more skin diseases; streptoderma 10 times more, and 2.1 times more diseases of the digestive organs.

Cancer rates in the metallurgical district of Chelyabinsk are four to five times higher than the Russian average. Children's morbidity and mortality rates in the metallurgical district are three times higher than the average for the city. Lead intoxication from the metallurgical factories causes blood diseases and brain damage. Chromium is another major pollutant. U.S. studies have shown that the incidences of lung cancer for chromium factory workers are 28 times than the average rates. Workers barely survive until their retirement age and male life expectancy has gone down to 57.

Statistics from the neighboring province of Ekaterinaburg show that in the early 1990s the number of women workers in the metallurgical and electrical engineering industry doubled, and their numbers in light industry tripled. Statistics in Chelyabinsk, if available, would probably show the same trend. After the Soviet Union dissolved in 1991, unemployment soared and Russia's social security system became more and more insecure. Today, most women cannot afford to lose their jobs and will keep on working as long as possible. The women work even though the working conditions badly affect their own health and their children's health. Maternity leave with pay was well taken care for under the Soviet system but now for fear of losing their jobs, women keep silent about their pregnancy as long as possible. Many women work more than one job. Apart from working under very unfavorable conditions women also have to take care of their families. Wages are low and poverty is increasing.

Even in the "workers paradise", as the former Soviet Union was called, working conditions were not always favorable. In the late 1980's, 20-50% of workplaces did not meet Soviet standards. By the end of the Soviet era, 14.5 million women worked in industry and 3.4 million, about one-fifth of them, worked under hazardous conditions such as toxic fumes, extreme high or low temperatures, and excessive noise and vibrations.

Chelyabinsk has long been a region of strategic military importance and has a history of secrecy. Even today it is not easy to obtain environment or health information. Obtaining information from independent sources is even more difficult.

Response to the Environmental Crisis

In 1992, Movement for Nuclear Safety (MNS), in co-operation with local authorities, organized an international conference on the consequences of nuclear industry in the South Urals. This was the first time that the public gained access to classified information concerning the health of the population affected by radionuclides from the nuclear military complex, Mayak. In the same year MNS began campaigns to register people affected by nuclear contamination in Muslyumovo. By the end of 1993 the democratic process was interrupted and the co-operation with authorities became less effective. By then, however, MNS had obtained a large group of voluntary workers and support from the local population.

During the 1995 UN Fourth World Conference on Women in Beijing, Natalya Mironova of MNS met with Women in Europe for a Common Future and partners in Uzbekistan and the Ukraine and discussed setting up a joint project on women, health and environment. In 1996, a project entitled Women Join Forces for Health and Environment, was launched to better understand the health effects of the environmental contamination in the Chelyabinsk region, particularly effects on women and children. MNS offered courses to women on healthy living and on strengthening their immune system. The NGO also sponsored seminars on how to reduce the effects of contamination of the human body caused by bioaccumulation of radionuclides. Women received information from a dietician and were taught how to cook to retain vitamins.

MNS also started publishing a series of brochures titled 'Simple Answers to Complicated Questions,' on the immune system and healthy food in a region contaminated with radionuclides. The brochures were widely distributed among the villages just outside the evacuated area near Mayak.

Together with other NGOs, MNS has been campaigning for resettlement of the village of Muslyumovo. In 1997 these actions finally became effective: the province administration decided to resettle the village. It is still unclear, however, when this will happen and where the villagers will go. MNS is also active in local politics and has been campaigning against the development of plutonium recycling facilities at Mayak to treat imported plutonium waste from abroad, particularly from Germany and the U.S.A. MNS promotes sustainable economic alternatives including energy-saving, alternative energy sources and organic farming.

Recommendations for Action

Most of the information about plutonium contamination and plutonium impacts is still classified, although plutonium contamination has affected a geographical area 10 times larger and 100 times more intensely than expected. Despite this, the local administration is eagerly looking at potential revenues from plutonium recycling. Plutonium recycling is not a sustainable solution. Chelyabinsk needs assistance from the international community to identify viable alternatives to polluting industries.

