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Gains of Regional Cooperation: Environmental Problems and Solutions

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Abstract

Cooperation between the states of the Caucasus and Central Asia is paramount in solving the region's environmental problems. Given the acute socio-economic difficulties they face, their slow progress is understandable. Serious environmental and socio-economic consequences cumulate as the neglect persists. Increased oil and gas revenues (for those who have access to these resources) cannot ease such consequences. The exploitation of oil revenues may benefit the national economy, but it does not generally provide enough for the poor local communities that depend on the natural resources of the Caspian for their livelihoods. The international community must therefore help to promote cooperation within the region. The Caspian Environment Program provides an example of the kinds of things that need to be done, but more resources are needed for sustainable development. Perhaps the oil companies will do more, given their long-term stake in the region. In addition, the countries themselves can, and should, allocate more funds for the sustainable development of the region, but co-ordinated programs will be required to dissuade governments from seeking a 'free ride' on the good actions of the others.

1 Background: The Physical Environment in the Caspian

1.1 The Physical Environment

The Caspian Sea, called the jewel of two continents, Asia and Europe, is the world's largest inland body of water, encompassing some 44 percent of the volume of all inland lakes and seas. Five countries[1] share the immense natural heritage of the Caspian See (See Map 1 for details).

1.2 Biological resources

The biodiversity of the Caspian aquatic environment is derived from the long history of the existence of the sea and its isolation, allowing ample conditions for speciation. The number of endemic aquatic taxa, over 400, is very impressive. There are 115 species of fish, of which a number are anadromous and migrate from the Caspian up the rivers to spawn. The best known of these is the sturgeon, which has provided a valuable economic resource for over a century. There is also a Caspian freshwater seal, one of only two species that occur worldwide.

Coastal wetlands attract a variety of birds that are prolific throughout the year in and around the Caspian, with their numbers swelling enormously during the migration seasons when many species visit the extensive deltas, shallows and other wetlands. It is at these times that ecologically-motivated visitors could be guided into carefully selected vantage points and allowed to experience the beauty and the bounty of protected ecological resources. Such ecotourism, carefully planned and managed, has tremendous potential both as an income earner and as an excellent mechanism to educate and inform the interested public, whether they are local or foreign visitors. Terrestrial flora and fauna are quite diverse as well, and include several thousand flowering plants, with a rate of endemicity locally reaching 20 percent. A similar range of diversity is seen among insects, reptiles, birds and mammals.

[1] Azerbaijan, The Islamic Republic of Iran, Kazakhstan, Russia and Turkmenistan

1.3 Socio-economic features

The Caspian basin, together with the Ural Mountain chain, is considered the boundary between Europe and Asia and has seen centuries of commerce along ancient caravan routes such as the Great Silk Road. The current total population around the Caspian is estimated at about 5 million, with the main urban centers concentrated on the western and southern shores. In the west, Baku is the largest city on the Caspian coast, with a population of 1.7 million. The balance of the Caspian basin population resides in cities or towns ranging in size from 20,000 to 670,000, plus about 1,000,000 rural inhabitants. In 2000, the annual GNP per capita was as follows: Azerbaijan US$600; Iran US$1680; Kazakhstan US$1260; Russia US$1660; Turkmenistan US$750[2]. It is noteworthy that all these countries have seen large falls in their per capita incomes in the last 5 years or so. The falls since 1995 have ranged from a low of 30 percent for Iran to a high of 52 percent for Azerbaijan.

Map 1: The Caspian Region

[2] At these levels of income all the Caspian countries qualify for assistance from the Global Environment Facility.

The principal economic activities in the Caspian basin are fisheries, agriculture, petroleum production and related downstream industries. The sea contains over 80 percent of the world's sturgeon stock as well as substantial stocks of other commercially valuable species. Revenues to the littoral countries from sturgeon, including caviar, are thought to total US$6 billion annually. Rice and vegetable cultivation and cattle and sheep husbandry are the prime agricultural activities in the catchment area. Oil exploration and production are increasing along the northern and eastern shelves of the Caspian and are already well established in the Baku and Tenghiz regions. Oil production is expected to increase substantially over the next few years, with several western companies and consortia bidding for concessions.

2 Environmental Challenges

The Caspian governments have repeatedly emphasized the primacy of the impacts of sea level rise as the leading environmental problem facing them. While response to the environmental impacts of sea level rise may be the most urgent in terms of alleviating human suffering, protecting valuable infrastructure and preventing pollution incidents, and other types and sources of environmental problems must also be considered in a comprehensive environmental program for the region.

2.1 Pollution

The ecological integrity of the Caspian is under significant threat from pollution by particulate organic matter and excess inorganic nutrients (eutrophication) and by various toxic materials. Except for oil products from oilfields or transportation by ship or pipeline, all other sources of pollution that are quantitatively important are well localized point sources. The Volga is beyond doubt the single major source: it drains the sewage of half the population of Russia, and of most its heavy industry. Much of the Volga pollution is broken down *en route*, or deposited on the bottoms of the Volga reservoirs, but sufficient amounts still reach the Caspian to cause major imbalances, especially in the shallow north basin, which has limited absorption capacity.

