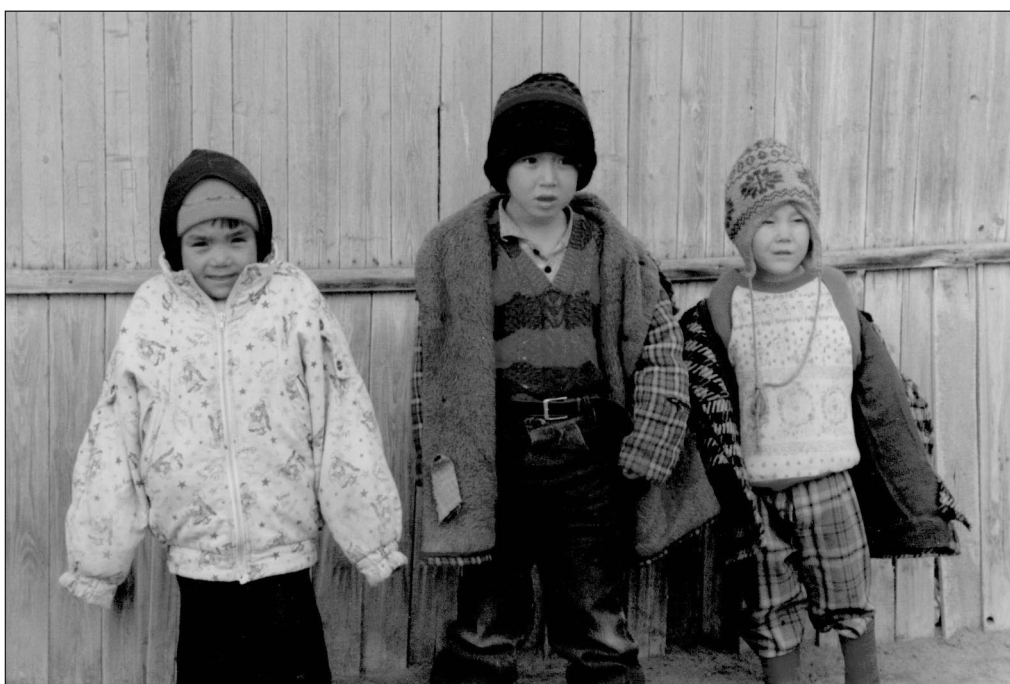


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# KARAKALPAKSTAN: A POPULATION IN DANGER

**The impact of the Aral Sea disaster and a worsening economic climate on the health and wellbeing of the people of Karakalpakstan**



*“In the past our region was one of the richest. There was a lot of fish, different animals particularly muskrat. But now, with the drying of the Aral Sea, the region became one of the poorest. If people are hungry, they develop diseases more frequently”. Local person, Karakalpakstan*

Contact details:  
Head of Mission  
hom@msfh-tashkent.uz

Public Relations  
pr-team@msfh-tashkent.uz

Médecins Sans Frontières  
Konstitusiy Street 4  
PO Box 333  
700000, Tashkent, Uzbekistan  
Tel: (998) 71-152 40 31/32  
Fax: (998) 71-152 40 72

Or visit our website on [www.msf.org/aralsea](http://www.msf.org/aralsea)



Médecins Sans Frontières is an international independent medical humanitarian aid organisation that provides emergency assistance to populations in danger. MSF works with victims of disasters, wars, and conflicts in more than 80 countries throughout the world and was awarded the Nobel Peace Prize for its work in 1999.

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## Executive summary

*“Karakalpakstan just isn’t coping...the collapse of the Soviet Union and the Aral Sea environmental disaster has been so devastating on every level, it has just beat us.”*  
Local doctor, Karakalpakstan

### Background

The break up of the Soviet Union in 1991 has had a profound effect on the socio-economic and health situation of the population of Uzbekistan and all the Central Asian states. Free of centralised control from Moscow, but also now lacking its subsidies and support, these states have struggled. A decade later, Uzbekistan is facing severe health problems and previously unknown levels of unemployment, poverty, and a growing feeling of hopelessness among its population.

*“In Soviet times there were lots of factories and plenty of work...”*  
Local taxi driver, Nukus, Karakalpakstan

No-where is this felt more acutely than in Karakalpakstan. Home to 1.5 million people, this autonomous republic within Uzbekistan faces an additional burden: it is home to one of the worst man-made environmental disaster of the twentieth century, the near total destruction of the Aral Sea. Years of regional irrigated agriculture intensification has shrunk what was once the fourth largest inland body of water in the world, and the major source of livelihood for those that lived on its shores, to less than a quarter of its size. The sea’s decline has been accompanied by similar devastation of the downstream area of the Amu Darya River upon which the population of Karakalpakstan has relied for centuries. Its people have watched much of their livelihoods destroyed in less than a generation.

*“The tide started receding in 1964. There have been no more full tides since the autumn of that year”.*  
Local person, Muynak, Karakalpakstan

For those living in the affected zone, the issue of the Aral Sea is nothing less than one of survival. If one stands now on what was once the beach front in a fishing town like Muynak, instead of staring out over the cool blue waters of the Aral, you look now across 38,000 square kilometres of highly saline and polluted wasteland. It is almost impossible to describe the enormity of this man-made tragedy, but suffice to say that the sea is now a staggering 150km away from what was once a thriving fishing port. The rusty hulls of decaying boats lie strewn across the sand.

*“...with the drying of the Aral Sea, the region became one of the poorest. If people are hungry, they develop diseases more frequently”.* Local person, Karakalpakstan

*“More and more of the local people we are in touch with are no longer making ends meet, some leave their children here and go to work in Kazakhstan...”*  
International non-governmental organisation, Nukus, Karakalpakstan

*“We have no factories left and no job...there has been no industry building at all”.*  
Local person, Karakalpakstan

*“I’ve no doubt that Karakalpakstan is worse off than many other parts of Uzbekistan and increasing economic pressures will continue to compound the deteriorating social situation here”.* International non-governmental organisation, Nukus, Karakalpakstan

Intensive agriculture and irrigation has resulted in land salinisation and contamination of water supplies by salt and agricultural chemicals. The fish basket of Central Asia became the wastebasket of the region with a large proportion of salts and agricultural chemicals from upstream activities being deposited in the lower reaches of the Aral Basin. With more of the seabed dried and exposed each year, these amassed salts and chemicals are being blown back into the face of the population.



*“The population of Karakalpakstan faces an unprecedented humanitarian and health crisis”.*  
MSF, Nukus,  
Karakalpakstan

*“I feel great pity for Karakalpakstan. We have an economy in disaster, but also the ecology. It is surely the worst place in Uzbekistan, possibly the whole of central Asia”.*  
Local person, Nukus,  
Karakalpakstan

*“The authorities in Karakalpakstan, they say the people in Tashkent don’t care for us”.*  
Local person,  
Karakalpakstan

For Karakalpakstan, the Aral Sea crisis is not just about lack of water: air quality, nutrition, climate, the economy, and public services have also plunged into crisis. Social implications have also been broad including health effects, increasing out-migration, and economic decline—the secondary impacts of which further threaten to lock the population into a downward spiral and weaken their ability to adapt and cope.

## Impact on health

The health-care system has been particularly affected. Services are in rapid decline in Karakalpakstan, as they are throughout much of Uzbekistan. Hospitals suffer from years of under-investment, and lack basic amenities, medical supplies, essential medicines, and diagnostic equipment. Health-care workers that remain are poorly paid and without basic tools for treating diseases and improving services. Government spending on health care in Karakalpakstan was only \$US 6.5 per capita in 2002. Many health indicators, including rates of maternal mortality, respiratory and diarrhoeal disease, are high, and are worse in Karakalpakstan than the rest of the country. Meanwhile tuberculosis, a disease that thrives amid impoverished populations, has grown to epidemic proportions.

Walk through one of the crowded tuberculosis hospitals in Karakalpakstan and the reality of the devastation reeked by this global pandemic is all too apparent; notified incidence rate among new infectious cases of pulmonary tuberculosis in Karakalpakstan in 2002 was 89 cases per 100,000 population per year. With one of the highest rates of infection in the former Soviet Union, much higher than the neighbouring region of Khorezm (23 per 100,000) and the national average (18 per 100,000 notified; 41 per 100,000 WHO estimate), tuberculosis exacts a heavy toll in Karakalpakstan. Rates of drug resistant forms of tuberculosis are also some of the highest recorded globally to date; 13% of new patients on the DOTS programme have multi-drug resistant tuberculosis.