When the Cold War ended Russian women wrote letters to the UN asking for assistance and tried to force the Russian authorities to listen to the voices of the NGO community. The international community can support the fight for a healthy and sustainable future by endorsing our demands to:

- Set up an international institution to set new health standards for radiation protection, because 1950 standards are no longer adequate or relevant;

- Disseminate information about the health effects of the nuclear industry;
 - Support the Comprehensive Nuclear Test Ban Treaty and make sure that victims get adequate compensation;
 - Stop the export of nuclear waste;
 - Collect data on environmental health problems;
 - Promote research and development of medical detoxification methods and promote the exchange of knowledge on successful methods;
 - Fund long-term epidemiological research in regions adversely affected by environmental pollution; and
 - Establish health care and health monitoring programs for victims of environmental pollution and people living in hazardous zones.
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Case prepared by:

Movement for Nuclear Safety (MNS) was formed in 1989 by a group of Russian women who were concerned about the levels of radioactive pollution in Chelyabinsk. MNS now runs environment and health education and awareness-raising programs and actively advocates in local politics for non-nuclear energy solutions instead of investments in fast-breeder technology. MNS has more than 150 active volunteers and is supported by five million citizens from the region.

Contact: **Natalya Ivanovna Mironova**
9-12 Kaslinskaya, 454084 Chelyabinsk, Russia
Tel: (7-3512) 356-459; Fax: 7-3512-356-459
Email: chel@glasnet.ru

Women in Europe for a Common Future (WECF), an NGO based in the Netherlands, networks women working on environment and health in Western and Eastern Europe and the Newly Independent States. Its primary aims are to link European women's organizations and networks that promote sustainable development and to strengthen their decision-making power in environmental and health policies.

Contact: **Sascha Gabizon, Hanna van Vonderen**
P.O. Box 12111
3501 AC Utrecht, the Netherlands
Tel: (31-30) 231-0300; Fax: (31-30) 234-0878
E-mail: wecf@antenna.nl

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Black Mesa is located in northeastern **Arizona** and includes the Dineh (Navajo) and Hopi Reservations. The region spans 3,000 sq miles and has a population of 3,000 indigenous people.

Abstract

The Black Mesa region in Arizona, USA is home to the indigenous communities of the Dineh (Navajo) and Hopi peoples. This region also contains major deposits of coal which are being extracted by North America's largest strip mining operation. The coal mines have had a major impact on families in the region. Local water sources have been poisoned, resulting in the death of livestock. Homes near the mines suffer from blasting damage. The coal dust is pervasive, as well as smoke from frequent fires in the stockpiles. Not coincidentally, the people in the area have an unusually high incidence of kidney and respiratory disease.

The Dineh (otherwise known as Navajo) were stripped of all land title and forced to relocate. Their land was turned over to the coal companies without making any provisions to protect the burial or sacred sites that would be destroyed by the mines. People whose lives were based in their deep spiritual and life-giving relationship with the land were relocated into cities, often without compensation, forbidden to return to the land that their families had occupied for generations. People became homeless with significant increases in alcoholism, suicide, family break up, emotional abuse and death.

Cause of the Environmental Crisis

In the 1930's, the U.S. government tried to replace the traditional governing mechanisms on the reservations with Western-style governments, but these institutions quickly collapsed from lack of support by the inhabitants. In the 1950s, vast coal deposits were discovered in Black Mesa. Because no government existed with the power to issue leases to the mining companies, white attorneys with strong ties to the mining industry used legal provisions dating back to the 1930's to create new tribal governments. The people on the Hopi reservation did not recognize the validity of the government or of the coal leases, and filed a suit in the U.S. courts to overthrow the leases, on the grounds that coal mining violated the Hopi religion. U.S. courts dismissed the suit, stating that the industry-created tribal council was a sovereign power, and the Hopi people could not use the U.S. courts to appeal its actions.