Major land-base point sources of pollution are oil extraction and refining complexes in Baku and Sumgait (Azerbaijan), the site of a century of oil production and environmental neglect, and the new Kashagan oil field at the mouth of the Ural river in Kazakhstan[3]. The Sumgait industrial area, currently operating at only a fraction of capacity, has been partly constructed in a flood-prone zone. Large quantities of toxic waste run-off and spills have been generated by on-shore and off-shore oil fields, refineries and petrochemical plants. The shorelines and near-shore waters are heavily polluted in many areas, most prominently in Baku Bay. The Kashagan oil field is just being opened up and will be the second largest in the world. The problems that have been raised by environmentalists and others include: damage to the shallow sea and to the beluga sturgeon fisheries for which the Ural delta is one of the last breeding grounds, risks of earthquakes if the oil, which is found at very high pressures is removed, and the stockpiles of sulphur, which are growing from the

[3] We do not discuss here the risks of oil spills but the consequences of normal operations. Oil spills are reviewed in Section 3.3.

oil and gas that is currently extracted. The sulphur is particularly controversial, with the oil companies saying that (a) it is not as serious an environmental and health risk as is claimed and (b) it can be dealt with by selling it to the chemical industry, reinjecting it into the oilfield or building safe underground storage bunkers. Unfortunately the market for sulphur is oversupplied and prices are too low to make this a viable commercial option, although some processing and sale, albeit at a loss may be justified. The re-injection option will take some time, as will the building of storage bunkers[4].

In addition to oil and gas extraction problems, there are also radioactive solid and liquid waste deposits near the Gurevskaya nuclear power plant in Kazakhstan. This plant, which generates both power and desalinated drinking water, has been constructed sufficiently above sea level not to be immediately threatened by flooding. However, solid and liquid radioactive waste has been dumped in a number of depressions over karstic formations, which may be leaking radioactivity via the subsurface. Hard data on this problem are lacking.

2.2 Biodiversity and depletion of bio-resources

The Caspian is noted for its fluctuations in water level throughout historical times. At present, water levels are rising at a rate of up to 20cm per year. The rising water level threatens the sturgeon hatcheries that were constructed as a response to declining natural 'recruitment' – i.e. 'Recruitment' is defined as an increase in the population due to successful reproduction (itself a consequence of upstream dam building). These hatcheries were built too close to the shore and now need to be relocated (and modernized) if the sturgeon is to be saved. Secondary contamination from flooding of industrial sites and other coastal facilities may also contribute significantly to the threat to biological resources.

Maintenance of the biological diversity of the Caspian depends on the maintenance of a healthy ecosystem which, in turn, means that there is an urgent need to address contamination of the Caspian environment by waste products of human activities (heavy industry, agriculture, weapons development, power generation, etc.). In parts this pollution is quite evident and levels of heavy metals, pesticide residues and other pollutants in fish already reach levels making their consumption hazardous. Massive bird and seal kills have also been reported, and although the causes area not known for certain, pollution is suspected as the cause. A recently completed eco-

[4] Article by Paul Brown, *Guardian,* December 4, 2002. He states that BP and Statoil have sold their stakes in this field on account of these problems.

toxicological study of the region has concluded that the main ecological driver in the Caspian Sea appears to be, first, organochlorines (especially DDT and its by-products), followed by some heavy metals in certain localities (especially off Baku, including mercury, lead, and other metals) (PADCO Co, 2002).

The sturgeon fishery is a traditional and well-known activity because of the value of caviar and fish. However, in recent times, there has been a drastic decline in the sturgeon catch. Landings have decreased from around 30,000 tonnes in 1985 to 13,300 tonnes in 1990, down to 2,100 tonnes in 1994 and even less, around 1000 tonnes in the last few years. A quota system that was introduced together with a ban on pelagic fishing does not seem to have had the desired effect. While fishing methods have become more efficient and overfishing has occurred, the greatest impact on the sturgeon and other anadromous species is thought to arise from the construction of numerous dams on the Volga river, and to a lesser extent, on the Kura river. These dams have effectively barred the fish from their main spawning grounds, reducing such areas to a small fraction of their previous size. In addition, the development of industrial complexes on the river banks with their subsequent discharges, coupled with non-point source run-off from intensive agriculture, have led to pollution of the remaining waterways.

In recognition that the Volga dams had reduced the spawning areas available for sturgeon, a system of hatchery production was developed. This functioned successfully until the current rise in water levels flooded a number of hatcheries.

