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Social Assessment of the  
Azerbaijan National  
Environmental Action Plan:

A Focus on Community Responses  
to the Caspian Sea Environmental  
Disaster

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*Ayşe Kudat*  
*Ahmed Musayev*  
*Bulent Ozbilgin*



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*This SA is dedicated to Professor Ahmed Musayev, Director of the Sorgu Institute for Applied Social Science Research and the founder of the Azerbaijan Social Science Network. Professor Musayev died in December 1997, an an early age. His contributions to innumerable social assessments of Bank projects are invaluable.*

# 1. Overview

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## Objectives

The SA represents a partial attempt to identify stakeholder perspectives for priority environmental action in Azerbaijan within the framework of the National Environment Action Plan (NEAP). At the outset of the preparation of the NEAP, the intention was to:

- Systematically identify social development and participation issues that resulted in segments of the population suffering from environmental problems and/or hindered their ability to affect improvements in their environment
- Define a sustained participation framework to ensure stakeholder needs are integrated in environmental planning and management
- Identify appropriate institutional mechanisms to ensure that environmental action is inclusive and responds to the needs of the poor and the vulnerable
- Propose a monitoring and evaluation framework, including social impact monitoring, for the management of the environmental agency and for environmental projects.

## Achievements

The SA objectives were planned to be met in several stages:

1. Develop an understanding of environmental priorities of communities affected by the rise of the Caspian Sea
2. Reach out to the rest of the population, with a focus on internally displaced people, and rural and urban residents
3. Use this information as representing the views of the ultimate stakeholders (the people at large) and facilitate other stakeholder (including institutional agents) consultations around them
4. Analyze existing local and national environmental planning and management processes to facilitate sustained stakeholder participation
5. Organize stakeholder workshops to integrate social development and sustainable participation concerns into the NEAP.

However, as a result of budgetary constraints only 1 and 5 of the stages outlined above were carried out. As such, the

SA presented here represents a partial effort. In the main body of the SA report, the main findings of the participatory information-gathering efforts carried out in the Caspian Sea communities are summarized and the implications for the NEAP and the follow-up investment project are presented. Information available through other SAs carried out by the Azerbaijan Social Science Network also drew attention to environmental priorities of displaced populations—namely, demining.

### **Participatory Process and the NEAP**

The NEAP process was carried out by a joint team of Azerbaijani professionals, international consultants and World Bank staff, supervised by a high-level governmental steering committee. During the process, a multidisciplinary team of local experts prepared environmental and natural resource sector studies and analyzed environmental issues within their physical, sectoral, and institutional contexts. Experts from the Committee of Ecology, other governmental and nongovernmental organizations, the Academy of Sciences, and representatives of local administrations, industries, ministries, the media, universities and regional authorities were closely involved throughout the development of the NEAP and, in particular, during the identification and discussion of national environmental priorities and criteria for ranking those priorities.

Within the NEAP, about 50 different actions were recommended to address existing environmental damage and to prevent more damage in the Caspian communities alone. To carry out all these actions would have been beyond the financial means of the government; thus, setting priorities was particularly important. The SA, based on people's views, assisted the NEAP team in using the following criteria in prioritizing these actions:

- Extent of social and human damage
- Danger of irreversibly losing natural resources
- Adverse employment conditions, loss of income, and other economic hardship to be suffered by impact populations.

Using these criteria, the SA pointed to the following priority actions:

- Relocation of households in the affected regions of Neftchala, Lenkoran, and Astara
- Prevention of secondary pollution of the sea from oil-related activities
- Restoration of some of the Sea-based industries and re-creating the jobs lost as a result of damage to these industries
- Restoration, relocation or protection of infrastructure of national importance, such as critical land-based transportation links.

The participatory approach helped incorporate citizens' needs and priorities into the national planning process. It promoted greater ownership of NEAP objectives and follow-up action. The process also increased the visibility of environmental institutions within the government, as well as in the country as a whole. In addition, environmental awareness was enhanced and the capacity of institutions dealing with environment was strengthened. During the NEAP preparation, media coverage of environmental issues increased and civil society organizations, including national associations of women, took greater interest in environmental protection. However, ensuring sustained stakeholder participation in the environment may prove difficult due to the pressing economic and political



problems the Republic is facing.

### **Project Implications**

To make sure that implementation of the most pressing actions would not be delayed until the finalization of the NEAP, the Urgent Environmental Investment Project was initiated in 1997, financed by the World Bank and other donors. This project represented a first step toward NEAP implementation in Azerbaijan and addressed the following components:

- Sumgayit city mercury cleanup
- Sturgeon hatchery development
- Oil pollution mitigation
- Institutional strengthening.

The SA's contributions were limited<sup>1</sup> to developing the sturgeon hatchery, but an earlier SA on the Baku Water Supply and Sanitation Project had, in 1994, called attention to oil pollution problems.

The sturgeon hatchery component included in the Urgent Environment Investment Project that would help address the decline in sturgeon stock and would provide relatively high-income jobs to a number of people in one of the most economically depressed regions of the country. Additional incomes would be earned from fishing and caviar production, and trading. The service and manufacturing industries that support fishing and caviar production would also be aided. Thus, in the long term, the component would improve the sustainability of sturgeon fishing and caviar production and help preserve sturgeon's historic importance to Azerbaijan's culture and economy. Additional benefits include:

- Increasing the commercial value of sturgeon

- Protecting sturgeon from extinction
- Preserving the value of sturgeon as a source of medicine.

### **Social Development Concerns and Main Findings of the Socioeconomic Studies**

The key social development concern was for vulnerable populations. These were grouped into those once displaced by armed conflict that had returned (or intended to return) to their original homes, and those displaced or otherwise impacted by the environmental disaster caused by the rising level of the Caspian Sea. The concerns of the internally displaced populations (IDPs) were addressed through a comprehensive process of SA, initiated in 1994 and completed in 1998 (Brown 1998)<sup>2</sup> and through the Azerbaijan Pilot Reconstruction Project financed by the World Bank and other donors. The concerns of the populations affected by the Caspian Sea disaster were incorporated in the NEAP and in the follow-up Urgent Environment Investment Project as described above. While measures have been taken to strengthen national and regional institutions to oversee the relevant environmental actions, no specific social impact monitoring has been incorporated in the Project's Monitoring and Evaluation (M & E) component.