In 1974, the mining industry played a major role in passage of the Navajo-Hopi Settlement Act of 1974. This crucial piece of legislation resulted in the largest relocation of Native American people since the 1860's. The relocation effort has been a disaster. More than 12,000 people have been relocated over the past 22 years. Some were sent to cities where, unable to speak English or relate to a non-traditional economy, they quickly lost the small sums of money they were given at the time of the relocation. The rest were sent to the "New Lands", an Environmental Protection Agency (EPA) Superfund site contaminated by the nation's worst nuclear spill. But many families resisted orders to relocate, and 23 years later, several thousand still remain on their traditional homesites. This relocation has cost the U.S. taxpayers over \$350 million.

The people affected by the legislation were never directly informed of its adoption, never allowed to testify in any Congressional hearing and never allowed to be represented in any way through the process. All the decisions that led to partition of their land were carried out and enacted by newly created male-dominated tribal councils located 100 miles away from the directly affected people.

With assistance from the U.S. government, the mining industry has supported a new faction on the reservations consisting of businessmen who profit from mining, large-scale cattle ranching, and other non-traditional economic activities. This faction controls the tribal governments and rejects traditional religious views about the sacredness of the land. It views the traditional Dineh living on the land as obstacles to the success of its business ventures. This faction is considered to be the sole legitimate voice of all the people and has been granted sovereign powers which deprive the people of fundamental civil rights.

Impact Of the Environmental Crisis

The mines threaten the sole source of water for the communities in the region. Ancient natural springs, washes and wells in the region are contaminated and have run dry, others have only a few years left. Mine soils, spoil and coal stockpiles are affecting surface water used for human consumption, as well as worsening potential plant and soil toxicity due to fugitive dust and airborne particulate from the stockpiles. The coal from the Black Mesa mine is transported to the Mojave Power plant through a slurry line that requires pumping 3 million gallons of water each day from the Navajo aquifer. The slurry line operates without any permit from the EPA. In a region where water is extremely scarce, the use of such a precious resource just to transport coal is a tragic waste.

Coal strip mining and the burning of fossil fuels is one of the most unsustainable ways of land and resource management. The operations of Peabody Coal have destroyed countless sites that are sacred to the Dineh. Stripping the land years in advance of the

planned mining operations has degraded the biota and caused displacement of the Dineh people, causing disruptions to their family life and health. Local residents living in the mining permit area have been told that they and the livestock upon which they are dependent for their survival can no longer drink from traditional water sources. Environmental degradation continues as multi-colored toxics seep onto their land. Some herbs used in traditional medicine were only available at places that have been destroyed by mining, rendering the herbs now unavailable. Since traditional medicine is closely interlinked with religion, this interferes with religious practice. Contaminated surface water discharge and elevated levels of selenium is causing livestock poisoning in the adjacent leaseholds. This has also threatened the livestock used for human consumption.

Unlined coal stockpiles and fugitive dust blown from mining and reclamation activities have increased the incidence of respiratory illnesses. Coal-fired power plants in the region generate over 10% of the nation's electricity, and are the largest point-source of greenhouse gasses in a country that leads the world in their production. The plants (exempt from all environmental laws by grandfather clauses dating back to the 1960s) operate without scrubbers or other emission controls and emit 350 tons of sulfur compounds and 250 tons of nitrogen compounds into the atmosphere each day. The incredible volume of these pollutants reduces visibility in an area of thousands of square miles, including a 50% reduction of visibility in the Grand Canyon in the last 15 years, and causes desertification, and acidification of rain and surface water in the region. The Mohave Generating Station burning Peabody Coal Company's Black Mesa coal stands out as one of the worst offenders because of its large scale, lack of pollution controls, and excessive emissions due to burning of moistured coal.

The current laws deny the Dineh families who remain on their land a fundamental constitutional right enjoyed by other citizens of the U.S. They are not allowed to vote or in any way to participate in the government which controls their lives. They are not allowed to participate in the legal system other than as defendants. They have no right to appeal any police or government action. Mining company security personnel, harass and intimidate elders, threatening them with imprisonment if they try to protect their homes, property and burial sites from Peabody Coal's bulldozers. They can be arbitrarily thrown in jail for resisting actions by the mining company. People and their livestock are given trespass notices. Ceremonial hogans, houses, sacred sites and graveyards are bulldozed. Armed rangers visit elders at their homes and threaten and harass them and confiscate their livestock at the government's discretion. They are denied access to water, their water wells are fenced, capped off and dismantled.