As noted, the Caspian basin is also rich in hydrocarbon deposits, with proven extensive reserves of oil and gas. Production of both oil and gas is significant, and a great deal of exploration activity is underway. This activity increases the risks to aquatic resources, in part for the reasons discussed in the previous section and in part through the constant shipping traffic generated. To the oil transport must be added the fishing fleets, passenger and cargo traffic. This traffic volume in an enclosed body of water has a number of potential impacts on Caspian biota. Stringent measures are urgently needed to prevent the accidental introduction of exotic species into the Caspian through ballast water carried by ships using the Volga-Don Canal between the Black Sea and the Caspian.

2.3 Sea level rise

Historically, the level of the Caspian Sea has fluctuated greatly. The lowest level for the last five hundred years was reached in 1977 (-29m below sea level); therefore, it is a fair assumption that the level could continue to rise from the current

level (-26m) until it reaches at least the 1900 level (-25m), presenting the littoral states with many urgent investment needs. In less than two decades, water levels have risen two and a half meters, inundating residential areas, transport, telecommunications and energy infrastructure, chemical and petrochemical industries, croplands and hatcheries. Thousands of residents have been evacuated from flooded homes, and up to 100,000 people in coastal cities and towns in Azerbaijan alone have been affected by the spread of toxic wastes, contamination of water supplies, loss of infrastructure, and inundation of workplaces and settlements.

3 Conflicts in the Management of the Caspian Environment

3.1 Background

The conflicts that arise in the management of the Caspian Sea stem from the common property or open access nature of the resource. Because it is 'owned' by very one, it is owned by no one and each party has an incentive to over use the resource. (Hardin, 1962). Managing this problem at the national level is relatively easy: governments try and make users pay the social costs of the use of the resource by some means or other. Measures can include economic instruments, such as charges, or direct controls, such as limited access to the resource (see Markandya et al, 2002 for a discussion). In the case of an international resource, however, the problem is much more difficult. There is no authority that can *impose* a solution[5]. Hence it has to be agreed. The literature is divided between those who argue that a successful agreement has to be based mainly on mutual self interest (each party will only join if it sees itself as better off in the immediate future as a result) and those who argue that cooperation can occur even when it is not in the narrow interest of each party, but when each party can see that it is in its long term interest to cooperate. Of course the latter does not mean that under the agreement any one party is worse off than it would be without the agreement. But it does mean that, when evaluating an agreement, each party will not renege if it is in its short term interests to do so[6].

This debate is not resolved and there is probably some element of truth in both positions. In the case of the Caspian, the cooperative solution was relevant before the break up of the former Soviet Union. At that time the Sea was managed essentially by two countries: USSR and Iran. Each had good reason to cooperate and did so in the broader interests of sustainable use of the resource. After the break up of the USSR, however, the situation has changed. The cooperative model is less compelling, partly because the Parties have no established relationship in this area and partly because they are unable to control their citizens, some of whose livelihoods have come under serious threat after the dissolution, and some of whom are able to act outside the law with impunity, often making considerable profits from doing so.

[5] Of course even national governments cannot coerce their citizens in these matters – some degree of broad acceptance is required. But it is materially different from a problem where there is an international dimension.

[6] In the economics literature this distinction is that between agents who operate under the 'Cournot-Nash Assumption' (if I change my behaviour others will carry on doing the same thing)and the "Kantian' Assumption (if I change my behaviour others in the same position will also change theirs).

3.2 The Sturgeon

3.2.1 Trends and Their Causes

These issues are brought out most clearly by looking at one of the key resources of the Caspian – the sturgeon. As noted above, the decline in catch has been alarming. The situation is now thought to be so serious that the Caspian sturgeon fisheries are in danger of being completely depleted within the next few years, and action is urgently required if this valuable resource is to be preserved. This has serious economic consequences, given that the market value of caviar has provided the Caspian region with a significant source of income over the last century. Even today, after major falls in production, the world-wide street value of the caviar is estimated at $3 billion. What are the main causes of the decline?

Over fishing, Poaching and Illegal Trade. With the collapse of the Soviet Union, the strong regulatory system that had existed since World War II also collapsed. Practices that had been banned under the regulatory system, such as fishing in the open sea, rather than in the rivers, started to be used by some states. Now only Iran, whose fisheries are tightly controlled, has the resources to implement effective management. Several states have regulations, but enforcement is limited due to lack of funding. The result is that the illegal catch in Caspian and the Volga river is estimated at six to ten times the legal catch. The 1998 US Fish and Wildlife Survey estimated that 50 percent of worldwide trade in caviar is illegal. Illegal trade is suggested e.g. by the fact that 1996 Turkish statistics record 121 tonnes of caviar exports, whereas Turkey does not have the means to produce anything like this amount of caviar. It is likely that these exports originated from illegal catches from the Caspian. Illegal trade has been reduced through trade restrictions, but given that one fish can still provide the equivalent of one month's salary, the incentive to try to catch sturgeon illegally is huge. It is thought that poachers catch almost all the sturgeons that attempt to reach the remaining spawning grounds, using illegal fishing gear such as nets that do not allow a certain proportion of fish to escape. The effects of poaching and illegal trade are not limited to the depletion of sturgeon stocks. They also result in a reduction of the quality, reputation and therefore price of internationally traded caviar. There is a mixing of caviar from different species, lack of washing, adding of the wrong amount of salt, mis-labelling etc. This leads to a lower-quality product, a deterioration of the image of "Russian Caviar", and a resulting drop in price. As an illustration of this, between 1990 and 1993, when control of the Caspian's sturgeon fisheries was effectively lost, the volume of caviar traded internationally *increased* by 30 percent, but the value of the trade *decreased* by 5 percent.

