THE GEOPOLITICAL DIMENSION OF ENVIRONMENTAL QUALITY. WATERS AND CONFLICT IN THE ARAL SEA BASIN

LA DIMENSION GÉOPOLITIQUE DE LA QUALITÉ DE L'ENVIRONNEMENT. EAUX ET CONFLIT DANS LE BASSIN DE LA MER D'ARAL

LA DIMENSIONE GEOPOLITICA DELLA QUALITÀ AMBIENTALE. ACQUE E CONFLITTO NEL BACINO DEL LAGO D'ARAL

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Résumé

Dans les dernières décennies, la mer d'Aral, située en Asie centrale à proximité de la frontière entre le Kazakhstan et l'Ouzbékistan, a connu un dessèchement dramatique qui a été divulgué dans la presse. Cette catastrophe environnementale, rebaptisée la "Crise de la mer d'Aral", est due à la base au détournement artificiel des fleuves du bassin pendant la période soviétique dans le but d'irriguer de nouveaux champs de coton. De nos jours, malgré la réalisation de différents projets de réhabilitation environnemental et d'une riche littérature scientifique à ce sujet, le bilan général concernant la mer d'Aral, et en particulier pour ce qui concerne sa rive ouzbèke, est encore critique. Cet article, après une synthèse sur les causes et les conséquences du désastre écologique, analyse les implications géopolitiques liées à la détérioration de la qualité de l'environnement dans la région et à la gestion des eaux en Asie centrale post-soviétique, en soulignant, dans le cas de la mer d'Aral, les criticités liées à la transition rapide de bassin interne à un état de bassin international. Dernièrement, sont remis en question les anciens programmes et les nouveaux projets centre-asiatiques concernant la gestion des eaux.
Mots-clés: Crise de la mer d'Aral; gestion des ressources hydriques transfrontalières; dévellopement durable; politiques environnementales.

Summary

In the last decades the Aral Sea, located in Central Asia on the boundary between Kazakhstan and Uzbekistan, experienced a dramatic shrinking, divulged even in newspapers and magazines. Such an ecological catastrophe, renamed the "Aral Sea Crisis", was triggered by the artificial diversion of the rivers of the basin during the Soviet period, in order to irrigate new cotton fields. Nowadays, notwithstanding the fulfilment of several environmental restoration projects and a wide scientific literature about the process, the general balance about the water body, in particular its Uzbek side, is still critical. This paper, after a synthesis concerning the causes and the consequences of the ecological disaster, analyses the geopolitical

implications connected to the deterioration of the environmental quality in the region and to water management in Post-Soviet Central Asia, underlining, in the case of the Aral Sea Basin, the criticities linked to its fast transition from an internal basin to an international one. Finally, Central Asian water-related old programs and future scenarios are discussed.
Keywords: Aral Sea Crisis; Transboundary Water Resources Management; Sustainable Development; Environmental Policies.

Riassunto

Negli ultimi decenni il lago d'Aral, posto in Asia centrale presso il confine tra Kazakistan ed Uzbekistan, ha sperimentato un disseccamento drammatico, divulgato persino dai quotidiani e dalle riviste illustrate. Tale catastrofe ecologica, ribattezzata la "Crisi del lago d'Aral", è stata innescata dalla diversione artificiale dei fiumi del bacino durante il periodo sovietico, allo scopo di irrigare nuovi campi di cotone. Ai nostri giorni, nonostante la realizzazione di diversi progetti di ripristino ambientale ed un'ampia letteratura scientifica circa questo processo, il bilancio generale riguardante il corpo d'acqua, specialmente per quel che concerne la sua sponda uzbeka, è tuttora critico. Questo articolo, dopo una sintesi relativa alle cause ed alle conseguenze del disastro ecologico, analizza le implicazioni geopolitiche connesse al deterioramento della qualità ambientale nella regione e alla gestione delle acque nell'Asia centrale post-sovietica, sottolineando, nel caso del lago d'Aral, le criticità collegate alla rapida transizione da bacino interno ad uno stato a bacino internazionale. Da ultimo, sono discussi i vecchi programmi e i futuri scenari centro-asiatici inerenti le acque.
Parole-chiave: Crisi del lago d'Aral; Gestione delle risorse idriche transfrontaliere; Sviluppo sostenibile; Politiche ambientali.