Into this context, the introduction of the World Health Organization’s (WHO) recommended Directly Observed Therapy, Short Course (DOTS) strategy for tuberculosis control with an assured drug supply, standardised regimens, and its effect on the political commitment afforded to tuberculosis, offers the opportunity to quell this raging epidemic. Médecins Sans Frontières (MSF), in close cooperation with the Ministry of Health, has worked since 1998 to expand this treatment programme first initiated by the WHO in Muynak throughout the whole of Karakalpakstan, and intends to begin piloting treatment of drug resistant tuberculosis in July 2003. To ensure an effective DOTS programme, all parties have worked to upgrade hospitals and establish a laboratory and data collection system, train health-care professionals, ensure

*“Since DOTS has come here things are getting better. We now have drugs to treat patients free of charge...”*

*Local nurse,  
Karakalpakstan*

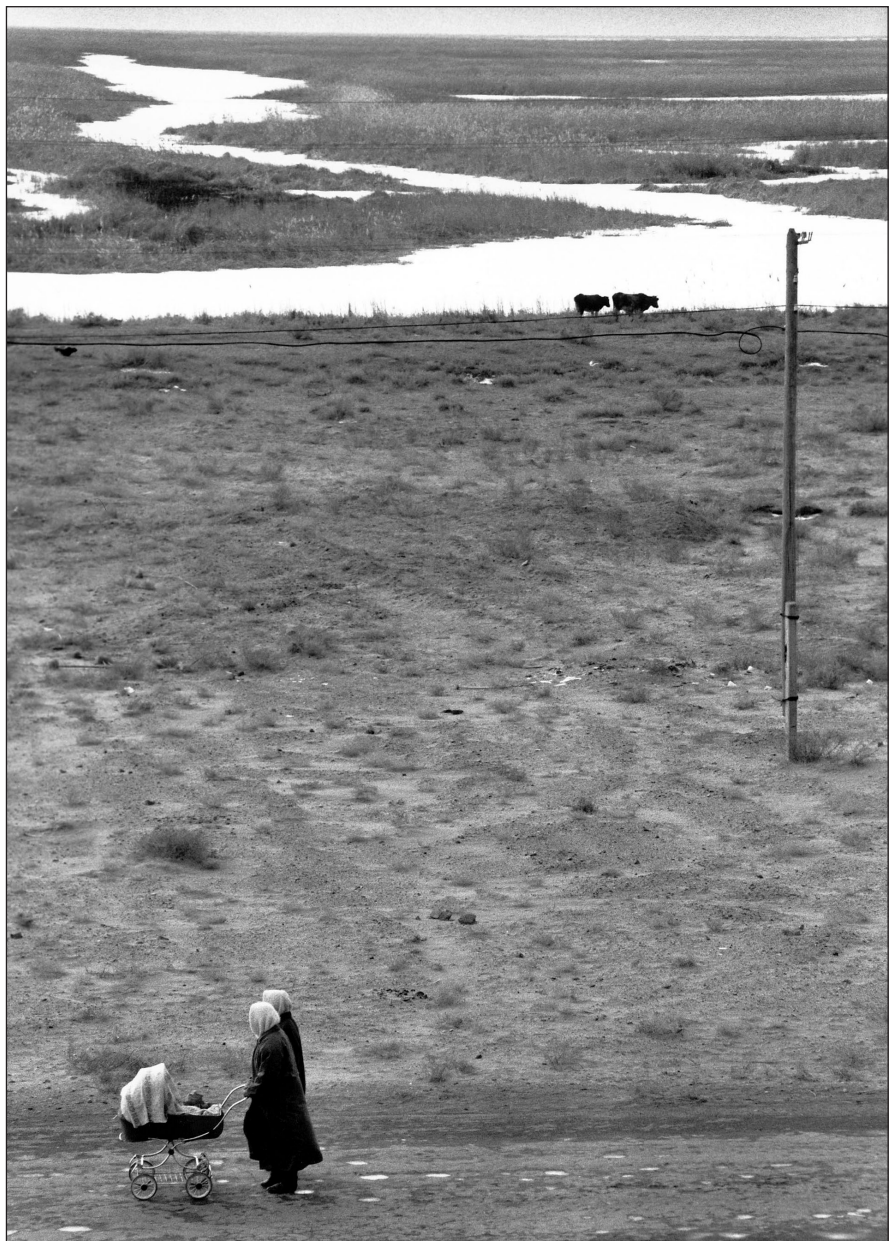
systems for waste management and basic water and sanitation, promote health education, and ensure a continuous drug supply to the region. Still, major political commitment and additional external donor support is critical if the DOTS programme is to remain on a sustainable footing in Karakalpakstan and expanded country-wide to fully control this pandemic.

Meanwhile, a plethora of other health issues still require urgent action in Karakalpakstan. Cancer services, emergency health services, maternal and child health services, public health and disease prevention activities, to name but a few, are all in need of upgrade and support. Pilot interventions to tackle the alarmingly high rates of infant deaths, acute respiratory infections, and diarrhoeal disease are ongoing, but will need substantial financial support to be expanded throughout Karakalpakstan. Karakalpakstan is also threatened by complex chronic health problems linked directly to the environmental disaster, for which neither the causes nor measures to prevent them are clear. Potential health threats include salinisation of drinking water, dust storms and the presence of agricultural chemical pollutants in the environment and food chain. Associated health impacts could be elevated rates of hypertension, respiratory conditions, heart disease, anaemia, various cancers, and kidney disease. Other suspected adverse health consequences relate to the maternal-foetal interface such as potential teratogenesis, endocrine disruption, and neurodevelopmental and behavioural effects associated with high exposure to certain pollutants.

*“I haven’t seen a healthy baby in Muynak since the eighties. The babies are weak because they inherit their mothers’ anaemia”*

*Local gynaecologist,  
Muynak, Karakalpakstan*

*“...there has been a drought so it is harder for people to grow crops...often they can’t afford certain foods”.*  
*International Federation of the Red Cross and Red Crescent, Nukus,  
Karakalpakstan*



*“...we knew those chemicals were dangerous especially when they accidentally fell on our vegetables and fruit trees”. Farmer, Chimbay, Karakalpakstan*

*“There has most definitely been an increase in rates of cancer in Karakalpakstan, and an increase in immunological disorders, kidney disease, and allergy, liver pathologies and reproductive pathologies”. Dr Oral Ataniyazova, Nukus Branch of Tashkent Paediatrics Medical Institute, Nukus, Karakalpakstan*

MSF initiated an Operational Research Programme in 1999 to help improve understanding of these health-environment concerns. Our understanding of these concerns is still limited. However, MSF maintains that fully understanding cause-and-effect relationships is unnecessary in order to begin to take action to address the health concerns and reduce environmental health risks. Instead, follow-up action and the development of culturally sensitive strategies that will enable the population to reduce their exposure and risk are urgently needed.

## **A future for the people of the Aral Sea?**

So what does the future hold for Karakalpakstan? Water could become scarcer and increasingly contaminated. Soil salinisation could continue, disrupting agriculture and livelihoods further still. In Karakalpakstan, efforts are underway, however, to restore and preserve parts of the once massive Amu Darya Delta. Projects to save delta lakes and wetlands are being undertaken by the government of Uzbekistan with assistance from several donors, with the aim of maintaining fish and wildlife there.

Besides these restoration efforts, the major donor initiatives in Karakalpakstan have focused almost exclusively on improvements in drinking water supply. Small grants and loans have supported hand-pump development, but the majority of funding has supported expensive improvements to the piped water network. However, despite the millions of dollars associated with such restoration and water supply projects, the people of Karakalpakstan have seen few improvements in their lives. Much more needs to be done to help residents adapt to their radically altered environment, allowing them to maintain a sustainable livelihood and their health.

*“What if water doesn’t come next year? What will we do?” Local person, Muynak, Karakalpakstan*

Without increased political commitment and donor funds to support health and quality of life improvements in the region, the situation is unlikely to improve. Of the donor funding that has come into the region in the past decade to address the Aral Sea disaster, little has focused directly on health interventions to improve the health of the population, and much momentum has been lost on other fronts through a lack of project coordination and widespread local corruption. Yet a relatively stable political situation and good levels of education, combined with the basic health infrastructure already in place in Karakalpakstan, means that it is possible to make a sustainable improvement to the health of people through targeted interventions. MSF has shown through its tuberculosis programme that direct intervention and capacity building activities can improve the situation for some of those living in and around this disaster zone, and encourages others to come forward to address other urgent health issues.

*“We mustn’t just sit around and cry that we are all poor people. We can’t just rely on handouts but must try and do things for ourselves to improve our conditions...” Local person, Nukus, Karakalpakstan*

MSF calls on international donors and the government to ensure a sustainable future for the people of Karakalpakstan through well-coordinated development plans and an ecological recovery strategy with clear long-term objectives—plans and a strategy that must be developed in consultation with the people themselves. Providing the people of Karakalpakstan with the tools to adapt to the environmental situation dealt to them is vital to this process. Such long-term plans, however, may take years to take hold, let alone bear fruit. And while we wait for long-term solutions to catch up, the population of Karakalpakstan must receive the humanitarian assistance it needs.

## Background to the ongoing crisis in Karakalpakstan

### Collapse of the Soviet Union

The break up of the Soviet Union in 1991 has had a profound effect on the socioeconomic and health situation throughout Uzbekistan. Over a decade later and the population of Uzbekistan face a desperate economic climate, with resultant high levels of unemployment, poverty, and a growing feeling of hopelessness throughout the country. Health-care services have been particularly affected. Spending of health care in Uzbekistan fell from 4.8% of GDP in 1992 to 3.4% of GDP in 2002 (1) impacting severely on the available funds and resources required to maintain an efficient service. Now in rapid decline, the health of the population suffers accordingly.