A series of consultative and systematic information activities was carried out in the preparation of the SA. In early 1996, a team of local social scientists and Bank social assessment specialist visited the Caspian Sea communities and carried out a rapid assessment based on ten focus group meetings and a large number of semi-structured individual interviews. The team also visited local government representatives and central government institutions. Secondary data were collected and the potential relevance of SAs carried out for

other Bank-funded projects was assessed. Subsequently, a team of local social scientists and members of the local Association of Women in Development were trained to carry out surveys and focus group meetings in affected areas as described in the rest of the paper. The findings were presented to the relevant government agencies and were shared with the NEAP team. They were also presented to the national stakeholder seminar organized to establish environmental action priorities for Azerbaijan.

## Main Findings

The following were the main findings of the SA:

- Income and employment are the most important concerns for local people living in coastal settlements of Neftchala, Lenkoran, and Astara. The rising sea level is perceived to be a priority concern only where it is recognized as a main cause of unemployment. In Neftchala, for example, most unemployment is perceived to be related to the sea rise because it was responsible for destroying the sturgeon hatcheries and fishing in that region. Consequently, the majority (almost 90 percent) of the people in this region views the rising level of the Caspian Sea as a priority concern. In Lenkoran and Astara, by contrast, the rising level of the sea is not perceived as a hazard. Although the rising level of the Caspian caused some households to suffer, region-wide impacts are less important than those in Neftchala. And unlike many of the residents of Neftchala, the people of these regions have access to other means of survival such as subsistence farming.
- Residents of coastal settlements experience severe health problems from exposure to poor sanitary conditions as a result of the sea rise. Seventy-one percent of Neftchala residents think that their health was better before the sea started to rise, and 36 percent indicate that their current health situation is poor; the situation is similar in other regions. All of these regions reported cases of asthma, tuberculosis, and rheumatism. In Lenkoran and Astara regions, in particular, there has been an increase in snakes and bugs in residential areas and homes due to a proliferation of swamps by receding sea water.
- The sea rise has serious indirect impacts on the level and quality of education available in these three regions, mainly because of the heavy damage to transportation and communication lines. Even though the majority of educational facilities are not directly affected by the sea rise, many roads are blocked and communication among settlements is, at best, irregular. Consequently, it has become extremely difficult to find teachers willing or able to go to schools. The declining quality of education further erodes the base on which new local development initiatives can be started. Unless the road infrastructure is improved and the local educational institutions start functioning, the future could result in further economic decline in the coastal settlements.
- Local basic infrastructure has deteriorated due mainly to the effects of the sea rise as well as poor construction. Electricity is the only source of energy for most people, but the supply is unreliable. In each of the three regions surveyed, rising ground waters have had a significant effect on the water supply. In most cases, good quality drinking water is not available. People usually

have to fetch water from a distance, and in most cases, pay for the water. A majority of households that cannot afford to pay, use poor quality water, which results in added health problems.

- Households in the city of Baku are not directly affected by the sea rise. In the suburbs of Baku, there are very few cases in which the rise in sea level has directly affected houses. Most concerns stem from the economic and environmental effects of the sea rise, such as the blockage of sewerage lines and the deterioration of production enterprises.
- For most households in the affected communities, migration to other regions is not viewed as a desirable option. But a large percentage of the population who are directly affected would be willing to move to other areas of the same village. Even though some relocation has been undertaken by the authorities, it has been limited in scope and in most cases, falls short of the real needs of people. Many households that do not want to migrate do so because they do not want to change their lifestyle. Some families think that they can stay in their homes until they are directly affected by the rising sea. Others continue living in homes that are largely inundated by sea water. Their main reasons appear to be their perception that those resettled are not faring well. While migration is not a desirable option for most households in affected coastal communities, relocation will be acceptable if livelihood in the new locations are sustainable. Any actions involving relocation should consider its long-term sustainability with respect to further (indirect) impacts of the sea rise (for example, further salinization of the land, lack of transportation, lack of basic infrastructure, lack of opportunities for alternative employment). Furthermore, these three regions have different socioeconomic characteristics (for example, Neftchala has oil wells whereas Lenkoran and Astara are on an important international railway route). Different measures for different regions should be envisioned.
- Most people trust the central government and think that their problems can only be solved through government intervention. Favoritism, together with adverse conditions caused by the sea rise and economic conditions, have caused people to lose trust in local administrations. Therefore, people do not have many expectations with respect to local governments. If they have a choice, they prefer to give local governments a limited role in further impact mitigation. They expect the central government to take the initiative to start mitigation measures in collaboration with international organizations who are experienced in such activities.
- Because the adverse impact of the rising sea levels vary widely from one region to the other, a case-by-case assessment of the affected communities is necessary to achieve maximum protection. In some settlements, for example, almost half the villages have been destroyed by the sea. In other settlements, by contrast, only a small number of households are directly affected. In designing mitigation strategies, therefore, it is important to assess the actual level of damage in each settlement.
- In one area, it is possible to reverse economic conditions by improving the fishing industry. The relevant investments recommended by the

communities include: drainage works in the delta of the Kura River to deepen the river and restore the operation of fishing boats (it is believed this measure will allow fish to swim into the mouth of the river and will revitalize the operation of fishing stations); constructing a canal extending from the Kura River to the Caspian Sea to ensure the flow of Kura waters into the sea, thus enabling fishing boats to move and restoring fishing stations; and supplying the necessary means to help create fishing teams, including the reconstruction of the fish plant for selling fingerlings.

- There is a clear need for timely and accurate information regarding the cyclical nature of the sea rise, expected sea level changes, and future mitigation measures. Although people are somewhat aware of the cyclical nature of the sea rise, some believe that the sea level has stopped rising, and is now regressing. This perception, coupled with peoples' desire to stay in their birthplaces (often located on valuable pieces of seaside land), cause them to stay in heavily affected areas and

undertake only limited measures to save the day until the sea returns to its former levels. Recognizing the uncertainties surrounding the sea rise, residents in all three regions expressed a need to forecast the sea rise through scientific methods requiring the involvement of international organizations. Perhaps more importantly, long-term land use regulations are required to ensure future safety.