The struggle in Black Mesa is between two divergent viewpoints on the relationship between humans and their environment. One group, led by male-dominated mining corporations and tribal councils, views land as property that title-holders should

exploit for the maximum profits regardless of the impact on the land or on people who currently inhabit the land. The other group, whose leaders are grandmothers in the matriarchal traditional Dineh culture, believe that the land is sacred and should not be violated by a strip mine. They believe that they must remain upon their lands, where their families have lived for countless generations and protect it from destruction.

The Dineh grandmothers represent a different set of values. The earth is a mother who gives life and must be respected and protected in turn. And while they want to be able to continue their traditional way of life they are also open to exploring other sustainable technologies, such as solar energy or alternative organic agricultural methods.

The grandmothers and other indigenous people in the area need a mechanism to participate in the policies affecting their community that is independent of the completely male-dominated, industry-established tribal governments. The coal strip mines do not represent a permanent solution to the economic problems of the Dineh and Hopi tribes. The coal-fired power plants in the Four Corners region are the largest single point source of greenhouse gases in North America. The enterprise for which the fundamental human rights of the Dineh families are being sacrificed is but a doomed scheme to make quick money.

The UN Conference on Environment and Development recognized in Agenda 21 that "women have an essential role to play in the development of sustainable and ecologically sound consumption and production patterns and approaches to natural resource management." It is essential to recognize the value of the Dineh grandmothers and the sacrifices that they have made to protect their land from destruction.

Women in Dineh society play the pivotal role, culturally and religiously. It is women's primal role as protectors of the land that is traditionally responsible for their religion, government and economy. Women were mainly responsible for income produced through sheep herding and weaving. In contrast, the impact of mining has created a transition to a male-dominated set of institutions in society. Jobs that have arisen from the mining industry all go to men. The traditional self-sufficient economy has been undermined by coal mining jobs that have created a new society run by men. Royalties generated from coal mining go to male-controlled tribal councils, both Hopi and Dineh, and women have never been chiefs of either executive institution. Women who have historically been protectors of the earth now face male-dominated institutions that view the earth as a resource.

Response to the Environmental Crisis

In 1996, Congress passed a law endorsing a 75-year lease arrangement that would

allow a few of the families to remain as tenants on the land. The law sanctions the relocation of families not eligible for these leases and forces the families who sign the leases to live without benefit of civil and religious rights exercised by other Americans. In April 1997, when all efforts to obtain justice in the U.S. judicial system failed, and in order to get the relocation laws repealed, the Dineh filed a formal request for the United Nations Commission on Human Rights to conduct an investigation of human rights violations against them by the U.S. government. Several visits to New York by Dineh helped create an Inter-faith coalition of faith-based Non-Governmental Organizations (NGOs). A delegation of NGOs traveled to Black Mesa to witness the historic meeting between the traditional Dineh and Hopi people and Mr. Abdelfattah Amor, Special Rapporteur on Religious Intolerance of the United Nations Commission on Human Rights. Mr. Amor traveled to Black Mesa in early February 1998 to investigate charges of human rights violations by the U.S. government. This is the first time the U.S. is being formally investigated by the United Nations for violations of the right to freedom of religion or belief. It is the hope of the Dineh people that the UN will cite the U.S. for violations of International Human Rights law.

"The forcible relocation of over 10,000 Navajo people is a tragedy of genocide and injustice that will be a blot on the conscience of this country for many generations."
-- Leon Berger, Executive Director, Navajo-Hopi Indian Relocation Commission upon resignation

"I feel that in relocating these elderly people, we are as bad as the Nazis that ran the concentration camps in World War II."
-- Roger Lewis, federally appointed Relocation Commissioner upon resignation

"I believe that the forced relocation of Navajo and Hopi people that followed from the passage in 1974 of Public Law 93-531 is a major violation of these people's human rights. Indeed this forced relocation of over 12,000 Native Americans is one of the worst cases of involuntary community resettlement that I have studied throughout the world over the past 40 years."
-- Thayer Scudder, Professor of Anthropology, California Institute of Technology in a letter to Mr. Abdelfattah Amor, UN Special Rapporteur on Religious Intolerance