Habitat destruction: Loss of spawning grounds due to dams, and possibilities of circumventing these. The availability of spawning grounds is crucial to the natural reproduction of sturgeon species. As noted earlier, the damming of the major rivers feeding into the Caspian, and in particular the Volga, was a significant factor in the decline of sturgeon stocks towards the end of the 20th century. Furthermore many of the accessible grounds have been destroyed by silting. The Ural is the last free-flowing river feeding into the Caspian, with only the upper part having been dammed to construct the Iriklinsk reservoir, and it is the only one in which sturgeon still reproduce naturally. However, very little reproduction is taking place there; it is thought that the spawning population has been destroyed by a combination of poaching and pollution. (Speer et al 2000).

Water Pollution/Oil spills. The third major problem facing the reproduction and quality of sturgeon stocks is the decline in recent decades of the water quality of the Caspian Sea. A key factor here is the fact that 10 million people live adjacent to the Caspian, with 60 million more living in Volga watershed. This section looks solely at the routine pollution from economic activity. The issue of oil spills is discussed in Section 3.3.

While much of the coastline of Kazakhstan and Turkmenistan is undeveloped, the water at the Southern end of the sea is polluted by sewers and industry, in particular the oil and mining industries, from the five states. The majority is accounted for by sewage and waste from industry. The World Bank estimates that one million cubic metres of untreated industrial wastewater empty into Caspian annually. One problem area is the Azeri city of Sumgayit, which was planned as a centre for petrochemicals industries, with the result that hundreds of thousands of tons of toxic wastes are emitted each year to both air and water, resulting in a "virtual dead zone around city and Baku" (US Energy Information Agency 2000).

Pollution has had a severe effect on human health and both water and land quality. In Kazakhstan, people in the Caspian region are four times more likely to suffer from health conditions such as blood disease and tuberculosis than the average Kazakh. This is thought to be mainly due to oil-contaminated drinking water. In Baku, reproductive problems such as increased miscarriages and stillbirths have been observed. Fish populations, including sturgeon, have been badly affected by pollution. Since the late 70's fish have been observed to suffer from hepatotoxic hypoxia, or muscle blistering. Pollution also affects the reproductive potential of sturgeon, although the precise nature of the effect is not currently known.

3.2.2 Possible Technical Solutions

Replacement of natural reproduction by means of aquaculture, including hatcheries. While natural reproduction is the most desirable outcome, a significant level of this is some way off, and in the meantime alternative means are required to prevent the disappearance of sturgeon species. Aquaculture can be used to control the entire life cycle of the sturgeon, or only part of it, for instance by using hatcheries to breed sturgeon artificially and release young fish in order to replenish stocks. The Soviet Union began programs for artificial reproduction in the 1950's, in the Volga and Kura rivers and in recent years these hatcheries have provided an essential function in maintaining recruitment to sturgeon stocks. The condition of these hatcheries, however, is critical; without modernisation and repairs they are likely to close. There are fears that with the sturgeon's natural environment worsening, the provision of hatcheries does not guarantee the preservation of the species (Williot 1997). An alternative is to breed and exploit sturgeon in captivity, while allowing the regeneration of natural stocks in the wild. This has achieved some success in Russia since 1994, when the BIOS research centre for commodity sturgeon rearing was established in Astrakhan.

Almost all these measures, however, generate benefits across national boundaries. This means that any one country, looking narrowly at its own benefits and costs, will not undertake as much action as would be globally desirable. If all countries do that, the level of action will be well below the optimal. The only way out of this impasse is international cooperation, with each country committing to actions that are in the regional interest. Analysis has shown (Aruero and Zuleta 1994) that, with transboundary fish stocks, co-operation will always produce a better outcome in terms of the total benefit of the fishery than non-co-operation.

3.2.3 Management Solutions for the Sturgeon

As noted earlier, the economics literature shows that where one party undertakes an activity that results in costs or benefits to another party, the first party is unlikely to account for these external effects, and will therefore not carry out the activity to the socially efficient extent. This problem applies to several aspects of the problem of managing the Caspian Sea's sturgeon stocks. If individual nations regulate their fisheries industries to maximise the returns from their fish stocks, and do not account for the fact that they share fish resources with other nations, the management of the fish stocks is likely to be inefficient, and aggregate effort will be greater than the efficient level. Some form of international agreement on action is essential if success is to be achieved in this area.