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- <sup>1</sup> Since the onset of the NEAP in 1996, the water level in the Caspian Sea has declined slightly. This has significantly altered the relative order or priority action in the NEAP as protection measures became less urgent, and time was gained to develop a coastal zone protection plan before new areas were flooded. Nonetheless, the damage was pervasive, with substantial social, environmental, and economic costs. Moreover, damage is on-going in some areas, because of wave action and significantly higher groundwater levels.
  - <sup>2</sup> Jonathan Brown. *Listening to People in Azerbaijan, Post-Conflict Reconstruction: A User's Perspective*. The World Bank. 1998.

## 2. Background

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Among the republics of the Former Soviet Union (FSU), Azerbaijan has the most severe environmental problems. The country inherited (from the Soviet period) an inefficient environmental management system and massive environmental degradation related to the high level of industrial development (particularly oil extraction and processing, chemical and metallurgical production in the Absheron peninsula where the capital, Baku, and the industrial city, Sumgayit, are located). In addition to these environmental concerns, the Caspian Sea level is rising rapidly, flooding industrial, urban, and agricultural lands.

The Caspian Sea, the biggest inland sea body in the world, is approximately 1,200 km. long and, on average, 320 km. wide with a total area of 350,000 km<sup>2</sup>. The total length of the coast is 6,500 km, of which 800 km belong to Azerbaijan. Fishing, especially for sturgeon, is important to local economies. The sea is also rich in natural resources such as oil and natural gas. Currently, a serious environmental concern for the Government of Azerbaijan is the cyclical rise of the Caspian Sea level. Historically, the sea level has fluctuated greatly. In 1977, the lowest water level of the last 500 years was recorded –29 meters below ocean level. In the last two decades, the water rose two and a half meters to 26.5

meters below ocean level. The sea is expected to continue to rise until about 2020, when it is expected to reach the level observed in 1900 (25 meters below ocean level). The principal productive sectors affected by the sea rise are the oil and gas industry, chemical industries, agriculture, and fisheries.

Apart from the long-term fluctuation of the average sea level, there are also seasonal fluctuations ranging from 20 to 55 cm. This results from seasonal fluctuations of the inflow of rivers and evaporation. The sea reaches its highest level in June and July. Due to the direction of winds and changes in atmospheric pressure, the level may rise as high as 80 cm. Tidal variations are limited to 2 to 6 cm.

The Kura River delta (Neftchala region) with impacts on sturgeon fisheries, caviar production and sturgeon processing plants and the southern areas of Lenkoran and Astara with impacts on housing, transport, and energy infrastructure are among the priority areas identified. In addition, large parts of the Absheron Peninsula, including Baku and Sumgayit, where rising Caspian and groundwater levels may cause severe pollution by flooding old oil fields and waste ponds, sewage systems, and hazardous and radioactive waste sites are also priority areas to be considered.

## Neftchala Region

The city of Neftchala is located 170 km. south of Baku in the delta of the Kura River. At its current level, the town is only a few meters above the sea level. The local economy heavily depends on sturgeon hatcheries and cotton production. The total land area of the region is 1,500 km<sup>2</sup>. According to local authorities, the population of the region is 67,700 of which 19,300 live in urban areas (28.5 percent) and 48,400 live in rural areas (71.5 percent). Most areas in the region are flat and below sea level. The oil field of Neftchala region is located 12 km to the south of the mouth of the Kura River. After iodine and bromine were discovered in the region, an iodine-bromine plant was also set up here; however, the plant is currently not operational. The main agricultural products are cotton and grain. The total area of land that can be used for agriculture is 49,300 ha. Fishing is one of the most important sources of income: the region has the biggest fish plant and largest fishing grounds of Azerbaijan. However, this industry has been damaged by the rise of the Caspian Sea, greatly affecting the livelihood of residents.

According to the data provided by executive authorities of Neftchala, the rise of the Caspian Sea level has already affected 2,866 ha. in the region which has a coastal line of 17.5 km. Overall, eighteen settlements along the coast have been affected.<sup>1</sup> In addition, 210 oil wells, which used to produce 142 tons per day, have been affected by water. Other facilities and infrastructure that were damaged due to the sea level rise are: roads (40 km., of which 20 km. belong to the state and 20 km. belong to the local administrations), electric and communication lines (50 km.), oil and gas pipeline (35 km.), Neftchala iodine-bromine production association, agricultural land (1,500 ha), pastures and wildlife preserve,

fishing plants,<sup>2</sup> and 500 households in various settlements.

In addition to large parts of the region which are already flooded, the level of the Kura River is also rising with the sea level. Major portions of the sturgeon hatchery in the region are permanently flooded and the rest have been damaged during storms. Buildings of the hatchery have also been flooded several times. The production capacity of the plant is currently about 20 - 30 percent of what it was before.<sup>3</sup> Revival of the hatcheries is of great economic importance as Azerbaijan's sturgeon and caviar production is directly linked to the number of fingerlings released.

Impeded drainage, the rising ground water levels and salt water intrusion during storms cause salinization of the land in the region. As the sea rose, the mouth of the Kura River became partially blocked by sedimentation caused by the fluctuations of the sea level, creating an obstacle for fishing boats. To keep the river accessible for boats, a canal has been constructed, which reconnects the river and the sea. However, flooding has occurred several times even around the canal. Therefore, the local economy is heavily affected by the sea rise and living conditions have considerably worsened.

## Lenkoran Region

The territory of Lenkoran region is 661 km<sup>2</sup>. Its total population is 190,000 people, of which 58,000 (30.5 percent) are urban and 132,000 (69.5 percent) are rural. Lenkoran is the most densely populated region of Azerbaijan. There are two cities, Lenkoran and Port-Ilich, and eighty villages in the region. Average population density is about 230 people/km<sup>2</sup>. The territory of the region is not flat—there are both plains and mountainous areas. The economy of the

region depends on agriculture. The main products are vegetables and tea, but the region is also well-known for its citrus plants. There are 27 industrial enterprises in this region, which include 2 vegetable/fruit canning plants, 6 tea plants, 2 fish processing plants, 3 textile plants, 3 car building plants and 1 electronics plant.

According to information obtained from regional authorities, around 850 households are affected by rising sea levels along the coast, which has a total length of 40 km. In Lenkoran town, for example, 672 houses and 18 public buildings along the coast have been evacuated due to permanent flooding. In addition, the economy of the region is also heavily affected. The Narimanov fish plant, Lenkoran nutria facilities, and the Lenkoran branch of the Baku knitwear plant are closed. The total agricultural area covered by water is approximately 200 ha. In addition, 900 ha. of pastures and 90 ha. of wildlife preserves have been lost to floods.