Karakalpakstan, the autonomous Republic region within Uzbekistan that lies at the end of the Amu Darya river and borders the southern edge of the Aral Sea, appears to be particularly worse hit than much of the rest of the country. Poverty is widespread, and the health of the population has deteriorated profoundly. In 2002, total spending on health care in Karakalpakstan was 10.1 billion som (approximately US \$10 million, according to the official bank rate) or US\$ 6.5 per inhabitant per year (2). This is low even by developing-world standards. According to the World Health Organization (WHO), no country can offer effective basic health care to its population without spending at least US\$60 per person per year on health (3), and has expressed grave concern over countries spending less than US\$15 per person per year (3).

*'One common concern of the Government and the aid community active in Uzbekistan is the welfare and development of Karakalpakstan, a region with one of the highest rates of poverty incidence in Uzbekistan...'*  
Asian Development Bank (4).

### A Soviet legacy: the Aral Sea disaster

*"I feel great pity for Karakalpakstan. We have an economy in disaster, but also the ecology. It is surely the worst place in Uzbekistan, possibly the whole of central Asia"* Local person, Nukus, Karakalpakstan

Karakalpakstan has borne the brunt of one of the largest human-induced environmental disasters the world has ever seen (5). In what The United Nations Environment Program (UNEP) has termed "One of the most staggering disasters of the Twentieth Century" (6), the shrinking of the Aral Sea has had far reaching consequences for Karakalpakstan; impinging further on an already declining social and economic situation, and on the health of those that remain in the region (6).

The southern area of the Aral Sea was once dominated by the extensive delta of the Amu Darya, a river that flows west from the mountains and crosses desert expanses through much of its range. In this area that grew to be known as Karakalpakstan,

“Cotton was planted everywhere. Right up against cottage windows, in former flower beds, in courtyards, near fences. It was planted instead of tomatoes and onions, instead of olives and watermelons. Over these villages drowning in cotton, planes and helicopters flew, dumping on them avalanches of artificial fertilizers, clouds of poisonous pesticides. People choked, they had nothing to breathe, went blind”. Ryszard Kapuscinski, author (7)



the livelihood of the peoples who roamed this region depended on wildlife, livestock and small irrigation works supported by the river waters. After the 1950s, intensive irrigation started to change this as Moscow centralised agriculture, introducing water-thirsty crops like cotton and rice here and in the upper reaches of the river. This policy had a profound impact on the water distribution and amounts of water reaching Karakalpakstan and the sea from both the Amu Darya and Syr Darya, the two rivers that fed the Aral Sea. By the mid-1980s both rivers barely reached the sea and it began to dry up, losing half its size and two-thirds of its volume in the early 1960s (8). What was once the world's fourth largest inland body of water has shrunk to less than a quarter of its original size.



“The tide started receding in 1964. There have been no more full tides since the autumn of that year”  
Local person, Muynak, Karakalpakstan

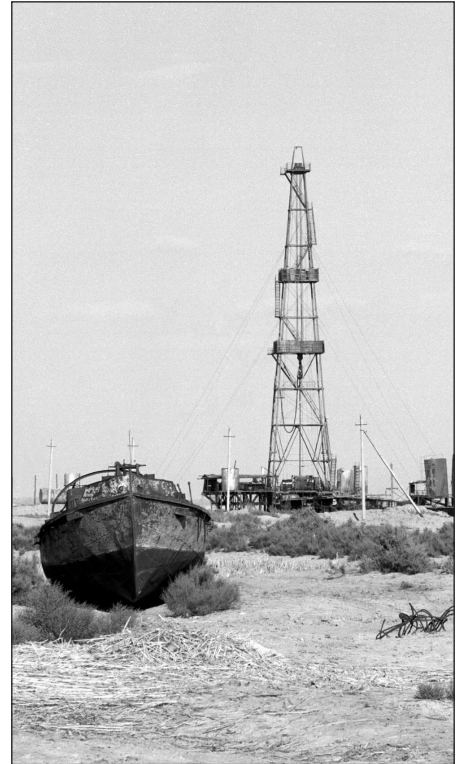
Now if you stand on the beach front of the fishing village of Muynak, for example, instead of staring out over the cool blue waters of the Aral, you look instead across 38,000 square kilometers of highly saline and polluted dry wasteland. It is almost impossible to describe the enormity of this man-made tragedy, but suffice to say that the sea is now a staggering 150km away from what was once a thriving fishing port. The rusty hulls of decaying fishing boats lie strewn across the sand.

The salt content of the sea has gone from slightly brackish to 70g/L, and may reach as high as 140g/L, a higher salt content than the oceans (9,10). The 20 fish species in the sea, which were an important economic and nutritional element in the region, have died (10). The once productive fishing industry decreased 10-fold between 1958-1985 (11). In 1983 fishing completely stopped at the Muynak fishery. The intensive cotton farming used an abundance of pesticides, herbicides, defoliants, and fertilizers (12). These chemicals have accumulated on the now exposed sea bed – an area roughly the size of the Netherlands – and are now picked up by dust storms. Each year an estimated 43 million metric tonnes of salt and pesticide laden dust is blown into the air people breathe (8). But the effects of the disaster are felt well beyond the former seashore near Muynak.

4 million people that live in downstream areas are affected by this environmental catastrophe. The largest density and most severely affected group is the 1.5 million living along the lower reaches of the Amu Darya in Karakalpakstan. With its entire

downstream ecosystem verging on collapse, the associated loss in agricultural output, fishing, and hunting have stretched the coping-mechanisms for the local population. Agricultural production has declined because of the lack of water and contamination of land with salts. By 1994, 94% of the land around the Aral Sea area was considered salinated (11). Water shortages have also increasingly affected the downstream areas. According to the United Nation's Food and Agriculture Organisation (FAO) during a recent severe drought although aggregate grain production in 2000 was down only 6% at the national level, output felt 54% in Karakalpakstan (13).

*"The fertility of soil has declined. Muynak used to be self-sufficient in vegetables. There were many gardens with apples and other fruit trees. Because of the declining fertility these gardens do not exist anymore. For instance, if you plant some grains in Turtkul they will grow but here this is difficult. Even hard working people who try to grow plants, they couldn't do it". Local person, Turtkul, Karakalpak*



People are still fishing in the former seaside town of Muynak. The city's aged fish cannery that once spilled out a portion of the sea's 150 tonnes a day catch still occasionally awakens to preserve a portion of the dwindling fish stocks in the upper Amu Darya delta's lakes and canals. The remaining fish catch provides meager supplementary food and income to families in Karakalpakstan's Muynak district—an area also once rich with muskrat pelts and dairy cows fattened in vast reed beds and irrigated pasture.

Families rely increasingly on pensions from the once productive collective farms and fishing brigades, meager wages from remaining jobs in reorganised enterprises, what livestock they can afford to raise, and what fish and wildlife they can scrape from the devastated local environment.

*"In this Republic, the rice and potato crop virtually failed while fodder and oilseed crops are down by about half, cotton and vegetable output by 30-40%. The perennial fruit trees and vines are reported to be dying. Furthermore, large areas usually sown to winter wheat have not been planted due to lack of water". FAO (13)*



*“20 factories have closed in Karakalpakstan in recent years, there has been no industry building at all” Local person, Nukus, Karakalpakstan*

*“There is 70% unemployment in Karakalpakstan...so what we are seeing is a lot of alcoholism, particularly among men. We’re told by the women we work with that domestic violence is the norm rather than the exception in Karakalpakstan. More and more of the local people we are in touch with are no longer making ends meet, some give up their children and go to work in Kazakhstan...up to 200 children are currently living at the local bazaar, pushing carts and stealing. We feel that there is a real need here in Nukus to set up some kind of family resource center that can offer counseling for abused women, address issues of child prostitution, alcoholism and drug addiction. Health education is also important, especially around issue of tuberculosis and basic hygiene. I’ve no doubt that Karakalpakstan is worse off than many other parts of Uzbekistan and increasing economic pressures will continue to compound the deteriorating social situation here.” International non-governmental organisation, Nukus, Karakalpakstan.*

**Unemployment levels in Karakalpakstan twice exceed the country-wide average (11). According to government statistics, salaries are lower in Karakalpakstan than elsewhere in the country and a decrease in standards of living, population can’t afford to buy basic commodities (11).**

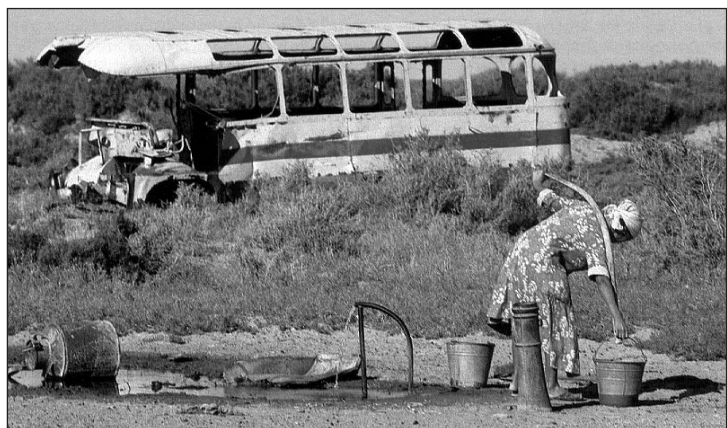
*“Basically no-one cares about Karakalpakstan. It’s a neglected part of the country. We are not rich and productive anymore...now that our cotton is growing less effectively that gives even more excuses to not invest in this region and to move our few remaining industries elsewhere...poor water management to this region means that we sometimes don’t even have water”. Local taxi driver, Nukus, Karakalpakstan*

### **No pure water – no life**

The Aral Sea basin confronts a crippling water crisis. Continued high dependence on rice and cotton production (last available government data note that cotton accounted for 50% of all export earnings) requires great quantities of water, up to 95% of which is lost in an inefficient and poorly maintained irrigation system. This dependence and waste often means there is little left for downstream Karakalpakstan.