The International Peoples Tribunal on Human Rights and the Environment, stated that the Dineh case along with 12 other cases presented in June 1997, demonstrated the globalization of unsustainable development particularly involving the exploration and extraction of fossil fuels. The United Nations Framework Convention on Climate Change, which aims to reduce the production of carbon dioxide through limiting the use of fossil fuels was signed at Rio. The Convention on Elimination of All Forms of Discrimination Against Women (CEDAW) is the second-most widely ratified international human rights instrument. Women, both in their own right and as mothers

and heads of households, have borne the heaviest burden of policies of globalization. Women have also suffered from unsustainable development and or developmental violence. At the UN World Conference on Human Rights in Vienna, women finally gained unequivocal recognition that women's rights are human rights. The Beijing Platform of Action of the UN Conference on Women and Development sets out an agenda to make those rights a reality. Both CEDAW and the Beijing Declaration are crucial if women are to reverse the conditions they face as a result of unsustainable development practices.

Dineh matriarchs have been active, traveling to Washington, DC, New York, California and Geneva, Switzerland. They have submitted hundreds of testimonies to the U.S. Congress but still they are denied access to water, the right to fix their homes, and protection of their land and livelihood. Over 100 Citizens Complaints have been submitted to the U.S. Department of the Interior's Office of Surface Mining. This has resulted in federal regulatory inspections and numerous citations against Peabody Coal Company. Solar operated seismograph machines are now visible next to some traditional hogans. Nighttime blasting and some other practices have ceased. The Black Mesa issue is the first case of environmental justice brought by Native people to the executive branch of the U.S. government since President Clinton signed Executive Order 12898 on Environmental Justice in February 1994.

The grandmothers request the human right to full and equal participation for all persons in environmental decision-making and development planning and in shaping decisions and policies affecting their community on the local national and international levels. When a government denies certain communities fundamental rights, it places the rights of all its citizens in jeopardy.

Other obstacles include the fact that most of the women do not speak, read or write English and are unfamiliar with western society and U.S. governmental structure. They can't afford to buy computers, fax machines, pay for copying or finance activism. Outreach is difficult since they live in a vast remote region without paved roads, electricity, telephones and running water.

Recommendations for Action

The Dineh people would like to see a future for their communities that is not tied to a unsustainable industry. They would like a future that is in harmony with the earth and which provides them the opportunity to pursue their traditional religion and values. It is their most fundamental human right to practice their religion, continue their culture, including the right to own, use and protect their land. It is this non-recognition of their rights to their ancestral territories and the resources found therein that perpetuates ethnocide and genocide against them. The distinct identity of the Dineh people is crucially linked to the lands they have occupied since time immemorial. Displacement

from these territories means death, destruction of Dineh identity, culture and way of life. It will only be with the participation of women in the decision-making processes that their voices will be fully heard.

U.S. government actions contradict paragraph 256 of the Beijing Platform for Action, which states among other things that all governments should:

- Integrate women, including indigenous women, their perspectives and knowledge in decision making regarding sustainable resource management and the development of policies and programs for sustainable development, including in particular those designed to address and prevent environmental degradation of the land;
- Evaluate priorities and programs in terms of women's equal access to and use of natural resources.

NGOs must advocate that women's human rights cannot be denied and should take precedence over national sovereignty -- whether it be the sovereignty of independent nations or the dependent sovereign status accorded to tribal governments. A strong statement to this effect would educate many people as to the nature of the struggle faced by indigenous women and would give encouragement to people and institutions who are hesitant about extending support in these circumstances.

Concerns about development policies and their economic and ecological impact are human rights issues. Governments must reaffirm the universal right of every woman, man and youth to ecologically sound development, in marking the fiftieth anniversary of the Universal Declaration of Human Rights. International human rights covenants and other human rights treaties and declarations are powerful tools necessary for implementing Agenda 21 and the commitments made in Rio.