Introduction

Nowadays, the Aral Sea shrinking (in the scientific literature renamed the "Aral Sea Crisis") represents a sort of symbol, assimilable to an admonishment: after its acknowledgement as the «worst ecological disaster in the 20th century» (FESHBACH, FRIENDLY, 1992) and an emblematic example of over-exploitation of water resources (GORE, 2006), scientific community, educational system and ecological movements identified in it a paradigmatic case of unsustainable development.

Notwithstanding a global awareness about the causes and the consequences of the process, Aral Sea criticities have not been solved. This paper, skipping ecological, hydrological and technical issues, focuses its attention to the geopolitical dimension of the Aral Sea Crisis, emphasizing the limits and the potential conflicts related to nowadays Central Asian Republics self-referring hydropolitics, which coincides with an old Uzbek proverb: «It is rich not the land owner, but the water one».

The Aral Sea holds a strong impact on the regional landscape, being Central Asia an almost completely arid territory, normally characterized by sandy deserts (Kyzylkum, Karakum) or steppe biome. Located in the middle of the Turolian lowland between 30 and 40 m a.s.l., it receives water resources from an endorheic basin. This definition applies when, because of the orography, rivers and streams do not flow in seas or oceans, forming on the contrary inland water bodies. The Aral Sea Basin (fig. 1) is considerably wide, reaching 1.8 million km^2 and involving Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan (until 1991 included in the USSR), Afghanistan and minoritily Iran and Popular Republic of China. In this basin, Amu-Darya and Syr-Darya are the main rivers, draining the most of the superficial waters: in both cases they are exotic watercourses, conveying downstream sources-originated waters, and not receiving considerable contributions from tributaries.

The Amu-Darya river (*Oxus* in Ancient Greek and Latin literature) originates from Pamir Chain, after the confluence of Pyanj (Afghanistan) and Vakhsh (Tajikistan) rivers. Its total length exceeds 2400 km, and, thanks to 70 km^3 annual discharge, it can be considered as the Central Asian biggest river (GLANTZ, 2005). The Amu-Darya règime is strongly irregular, influenced by seasonal meltings of Afghan and Tajik glaciers; its muddy waters are very rich in silt.

The Syr-Darya river (*Iaxartes* in the Antiquity), 2300 km long, originates from Tien Shan mountains in Kyrgyzstan, crosses Tajikistan and Uzbekistan, and finally reaches Kazakhstan, where flows through a delta in the Aral Sea. Analogously to Amu-Darya, also Syr-Darya river holds an irregular règime, but its annual discharge is lesser than the first one.

In the 20th century, the ’50s meant for the USSR a u-turn in the economical field. Ceased the Stalin Era, the Soviet Union, under the guide of Nikita Kruscev, launched a new ambitious agrarian project in Central Asia: the quinquennial plan and several CPSU resolutions ratified, in the central part of the Aral Sea Basin, the development of cotton cultivation, trying to reach the self-sufficiency about this sector and become the first cotton producer in the world, exceeding the USA (ZONN, 1999). The official reasons of such an initiative were economical and agrarian, but behind this operation there were also propaganda reasons within the Cold War: the USSR intended to demonstrate the superiority of the Socialist model in comparison with the Capitalist one. Moreover, the giantism of this program is connected with Soviet Union environmental policies, based on a concept of mere exploitation of natural resources, considered virtually inexhaustible and without intrinsic values, paradoxically similar to the theories of the contemporary capitalistic neoclassical economists (ZIEGLER, 1987). Consequently, most of Uzbekistan and part of Southern Kazakhstan (at that time Republics included in the USSR) were reconverted into a cotton monocolture, collectively driven through the creation of *Kolkhoz* and *Sovkhoz*: *Kolkhoz* were smaller and quite similar to cooperative enterprises; *Sovkhoz* were governmental companies, extended in the order of thousands hectares, hierarchically managed by Soviet agronomists.

New cotton fields were irrigated thanks to a myriad of irrigation channels, diverting great water volumes from Amu-Darya and Syr-Darya. The cotton production of Soviet Central Asia grew sensibly, but it never exceed the American one. Unfortunately, this project had a terrible impact on the environment in general and on the hydrological balance in particular.