Between 1999 and 2001 the flow of the Amu Darya diminished, with less than half the average amount of water received in previous years reaching Karakalpakstan in the first nine months of 2000 (13) and even less the following year. This was due to a reduction in snowmelt in the feeder mountain ranges on the Tajik-Afghan border and continued high rates of water use upstream. Effective water management in upstream regions is crucial for the long-term sustainability of Karakalpakstan. Without improvements in the efficiency of upstream irrigation systems and/or reduction in the amount of water intensive crops, droughts such as the recent one will likely occur with increased frequency.

*“Thankfully we have water this year, but during the drought we really suffered. We had to dig at the bottom of the well and the water we found was always dirty. What if water doesn’t come next year? What will we do?” Local person, Muynak, Karakalpakstan*



*“Add milk to your tea in Karakalpakstan and it curdles.” Local person, Nukus, Karakalpakstan*

Access to safe drinking water is also a pressing issues in this region: up to 75% of respondents to an MSF survey in Muynak and Kungrad in Karakalpakstan felt that access to water was their greatest concern (14). Although major donor and government investments are working to remedy this situation, in Karakalpakstan, rates of access to piped water remain considerably lower than in Uzbekistan as a whole (15). Where piped water is available, supplies are often intermittent (16), and leaks and water loss through the distribution systems diminish the quantity of water available for consumption. These problems along with the fact that many rural families still relying on irrigation canals as their main water source, makes drinking water quality a priority concern. It is not unusual for boreholes to have to be 600 metres deep in Karakalpakstan to reach water. Regardless of source, piped water, surface or groundwater, drinking water in Karakalpakstan regularly contains unusually high amounts of salt. Levels of up to 3.5g/L (17), far above international standards, have been noted, with as yet unknown effects on people’s health.

### **Acting on an environmental disaster**

Médecins Sans Frontières (MSF) arrived in the region in January 1998 and initiated a number of health projects, in conjunction with health ministries, primarily focused on control and treatment of tuberculosis. Initially, MSF took over a pilot WHO tuberculosis treatment programme in Muynak and has since helped to expand, throughout Karakalpakstan, availability of free tuberculosis treatment under the WHO protocol known as DOTS – Directly Observed Treatment, Short Course. MSF also supported expansion to the adjacent areas of Khorezm in Uzbekistan, and Dashogouz in Turkmenistan. In total a population of 4 million is now covered. MSF is helping the government of both Uzbekistan and Turkmenistan to fully take over control of the DOTS programme by December 2003.

*“MSF feels that immediate basic human needs must be addressed. Assistance must be immediate, practical, and impact at a local level. In the Aral Sea area, it must be realized that quality of life is profoundly poor and deteriorating further”.*  
*Ian Small et al (18)*

MSF also began an Operational Research programme in Karakalpakstan in 1999. The programme aims to help improve understanding of the relationship between the environmental disaster and human health concerns in the Aral Sea area and promote action to address these concerns. This MSF programme catalysed several research projects completed in cooperation with local scientists, international institutes, and universities. Through the publication of objective scientific data in international peer-reviewed journals and dissemination of results to policy makers, it is hoped a greater understanding and awareness of the relationship between the environmental disaster and the effects on human health will be created and lead to new actions to address these issues.

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## Health impact on the Karakalpak people

*“Yes, Karakalpakstan is far worse off than the rest of Uzbekistan. The water is dirtier here than other regions. There is more anaemia and tuberculosis than other parts of Uzbekistan. It is not that we are neglected by the government and international community, but that our local government doesn’t cope. Karakalpakstan just isn’t coping... the collapse of the Soviet Union and the Aral Sea environmental disaster has been so devastating on every level, it has just beat us”.*

*Local doctor, Nukus, Karakalpakstan*

Those living in the Aral Sea area suffer from a litany of health problems. For ease of analysis, two sets of health issues can be described in Karakalpakstan, although they are not mutually exclusive. The first are those diseases and health conditions that are linked to a deteriorating economic situation, poverty, and an under-funded health service. These are essentially common public health problems, symptomatic of a population suffering from disruption and upheaval. The other set, more directly linked to the environmental destruction, is a range of complex chronic health problems for which neither the causes nor measure to prevent them are clear. The potential of the environmental disaster directly impacting human health lies within such concerns as the salinisation of the water table, pesticides in the environment and food chain, and dust storms and air quality.

Some international groups have been attracted to Karakalpakstan in an attempt to tackle the growing health crisis; yet despite urgent needs throughout Karakalpakstan, few programmes have yet gone beyond the pilot stage. Indeed, considerable amounts of new funding will be required if expansion of these programmes is to be possible. In addition, a number of health issues are not yet being addressed at all.

### General health concerns

- The most serious concern remains the continued spread of infectious diseases such as tuberculosis, and respiratory and diarrhoeal diseases (1,2). The last available data show that incidence and prevalence of these diseases in the Aral Sea area are among the highest in all of the former Soviet Union and are higher than national averages (3).



“90% of the kindergartens and nurseries in Karakalpakstan do not have a supply of clean running water”. Local nurse, Karakalpakstan

- In 1999, approximately half of all infant deaths in Karakalpakstan were attributable to acute respiratory infections, and infant mortality (4) and rate of acute respiratory infection was higher in the Aral Sea area than the rest of Uzbekistan (3). To what extent this is still the case is unclear.

- Access to safe drinking water is deemed a fundamental human right, yet despite work by various organisations and the government on the issues of improving water quality and water access in Karakalpakstan, many rural communities do not have access to potable water of sufficient quality. This may be a contributing factor to the high rates of diarrhoeal diseases seen in Karakalpakstan (1, 2). In 2000, research showed that microbiological standards were breached on average in Karakalpakstan in 14% of water samples analysed, with a peak of 69% in December 2000 in Karakalpakstan (5). The availability of sewerage treatment in towns is low throughout Uzbekistan (5), but particularly low in Karakalpakstan as they are expensive to build and maintain. Interruptions in water supplies are common, which is unfavourable for the biological quality of the water and constitutes a risk for gastrointestinal infection (6).

“I haven’t seen a healthy baby since the eighties. The babies are weak because they inherit their mothers’ anaemia”. Local gynaecologist, Muynak, Karakalpakstan

- Maternal mortality has “worsened critically”, particularly in Karakalpakstan according to UNICEF in 2002 (7). Main causes of maternal mortality include haemorrhage, toxæmia, infections, abortions, extragenital pathologies and the overall poor health of women. Because most women attend antenatal care services and only a small percentage of home deliveries, such data are indicative of a failing maternal health-care system and indicate considerable room for improvement in the quality of antenatal and obstetric care services. Strategic focus of future action might be on women’s health, child health, and water issues, since these issues are felt to be priorities.

- Nutrient deficiencies are a particular concern among the population of Karakalpakstan. The salinised soil means that few can grow vegetables in their gardens, and the high rates of poverty among local families means that some cannot afford to buy the imported food available at the bazaar. Many families can only afford to buy meat once per month, according to local sources, and as the economical situation worsens throughout Karakalpakstan general nutritional status may be set to worsen still.

Anaemia is known to be high among the population of Uzbekistan in general, and is a particular issue among women (7). In UNICEF’s 2002 report it notes that the number of anaemic pregnant women in Karakalpakstan is higher than the rest of the country (98.7%), and similarly in other parts of the Aral Sea area such as Khorezm (91.0%), compared with Tashkent (39%) and Syrdaria Oblasts (51%). The main type noted is iron-deficiency anaemia, which is aggravated by poor diet and dietary practices. The relatively low consumption of meat products, lowering still with increasing poverty, and the Central Asian practice of giving tea to children (which inhibits iron absorption), contribute to the high levels of anaemia observed.

Given the already poor nutritional status of much of the population, many fear the impacts of future drought events on food security and human health. During the drought in 2000, the WHO highlighted its concerns over the increased frequency of diarrhoeal diseases in Muynak, and the potential for more serious illnesses such as cholera (8). MSF reiterates the FAO and World Food Programme’s position that based on known crop failure during the recent drought period, and prospects of drought in the future, the state of people’s nutrition could become further compromised. Measures need to be taken to monitor such changes in order to respond appropriately and in a timely manner.

“We now depend on imports of food from different parts of Uzbekistan. It’s not that we have people dying on the streets of hunger, but things are more expensive now and salaries remain low. Some people can only afford to buy meat once a month, for example”. Local person, Turktul, Karakalpakstan

“My feeling is that the biggest problem in the Aral Sea area is nutrition. Probably because of the poor nutrition people have low energy, they are weak”. Local nurse, Karakalpakstan

## Potential environmental effects on health

- Water in Karakalpakstan tastes salty. Although agriculturists can pinpoint a precise ratio and relationship between an increase in mineralised or salinised water and a decrease in crop production in the region, there is yet no reliable data on possible health effects associated with the chronic ingestion of dissolved salts in drinking water (9). Health effects could be increased rates of hypertension, cardiovascular disease, urinary tract disease, and kidney disease, but there is little evidence currently available and such research is hard to do in this setting. Several organisations are working in the region to install water pumps and desalination plants in some areas, and to improve and expand piped water supplies, but the task is enormous. As a basic humanitarian and public-health measure, there is an urgent need for provision of safe water in adequate amounts to all in Karakalpakstan.