The goals of the matriarchs from the communities in the Dineh nation can be summarized as truth, participation, and sustainability. They would like to be given an opportunity to present testimony to an independent body that would look at the overall situation -- that would be open to information about the past so that it could understand the dynamics of the present and that would listen to the voices of the women and the indigenous families and not just the voices of the government lawyers. They would like direct participation in the decisions which affect their lives. The people have never had an opportunity to vote in any referendum on any of the issues that have devastated their communities.

Case prepared by: The goal of the **Sovereign Dineh Nation (SDN)** is to ensure that the traditional Dineh are honored, respected and protected, and that they are able to

remain on their land and continue their traditional way of life. SDN was founded ten years ago by a Council of Elders, with Roberta Blackgoat, an elder matriarch, the spiritual leader and chairperson of the organization. A SDN New York Support Group was created to interface and advocate for them with various agencies and NGOs. This group identifies institutional frameworks that can be used to combat industrial practices that constitute violations of the Surface Mining Coal Reclamation Act (SMCRA). It helps to facilitate the filing of formal complaints to the UN Commission on Human Rights and other UN forums.

Contact: **Marsha Monestersky (New York Support Group)**

244 Fifth Avenue, Box 2767

New York, NY 10001

Tel: (1-718) 349-1841; Fax: (1-718) 349-1841

Email: sdnation@earthlink.net

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Ukraine has a population of 50.9 million and a total land area of 603,700 sq. km. The five cities featured in this case study were Artyomivsk (Population 90,000); Kalush (Population 136,000); Pripiat (Population 49,000); Chernobyl (Population 12,500) and Kiev (Population 2.6 million)

Abstract

Extensive pollution of surface and groundwater in the Ukraine has had a severe impact on the drinking water supply of the country. Deteriorated, centralized water pipeline systems, disastrous sewage systems and excessive agricultural drainage have led to the gross contamination of Ukraine's drinking water. The poor quality of drinking water has led to a wide variety of diseases in the country including hepatitis, oncological diseases, metabolic disorders, allergies and skin diseases, endocrine dysfunction and others. Periodic acute epidemics of intestine infections, cholera, and hepatitis A can also be traced to the poor quality of drinking water.

Cause of the Environmental Crisis

Drinking water in Ukrainian cities comes from surface water and groundwater sources. Although it is well known that surface water is extremely polluted, the quality of artesian water has yet to be investigated. There is data that proves that the level of drinking water contamination is very high. Major contaminants include DDT, lindane, and other pesticides which were officially prohibited in Ukraine many years ago. Even though pesticide use has decreased due to the current economic crisis, there are residual pesticides stored in plots in the countryside that are unknown to the

general public. These persistent organic pollutants have been leaking into the soil and groundwater.

While world wide attention has focussed on the massive environmental crisis of the Chernobyl disaster, there are also other significant environmental threats to the region. According to the Ministry for Environmental Protection and Nuclear Safety of Ukraine, in 1995, ambient air in Ukrainian cities contained 36 pollutants. The major share of registered contamination (about 60%) was represented by common contaminants: sulfur dioxide, carbon monoxide and nitrogen dioxide. In the case of specific hazardous substances monitored in cities, average annual concentrations exceeded environmental norms: formaldehyde (3 times); benz(a)pyrene (1.9 times), phenol (1.5 times), ammonia (1.36 times). The poor condition of water mains and sewage treatment facilities, frequent accidents at these facilities, lack of disinfection and poor distribution networks have resulted in drinking water quality that is below the set standard. Quality monitoring of surface water shows contamination by untreated municipal and industrial wastewater, sewage and parasitic agents.

The town of Tatarbunary, located in the Bessarabiya steppe area, has been suffering from shortage of water for centuries. Under the Soviet regime, the Black Sea bay Sassyk was partly desalinated and converted into a fresh water lake. The purpose of desalination was to build up a fresh water reservoir for irrigation. The use of water from Sassyk caused soil salinization (approximately 30 thousand hectares of land), salinization of natural sources of drinking water and the loss of recreation of the area. Artesian drill-holes and wells became mineralized beyond the maximum allowable level (MAL). Due to the absence of a centralized water supply system in the area, people are forced to consume processed water from water tanks.

