



Environment and Security

in the **Amu Darya** basin



ENVIRONMENT AND SECURITY IN THE AMU DARYA BASIN



This report was prepared on behalf of the partner organisations of the Environment and Security Initiative by UNEP, GRID Arendal and Zoi Environment Network with assistance and advice from:

M. Akmuradov, M. Anstey, D.M. Baheer, B. Baliev, M. Baltes, M. Beilstein, T. Berkeliev, H. Boboev, L. Bogdetskaya, E. Bournay, B. Bowling, E. Buttanri, C. Daniel, R. Daussa, S. Davidov, K. Davis, L. De Martino, K. De Wispelaere, N. Denisov, S. Dustov, M. Farhad, B. Frattini, Z. Hamdard, H. Hopko, U. Islamov, I. Kadyrzhanova, Y. Kamalov, A. Karimov, A. Kayumov, M. Khakdodov, A. Khomidov, S. Khoshmuhamedov, G.N. Khurami, V. Kim, J. Krähenbühl, B. Libert, S. Mahmood, A. Mäkelä, S. Michaelis, C. Milow, M. Moseneder, A. Nasretidinov, L. Nazarova, S. Nordström, V. Novikov, R. Nurmuhamedov, M. Palosaari, A. Reimov, L. Reznikova, L. Rio, N. Safarov, F. Safi, S. Samoylov, B.A. Sarwari, A. Stralchenia, O. Simonett, B. Slay, S. Smalys, B. Snoy, D. Stucker, A. Stukalo, G. Thapan-Raina, S. Vuola, A.W. Modaqiq, K. Wegerich, H.E. M. Zaher, A. Zaidi

Language editing: Harry Forster

The Ministry of Foreign Affairs of Finland has provided generous support for the process of identifying environment and security issues in the Amu Darya river basin, regional and local consultation, field missions and publication of the assessment report. The Government of Norway has supported the project by providing additional resources to GRID-Arendal. UNDP contributed to the cost of activities related to Afghanistan.

The views expressed in this publication do not necessarily reflect the views of the ENVSEC partner organisations, their donors and the member countries.

The designations employed and the presentations do not imply the expression of any opinion on the part of the organisations concerning the legal status of any country, territory, city or area of its authority, or delineation of its frontiers and boundaries. We regret any errors or omissions that may unwittingly have been made.

Copyright © 2011: UNEP, UNDP, UNECE, OSCE, REC, NATO

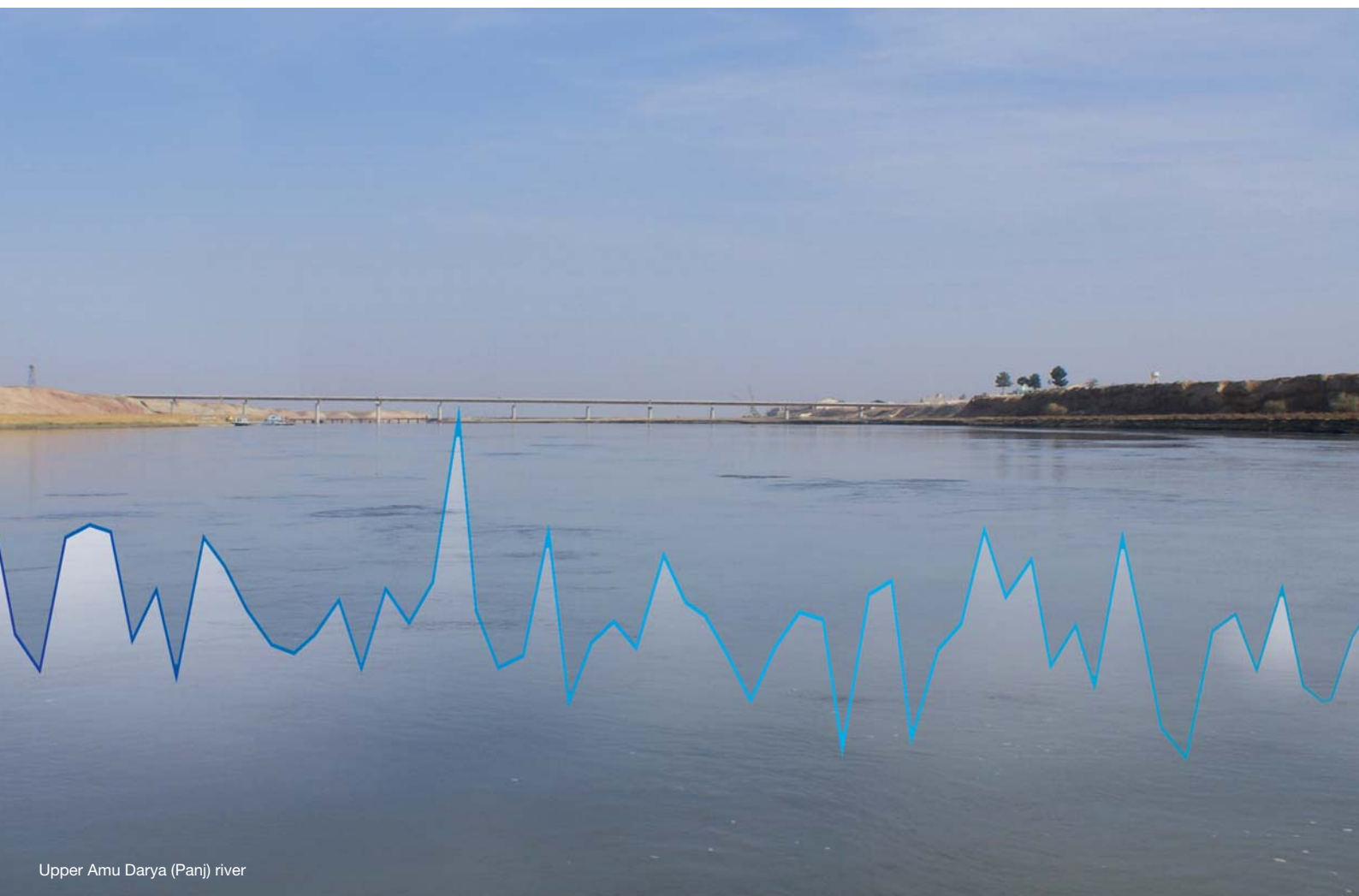
Cover artwork based on photo from: shutterstock image