- In 2000, MSF initiated a study to assess links between the high rates of respiratory disease among children in the region and the high levels of ambient dust in Karakalpakstan (MSF, unpublished). Dust storms from a now exposed sea bed displace roughly 43 million tonnes of dust per year, dust that sweeps through local villages (10). Results of an initial assessment of dust deposition rates in the Aral Sea region of Turkmenistan in 1998, found dust deposition rates to be amongst the highest in the world, potentially contributing to illness and deaths among all age-groups. 50% of all reported deaths in this region, say the authors, are respiratory in nature (11). MSF's study, done in collaboration with the British Universities of Nottingham and Sheffield found evidence of a dose-related impact of dust levels on lung function of children. These associations were statistically significant for all measures of dust exposure but were most marked for levels of winter dust exposure and level of certain fine particles. These particles are thought to be detrimental to health because they are able to penetrate into the immune system and cause damage.

*“The public health impact of the high degree of exposure to contaminated dust for people living in the Aral Sea region needs to be properly assessed, and urgently”,*  
S LO'Hara et al (11)



Although it is difficult to estimate the extent of the health effects of these findings, a few studies carried out in several countries in recent years have shown a relationship between dust exposure and increases in incidence of chronic obstructive pulmonary disease and asthma. Recent data have shown an increased incidence of obstructive lung diseases in the Aral Sea area, particularly in Karakalpakstan (5). Rates of bronchial asthma in Karakalpakstan are “abnormally high” (5). The incidence of asthma has sharply increased in Karakalpakstan since 1992, and in 1998 it was 178 cases per 100,000 population, more than three times higher than the national average (5).

*“I only know the sand storms of the desert. They make my eyes sting and I cough a lot”. Tuberculosis patient, Muynak, Karakalpakstan*

*“The population is in poor health here, but the reasons why are complex. Both ecologically linked and socially linked. I feel, however, that in the last 3 years there has been a large increase in complaints over allergies, really the dust has got much worse. Bronchitis and anaemia are also big issues here”. Local doctor, Kungrad, Karakalpakstan*

*“There has most definitely been an increase in rates of cancer in Karakalpakstan, and increase in immunological disorders, kidney disease, and allergy, liver pathologies and reproductive pathologies”,  
Dr Oral Ataniyazova, Nukus Branch of Tashkent Paediatrics Medical Institute, Nukus, Karakalpakstan*

Other studies have shown that Karakalpakstan’s capital, Nukus, has a daily average concentration of total suspended particles in the range of 300 micrograms per cubic metre of air (5). According to one source “This is more than twice the accepted international threshold that defines these areas as ‘black spots’ and requires measures to reduce population exposure” (5).

Epidemiological studies, conducted worldwide in the last decade, indicate a wide range of serious health effects associated with this pollution level, including increase of incidence of acute respiratory infections in children and increase of cardio-respiratory morbidity (5).

- In 2001 MSF, in collaboration with the Ministry of Health and the WHO, carried out a study to assess the dietary exposure to persistent organic pollutants (POPs). The study found much cause for concern. High levels of dioxins were detected in food samples, particularly food samples of animal origin. An estimate of the average monthly intake of dioxins and dioxin-like chemicals among Karakalpakstan residents has shown that intake is almost three times higher than that recommended by WHO (MSF, unpublished). Health effects include cancers, nervous system damage, reproductive and developmental disorders, and disruption of the immune system. POPs can also be passed from mother to foetus.

Pollution of the environment with pesticides and other pollutants is a common concern in Karakalpakstan. One study highlighted the fact that there are “low but appreciable quantities of pesticides (gamma-HCH=Lindane) in all treated waters” in the region (12). A study that looked at the presence of pesticides in dust in Turkmenistan (11) found high concentrations of phosalone in Dashogouz, a region located in the main irrigation zone close to the Aral Sea. Despite the fact that systematic spraying with pesticides is no longer happening in the region, there is still considerable contamination of airborne dust and the authors of the study call for “urgent assessment into the public health impact of such high degree of exposure to contaminated dust”.

- Until recently, little was known about the psychological effects on a population that has witnessed the complete destruction of their environment and had their livelihoods destroyed in less than a generation – a population that has little hope for restoring their home. Previous research in other areas has shown that environmental exposures may impact not only the physiological but also the psychological health of individuals. A study by MSF in Karakalpakstan in 1999, done in collaboration with the McMaster Institute of Environment and Health (13), showed that almost one-half of the population reports high levels of somatic stress associated with emotional stress that was above the normalised cut-point—levels similar to those found in populations living near such North American disasters as the Three Mile Island nuclear reactor.

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## Tuberculosis: a public health emergency

### The epidemic in Karakalpakstan

Walk through one of the crowded tuberculosis hospitals in Karakalpakstan and the reality of the devastation reeked by the global pandemic of tuberculosis is all too apparent. A high incidence of tuberculosis exacts a heavy toll on a population already suffering from the economic and environmental effects of the Aral Sea disaster in addition to the collapse of the Soviet Union and a rapidly declining health service (1).

Rates of tuberculosis witnessed in Karakalpakstan are in epidemic proportions. Data from the DOTS programme show that in 2002 the notified incidence rate for new infectious cases of pulmonary tuberculosis in Karakalpakstan was 89 per 100,000 population. In the areas of Karakalpakstan closer to the Aral Sea, the rates are higher. This compares with an incidence rate for the entire country of 18 per 100,000 notified cases and 41 per 100,000 as estimated by the WHO (2). In neighbouring Khorezm Karakalpakstan. If Karakalpakstan were an independently reporting country it would rank eleventh on the list of countries with highest notified incidence rates for new smear positive tuberculosis.

MSF, together with the Ministry of Health has been addressing the issue of tuberculosis in the entire Aral Sea area since 1998 by expanding the WHO's DOTS treatment protocol. By the end of 2002, 17,150 patients were receiving or had received treatment in the region. Once the expansion is finished by the middle of 2003 the total population covered will be 4 million. MSF is now working towards a gradual hand-over of most components of the DOTS treatment programme to the Ministry of Health by December 2003.



There are a number of reasons for the high incidence of tuberculosis in Karakalpakstan. A lack of funding generally for health-care services in Karakalpakstan, and indeed the rest of Uzbekistan, is felt acutely within tuberculosis treatment services. A disease associated mostly with poor and marginalised members of society, tuberculosis is commonly a neglected disease in many resource-poor settings.



In Karakalpakstan, although the authorities are increasingly committed to fighting tuberculosis services since MSF started lobbying for these patients, they just lack the resources to do so. The total health-care budget for 2002 in Karakalpakstan was only US\$6.5 per capita of which 9% was spent on tuberculosis services (3). Basic items like paracetamol, syringes, or some car petrol to do supervisory visits, are often unavailable despite the fact that almost all other items needed for a DOTS programme are provided by donors. Support from international organisations is therefore crucial for improving all health services in Karakalpakstan in order to improve the health of the population.

*“We haven’t received cash salary payments now for one year. We have to grow things at home in our gardens – fruits and vegetables – and we sell them at the local bazaar. Before DOTS we had no fume cupboard, no masks, and no laboratory at all here in this tuberculosis hospital”. Laboratory technician, Karakalpakstan*

Health-care staff are poorly paid (a doctor can expect to earn around \$US 24 per month; and nurse and a laboratory technician around \$US 12); often this money if not paid on time or is paid in the form of credit for food from a certain shop. They therefore have to save time and energy to make money in other ways. Since the DOTS

treatment programme requires extra efforts from several health-care professionals compared with the Soviet treatment system, many are not motivated to take on this extra work without additional rewards. Unlike in other poor countries, Africa for example, in Karakalpakstan living expenses are relatively high. The winters in Karakalpakstan are bitterly cold (minus 20°C is normal), for which you need a well-built and heated house and good clothes. Many health-care professionals are known to have moved from the region in search of better salaries in Kazakhstan and Russia.

The epidemic of tuberculosis is fuelled by poor living standards. That gas pressure goes down with the temperature in Karakalpakstan is commonly acknowledged, and many families survive throughout the winter with no gas at all. As a result, families and groups tend to huddle together in one room for much of the time, conditions that may increase transmission. Poor nutrition is a issue in Karakalpakstan and is known to be associated with increased risk of acquiring tuberculosis. Tuberculosis patients are a particularly vulnerable group, and hospitals provide little food for their patients. The International Federation of Red Cross and Red Crescent Societies is currently working in Karakalpakstan providing food parcels to all patients with active tuberculosis and their families.