### **Astara Region**

The total area of this region is 616 km<sup>2</sup>. Its population is 77,000 people, of which 17,000 are urban (22 percent) and 60,000 rural (78 percent). There are fifty-six villages and one city in the region. The local economy depends on tea and vegetable production as well as on fishing. As in Lenkoran region, citrus plants are cultivated here. According to information obtained from local authorities, around 30,000 people are affected by rising sea levels: 560 households in the region are directly affected at the coastal line which is 21 km. long. Industrial enterprises and institutions that were affected include the Motor Vehicles Agency in the rayon, asphalt plant, and Shahagaci tractor park. In addition, 400 ha. of cultivated land in the region were washed away by rising water and another 600 ha. became marshland.

The main road to Iran, crossing through Lenkoran and Astara, is an important international road link. The railway passing through the region is heavily used to transport passengers and goods from Astara and Lenkoran to Baku. However, in some areas, the coast is so eroded that the railway and the roads have been undermined and washed away. The current condition of roads seriously hampers land transportation. In this area, coastal protection against the rising sea level and wave action is insufficient or completely absent.

### **Methodology of Social Analysis**

The main goal of the socioeconomic surveys and qualitative investigations carried out for the SA was to examine the social, economic, and psychological impacts of the Caspian Sea rise and the attitudes of the people living in the coastal communities of Azerbaijan. The specific objectives of the assessment were to assess the number of households affected by the sea level rise; determine the extent to which they are affected; explore the problems of households living in these coastal communities; explore these communities' responses to the environmental problems and their coping methods; assess their attitudes toward further rise in sea levels; and based on these findings, contribute to the NEAP process by making recommendations on actions for mitigating further impacts of the Caspian Sea rise.

Following rapid assessments and evaluation of secondary data, the socioeconomic analysis comprised interviews with 432 households in affected communities of Neftchala, Lenkoran, and Astara regions and seven focus group discussions in these regions and Baku. In addition, in-depth interviews were conducted in the communities and

discussions were held with local leaders. Table 1 lists settlement names, their populations, the number of households, and the number of families affected by the sea rise for settlements included in the sample. Interviewers conducted the survey by going into each of these settlements and interviewing every third house on all streets according to the numbers on houses. In case the house was empty, or the family did not want to be interviewed, interviewers proceeded to the next house. The sample is representative for coastal settlements at the region level. Settlements which are further away from the sea (and therefore not directly affected) are not included in the sample. Table 1 illustrates the official population data and data on the number of houses directly affected by the sea rise as identified by the interviewers. Official

statistics on affected households differ somewhat from SA findings. This is due partly to differences in the date of data collection and to the criteria used for classification. The SA results are based on people's judgments on the nature and type of adverse impacts.

## Analyses

### *Household Composition*

Households in affected communities are relatively large and many host a small extended family of a couple, their children, and a widowed parent. Family members help each other to cope with enormous difficulties imposed upon them both by the environmental disaster and by the transition. Out-migration from Neftchala

**Table 1. Population in Social Assessment Communities**

Region	Settlement Name	Population (thousands)	Households	Seriously Affected (relocated)	Partially Affected
Lenkoran	Lenkoran Town	46,000	9,000	672	n/a
	Por-Ilich town	11,182	2,049	50	170
	Narimanabad	7,100	1,400	70	150
	Veyli	4,000	800	13	50
	Sirinsu	2,000	420	0	50
	Siyavar	2,000	350	0	15
	<b>Subtotal</b>	<b>75,482</b>	<b>14,549</b>	<b>825</b>	<b>480</b>
Astara	Astara Town	20,000	3,500	50	150
	Gamishovka	200	40	5	20
	Shahagaci	7,000	200	25	130
	Kaladaniya	350	60	10	20
	<b>Subtotal</b>	<b>27,550</b>	<b>3,800</b>	<b>90</b>	<b>320</b>
Neftchala	Sarigamish	320	65	43	22
	Mikayilli	400	81	0	20
	Mayak - I	551	137	28	40
	Mayak - II	371	76	15	15
	Subh	336	72	27	25
	Banke	7,000	1,200	0	50
	<b>Subtotal</b>	<b>8,978</b>	<b>1,631</b>	<b>113</b>	<b>172</b>
<b>TOTAL</b>		<b>112,010</b>	<b>19,980</b>	<b>1,028</b>	<b>972</b>

Source: Local Executive Offices of Neftchala, Lenkoran, and Astara regions, 1996.



where employment opportunities have dramatically shrunk resulted in substantially smaller household size in this region: while in Lenkoran and Astara households room 5.6 and 5.4, respectively. In Neftchala, 4.6 persons live in a household. In Lenkoran and Astara, there are many Talish people who practice polygamy and value extended family traditions. This is yet another reason for larger household size in these regions. The out-migration of working-age populations from Neftchala is also reflected in the relatively younger composition of the households in Lenkoran and Astara: In Neftchala the average age of the household is 29, in the other regions, it is 27. Young people in Neftchala usually go to Baku, the capital, for work.

### *Income Levels*

Incomes throughout the communities affected by the rise of the Caspian Sea are low. In comparing these with incomes revealed by the poverty surveys for the

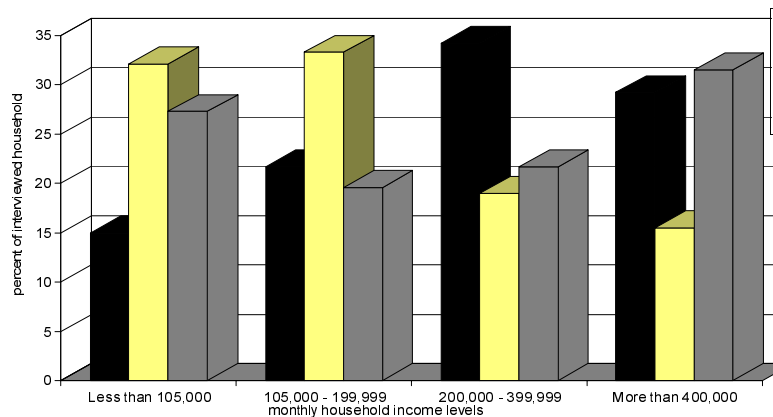
country, this is particularly evident. In Lenkoran, where the adverse impacts of the disaster is particularly pronounced in terms of agricultural productive capacity, monthly household incomes are as low as U.S.\$58;<sup>4</sup> in the two other regions the monthly household incomes are slightly lower than \$80 (Figure 1). The Caspian Sea rise has inundated many citrus gardens and resulted in a loss of cultivable land. More importantly, the rise of the water table and extreme increases in its salinity have made it impossible for the people to produce citrus and to raise livestock. In the region, once a major exporter of these goods, collective farms have been unable to pay farmers. More so than other regions of the Republic, reported wage and pension arrears were high, with households barely able to cope with subsistence agriculture and with occasional incomes earned in Baku.<sup>5</sup> The inability to trade with Russia and enhanced difficulties of getting employment in Russia further added to their problems. In Neftchala, the local economy, which once