In the city of Odessa, the condition of water pipelines is extremely poor. The population of the city is supplied with drinking water only twice a day. Independent experts claim that the quality of tap water and immediately purified water at the water treatment works outlet differs greatly. The major concern of NGO's is that deteriorated pipeline systems lead to a dramatic change between the quality of drinking water from centralized water supply systems and tap water actually consumed. The Odessa region has a constant shortage of water as do all other southern areas of Ukraine. Analysis of the drinking water of one city in the Odessa region (Luzanovskiy) has shown an excess of residual active chlorine, which indicates that the water is hyper-chlorinated.

In Kalush, there is a centralized water supply and 72 artesian wells. Water turbidity has recently increased to 11mg/dm³, well-above the standard, 1mg/dm³. Though chlorination is the only way to disinfect drinking water at present, hyper-chlorination has resulted from the disinfection process. Local experts claim that the drinking water

supply is being monitored. However, in rural areas, there is no monitoring system in place. The regional public health station has no data on the chemical composition of the well-water in 39 villages.

Kiev, the largest city in Ukraine, has high levels of air and water pollution. The length of the water pipeline network is extremely long, exceeding 3,500 km, and there are sections which have not been replaced since 1900. The renovation of pipelines is done only in emergencies. The problem of hyper-chlorination is also very acute, particularly during flowering period in natural reservoirs, when the maximum allowable level (MAL) of chlorine is exceeded by several times. Artesian water from drillholes in Kiev is extremely popular. At present there are 36 drillholes operating throughout the city and people regularly stand in long lines to fill up their buckets, jars, and containers. This reflects people's concern over the quality of tap water and their health.

Ukraine occupies one third of the overall territory of Central European countries and contains almost 40% of the world's most productive terrestrial soil. Yet, only 27.4% of land is virgin territory. There are only 163,900 sq. km (25% of Ukraine's territory) suitable for human habitation of which 14,800 sq. km is moderately contaminated and 49,100 sq. km is conventionally clean.

Impact of the Environmental Crisis

There are a wide variety of diseases that could be connected to drinking water: hepatitis, oncological diseases, metabolic disorders, allergies and all sorts of skin diseases (including dermatoses, eczema), endocrine dysfunction and others. Periodic acute epidemics of intestine infections, cholera, and hepatitis A are caused by the poor quality of drinking water.

Contemporary Ukraine is part of the group of European countries with the lowest birth rates (along with Spain, Italy, Germany, Bulgaria and Russia), mainly because of the catastrophically bad state of the women's reproductive health. Medical research shows that 70% of pregnant women today have extragenital and obstetrics disorders. Among them 27.9% suffer from anemia, 8.1% from late toxicosis, 5% from cardiovascular disorders and 7.6% from urogenital diseases.

Consuming processed water in the area of Tartarbutnyy (instead of drinking water) causes many diseases among children and pregnant women including metabolic diseases, nephritis, polyarthritis, scoliosis and pregnancy-related illness.

In the Luzanovskiy area of Odessa, excessive residual active chlorine, had led to intestinal diseases (dysentery, virus hepatitis), measles, whooping cough, meningitis, and diphtheria. The population of the district suffers mainly from endocrine and

urinary system diseases, blood diseases and oncological diseases. Results of the population poll in the district showed that only 4.8% of respondents estimated their health as "good" and 51.7% of respondents characterized their health as "bad and very bad." People complain of frequent headaches, eyes pains, nervousness, coughing, nasal bleeding, pain in the abdomen, nausea, vomiting, heart pains and palpitation. A number of other contaminating sources (disastrous sewerage system and railway cleaning branch) located in this district, influence air quality as well.

In the town of Artyomivsk (population: 90,000) located in the heavily polluted industrial and mining area, tap water is highly contaminated and has dark coloring. The water supply comes from an artesian drillhole and the Severskiy Donets-Donbass channel water. Research showed that groundwater closest to surface layers is heavily polluted. Relatively clean groundwater can be found only in non-industrial areas, namely in the northern and western parts of the Donetsk region. In the industrial Artyomivsk-Horlivka-Yenakyevo center of the region, groundwater is polluted with mercury (15-20 times the MAL), nitrates (4-5 times the MAL) and zinc (2 times the MAL). Water is also polluted in the Donetsk-Makiyivka area by nitrates (12-31 times the MAL), fluorine (2.5 times the MAL), mercury (6 times the MAL) and arsenic (up to 24 times the MAL).