*“The International Federation of the Red Cross and Red Crescent are currently in their fourth year of a supplement food relief programme in Karakalpakstan. There is clearly a nutritional problem throughout the population in Karakalpakstan, but we decided to focus on the most vulnerable – tuberculosis patients. We found that tuberculosis patients are often the main money earner in the family, so we support the entire family with extra food supplies. Although I wouldn’t say there is a food shortage here in Karakalpakstan, there has been a drought so it is harder for people to grow crops. Also, there are barriers to Karakalpakstan to getting certain key nutrients – often they can’t afford certain foods, much of the food here is poor quality, and there are cultural issues that may impact on their poor nutritional status”. Kristen Donnelly, International Federation of Red Cross and Red Crescent Societies, Aral Sea Program Coordinator, Karakalpakstan*

A huge stigma is attached to tuberculosis in Karakalpakstan. As a result, many are reluctant to come forward for testing and treatment and MSF has noted high failure and high death rates partly caused by patients presenting late to the tuberculosis service. Many local people in Karakalpakstan see tuberculosis as a disease of the poor, associated with poor diet and poor hygiene. Such a stigma contributes to the fact that some people are more likely to go to the local bazaar when they have symptoms than present to the tuberculosis facility. Anti-tuberculosis drugs are widely available on bazaars in Karakalpakstan. MSF carries out a programme of health education, to encourage people to come forward to testing, but the task is enormous. On World

*“My neighbour used to conceal her tuberculosis, but we all knew she was sick. Her family was one of the better off families, and they were ashamed that she had tuberculosis because that means you are poor and eat bad food. Then one day it was discovered by local health care workers...but she died anyway, as it was too late to do anything”.*  
Local person, Karakalpakstan

*“There is still a great deal of stigma. Many think tuberculosis is spread genetically between families and I have heard cases where a young girl has difficulty marrying if parents have had tuberculosis. Many times people will come forward for treatment and ask that their family is not told that they have tuberculosis”.* Local nurse, Karakalpakstan

Tuberculosis Day in March, 2003, MSF could not find one ex-patient in Karakalpakstan who was willing to stand up in front of an audience and discuss his/her disease history, which well highlights the situation at this time.

Multi-drug resistant tuberculosis (MDR-TB) is emerging as a major threat to tuberculosis control in many parts of the world (4). Throughout MSF's work in the Aral Sea area, MSF has observed that a consistently high number of patients are not fully cured after a course of DOTS treatment and MSF has suspected that resistance to these “first-line” drugs is the reason. In Karakalpakstan in 2002, a survey was carried out into the drug resistance profile of the tuberculosis that is infecting patients in the community (MSF, unpublished). Results show some of the highest rates of MDR-TB yet recorded globally to date. 13% of new patients presenting to tuberculosis clinics in Karakalpakstan have MDR-TB. According to WHO, countries with MDR-TB resistance levels above 5% represent an international public health emergency (5).

From June 2003 the DOTS programme will have expanded to cover the whole of Karakalpakstan. MSF has ensured a continuous supply of anti-tuberculosis drugs and laboratory supplies to the region (since January 2003 this has been provided by the German bank KfW), has trained health-care workers in internationally approved protocols, upgraded laboratory facilities, built waste-compounds and latrines, carried out supervisory visits, and successfully lobbied for local authorities to renovate existing health-care facilities. However, the process has not been an easy one. MSF has encountered many problems and obstacles along the way. MSF wants to share these experiences with other international and national organisations that might be interested in the future to expand the DOTS programme in other parts of Uzbekistan and in similar settings. Only 7% of Uzbekistan's population is covered by the WHO recommended DOTS treatment programme at this time (6), and MSF hopes that our experiences in Karakalpakstan will encourage others organisations to take up this challenge. Attempts by other interested organisations to access prison populations in Karakalpakstan should also be encouraged with utmost urgency.

*“So many health services need support and upgrading in Karakalpakstan. Much of the equipment destined for Karakalpakstan goes through Tashkent and then is never seen again. Sometimes the Ministry of Health in Tashkent won't even release health-care data collected on Karakalpakstan, which might indicate that the situation is far worse there...”*  
Anonymous, Karakalpakstan

Furthermore, many of MSF's experiences gained in improving tuberculosis treatment in Karakalpakstan can be applied to other diseases and health-care issues facing the population. Basic primary health care, public-health interventions, disease prevention activities, cancer services, emergency health care, sexual health services, to name but some, are all in need of support. The extensive health-care infrastructure that exists,

built during the Soviet era, is struggling to meet current challenges. Urgent assistance is needed to upgrade and maintain its capacity. Through MSF's positive experiences in Karakalpakstan, we hope to encourage interested parties to initiate pilot health-related projects in the region and then work to expand them accordingly. Emphasis should be placed on working collaboratively with society, international non-governmental organisations (NGOs), donors, and local and national government.

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## Health infrastructure in rapid decline

A general deterioration in health infrastructure witnessed since the collapse of the Soviet Union ensures that what was once a strong functioning health-care system is now in rapid decline (1). Health-care facilities suffer from years of under-investment and in many rural hospitals lack even basic amenities such as washing facilities and sewerage (1). Although tuberculosis infrastructure has now been upgraded considerably in Karakalpakstan with donor support, there is still much work to be done among general hospitals throughout the region and in many parts areas of the country. General hospitals in Karakalpakstan remain in an appalling state of disrepair, with poor sanitation, unusable latrines, and poor health-care waste management. Roofs are leaking, windows missing, and heating systems don't work. Drug deliveries are sporadic, diagnostic equipment is antiquated and in need of replacement, and access to essential medications and supplies is extremely limited. People in Karakalpakstan therefore don't get good treatment, ensuring that they stay ill for longer or die from treatable diseases.

*"There were so many patients in one room, and it was so cold at night. Sometimes there would be no gas to make hot water for tea. They wanted to operate on me and I got scared I ran away back to my family".*  
Patient, Karakalpakstan

*"We urgently need funding for hospitals in Karakalpakstan. Especially to enable us to provide washing facilities to our patients".* Local doctor, Karakalpakstan

Out-migration of medical personnel and other professionals in Karakalpakstan, and poor training of those that remain behind, jeopardise an already poorly funded regional health-care service and development infrastructure. Even many of the top health professionals do not have the means to perform their jobs effectively. They have limited access to new international protocols for treating disease and improving services. They lack basic tools, such as access to up-to-date scientific research, computers, and expertise. The authorities are committed to improving training of health-care staff in Karakalpakstan, but they need financial support and the resources to do this.



*"We have some extremely capable medical students here, who are eager to learn and interested. It costs them US\$550 per year to study at the medical school, and some are even selling the furniture from their house so that they can learn. We don't have enough books here at the school, and our equipment is old. I would like to see money coming in to Karakalpakstan from the international community supporting some of these talented young individuals with expertise, research opportunities, chances to go abroad and further their knowledge, and then encouraging these young doctors to bring those new experiences back to the region".* Dr Oral Ataniyazova, Nukus Branch of Tashkent Paediatrics Medical Institute, Nukus, Karakalpakstan

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## Overcoming a toxic legacy: persistent organic pollutants in the Aral Sea area

During Soviet Era development of Uzbekistan's cotton production, heavy application of pesticides, herbicides, and defoliants became the norm over a 30-year period (1). The Amu-Darya and the Syr Darya rivers received much of the drainage water from irrigated cotton fields and transported many of the more persistent agrochemicals downstream to the Aral Sea area. As a result, evidence is growing that the local population in Karakalpakstan is being exposed to high chronic doses of these persistent organic pollutants in water, airborne dust, and especially food.



*“In the past, we were instructed to spray entire fields after finding just one pest—one that today we just squeeze between our fingers to kill...we knew those chemicals were dangerous especially when they accidentally fell on our vegetables and fruit trees”. Farmer, Chimbay Karakalpakstan*

In 1998, high levels of pesticides and dioxins were documented in the breast-milk of women living in the Aral Sea area of Kazakhstan (2). Subsequent analysis on maternal blood, cord blood, and breast milk of women in Karakalpakstan has shown similarly high levels of contamination by several persistent organic pollutants (POPs) including the most toxic dioxin, 2,3,7,8-TCDD, at five times the levels found in The Netherlands (3).

The source of exposure to these pesticides and dioxins has yet to be clearly identified. Studies have found Karakalpakstan drinking water contaminated with some pesticides at concentrations higher than national and international standards (4). However, because of the generally high fat solubility and low water solubility of the pollutants in question, one might expect exposure from contaminated drinking water to be less important than exposure via food consumption, especially fatty foods.

Prompted by this concern, in 2001 MSF carried out a study in partnership with WHO's European Centre for Environment and Health and collaborative laboratories in Italy and Germany to assess the level of dietary exposure by the population of Karakalpakstan to several different POPs. Study teams assessed samples of typical foods both of animal and plant origin sold at markets in three different Karakalpak cities. The findings raise serious concerns.