**Figure 1. Income Levels in Coastal Communities**

#### **Average Incomes**

Neftchala:	315,635 manats (\$77.9)
Lenkoran:	233,697 manats (\$57.7)
Astara:	321,422 manats (\$79.4)

The primary reasons for incomes in Lenkoran are the revenues from cultivation plants and raising live



Source: Caspian Sea Communities Household Survey, 1996.

provided some 1,200 jobs directly within the sturgeon hatchery and larger numbers in supporting industries and services, is likewise severely affected. As a result, people in Neftchala fully attribute their current unemployment problems to the environmental disaster. In the other regions perceived linkages between current employment conditions and rising sea level are weaker.

In Neftchala, despite severe damage to the local fishing industry, some people cope by fishing, although this is not legal. Similarly, in other regions informal activities supplement incomes.<sup>6</sup> A similar pattern is observed in Astara. Income levels in Astara are slightly higher than those in the other two regions. This is partially due to the level of informal economic activities in the region. For example, during focus group discussions, residents of Shahagaci village in Astara region reported that they earn most of their revenues on “private economies.”<sup>7</sup> Villagers are engaged in fishing which is done informally and, in some cases, illegally. This is no doubt the case in many villages in the coastal areas of Azerbaijan. Even though open sea fishing is prohibited, in most villages, it is the only way of sustaining a livelihood for many families due to the losses of arable land, livestock, and the salinization of available land.<sup>8</sup>

In addition to cash income reported as wages, salaries, pensions and/or part-time jobs, etc., households generate some income from their garden plots; however, as mentioned earlier, the rising sea level has adversely affected the ground water and caused deterioration of soil conditions, thus, making it difficult for families to have a reasonable return to their agricultural activities.

The coastal areas of Baku are also inundated by the rising Caspian Sea. Direct

losses of income suffered by households, however, is less evident and more difficult to capture through the methodology employed in the social assessment. In Baku, affected areas were previously used for leisure or for commercial activities. Other parts of the coast were used for industrial purposes by enterprises that no longer function as a result of transitional economic problems. Needless to say, the loss of commercial and industrial activities might have caused actual losses and increased opportunity costs. The overall productive capacity is perceived to be much less affected by the environmental disaster in Baku than in other coastal settlements.

### **Priority Problems and their Relation to the Caspian Sea Rise**

In the affected coastal communities, economic problems of transition and problems caused by the rise of the Caspian Sea are considered the most important concerns in daily life. Other concerns such as employment, health, education, and demographic problems are all connected to these two major problems.<sup>9</sup> According to the household survey, about 86 percent of the households in Neftchala relate their economic problems to the rise of the Caspian.

People who had to move from their homes consider the sea level rise as an important factor affecting their livelihood in general even in their new locations (Table 2) even though their situations seem to be better than those who did not move. For example, only 37 percent of the households that moved relate their health problems directly to the rise of the Caspian; the region’s average is 68 percent. The majority of residents links ecological problems such as formation of swamps and polluted ponds and infrastructure problems directly to the sea rise.<sup>10</sup>

**Table 2. People’s Perceptions of the Relationship between Priority Problems and the Sea Rise** (percent of interviewed households)

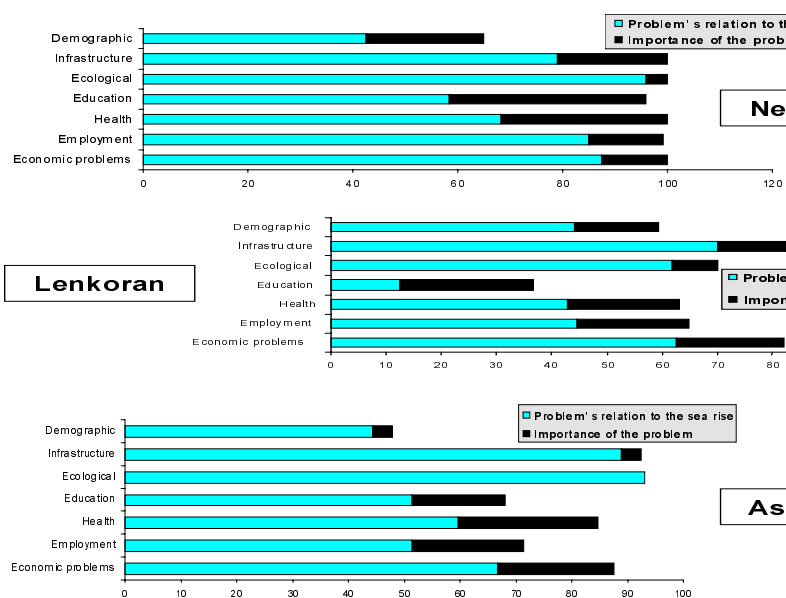
Problems	Neftchala	Lenkoran	Astara
Economic	88	62	67
Employment	85	45	51
Infrastructure	79	70	89
Health	68	43	60
Ecological	96	62	93
Education	58	12	51
Demographic	42	44	44
Other problems caused by the sea rise	100	95	98

Source: Caspian Sea Communities, Household Survey, 1996

There are significant differences among communities with respect to the perceived relationship of current economic problems with the rise of the Caspian Sea level are (Figures 2, 3 and 4). More people in Neftchala region connect their economic, employment and infrastructure problems to