Starting from the '60s of the 20th century, a decade after the beginning of Kruscev's new agrarian approach in Central Asia, the consequences of this program, at first weakly, then brutally, arose. Deprived of the water contribution of its tributaries, the Aral Sea started a fast regression, because the inflow of the Amu-Darya and Syr-Darya rivers could not balance the evaporation. This shrinking did not shock Soviet technicians; on the contrary, as a logic result of the increase of the irrigated area, they had forecasted this process, defining it as a «necessary sacrifice» for the growth of the Nation (RUMER, 1989). In the last 40-45 years the sea level shrank for more than 20 meters; the area and the water volume decreased of 75% and 90% respectively (fig. 2). This process, hidden for a long time by Soviet authorities and spread to the world community only between the '80s and the '90s (MICKLIN, 1988; ELLIS, 1990; REZNICHENKO, 1992), was so intense that in 1989-1990 the Aral Sea divided into two separated water bodies: the Small Aral Sea (also called North Aral Sea), fed by the Syr-Darya river and entirely settled in Kazakhstan, and the Large Aral Sea (also called South Aral Sea), fed by the Amu-Darya river and shared between Kazakhstan and Uzbekistan, at that time Republics of the Soviet Union.

The Aral Sea fast regressive trend caused a long series of environmental problems. Because of the reduction of the sea level, water salinity grew enormously, passing from 10 g/l to 160 g/l nowadays verifiable in some areas, changing most of the Aral from a brackish basin to a hyperaline one. This transition produced serious repercussions from an ecological point of view, inducing at first the extinction of local ichthyofauna, artificially replaced by exotic species; then a reduction in number of the last ones. The Syr-Darya and Amu-Darya deltas have undergone an involution from wetlands to arid zones; in the so-called *Priaralye* (Aral Sea region), groundwater table sank, contributing to soil salinization and desertification. The Aral Sea shrinking also triggered climate change on a regional scale: without the mitigation of the water body, the climate accentuated its continental characteristics, suffering hotter and drier summers and colder winters than usual. Moreover, whereas the Aral Sea disappeared, the dried bottom of the water body, made up of saline deposits and pollutants collected by the rivers of the basin, is now exposed to wind erosion, causing health problems (in particular cancers) to local communities. Last but not least, the regressive trend nearly caused a further splitting of Large Aral into a Western Large Aral and a Eastern Large Aral (Glantz, 2007).

Discussion

The Aral Sea tragedy presents a geopolitical dimension related to water management in its basin.

During Soviet times, regarding water resources, the five Central Asian Republics included in the USSR (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan) were part of an integrated system which carried out a top-down basin solidarity. Jointly to Kruscev program of development of cotton cultivation, beginning from the ’50s Kyrgyzstan and Tajikistan, the uspstream Republics along the courses of the Syr-Darya and Amu-Darya, became the “water reservoirs” of Soviet Central Asia: in those years, several dams were built on these rivers, in order to store large water volumes during winter months, and to assign them, in summer months, to irrigation of downstream cotton fields in Kazakhstan, Turkmenistan and Uzbekistan. The main dams built during Soviet Era were Nurek (Tajikistan), on Vakhsh river (tributary of Amu-Darya), still today the tallest dam in the world (300 m), and Toktogul (Kyrgyzstan), on Naryn river, tributary of Syr-Darya. In exchange for water storing and non-use of water resources during winters for hydropower, Kyrgyzstan and Tajikistan received from Kazakhstan, Turkmenistan and Uzbekistan free supplies of coal, natural gas and oil, utilized for civil heating (Sievers, 2002; Kemelova, Zhalkubaev, 2003). In Soviet times, Kyrgyz and Tajik water volumes were also used to develop cotton cultivation in the Turkmen part of the Aral Sea Basin thanks to Karakum canal (former Lenin canal). This hydraulic infrastructure was begun in 1954 under Stalin will, diverting waters from Amu-Darya and conveying them, across Karakum desert, as far as the Caspian region. It is the longest channel in the world (1370 km), distintive for its low efficiency in water transportation due to its sandy bed and to the absence of concrete banks.

The disgregation of the USSR and the independence of the five Central Asia Republics (1991) caused the collapse of such a system: suddenly, water management in Central Asia, a basic theme for a arid and semi-arid region, from internal matter of Soviet Union became an international matter among newly independent Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Russia took no interest in this affair, while every single Central Asia Republic, getting into line with growing nationalism fed by old Soviet *Nomenklatura*, now Republican ruling class (Carney & Moran, 2000), chose a self-referring hydropolitics, producing a potentially conflictual situation on a regional scale (Bedford, 1996; Elhance, 1997; Wegerich, 2001; Spoor, Krutov, 2003).