There are various policy options for this agreement, *the most attractive of which remains the one that restricts total allowable catch (TAC) to the sustainable and efficient level, while minimising the costs of landing this catch.* A TAC quota for each country, with additional restrictions on size, fishing location and season, is thought to be the best method of achieving conservation aims and increasing the rents from transboundary fisheries. Allowing these quotas to be tradable would increase efficiency. There are other actions which can also contribute to the solution and which also need some international agreement. One is for each country to invest in hatcheries. It can easily be shown that if each country invests in hatcheries to the extent that it is only compensated by an increased catch in its own territorial waters, the level of investment will be sub-optimal. Any such investment benefits other parties as well and they should make some contribution to the country that provides the increased stock. Models for working out how much each should pay exist, but it does need trust and verification possibilities to arrive at an agreed solution.

Implementing a joint management of the stocks by all of the littoral states requires: (i) identifying the sustainable catch level, (ii) finding the most cost-effective way of limiting total catch to a sustainable level and (iii) dividing this total catch among the littoral states in a way that is perceived to be fair (iv) compensating countries that make investment that benefit all parties. This is likely to involve rewarding states, by increased share of the total quota, for their contributions to stock reproduction by investment in hatcheries and the maintenance of spawning grounds, and possibly for reductions in pollution.

Any action, even if agreed at the regional level, is likely to fail, however, given the extreme economic problems facing many people in some of these countries, especially in the Former Soviet Union. The ability to police the actions of small fishermen is simply not there, and a commonality of interest between the ‘police’ and the local communities will result in many a blind eye being turned. The only way to address this is to ensure that any program limiting catches is accompanied by a complementary program of coastal community development, which offers credible alternatives to the individuals who are currently making a living from banned and gray activities related to the sturgeon. This is something where the international community can help and indeed some of the actions discussed in Section 4 are based on that. But the Caspian program is only a start and much more can be done, with relatively small outlays resulting in significant environmental and social benefits.

3.3 Oil Spills

The extraction and transportation of oil and gas is associated with significant oil spills, which cause substantial environmental damages to the wetlands aquatic and shoreline birds, and marine mammals such as seals. An analysis carried out by the World Bank has shown that the risks of spills are highest from the abandoned Kazakh flooded oil fields in the vicinity of the Tengiz field in the North Caspian. The crude oil there is very heavy and waxy and any spill could affect an area as large as 100 square kilometres. Once a spill occurred it would cause also great damage to the caviar exports from the region as well as the developing tourism business. The second most risky area from an ecological point of view is the Kashagan field, which has already been mentioned in Section 2. The potential consequences of a spill here would include damages to the abundance of marine mammals and habitats for 33 million migrating birds, as well as choking off local fishing and tourism. Other activities where the risks from oil spills are significant include the barging of oil (especially from Aktau to Baku) and the activity at the Gunashli oil field in Azerbaijan and the promising new Russian sector LukOil field.

The above study has concluded that environmental damages from an oil spill in the region are around $2600 per ton of oil spilled, and would occur over a period of 6-10 years. These refer only to losses of tourism and fisheries and other third party damage claims, and exclude losses from taxation to the government as well as the losses from delays in the operations at the oil field. Moreover they exclude losses associated with the environmental damages *per* se, i.e. the losses referred to as 'non-use values' measured in terms of the willingness of individuals who do not visit the area to pay for its conservation. In addition to the damage costs there are clean up costs of around $1000 per ton spilled. Typical spills, if they occurred would be of the order of 10,000 to 30,000 tons, implying environmental damages in the range of $26 million to $78 million and clean up costs of $10-30 million. Most importantly the environmental losses would be borne by those least able to cope with them – those engaged in tourism and fisheries.

Actions to address this problem are classified under the following headings:

- Development of coordinated safety and loss prevention programs by operators of fields
- Introduction of state of the art preventive measures
- Replacement of Soviet era platforms that are in poor condition.
- Reduced impacts of spills in sensitive areas by spending $10-20 million to cap wells

- Clear assignment of responsibility for oil spills planning and response, particularly for the abandoned, flooded wells near Tengiz where the owners are now defunct former Soviet oil and gas organizations
- Establishment of stockpiles of equipment to fight spills. The likely capital cost of this is estimated at $30 million.
- Extend insurance coverage for spills to exploration, production and pipelines so that compensation for claims can be met.

By and large these measures are not excessively costly for the oil companies who are active in this area and who can meet the costs of the proposed measures, which are estimated at around $30 million a year, excluding the costs of increased insurance cover. They would reduce damages from spills by around 50 percent and substantially lower the probability of a spill. Oil production in the Caspian from Azerbaijan, Kazakhstan and Turkmenistan alone amounts to around 1.3 million barrels a day. At a price of even $20 a barrel, the revenues amount to $9 billion a year, and an annual cost of $30 million is a drop in the ocean[7]. One stumbling block is the fact that some risks come from past operations. It is imperative for the littoral states to ensure that these risks are minimised and appropriate actions taken as soon as possible. The Caspian Environment Program is an important vehicle for ensuring that all these actions are indeed taken (see below).