Samples of beef and sheep fat, fish, chicken, eggs, milk products, cotton oil, bread, onions, carrots, potato, and rice had significant residues of several organochlorine pesticides, including hexachlorocyclohexane, and dioxins, including the most toxic 2,3,7,8-TCDD. DDT and DDE were also regularly detected. A major concern is the high level of identified dioxin contamination. The study team estimated that a typical diet in Karakalpakstan contains almost three times the WHO dioxin

### Health effects of POPs

*Of all the pollutants released into the environment by human activity, POPs are among the most dangerous. POPs include numerous pesticides, industrial chemicals and by-products of combustion and industrial processes that can remain for years or decades in the environment. They accumulate as they move up the food chain leaving such animals as predatory birds and human beings vulnerable to high-levels of exposure. POPs are known to cause an array of toxic effects in humans and animals, including: cancers, nervous system damage, reproductive and developmental disorders, and disruption of the immune system. POPs can also be passed from mother to foetus.*



intake standard of 70 pg-TEQ/kg body weight/month. Food samples of animal origin contained especially high levels of dioxins. The dioxin types found suggest that the source of this contamination may be from historic use of 2,4,5-T (a component of Agent Orange), a defoliant that often contains this dioxin and related compounds as impurities.

*“For those that live in the Aral Sea zone, concentrations of certain highly toxic substances are extremely high and pose a significant health risk to the population...we need to strengthen our research and attract more funds to address this crucial issue”. Prof V Chashchin, Northwest Russian Regional Centre for Hygiene and Public health, Russia at the INTAS, Bukhara Aral Sea Basin Conference, April 2003.*

For some foodstuffs, the degree of contamination with POPs signifies that even their consumption in small amounts would exceed international standards for tolerable monthly intake—a critical situation for the health of this population.

MSF is working to urge international donors and other concerned organisations to join in our efforts to lobby authorities for Stockholm Convention ratification. When the Stockholm Convention comes into force it will set out control measures covering the production, import, export, disposal, and use of POPs. Other national measures required under the treaty relate to reporting, research, development, monitoring, public information, and education. MSF is lobbying for the development of a national strategy for POPs contamination characterisation and elimination, and to promote responsible communication of health concerns to the population at risk.

*“The link between pesticides in water, dust, and the food chain and its impact on health among people in Karakalpakstan is not clear. However, there are clearly health concerns, data from other countries have shown that. I'd like to see the international community supporting local scientists to do research into these type of issues...research that is focused on providing practical recommendations to improve people's health, research that will have positive benefits for the health of Karakalpaks”. Dr Oral Ataniyazova, Nukus Branch of Tashkent Paediatrics Medical Institute*

In Karakalpakstan, MSF is beginning consultations with local government, non-governmental organisations, and other interested parties to develop an appropriate strategy to inform the local population of POPs research findings. This communication strategy would aim to enable the local population to reduce POPs exposure and associated health risks through changes in behaviour that balance the risks and benefits of different dietary practices.

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## Unable to cope: out-migration from Karakalpakstan

The environmental refugee or migrant has become an identifiable subgroup of those fleeing their homes around the world—adding to the long list of war and political refugees and economic migrants. Karakalpakstan has been particularly affected by out-migration. Many residents have responded to high unemployment, water shortages, and declining fish stocks and agricultural production associated with the environmental disaster by simply moving out. Unfortunately it's a situation that has yet to be officially recognised or addressed in any consistent manner.

At a Commonwealth of Independent States (CIS) conference on refugees and migrants, held in Geneva in 1996, the estimated number of displaced people due to the environmental disaster in the overall Aral Sea region during the 1980s and 1990s was more than 100,000 (1). The United Nations High Commissioner for Refugees (UNHCR) has estimated that around 50,000 left Karakalpakstan in the 1990s alone (2). Much of this early out-migration was attributed to the collapse of the sea-based fishery in Muynak and departure of many Russians and Eastern Europeans after Uzbekistan's independence.

*“...a villager in the Takhtakupyr region, is slowly dismantling his house in preparation for a move to Kazakhstan. Selling the roof, bricks, and doors to building contractors is the only way he can recoup the money invested in his home. Nobody is interested in buying property in Karakalpakstan. Jumanov says he is leaving because of ‘the terrible poverty and lack of work prospects, and because I can’t support my wife and three children if I stay here’. Almost every family in this small village has a relative now living – and working – in Kazakhstan. Dozens of partially dismantled houses and outbuildings, stripped of everything that could be sold on to building companies, are dotted along its dusty streets”. Olga Borisova, IWPR article, Karakalpakstan*



Data provided to MSF by local researchers and government sources indicate that in the years preceding the 2000–2001 drought, net out-migration from Karakalpakstan averaged around 3000 to 4000 per year—consistent with the UNHCR estimate for the 1990s. Meanwhile, in the same period, the overall population, which stands at around 1.5 million, was reported to be growing by more 20,000 a year. Thus, even with a substantial increase in outflows, Karakalpakstan's population is likely to continue growing in the near future.

So, does this out-migration pose any problems for Karakalpakstan? Since 1999 MSF has collaborated with local non-governmental organisations and academics to explore these details and better understand on-going demographic change in Karakalpakstan. Of particular concern are the implications of out-migration on the provision of health-care to this vulnerable population. Through an ongoing series of key informant interviews, focus groups, and large household surveys started in 2001, a number of key findings have begun to emerge.

- Migration, especially from particular Karakalpakstan districts, is likely to continue and may well increase sharply in the future. Over the last decade, net out-migration has been heaviest from the same peripheral districts most severely affected by the recent drought (3). The numbers of out-migrants appears to have doubled during the 2001 peak of the drought—a situation that many worry will reoccur in the near future. Many residents are already thinking about moving. Even after the drought abated in 2002, about a quarter of households in two drought-affected districts reported that they were considering a move.

*“Many of my friends and some of my family have left. Most have gone to Kazakhstan, some to Russia. In Kazakhstan many work on local bazaars. Some go to live, some work for maybe a year and send money to their families in Karakalpakstan. I want to stay in Karakalpakstan, as this is where my parents died so I am obliged to stay here according to our customs. But if I can’t find a job when I leave University, I’m not sure how long I can stay here doing a bad job”. Local student, Nukus, Karakalpakstan*

- Valuable human resources are being lost. Families with members that have completed higher education were found to be almost two times more likely to be considering a move than those without.
- Leaving home to find work has become very common. About 7% of both urban and urban working age residents in surveyed areas had left home to work in the last year—mostly going outside the country. These temporary migrants usually spend about 3 months away from home. Unfortunately many return without any significant supplementary income for their families.

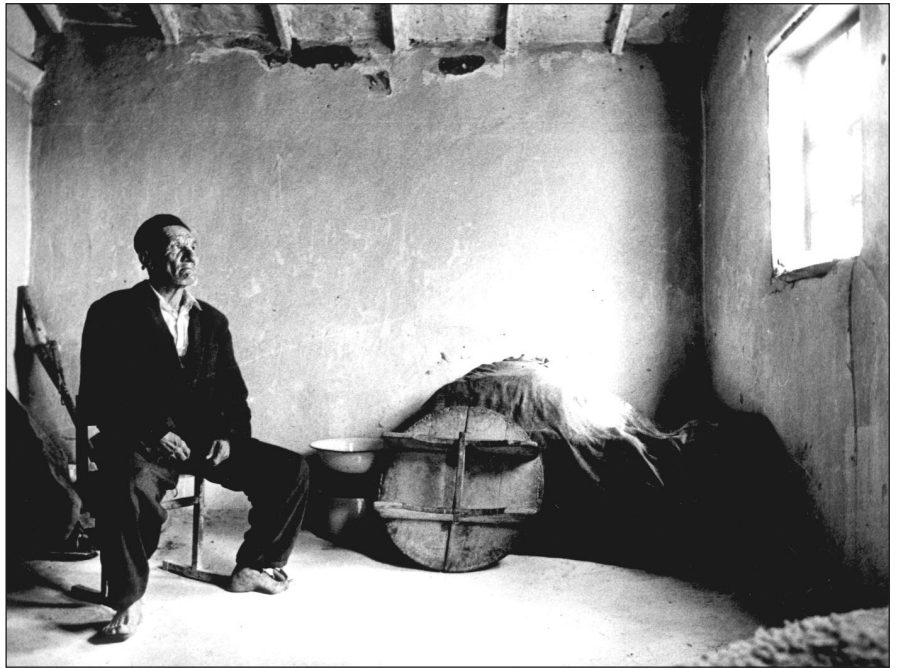
While not at crisis levels throughout Karakalpakstan, both temporary and permanent out-migration is a significant phenomenon and is likely to continue to be so in the coming years. There are concerns over the effects of these movements both on the areas from which people are leaving and where they settle, including several important public-health concerns.

*‘We met Olga. A pretty 12-year old who had been living at the orphanage for 2 years. We sit in a bare dusty room that she shares with eight other children. She tells us that she wants to become a doctor when she grows up, that she has two sisters and a brother here also. “My parents work in Kazakstan”, she says. “We were poor, we couldn’t pay for food even, so my parents brought us all here. But they come and visit us in the holidays in the winter and bring us things. I like it here, we get to do dances and go to school”. The nurse here tells me she has worked in the orphanage for 18 years, and that only in the last 4 years has she started seeing parents leaving their children behind as they head to Kazakhstan in search of work opportunities. “It’s not nice when they leave them here like this”, she says. “I look after 30 of the 300 children in this orphanage, and only one is truly an orphan, the others all have parents that work in Kazakhstan...they work in the bazaars there and build houses, doing work that the Kazaks don’t want to do”.’*  
Sally Hargreaves, MSF, Nukus

Out-migration is threatening the ability of Karakalpakstan to cope with its considerable problems especially in those peripheral areas most severely affected by the ongoing effects of the environmental disaster. Recent migrants and those most likely to move in the near future tend to have the opportunities, skills, and fortitude to leave and adjust to a new way of life. Thus, the population remaining is left with even less capacity and potential to remedy or at least adapt to the permanently change environmental and economic situation.