Printed on 100% recycled paper at GRAPHI 4, France



UNEP promotes environmentally sound practices globally and in its own activities. This report is printed on 100% recycled paper, using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.

The Amu Darya river basin	5
The Amu Darya river basin: geographic and socio-economic context	11
Geographic and hydrological features	14
Economic development context	16
Population	23
Upstream and downstream relations	24
Afghanistan and armed conflicts	26
Climate change: a threat to security?	27
Agriculture and water	33
Irrigated agriculture	37
Challenging tasks: managing water, energy and agriculture	41
Lack of data	43
Afghanistan: outside the regional water management framework	44
A new challenge? The consequences of changing energy demand	45
A win-win solution	49
Degradation and over-exploitation of natural resources	51
The Amu Darya river delta region: a hotspot	53
The increasingly important problem of declining water quality along the basin	57
Point source pollution in the Amu Darya basin	58
Biodiversity, ecosystem services and watershed protection	61
Disasters as a cross-cutting issue	67
Conclusions	72
Options and recommendations	76
Dialogue	76
New geopolitics	76
Trust building and cooperation	76
Modernization	77
Possible action by ENVSEC partners	78
References	80
Endnotes	88
Glossary	94
Index	95
Annex 1: Meetings and field missions	96
Annex 2: List of abbreviations	96



Amu Darya river hydrograph 1950-2008, at Kerki (above) and Samanbai (opposite)



Lower Amu Darya river at Nukus

The Amu Darya river basin

When Central Asia and especially the Amu Darya basin region comes to mind, it prompts memories of the Silk Road and ancient civilizations with limitless barren lands and the sands of Karakum and Kyzylkum, the dazzling ice-covered mountains of the Pamir, Alai, Zarafshan and Hindu Kush, the Aral Sea, wild rapid rivers, and the historical centres of Samarkand, Bukhara, Termez, Sogdiana, Balkh, Merv, among others.

In recent decades the Amu Darya has attracted international attention both because of the Aral Sea crisis, and its large hydropower, irrigation and water engineering projects. Under the Soviet Union expert missions warned of the disastrous effects of rapid, massive development of cotton monoculture in Central Asia. The shrinking of the Aral Sea and the increasingly poor environmental conditions in the surrounding region brought it home to policy makers that urgent action was needed to mitigate the sea's disappearance and the resulting socio-economic disaster. In the past 20 years various international conferences and missions

by national and international experts have described the deteriorating environmental and socio-economic situation, especially in the Amu Darya delta region.

There is no shortage of well-documented literature on the problems of regional water management in Central Asia. Various reasons, among others the rising number of disputes about water use and hydropower projects, prompted the Environment and Security Initiative (ENVSEC) partners to decide that the Amu Darya basin was a priority. As early as 1994 research identified the Amu Darya delta¹ (Klötzli, 1994) as an environment and security hotspot. Research has shown that instability related to environmental degradation is more likely to occur in marginal vulnerable areas, typically arid plains, mountain areas where high and low-land interact, and transnational river basins (Baechler, 1999), all characteristics of the Amu Darya River basin. Over the years the challenges for the region from an environmental and security perspective have increased and the outlook for the future raises concerns among the general public, national authorities, international organizations and experts.