Since the independence, because of the cessation of Turkmen, Kazakh and Uzbek fossil fuel free supplies, Kyrgyzstan and Tajikistan decided, during the winter season, to open the locks and let waters flow downstream to produce hydropower. New dams were also projected or are nowadays under construction: the most important of them is Rogun dam, located in Tajikistan on Vakhsh river just upstream the Nurek one, not finished yet (Wegerich, 2008). As a direct consequence of lack of water-storing during winter, in the last years Turkmen, Kazakh and Uzbek cotton fields suffered an irregular irrigation during summer, decreasing their productivity and cotton quality.

Furthermore, every Central Asian Republic presents specific problems related to water management in the basin: the Aral Sea Crisis can be virtually considered as the result of the addition of these criticities.

Turkmenistan enlarged irrigated area and continued to develop cotton sector, increasing water derivations from Amu-Darya river through the Karakum canal (Hannan, O'Hara, 1998; O'Hara, Hannan, 1999). Former Turkmen President Niyazov, died in 2006, coherently with his authoritative-theocratic internal policy, encouraged the realization of a large artificial basin in the middle of Karakum desert, pompously called the "Golden Century Lake" (Badykova, 2005). In case this basin will be finished in the future, it will imply further water diversions from Amu-Darya river, but, until today, Turkmen President Berdymukhamedov, Niyazov's successor, has not taken yet an official decision about the continuation of "Golden Century Lake" project.

Kazakhstan, leaded by President Nazarbayev, thanks to its fossil fuel-pulled economy, re-organized its agricultural system, reducing the irrigated area and improving the channels efficiency. Water derivations from Syr-Darya were reduced, and the river returned to inflow into the Small Aral Sea, entirely located in Kazakhstan. Kazakh Government also encouraged the construction of a dam in the Berg Strait, with the aim to prevent water exchange from Small to Large Aral Sea, and to keep Syr-Darya water inflow only in the first water body. Beginning from the '90s, Small Aral Sea level arose of several meters; salinity passed from 30 g/l in 1990, to 17-18 g/l in 2002, to 12 g/l in 2006. These conditions allowed the return of ichthyofauna (fresh and brackish water species): in the case of Small Aral, in the last 15 years the ecological restoration had a strong impact on social and economic fields, permitting, mainly thanks to Danish financial and technical support, the recovery of fishing industry, previously ceased. But, besides strong points, this process presents also weak points: from one side the dam on Berg Strait improved water quality in the Small Aral, but from the other one it condemned the Large Aral to a further worsening of its ecological situation.

Uzbekistan, leaded by President Karimov, is facing the crisis of the most problematical water body, the Large Aral, which Kazakhstan completely neglected, focusing its attentions and funds only to Small Aral. Moreover, Uzbekistan has got less fossil fuel than Kazakhstan, and, notwithstanding the recent agrarian reform and decollectivization, presents a cotton-based economy, which cannot afford a sudden reconversion to other less water-needing cultivations. Nowadays, water derivations from the lower course of Amu-Darya continue, and the situation of Uzbek Large Aral Sea can be considered dramatic: Moynaq, once one of the most important port on the water body, is now located more than 40 km far from the shores, and the fishing industry is here completely cancelled. Finally, Karakalpakstan, region located on the Southern shores of Large Aral Sea and suffering the worst consequences of the Aral Sea Crisis, is formally organized as a Autonomous Republic included in Uzbekistan, and its first ethnic group is represented by Karakalpak people (ethnic group assimilable to Kazakhs). Recently,

this fact produced autonomist and secessionist political movements (HANKS, 2000).