[7] It was not possible to get figures for production in the Caspian shelf from Iran and Russia.

4 Cooperative Policies for Stabilizing the Environment

4.1 Background

In the discussion so far we have stressed the need for cooperation in addressing the environmental problems. In some respects the omens are good: despite their political and social diversity, the people of the region share a common concern for the Caspian. While a Framework Convention for the Protection of the Marine Environment of the Caspian Sea is being developed under the auspices of UNEP, no Caspian – specific regional environmental convention or treaty exists as yet although progress toward one is substantial (See Box 1). The Caspian littoral countries have demonstrated some commitment to joint efforts and are urgently seeking to address problems caused by sea level fluctuations in the Caspian, and are also grappling with greatly reduced catches of fish (especially the valuable sturgeon). The five littoral countries also share common problems with pollution abatement and control from municipal and industrial sites in the Caspian basin, from the exploration and development of hydrocarbon resources, as well as contributing non-point source contaminants from agricultural sources.

Box 1:

A FRAMEWORK CONVENTION FOR THE CASPIAN

In November 1996, UNEP convened a meeting of experts in Geneva to address recent developments in the Caspian's legal status, and work out the basic elements for a Framework Convention for the Protection of the Marine Environment o fhe Caspian Sea. The Framework Convention is to include pollution prevention, reduction and control; protection, preservation and restoration of the marine environment; procedures to fulfil the obligations contained in a Framework Convention; and formation of the Organization for the Protection of the Marine Environment of the Caspian Sea. Work is proceeding to develop a draft Framework Convention, which was considered by the Caspian states at a UNEP meeting convened in Moscow in February 1998. Progress continues on this notwithstanding ongoing difficult negotiations regarding the legal status of the Caspian, and the implications regarding the corresponding delimitation of exclusive economic interest zones. At present all but one country (Turkmenistan) are prepared to ratify a convention.

4.2 The Caspian Environment Program (CEP)

4.2.1 The Role of a Regional Sea Program

A major interim forum for cooperation in this region is The Caspian Environment Programme (CEP). The overall goal of the CEP is to 'promote the sustainable development and management of the Caspian environment'. The programme draws extensively on lessons learned from other regional seas programs, such as the Baltic and Black Sea Programmes, and the Mediterranean Environmental Technical Assistance Programme. These more mature programmes have demonstrated that regional environmental cooperation can provide an effective forum for relevant agreements or conventions among parties (See Box 2 below). The rationale behind such a program is the recognition that, left to themselves, the littoral countries would probably not forge a consensus on what actions to take and would most likely not implement the actions they may agree upon. The reasons are primarily two. The first is poverty: the newly formed states have very few resources to devote to environmental protection, which is, generally, long term in its impacts. Not spending something today on protection does not immediately compromise the functioning of the economic systems in this countries. In this respect external resources are vital to the success of any cooperation and CEP is a vehicle for these to be made available to the region. Second, there is need to establish trust between the member states and that is a slow process, which best proceeds through smaller confidence building measures, such as joint programs of training, monitoring, research and the implementation of pilot projects where benefits are shared. Both of these reasons mentioned require some external agency to be involved in the process and this a second role for the CEP.

Having noted the importance of an external agency in the cooperation it is critical that it not pre-empts the role of the member states – they have to implement the projects and they should be principally involved in identifying the programs that should be funded. Following on from that, the states should also have an important financial stake in the success of the programmes. Unless this is the case, the CEP will be leading a supply driven agenda that will not succeed in its objectives.

Box 2:

LESSONS LEARNED FROM OTHER REGIONAL SEAS PROGRAMS

Other sea programs that are relevant to the Caspian include the Mediterranean Environmental Technical Assistance Program (METAP) and the Black Sea Environment Program (BSEP) the Danube Basin Program and the Baltic Sea Program. The process of developing Strategic Action Programs (SAPs) under the Danube Basin Program and the BSEP provides insights and experience in the process of national/regional/international team cooperation dealing with multi-country environmental programs. The Baltic Sea Environment Program provides a successful model for cooperation between international organizations and countries around a common environmental objective, and offers useful lessons on the use of environmental data to drive policy decisions for investments and institutional change. The following lessons have been learned from the regional seas programs:

- *The government of each littoral state must be engaged at a senior level, and relevant Ministries in addition to Environment must be included in the policy decisions, including Foreign Relations, Fisheries, Industry, Privatisation, Energy, Agriculture and Education.*
- *Ensure that effective measures are selected for implementation, that assistance matches needs and does not exceed the absorptive capacity of countries, and that both countries' and donors' expectations for the program are realistic in terms of achievable timeframes and outcomes.*
- *Require country contributions to the program to help ensure that authentic national and regional views are integral to the development and implementation of program activities, and that each state has a real stake in the success of the program. Country commitment to the goals of the program can be measured by willingness to finance high priority investments from national budgets or loans.*
- *Recognize that longer term analytical studies should be accompanied by shorter term, immediate impact activities such as demonstration projects and projects identified and prepared through the Priority Investment Portfolio process.*
- *Blend international and local expertise in preparation of pre-feasibility studies, training and technical assistance tasks so as to benefit from both perspectives.*
- *Link ongoing national environmental programs and strategic planning efforts (e.g., NEAPs) with regional programs to ensure effective coordination of programs and mutual benefit through shared information and human resources.*
- *Recognize the critical role that stakeholders in the private sector and civil society can play, and create opportunities for such key stakeholders to work together.*
- *Appreciate that the process of interaction within the program, for example, to prepare a regional Strategic Action Program, to identify projects for investment, to manage implementation of tasks – can make a valuable contribution to establishing the working relationships and policy steps needed to solve environmental problems.*
- *Bear in mind that national or regional action plans should focus on activities that are financially and institutionally feasible for the countries concerned in the foreseeable future, rather than aiming at specific target levels of pollution reduction.*

4.2.2 Challenges in Implementing a Regional Caspian Program

What are the main challenges that one faces when implementing a cooperative program such as the CEP? *The first is the problem of management*. Statutory, administrative and procedural capabilities for environmental administration and management are weak in many countries in the Caspian region. Some are in the process of updating their laws for environmental management, and effective implementation is sporadic. Administrative structures tend to be biased towards inspection and enforcement, rather than education, information and compliance. CEP measures to address environmental policy and management needs provide assistance in the following topic areas: (a) institutional development and capacity building (including legal and regulatory issues); (b) integrated coastal zone management (including sea level fluctuation) and (c) development of a Framework Convention for the Protection of the Marine Environment of the Caspian Sea.

The CEP embraces three categories of activities:

(i) *Caspian Regional Projects*, such as the Bio resources Network that involve two or more Caspian countries.
(ii) *Associated National Projects,* that are ongoing or planned activities specific to one country that contribute to improved environmental management of the Caspian on a national basis.
(iii) *Associated Regional Projects or Programs,* that provide support to Caspian regional or national tasks. Examples include interstate (regional) programs supported by EU/Tacis in the CIS countries on NEAP development, public awareness, and widening the Environmental Action Plan (EAP) process to facilitate project preparation.

Second there are institutional development and capacity building issues. Effective regional cooperation will require effectively applied and harmonized national legislation, standards and environmental regulations, based on agreed common environmental standards, a regional chemical and oil pollution incident preparedness plan and a Caspian regional Strategic Action Program (SAP).

Various partnerships are critical to the cooperative process in the Caspian. Three types of partnerships are needed to help the region meet its environmental and sustainable development challenges: first, partnership at the national and local levels among different government agencies, and between government, the community, and polluting enterprises; second, partnership at the regional level between the Caspian countries; and third, partnership at the international level between the international

finance community, the Caspian countries, bilateral assistance programs, and international companies that have a great interest in the region. The Caspian Environment Program (CEP) is a mechanism through which each of these partnerships can work for the region.

Partnerships Between the Caspian Countries. The littoral states need to develop a partnership because most actions will have to be coordinated between them and there has to be some conviction on the part of each that the others will honor their part of any agreement. As noted earlier, this is a slow process but one that has to progress so that, eventually, the external agencies disassociate themselves from the process and leave it to the countries to management any cooperative programme.

International Partners. Because the Caspian is a resource that has attracted significant international concern, there is a need for wide consultations with international partners on the contents of a strategic approach to address the region's environmental problems. This process has already begun, through ongoing intra-regional meetings and negotiations, consultations with international organizations such as the EC, UNDP, UNEP and others. In addition, direct dialogues between private sector, scientific and academic experts, non-governmental interests, and governmental representatives in the region will be an important aspect of the program, to generate undertakings with tangible results. This process can mobilize technical expertise and private capital, and stimulate cooperative action including contracts which address the key issues facing the Caspian.

The European Union's Technical Assistance for the Commonwealth of Independent States (Tacis) Programme has allocated resources for the Caspian environment, to support the regional Program Coordination Unit and Caspian Regional Expert Centres, as well as identify and prepare investment projects in cooperation with the World Bank. Collaboration with national bilateral programs and private sector initiatives operating in the Caspian region is also anticipated. The GEF has also provided funds to prepare a proposal for the "Caspian Environment Programme", to be implemented by UNDP.