In the industrial Artyomivsk-Horlivka-Yenakyevo center of the region, local experts claim that there is a direct correlation between groundwater pollution and incidences of disease among the population. Heavy metals, halogens, pesticides, and nitrates are major pollutants that cause the non-infection illnesses. In the industrial areas of the region it is very common to find people who suffer from gastro-intestinal, respiratory diseases, blood exchange disorders, and oncological diseases. The high level of mineralization has also been shown to be a problem for dry residue excess-1821mg/dm³ (MAL-1000mg/dm³) and sulphates-805mg/dm³ (MAL-500mg/dm³).

Response to the Environmental Crisis

MAMA-86 is a solution-oriented organization that works on the issues of preventive health care. MAMA-86 activities include preventive health care advice and conscious parenthood counseling. The NGO also organizes summer camps for children and mothers. For several years, MAMA-86 has had an in-house clinic where 4,000 children are examined. MAMA-86 has recently set up a new clinic for preventive health care for mothers and children. The organization also has a "hot-line" where concerned consumers can obtain information about contamination of food products (radiation levels, additives, water pollution) and a newsletter on environment and health issues.

The goals of MAMA-86's Drinking Water Project are:

- To clarify the situation with drinking water in Ukraine, i.e. to define the main sources of water supply;
- To find the alternatives of the centralized drinking water supply;
- To investigate changes in drinking water quality over the last three years;
- To determine the difference between water immediately purified at the water treatment works and tap water consumed by people;
- To determine the influence of drinking water quality on public health in five cities and towns of Ukraine (Odessa; Tatarbunary, Odessa region/Southern Ukraine; Artyomivsk, Donetsk region; Kalush, Ivano-Frankivsk region; Kiev);
- To widely inform people at the grass-root level of the situation with water, increase their awareness of the drinking water problems and its connection to health problems; and
- To facilitate public participation in the decision-making process on the issue and to stimulate personal initiative to improve the state of things.

The final report on the project will be compiled and issued in November 1998 and distributed to partner organizations, including those involved in the inquiry, to be disseminated in the regions among the citizens to raise public awareness on the issue.

Recommendations for Action

Based on the experiences with the drinking water supply system in Ukraine, the following recommendations are made by MAMA-86 to improve policies and programs carried out in the region:

- Women's health must be a priority

The Ukrainian women are the worst hit by the drinking water crisis in Ukraine. Ukraine is in a state of 'depopulation' mainly because of the extremely bad state of women's reproductive health. It is unacceptable that the consumption of processed water should cause diseases among children and pregnant women. In order for new policies on water to be effective, women's health and women's needs must be addressed.

- A safe environment is a human right

According to Ukraine's Environment Protection Law "every citizen has the right to a safe environment, considering his or her life and health." In 1996 this right was approved by new Ukrainian Constitution (Articles 3, 13, 50). According to Article 16 of the Ukrainian Constitution, the government must provide environmental safety and stability and Article 49 guarantees free medical service. MAMA-86 calls upon

international agencies and international NGO's to put pressure on the Ukrainian government to fulfill its promises and duties.

- Safe drinking water must be provided

NGOs are concerned that the Ukrainian government does not adequately address the problem of public health and drinking water supply. The situation with drinking water in different regions of Ukraine is critical. Notwithstanding the current economic crisis, it is imperative that the Ukrainian government take immediate action to improve the drinking water situation.

Case prepared by:

MAMA-86, a women's ecological organization, was founded in 1990, with the objective of raising awareness of the importance of sustainable development for the health of the people of Ukraine. MAMA-86 monitors women's rights, sustainable development, health, democratic choice, consumer choice and prophylactic environmental strategies.

Contact: **Anna Onisimova**

Michailovska Str. 22-A

Kiev, 25001, Ukraine

Tel: (7-044) 228-3101; Fax: (7-044) 229-5514

E-mail: mama-86@gluk.apc.org

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