In the last years, UNDP, UNEP and World Bank promoted the creation of international organizations, with the aim to manage the Aral Sea Crisis, solve the conflicts and direct Central Asian Republics towards a sustainable use of water resources (Carlisle, 1997; Weinthal, 2002). It dates to 1992 the origin of the *Interstate Council for Addressing the Aral Sea Crisis* (ICAS), formed by 25 members designed by the five Central Asian Republics and periodically convoked twice a year: this organ is appointed to manage the international funds granted by the World Bank. On the basis of an anachronistical, Soviet-style and bureaucratic model, ICAS promoted the establishment of two technical commissions, an *Interstate Commission for Water Coordination* (ICWC) and a *Sustainable Development Commission* (SDC), formerly *Interstate Commission for Socio-Economic Development and Scientific Technical and Ecological Cooperation* (ICSDSTEC). Both of them meet five times a year. Beginning from 1997, ICAS was substituted by an *International Fund for the Aral Sea* (IFAS), fund cofinanced by the World Bank and the five Central Asia Republics through the allocation of 1% of their GNP. Besides this international bodies, *Basin-Valley Organizations* (BVO), heritage of the Soviet Era, still keep their technical prerogatives on the Amu-Darya and Syr-Darya courses.

Although governative and pro-governative books and journals pass positive judgments on these organizations (e.g. Karimov, 1999; IFAS, 2003a), an impartial view is forced to strike a negative balance about them. In fact, year after year they have become lobby bodies, more interested in sharing international funds than solving the Aral Sea Basin ecological problems. Regarding to this, it is emblematic the hypertrophic organization chart of IFAS: since 1993, 124 manager for 95 positions (IFAS, 2003b) and an indeterminate number of technical and administrative employees. Ruling class' superficiality and indifference towards the Aral Sea Crisis are effectively described by R. Ferguson in his accusation-book *The Devil and the Disappearing Sea* (2003): called by Uzbek government as an international expert, Ferguson fails his goals because of local authorities wait-and-see policy.

During the '70s and the '80s, when the Aral Sea regression had already reached an alarming state, Soviet technicians supposed to raise its level artificially diverting into it Western Siberian rivers Ob and Irtysh (fig. 3). This program, emphatically renamed "The Project of the Century", hypothesized the realization of the longest channel in the world (2200 km long), called "Sibaral" because Siberian waters should have to stop the regressive trend of the Aral and re-establish the originary conditions (Hollis, 1978; Lipovsky, 1995). Analogously to Kruscev's cotton development program in Central Asia and coherently with Soviet technocratic approach to Nature, it was a pharaonic project, without any environmental impact evaluation: if finished, it could perhaps have solved the Aral Sea Crisis, but in the meantime it would certainly have triggered a new ecological crisis in the Siberian taiga biome (Micklin, 1987a; Micklin, Bond, 1988). Thanks to the opposition of a

part of Soviet scientific community (Darst, 1988), and under the influence of new Soviet Leader Gorbachev's *Perestroika* and *Glasnost*, in 1986 "The Project of the Century" was officially stopped (Micklin, 1987b).
Around the middle of '90s, several years after the USSR disgregation, Karimov and Nazarbayev, Uzbekistan and Kazakhstan Presidents respectively, exhumed the Siberian rivers diversion project to fill up the newly born Large Aral Sea, re-proposing it to Russia. This state, even though it emphasizes the high costs and the environmental impact of such a work, assuming an ambiguous position until today has not rejected the program, perhaps with the aim, in the near future, to keep influence and political pressure towards Uzbekistan and Kazakhstan (International Crisis Group, 2002).
At now, Central Asian economical and geopolitical situation persuaded most of the scholars to consider an Utopia the restoration of the Aral Sea in conformity with the originary level. If Small Aral Sea does not present alarming criticity and it appears addressed to water resources sustainability, the efforts, both theorical and practical, are now devoted to the Large Aral Sea. Regarding to it, in the last years most of the scientists assert a perspective of environmental problems mitigation, comparing different projects and scenarios.
The first one supposes to isolate completely and permanently the Western Large Aral from the Eastern Large one: the Eastern water body could keep today's level or increase it thanks to surplus waters from Small Aral; the Western one, without any water inflow, should be condemned to total dessication. The weak points of the project consist in the necessity to double water inflow from Amu-Darya into Eastern Large Aral (Islamov, 1999), action very hard to propose to a cotton-based economy like the Uzbek one. Moreover, real Kazakh receptiveness to let Small Aral surplus waters stream into Eastern Large one should have to be officially investigated.
A second supposition was drafted firstly by A.T. Salokhiddinnov and Z.M. Khakimov (Salokhiddinnov, Khakimov, 2004), and then re-proposed by P. Micklin (Micklin, 2006; Micklin, 2007): it presents the ambitious aim to conserve, through years, the three water bodies (fig. 4), which should have to be put in communication each other. In particular, Amu-Darya river should be diverted to West, inflowing into Western Large Aral and increasing its level up to 33 m a.s.l.; from here, exceeding waters could stream, thanks to gravity, through a concrete-banked channel as far as Eastern Large Aral; analogously, the exceeding waters of Small Aral could be conveyed to Eastern Large one through a new channel. In this vision, Berg Strait must be closed. Such a project could allow to Eastern Large Aral Sea a transgression up to 29 m a.s.l. Similarly to the first conjecture, such a program does not face practical problems about the reduction of the irrigated area and Kazakh receptiveness to cede Small Aral Sea surplus waters to Uzbekistan.
A third, radical, scenario, perhaps the most realistic of all, advances the hypothesis of a total dessication of Western and Eastern Large Aral Seas. In such a perspective, Aral Sea dried bottom salty deposits, now exposed to wind erosion and potentially dangerous for human health, must be fixed through the seeding or the