*“There has certainly been a increase in migration of doctors and other health-care professionals in recent years. However, I think we have enough at the present time, it is just that the best ones have left, and the quality is bad. Doctors in Karakalpakstan have no chance now to improve their skills – there is no money for example, for them to go to Tashkent to do further study and research. With such low salaries they are also poorly motivated”.*  
Local doctor, Karakalpakstan

“We sat in a cramped low-basement room that at night was carpeted with eight sleeping labor migrants talking to skittish Karakalpak boarders about their stern landlord and the difficulties in finding work that would pay enough to support them. They all said the water and food was better here and they felt healthier but admitted that paying bribes to officials for the right paperwork and the high cost deters them from seeking medical care here. They hurried us out just as the landlady learned of our visit.”  
Anthony Kolb, MSF, Almaty, Kazakhstan



“We don’t have enough doctors who are prepared to work in the more rural regions, we have a real shortage and I am currently doing the job of three doctors. Many doctors went to Russia and other countries. The reason is mainly because our salaries are lower, but also because we don’t get paid in cash in more rural places but given credit to buy flour and other things at the shop. I have not been paid my salary in cash for 3 months now. If the government paid good salaries in cash the doctors will come here”. Local doctor, Karakalpakstan

Of particular concern to MSF is how this “drain” impacts the availability of trained medical staff and health administrators. Not only are skilled people drawn to better opportunities away from the most affected areas, but replacing them is becoming increasingly difficult. In Muynak, for example, only 22 of the 64 positions for doctors are currently filled. Medical personnel staffing problems jeopardise an already poorly funded health-care system.

### Leaving an unhealthy environment for an uncertain one

Residents may be moving to better their economic wellbeing but the situations they encounter at migrant destinations present their own health threats. Living conditions in migrant destinations are often substandard. Many migrants live in cramped or poorly serviced housing in areas where crime, drug abuse, and the sex trade are of heightened concern. Migrants are harassed by unfriendly local officials and have limitations imposed on their access to essential services like health care. Unless all their documentation is in order, migrants can be asked to pay more for health care or simply refused access. They also frequently take high-risk jobs that locals are unwilling to perform thus further risking their health and wellbeing.

Out-migration from Karakalpakstan also involves some particular concerns regarding the spread of tuberculosis. As with many migrant populations, the cramped and poor conditions most live in are perfect incubators for this disease. Also the long drug regimens (from 6 to 12 months) used in tuberculosis treatment are difficult to administer to a population on the move. Patients forced to cut short their treatment to move away for work or migrate with their family makes proper treatment difficult and may further fuel development of drug resistance.

## Facing the challenges

Talks at international conferences on the Aral Sea disaster and among high-level decision makers have frequently included consideration of wide-spread relocation of the Karakalpak population. Given current migratory behaviour and attitudes this does not appear to be the preference of the people themselves. Even during periods of great hardship like the recent drought, most residents report no intention of giving up on their homeland. MSF feels that decision makers could more productively focus on addressing the threats that current limited out-migration presents and make a more concerted effort to develop long-term solutions that will remove the pressures that are driving people to make such difficult decisions.

To reduce pressures for future out-migration from Karakalpakstan and the Aral Sea region in general, regional governments, donors and non-governmental organisations need to develop a multi-pronged and long-term strategy. Implementation of such a strategy will require a sustained commitment to assist the population in adapting to an increasingly uninhabitable environment.

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## A future for the people of the Aral Sea?

The restoration of the Aral Sea to pre-1960 levels has long ceased to be a goal of the governments of Central Asia. Such restoration would require substantial reductions in irrigation and have social and political consequences that they are unprepared to contemplate. Even stabilisation of the Aral Sea at current levels would require major efforts by the five Aral Sea Basin nations and is rarely seriously discussed.

In the last decade, the Aral Sea has separated into two bodies, the Small Aral Sea in the northeast fed by the Syr Darya, and the Large Aral Sea in the south fed mainly by the Amu Darya. Attempts are being made by Kazakhstan to stabilise the Little Aral, and hopefully restore a fishery there. Whilst there is some reason for optimism for the Little Aral Sea, the Large Aral Sea appears destined to continue to shrink and soon break up into smaller, highly saline bodies of water. In Karakalpakstan, efforts are underway, however, to restore and preserve parts of the once massive Amu Darya Delta. Projects to save delta lakes and wetlands are being undertaken by the government of Uzbekistan with assistance from several donors with the aim of maintaining fish and wildlife there.

Besides these restoration efforts, the major donor initiatives in Karakalpakstan have focused almost exclusively on improvements in drinking water supply. Small grants and loans have supported hand-pump development, but the majority of funding has supported expensive improvements to the piped water network. However, despite the millions of dollars associated with such restoration and water supply projects, the people of Karakalpakstan have seen few improvements in their lives. Much more needs to be done to help residents adapt to their radically altered environment, allowing them to maintain a sustainable livelihood and their health.

*“Creating employment is the key in Karakalpakstan. We have no factories left and no jobs. People cannot be dependent forever on outside help. In Soviet times there were lots of factories and plenty of work, and as a consequence no tuberculosis epidemic like we are seeing now and so many other diseases”. Local doctor, Nukus, Karakalpakstan*

With agriculture enterprises in decline and Karakalpakstan still awaiting an industrial revival, people are living on the edge. Two years ago, at the height of a severe drought, the remaining delta lakes were drying and being cleared of fish to avoid watching them wastefully die on their muddy bottoms. Family cattle were wasting away from lack of fodder and drinking water. With the return of minimal water flows to the district last year and capture of these waters by new levees preventing any water flowing to the sea, some hope has returned as several lakes have been revived. However, this hope is tempered by fears of a new drought and the lack of any major new projects on offer to revive the local economy. Most local people struggle to develop a self-sufficient livelihood. In 2003 unemployment remains high, out-migration continues, poverty is widespread. A creative long-term vision is needed to enable this population to adapt and cope. Local government – in cooperation with international donors –



should honestly and openly recognise the existing environmental and economic constraints and help lay out a clear vision for adapting to them. No such vision currently exists. Most importantly, this vision must be developed in consultation with the people themselves.

*“One of the roots of the problem is that local communities have never been involved in assessing needs, planning, decision-making, monitoring or evaluation. There are so many Aral Sea programmes, organisations and experts around the world; they come regularly, and replace each other, with no real outcomes for the local people. We have become an experimental zone for investigation and model implementation... local people should have an opportunity to decide about their health, their future, their life, and their environment”. Dr Oral Ataniyazova, Nukus Branch of Tashkent Paediatrics Medical Institute, Nukus, Karakalpakstan*

*“We mustn’t just sit around and cry that we are all poor people. We can’t just rely on handouts but must try and do things for ourselves to improve our conditions, and must get rid of this mentality that people will come in and do things for us”. Local person, Karakalpakstan*

Sustainable development and ecological recovery vision needs to be part of the long-term objective for the region; yet they will take years to begin to take hold, let alone bear fruit. The reality is most families in Karakalpakstan are already becoming more reliant on their own initiative to just feed themselves—either because of unemployment or low salaries. People are attempting to start small enterprises or simply add an animal or two to their family holdings. Such self-starting individuals and the various small organisations supporting them have many barriers to overcome, including high taxes, control on availability of agricultural and other inputs, and limits on access to outside markets. These barriers must be overcome and successful small-scale initiatives supported by the major donors if any short-term improvements are to be achieved.



Although government benefits may reach a majority of the population, the population of Karakalpakstan will continue to be one of the most vulnerable groups in Uzbekistan and in need of ongoing humanitarian aid. Assistance must be immediate and practical. Consultation must occur with aid recipients to ensure that efforts are properly directed. Aid from different sources should be well coordinated to make their activities synergistic rather than competing.

*“I want to see help in the form of grants from the international community so that people can start up for themselves”. Local person, Muynak, Karakalpakstan*

*“We have some villages here without gas, electricity, or running water. We want to sort these problems out for ourselves. Once on my street we collected 25,000 som from each family and got gas connected to all our houses. I’m convinced that it wouldn’t have happened otherwise. Although we have lots of local NGOs here, they have no grants to work. We would prefer to have the money ourselves to ensure that our families have basic supplies of water and gas so that they don’t get sick when winter comes. There is a lot of local mismanagement of funds by the government, we’d like to take control ourselves”. Local taxi driver, Nukus, Karakalpakstan*

Any development initiatives in Karakalpakstan will continue to be threatened if the health of the population is not maintained. Although attempts are being made to tackle some of the health concerns, funding is urgently required to expand pilot health interventions and target unmet needs.

There are also still many questions about how the environmental disaster is impacting human health. Answering these questions will require long-term research efforts in the region, external funding, and close collaboration between international and local researchers. Research findings should specifically aim at developing the most appropriate and effective interventions to address environmental health concerns. However, fully understanding cause-and-effect environmental-health relationships is not necessary for initiating action. There are existing findings regarding environment and health concerns in Karakalpakstan that demand action now.