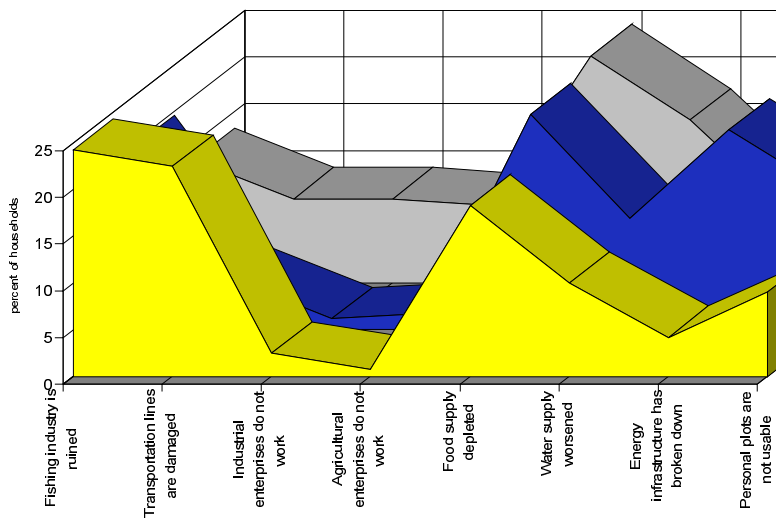
the rise of the Caspian as compared to residents of other regions. One possible reason for that is Neftchala’s flat landscape and its heavy reliance on sturgeon fisheries, which have been heavily damaged by the flooding sea waters. Currently the water has regressed to some extent and exposed some land; however, this land is saline and not fit for agriculture. In Neftchala region, 100 percent of the households agreed that salinization of land is an important problem for them. Unemployment problems caused directly by the sea rise are compounded due to the flat geography of the region. While in higher elevations in Lenkoran and Astara some people can raise livestock and fruits, the flat terrain in Neftchala, and the fact that almost all the land is at the same level as the sea, makes a shift to agriculture more difficult. The settlements in Neftchala region are somewhat universally affected by the sea rise, whereas in Lenkoran and Astara, the impacts can better be analyzed on a

**Figure 2. Priority Problems and their Relations to the S Level in Neftchala, Lenkoran and Astara**



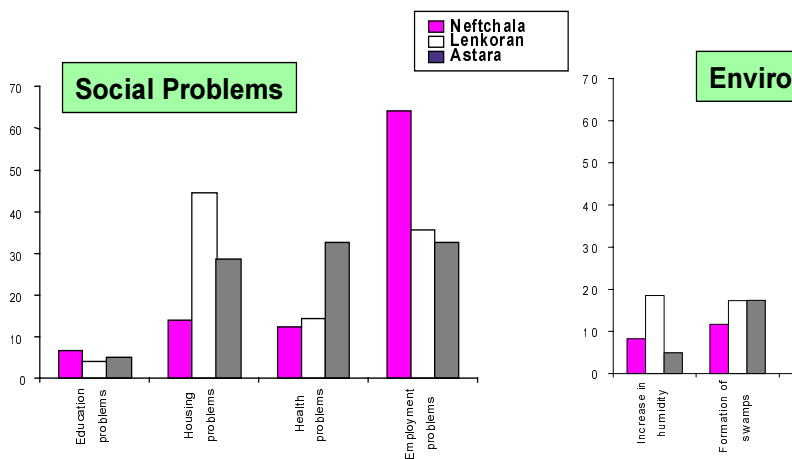
Source: Caspian Sea Communities Household Survey, 1996.

**Figure 3. Priority Economic Impacts of the Sea Rise**



Source: Caspian Sea Communities Household Survey, 1996.

**Figure 4. Sociological and Environmental Problems in Coastal Communities due to the Caspian Sea Rise**



Source: Caspian Sea Communities Household Survey, 1996.

community basis. In Neftchala, the sea rise affects the livelihood of residents in almost all settlements due to flooding from the Kura River and the flat geography of the region.

### **Impacts on Employment**

According to the household survey, fishing was the most common employment source in Neftchala before the environmental disaster. About 24 percent of the population (older than 20) were directly engaged in the fishing business. However, of this 24 percent, the majority (66 percent) are currently unemployed, the main reasons being that people are unable to find employment that matches their skills and qualifications. The premises of the fish plant (including special pools for fingerlings and workshops) are currently in poor shape. According to focus group participants, a high number of workers were dismissed on grounds of redundancy. In addition, because of silting in the Kura River delta, fishing boats cannot be used – fishing stations close and employees are laid off. In this region, almost everybody has an employment problem and 85 percent link these problems to the rise of the Caspian.<sup>11</sup>

According to focus group discussions, in Lenkoran, even though wage employment problems are important, they do not have the absolute priority that they have in Neftchala, and people seem to think that these problems are not necessarily connected to the rise of the sea, but rather, to the transition to a market economy. Sixty-five percent of the respondents in the region consider wage employment problems important. Even though some production facilities in the region were seriously affected by the rise of the sea level and consequently ceased operations, not all unemployment is caused by the disaster. Indeed, small settlements are more affected as compared to larger towns and it is the

latter that previously had employment opportunities. Residents of these settlements think it crucial for their livelihood to have the fish processing plant brought back into operation (to resolve their unemployment problems). The closing of the fishing plant hit the local economy, including nearby villagers, hard.

In Astara, too, people do not heavily relate their unemployment problem to the sea rise. A number of industrial enterprises, social facilities and enterprises located along the seaside had to close due to the rise of the sea level. Among people who are older than 20, a high portion was working in agriculture (25 percent) before the sea rise. However, currently only 16 percent of the population between ages 16 and 65 are reported to be employed. The local economy in small coastal settlements of Astara region depended heavily on fishing. The local population is experienced in fishing and raising citrus trees, and sees these activities as the main sectors of the economy in the future as well. They expect government action to reverse conditions. Table 3 and Figure 5 summarize the economic impacts of the sea rise as perceived by the residents.