plantation of halophilic species (Khamzina et al. 2005). In the Amu-Darya delta, cotton fields residual waters could be used to flood small depressions, in order to transform them in fresh water artificial basins (KINDLER, 1998). Regarding to this, a pilot-experience consists in Sudoche lake, located about 30 km South-West of Moynaq: thanks to a project funded by the World Bank, between 1998 and 2003 a new fresh water body was created (World Bank, 1998; Schlüter et al. 2007). Its area is about 10 km^2; the water volume about 2 km^3. Sudoche lake holds strong natural values, because a massive wetland birds frequentation has begun; moreover, water low salinity permitted the introduction of ichthyofauna and, thanks to this, the recovery of a small fishing industry (20-30 fishermen in May 2007; C. Cencini, & S. Piastra, field research data). The Sudoche experience proves that, in the Amu-Darya delta, environmental restoration projects are technically feasible, ecologically useful and socially and economically effective. But, from the other hand, it must be considered the balance between costs and benefits: the expensive budget needed for Sudoche lake (4 million USA $), demonstrates that this strategy cannot be extended on a large scale in the Amu-Darya delta (Piastra, 2008).

Conclusions

As previously analysed, beginning from the '50s of the 20th century the USSR encouraged in Central Asia the development of cotton cultivation, emphatically renamed the "White Gold". In the Aral Sea Basin, water resources over-exploitation caused an ecological disaster without any precedents in recent human history, cancelling a valuable landscape which impressed, for example, Russian Admiral A.I. Boutakoff, the first to explore this region in the 19th century (Piastra, on press). In the case of the Aral Sea, the decreases of level, area and volume created a splitting in three different water bodies: the Small Aral, the Western Large Aral and the Eastern Large Aral. The first, entirely located in Kazakhstan, at now seems to have entered a sustainable strategy about water resources; the second and the third, located on the boundary between Kazakhstan and Uzbekistan, show critical conditions.

The international scientific community promoted several appeals to extend to the Aral Sea the *status* of UNESCO World Heritage (Glantz, Figueroa, 1997) and to save its Biodiversity (IUCN, 2004), but without any practical results. The key to solve radically the Aral Sea Crisis is economical and political, and it is related to decrease drasticly the irrigated area in the basin; but such a program should involve a total re-organization of agriculture, nowadays based on cotton, which Central Asian Republics, except for Kazakhstan, cannot afford. Moreover, Central Asian leaders have no interest to take unpopular and uneconomical decisions in a short period such as a reduction of cotton production or an introduction of specific taxes about water resources utilization to prevent their waste, because their authority is based on a populist and demagogical policy.

Under this situation, development goals supposed by UNESCO for the year 2025 for Aral Sea Basin (ecological, social and economical significative improvements) (UNESCO, 2000), are unattainable.

Table 1 - *List of Acronyms*

BVO	Basin-Valley Organizations
ICAS	Interstate Council for Addressing the Aral Sea Crisis
ICSDSTEC	Interstate Commission for Socio-Economic Development and Scientific Technical and Ecological Cooperation
ICWC	Interstate Commission for Water Coordination
IFAS	International Fund for the Aral Sea
IUCN	International Union for Conservation of Nature
SDC	Sustainable Development Commission
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

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