The Environment and Security Initiative (ENVSEC)

ENVSEC was launched in May 2003 during the Fifth Environment for Europe Ministerial Conference in Kyiv and the OSCE Economic Forum in Prague, by three international organizations with different yet complementary agendas and missions: the UN Environment Programme (UNEP), the UN Development Programme (UNDP) and the Organization for Security and Co-operation in Europe (OSCE). In 2007 the Initiative was joined by the UN Economic Commission for Europe (UNECE), the Regional Environmental Centre for Central and Eastern Europe (REC) and as an associated partner, the Public Division of the North Atlantic Treaty Organization (NATO). Detailed information is available at www.envsec.org

From the outset the Initiative has seen its primary goal as helping the countries to identify, understand and, where possible, mitigate risks to stability and security that may stem from environmental problems and challenges. Traditionally the notion of security has primarily been conceived in terms of neutralizing military threats to the territorial integrity and political independence of the state. However, in recent years, increasing emphasis has been placed on expanding the traditional concept of security to include non-conventional threats and factors promoting tensions and conflict.

One of the strengths of the Environment and Security assessment is that it integrates both known and emerging socio-economic and environmental trends in a basin-wide perspective and analyses them by focusing on the role they play in the security and stability of the region and its communities.

The Environment and Security Initiative is based on a process that starts from the identification of problematic issues and sites, or “environment-security hotspots”². These are identified and prioritized through expert inputs, public consultation, joint field assessments, and information from authoritative international and national sources. Proposals for follow-up actions are developed by national and local institutions and players in collaboration with the organizations partnering the Initiative. Projects on the ground range from in-depth investigations of hotspots and awareness-raising, to helping countries strengthen their institutions, improve policies, find solutions to concrete environmental and security problems, and mount pilot interventions.

In Central Asia, the Environment and Security Initiative has based its initial work on the regional consultation held in Ashgabat in 2003, where representatives of states and partner organizations gathered to define priorities jointly. After the Ferghana Valley and the Eastern Caspian, the third assessment in Central Asia focuses on the Amu Darya River basin. So far the ENVSEC Initiative in the region has been seen as acting as a catalyst, keeping otherwise low priority or little known issues in the picture, while promoting actions on the ground.

The prime aim of this report is to identify the environmental stress points in the Amu Darya basin which have, or may have, security repercussions for the states and population. The report then suggests solutions to the challenges identified during the assessment.

The assessment report is based on a process comprising missions and consultations with state authorities, representatives of the media and civil society in Afghanistan, Tajikistan, Turkmenistan and Uzbekistan in 2007-2010. The process included drafting national contributions on environment and security issues at country and local level, and regional meetings with the countries of the basin. The meeting in Ashgabat (Turkmenistan)

in September 2007 focused mainly on issues related to the lower part of the basin³. The meeting in Kabul (Afghanistan) in November 2007 discussed upper-basin issues and Afghanistan’s perspective⁴. Field visits were made to the upper Amu Darya basin in Tajikistan and its regions adjacent to Afghanistan in spring 2008. Similar field missions to Turkmenistan and Uzbekistan covered the middle and lower parts of the Amu Darya River basin, river delta and the Aral Sea region. All in all, the field missions covered more than 3 000 km. Participants included experts from the region and from international organizations (see Annex 1 for details). Almost 100 experts were directly involved or consulted during the process.

Environment and Security linkages

In general there are two main areas of concern when considering environmental factors as a source of modern conflicts: resource scarcity and degradation; and resource abundance. In both cases the problem is often (unequal) access to critical resources and competition for the control and exploitation of valuable commodities.

When considering the first concern – degradation of resources and scarcity – the two factors are closely linked, as degradation can increase scarcity and tension over distribution and access, while scarcity of natural resources exposes the resource to over-exploitation (Bolma, 2006; UNEP, 2009). When a community depends directly on natural resources, such as land and water, for its survival, the negative changes associated with their loss, serious degradation, and/or inaccessibility threaten livelihood security and increase vulnerability to social and violent conflicts (Stucker, 2006 and 2009). Scarcity, degradation and lack of access to freshwater and agricultural land are specific factors of instability, especially at the communal level.

On the other hand, the abundance of natural resources can also become a source of tension between and within states. Countries whose wealth depends on the export of natural resources face several challenges related to economic and political stability (Collier 2002). How resources are managed and how the resulting revenue is redistributed influences national stability (UNEP, 2009).

Looking specifically at the factors related to transboundary rivers, international research on conflict and cooperation over international water resources shows that although international relations over freshwater resources are overwhelmingly cooperative, conflicting relations between states tend to focus on three main issues: water quantities and allocations; radical institutional change within a basin and infrastructure projects along transboundary basins (Yoffe, Wolf and Giordano, 2003).