Private Sector Partners. One approach, which will help to ensure concerted and harmonized environmental activities by the littoral states is to create transnational networks and public-private partnerships, to take actions in the stakeholders' mutual interest and to enhance the sea's sustainable development and protection. In this context, the role of *Oil companies* operating in the Caspian region is important. They can work with the CEP to help ensure the adoption of environmental management systems (e.g. ISO 14000), with which the oil companies are familiar, by government bodies and others to minimize waste and prevent pollution in their various operations

in the Caspian (exploration, extraction, refining, shipping); develop emergency preparedness and response systems; take a proactive role to improve the environmental provisions in concession agreements under negotiation and express their views on the feasibility of regulations under consideration by the Caspian governments (i.e., engage in regulatory negotiations). (see discussion in Section 3.3).

Similarly, representatives of international caviar trading companies could also be encouraged to participate in and contribute to the CEP to help prevent the collapse of the wild sturgeon fishery. For example, specific measures could include practical advice regarding implementation of the new export and import certification and inspection regime for sturgeon products that took effect in April 1998.

Non-governmental organizations (NGOs) can play an important and constructive role in the environmental management systems of the Caspian, particularly with regard to monitoring of the environment and informing the public of any violations of environmental standards, and working with local fishermen, to ascertain if environmentally sound methods used in other locales would be relevant to their situation.

4.3 Priority Investment Needs

What are the priority investment needs for the cooperative program? The main investment needs that have been identified are as follows:

Restoration of fisheries. Restoring the sturgeon resource is a top priority from both the biological and economic perspective. Any investment in hatcheries or other protective measures must, however, be supported by an agreement to limit catch and to share benefits between member states on an equitable basis.

Protection of Other Biodiversity. Sustainable management of natural resources requires a sound information base, adequate knowledge of natural processes, and understanding of the inter-relationships between living resources and between them and their environment, as well as their range of tolerance to environmental stress. The first activity in the immediate future therefore will be to undertake a survey of the bio resources developments, uses, values, impacts and threats for the Caspian coastal zone of each of the five littoral states; prepare National Reports on the State of the Caspian Environment and synthesize the five national reports into a Regional Overview on the State of the Caspian Environment. On the basis of this a monitoring program targeted to specific parameters, and undertaken according to agreed, consistent procedures may be initiated. Other measures that are urgently needed include prevention of

accidental introduction of exotic species (e.g., via shipping through the Volga-Don Canal) and establishment of a joint regional database, including the *Caspian Bio-resources Network*, as the repository for environmental and resource information for use by all partners.

Tourism and rural development. Establish basin-wide tourism opportunities, with streamlined entry/exit formalities, to allow access to nature reserves, scenery, and unique aspects of the cultural and historical heritage of the region. Initiate rural development programs that offer alternative livelihoods to local communities, of which tourism could be a part.

Monitoring Systems. Environmental research, monitoring and data collection and analysis capabilities have been generally adequate throughout the region, and very strong in places. However, in many cases investments have not been made to upgrade and modernize equipment and personnel skills, and funds for supplies, maintenance and spare parts are lacking; the monitoring network that existed in the former Soviet Union has been dismantled and is not currently functioning, although it could probably be restored with an infusion of resources.

All this will have to be built up in stages, as funding is a problem and remains a major constraint. Most importantly, the programs need to have national ownership and commitment if they are to succeed. This may necessitate some complementary actions on the part of the CEP. As an example consider the sturgeon program mentioned in Section 2. Many of the actions proposed to address that problem would need national governments to be sure that, for example, quotas commitments would be respected by all parties. At the same time complementary programs for rural coastal development would ensure credible alternative sustainable livelihoods for the people.

5 Conclusions

The countries that emerged from the former Soviet Union (Azerbaijan, Kazakhstan, Russia, and Turkmenistan) are confronting difficult economic and administrative adjustments that complicate environmental management and natural resource protection efforts. All of the littoral countries are urgently seeking to address problems caused by recent water level change in the Caspian, and all are also grappling with greatly reduced catches of fish (especially the valuable sturgeon). The five littoral countries also share common problems with pollution abatement and control from municipal and industrial sites (especially in the oil and gas sector), and from agricultural sources in the Caspian basin.

This paper has stressed the importance of cooperation between the states in solving these problems. In the light of the massive economic and social problems they face one can understand why they are not moving as fast as one would wish in this area. But to ignore it can have very serious consequences. The exploitation of the oil revenues may benefit the country as a whole but it does not appear to provide enough for the poor local communities that depend on the natural resources of the Caspian for their livelihoods. For them the decline in the value of these resources is a major critical issue.

The international community must also play a role to promote cooperation within the region, although it has to careful to ensure that it does not end up pushing a supply driven program. The Caspian Environment Program provides an example of the kinds of things that need to be done. More resources will be needed, however, to achieve the goal of sustainable development in the region and perhaps more can come from the oil companies. They have a long term stake in the region and the need for corporate responsibility on their part should extend to wider support for the whole eco-system, not just the direct implications of oil extraction and transportation. The countries too can, and should, allocate some more funds for the sustainable development of the region. But most importantly, they should develop joint programs, that coordinate action and see that no one tries to ‘free ride’ on the good actions of the others.

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