### **Impacts on Health**

The sea rise has adverse effects on the health of the local population in the affected coastal regions of Azerbaijan. For example, a significant portion of the people in coastal settlements of Neftchala (71 percent) think that their health was better before the sea started to rise, and 36 percent of the people say that their current health situation is poor. On average, this region's residents were sick for 5.98 days during the month before the survey. Their complaints include rheumatism, asthma and, in some cases, tuberculosis. During focus group discussions, some villages in the region indicated that they have no medical facilities

**Table 3. Perceived Economic Impacts of Rising Sea Levels in Coastal Communities of Neftchala, Lenkoran, and Astara**

<u>Problem</u>	<u>% Households who find a particular problem important</u>		
	Neftchala	Lenkoran	Astara
Fishing industry ruined	73	70	75
Industrial enterprises ceased working	37	26	56
Agricultural enterprises ceased working	38	26	78
Employment problems increased	95	58	78
Transportation and communication lines not working	59	31	71
Food supply worsened	78	67	90
Water infrastructure not working	78	91	96
Energy infrastructure not working	54	64	91
Personal plots are non-usable	96	90	92

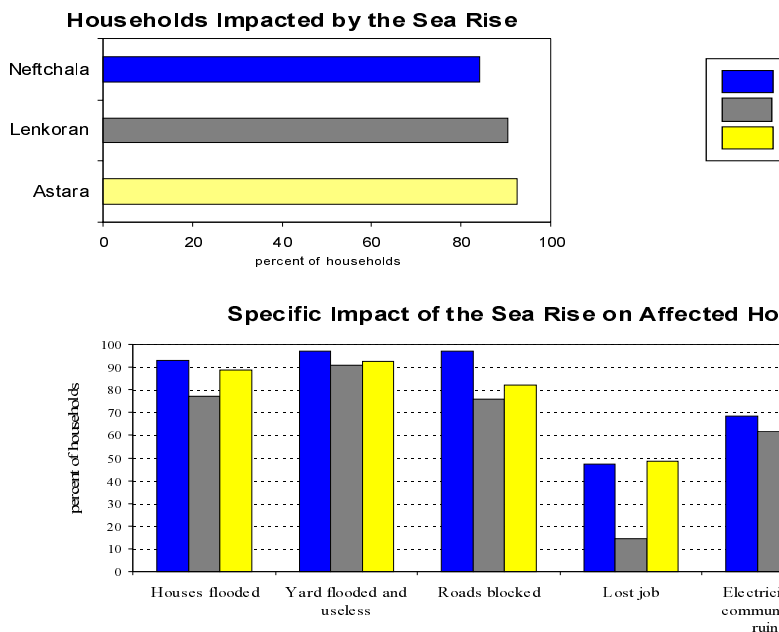
Source: Caspian Sea Communities Household Survey, 1996.

because rising water encompassed those buildings, barring access.

The rise of the Caspian Sea caused health problems in Lenkoran, too, where about 20 percent are in poor health, and more than 80 percent think that their health has

worsened. On average, people here were sick for 3.7 days out of one month. This average is slightly lower than that for Neftchala. In focus group discussions, it was established that in Lenkoran, the quality of drinking water has worsened considerably and that the increase of swamps has

**Figure 5. General Impacts of Sea Rise in Neftchala, Lenkoran, and Astara**



Source: Caspian Sea Communities Household Survey, 1996.

resulted in bad sanitary and hygienic conditions. The number of registered cases of rheumatism, asthma, and infectious diseases went up. The increase of swamps led to an increase in the number of snakes in residential areas.<sup>12</sup> Sector-specific ecological assessments are necessary to evaluate the current conditions of swampy areas and marshlands, which are major causes of diseases.

Especially in the Shahagaci and Narimanabad villages of Lenkoran, health conditions were very bad. At least one person in each household was afflicted with tuberculosis or asthma. In Port-Ilich, an entire family was lost as a result of tuberculosis and poor nutrition. People tend to go to state hospitals and clinics for treatment of tuberculosis; however, most of the sick here do not stand a chance of receiving treatment. As one person said, "... our situation is worse than even the refugees, but we can't talk about it. At least the refugees have international aid and their health problems are somewhat taken care of. Here, we get sick and die, but nobody knows about it even just outside the settlement . . ."

Source: Focus group discussions, 1996

Deteriorating health conditions were also reported in Astara region. Twenty percent of the population in this region are in poor health, and 87 percent indicated that their health was much better before being impacted by the sea rise. On average, residents of this region were sick for 4.49 days of one month. Cases of rheumatism, tuberculosis, and asthma among people living at the seashore increased. The number of marshes and pools with dirty water also increased due to the fluctuations of sea levels, which exacerbated sanitary conditions and led to a spread of contagious diseases such as malaria and skin diseases. Here, too, the number of snakes at the sea shore has considerably increased. As in

Lenkoran, cases of snakes entering houses were reported.<sup>13</sup>

### Impacts on Education

In the affected communities, most schooling facilities were not directly affected by water; however, indirect impacts have serious implications for the level and quality of education in these regions. In Neftchala region, 60 percent of the schools were not affected directly by the rising water. Yet, in focus groups, it was emphasized that the quality of education had deteriorated. For example, regardless of the fact that the Sarigamysh school was moved to Mikailly village, classes are not held. There are no teachers in the village and teachers from outside cannot travel to Mikailly for lack of transportation. There is no way for children to study somewhere else. Thirty-four percent of the respondents indicated financial and work-related reasons for not going to school, and 6 percent complained about the school being too far to travel without adequate means of transportation.

There are hardly any jobs in Sarigamysh village. The only available means of sustaining a livelihood are through fishing and livestock raising. Jobs may be available in other villages, but the lack of transport and the poor state of the roads make commuting almost impossible. After the local collective farm and the iodine plant in Neftchala closed down, residents were left with no employment opportunities. There are no educational facilities in the village—flooding waters have made the school buildings unusable.

Of the total 56 households in Sarigamysh, 43 were completely ruined. Currently 22 households remain in the settlement (33.8 percent of the original). Some of these households had to relocate to other relatively sites within the villages. Others moved to Mikailly village, about 3 km. away.

Source: Focus group discussions, 1996.

Astara residents also mentioned adverse effects of the rise of the sea level on education, which led to an increase in the number of school absences. Fourteen percent of the population interviewed mentioned financial problems as reasons for children not going to school. Generally, education possibilities for children from coastal communities have been considerably restricted. Children from households located in the remote parts of villages have to walk long distances to get to school. Table 4 provides a snapshot of people’s views of the perceived social infrastructure impacts of the sea rise.