The issue of who controls water resources, and how, is often a decisive factor in environment and security relations in the arid lands of Central Asia and Afghanistan. In this region the water question cannot be dissociated from climate change impacts, energy and food security, as a large percentage of the population depends on irrigated agriculture for its livelihood.

From a security perspective, climate change, water, energy and agriculture constitute the main areas of interest for this report, as they reveal the potential for increasing instability and even confrontation. We shall look at water management and allocation mechanisms in the region, the question of deteriorating soil and water quality and energy supply, trans-border industrial pollution, biodiversity loss and natural disasters which have a profound effect on people's livelihoods and exacerbate environmental stress.

A number of factors and issues make it necessary to analyse the basin from several perspectives. The first factor relates to geopolitical changes. From a system with two players (the Soviet Union and Afghanistan) the basin has moved to one with five states (Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Afghanistan) along its length.

The region's economy is still mainly based on exploitation of natural resources, some non-renewable such as hydrocarbons, others renewable, particularly water. The latter is vitally important to agriculture, a key economic sector in all the states in the region. Overall water consumption is much as in the past, but patterns of water use have evolved in line with changes in agriculture. Cotton is still a strategic crop but wheat and other crops such as rice are playing a bigger role, to improve the food security of Central Asian countries. Large segments of the existing water infrastructure (canals, pumping stations, dams) are facing maintenance and deterioration problems, but new projects (dams and hydropower stations, artificial lakes) are changing the situation, modifying the existing balance and relations between riparian states. Different interests between upstream and downstream countries make regional cooperation and finding common solutions an imperative. Energy and food security considerations influence the policies of the states as well as relations between countries in the region.

In the last 10 years severe drought and extreme cold wave have dramatically exposed the vulnerability of the region's agriculture and energy supply systems to severe weather events. Successive reports have warned of rapid glacier melting in the areas where the region's main rivers rise. Previous natural disasters and severe weather events are testimony to the challenges posed by a changing climate. The effects of climate change are more serious and challenging than previously thought, potentially including more frequent, more intense natural disasters, water and consequently energy shortages, crop failures, pest infestations and food insecurity. These challenges will affect all countries in the region and forward-looking collaborative solutions are needed.

Furthermore, environmental legacies such as cross-border pollution hotspots remain unresolved. Both desert and mountain ecosystems, which previously enjoyed a status of protected areas, are increasingly fragmented by stricter national border regimes. The development of energy and transport routes is an additional burden for regional biodiversity. Unregulated pasture and forest use, pests and invasive species are all factors constraining Central Asia's fragile ecosystems.

Finally, a secure Afghanistan will also play a larger part in relations within the basin. Until now Afghanistan's role in regional water management has been relatively marginal, mainly because of its repeated armed conflicts and widespread insecurity. Existing literature

From the Aral 1988 expedition to the ENVSEC 2008 assessment: what has changed?

Twenty years after the first major warning signs of the consequences of mismanaging natural resources, and confronted with recent reports underlining the risk that Central Asia now faces from climate change and a decline in the key resource for the whole region, namely water, the Environment and Security Initiative assessed the situation and trends affecting the region. To understand the changes that have occurred in the Amu Darya basin and identify the environmental factors that may pose a threat to security, the Environment and Security Initiative carried out several missions in 2008, mainly following in the steps of the Aral 88 expedition, but adding visits to Afghanistan.

The Aral 88 expedition (Reznichenko, 1992) was one of the landmarks in recognizing the Aral Sea crisis⁷. The Novy Mir and Pamir magazines organized the expedition, inviting a group of writers, scientists and journalists to travel all over the Aral region and meet with the governments of republics and districts, the local population, agricultural and water specialists. This expedition covered the entire basin of the Aral Sea – from the high mountains and glaciers of the Pamirs, to the Zarafshan and Ferghana Valleys, and the deserts of Kazakhstan and Turkmenistan. It revealed major problems of water wastage, excessive application of pesticides and soil salinization. A short book and several articles were published in 1992 as the visible results of the expedition with an analysis of the critical situation in the Aral basin. The authority of the well-known scientists and writers who took part in the expedition exposed the Aral Sea problem to the public. A parallel UNEP-Soviet diagnostic study of the Aral Sea in 1988-1991 (UNEP, 1993) broadened the scientific basis and exposed the problem to the international community. The study focused on regional water and land resource management issues, trends in climate change, inadequate environmental monitoring systems and policy-making to respond to the changing and deteriorating environment. An article in the National Geographic magazine of February 1990 (by W. Ellis) – “The Aral: A Soviet Sea Lies

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_9845