**Table 4. Perceived Social Impacts of Rising Sea Levels in Coastal Communities of Neftchala, Lenkoran and Astara**

<u>Problem</u>	<u>% Households who find a particular problem important</u>		
	Neftchala	Lenkoran	Astara
Health problems became more acute	70	44	60
Education levels fell	62	16	37
Housing is destroyed	88	83	96

*Source:* Caspian Sea Communities Household Survey, 1996.

**Impacts on Local Infrastructure**

According to the focus group participants, the road connecting Mayak-I village and the regional center is in poor shape. This is verified by the household survey, which shows that almost everybody in Mayak-I agrees that the sea rise ruined their transportation and communication lines. The physical damage caused by sea rise in other villages is similar.

Electricity is supplied on an irregular basis to the affected communities.

According to the household survey, about 93 percent of households in Lenkoran have electricity and everybody interviewed in Narimanabad has it. However, central heating is unavailable for almost all households interviewed, and central water supply is low in Lenkoran (10 percent in the affected communities of the region).<sup>14</sup>

*Water Supply.* The supply of drinking water is problematic in Neftchala region. About 78 percent agree that their water supply has worsened as a result of the sea rise. Focus groups found out that drinking water is brought by trucks at a price of 70,000 manats per truck. Most households cannot afford this amount, and are forced to drink salinized or dirty water, or carry water from far away, on foot. There is also no drinking water for animals, which causes livestock to perish as they are forced to drink salty sea water.

Availability of good quality drinking water also constitutes a serious problem for people living in affected cities of Astara region. For example, 97 percent of households say that good quality drinking water is not available, and 90 percent link their worsening local water supply to the rise of the Caspian Sea. The local population uses water from wells for drinking; however, due to the rise of the sea, the water in shallow wells has become saline and there are even cases where sewerage waters have mixed with drinking water from wells. Currently, people living at the seaside are forced to bring drinking water from the upper part of the town, but this water, too, is not of good quality.

The majority of the households interviewed reported that they were affected by the rise of the sea level one way or another (84 percent in Neftchala, 91 percent in Lenkoran, and 93 percent in Astara). About 34 percent in Neftchala were completely flooded by the Caspian at some



Narimanabad village, Lenkoran region, was affected from all directions as it is located on an island. There used to be 1,732 households in Narimanabad, of which about 500 were affected: over 200 of these were completely destroyed. Some affected households received aid in cash (300,000 manats per household) and construction materials (5 sacks of cement per household) but these measures compensated for only a small portion of the damage incurred, and did not satisfy the local people. There are reports of land allotments (60 square miles); however, these pieces of land are too small, and too far away from the city. Even if people had the means to move to those land plots, they would not be able to sustain a living on them.

Residents who used to live in the flooded parts of Narimanabad village did not move out of the village, choosing instead, to relocate to other parts of Narimanabad. These households' conditions are particularly bad: they lack access to even basic utilities. Only a few residents succeeded in salvaging their property.

In Shahagaci village, where many houses on the shoreline were completely ruined, the situation is even worse. The distance between shoreline homes and the sea used to be between 500-1,000 m. before the sea levels rose. Today, most houses are less than 500 m. away from the sea, and are thus in a constant state of danger, especially during high tides and strong winds. The sea washes away walls and groundwork of these houses. In total, 85 houses in the village were reported to be directly affected by the water. Of this number, 40 were completely destroyed. The rest face a similar fate.

Source: Focus group discussions, 1996.

point, and 59 percent reported partial flooding. More than 90 percent indicated that their land plots were rendered useless as a result of flooding (Table 5).

Although the situation is similar in other regions, Neftchala residents report a more acute deterioration in living conditions. About twice as many households in

Neftchala than in other regions are completely flooded, more land plots have become useless, and access to farmland from the city is blocked in many instances. Not surprisingly, people in Neftchala more commonly link the reasons for their poor living conditions directly to the sea rise in contrast to the residents of Lenkoran and Astara. With respect to communications

**Table 5. Type of Adverse Household-Specific Impacts of the Environmental Disaster (percent of households)**

	Neftchala	Lenkoran	Astara
<i>Impacts on the homes</i>	84	91	92
House partially flooded	59	57	69
House completely flooded	34	20	20
Yard flooded and became useless	97	91	92
<i>Impacts on infrastructure</i>			
Roads to farmlands blocked	97	76	82
Electricity and communication lines to house ruined	68	62	68
Drinking water supply worsened	95	99	97

Source: Caspian Sea Communities Household Survey, 1996.

and electricity infrastructure as well as access to drinking water, all three regions are similarly affected by the sea rise.

Focus group discussions and household visits in Lenkoran revealed that people in some homes lived practically in water: first floors of multi-story buildings were filled with water, so families live on the upper floors. Snakes and other bugs were commonplace – when one interviewer wanted a demonstration, household residents went downstairs and promptly returned with a snake to show her. Regardless of the fact that plots in the safe part of the village were allocated for households affected by the water, people did not have the means to construct new houses. Although families living in houses which were completely destroyed found refuge in different parts of the village there appeared to be a general resistance to leave. The fact that many of those who were allocated land by the government elsewhere in the settlement or the region did not fare well, and had severe difficulties in building their homes, had much to do with the peoples' apparent willingness to continue to live in homes largely inundated by floods.

The coastal part of Astara city in the Astara region has been severely affected by the rise of the Caspian Sea. According to residents, there used to be three rows of houses at the seaside. All houses in the first row were completely ruined and residents had to leave. The same happened in the second row, but the majority of households in this row did not leave their homes, even when seriously impacted, because of their inability to move, or reluctance to change their lifestyles. About 150 houses are partially affected and 50 households have already moved because of the rising water in Astara town.

Focus group discussions showed that most people in Astara moved from their

houses on their own, and were not able to take most of their property with them. Some moved to the house of their relatives, others moved into public buildings, while some households failed to find any refuge, and had to stay in the affected areas. Regardless of the fact that households affected by the water were offered new sites in safe parts of the town, no construction work is underway there, due to a lack of finances.

In Neftchala, the impact of sea rise on the livelihood of people in terms of their economic situation and hopes for the future is severe. Most households in coastal settlements are completely ruined: their gardens have perished, and their land is salinized. Local authorities allocated plots in safe areas of the region for residents of Subh, Mayak-I and Yenikend, but villagers are unwilling to move to these new plots, mainly due to lack of money, and because the small size of these land plots makes it nearly impossible to raise livestock, vegetables, or fruits.

Perceived impacts of the rising level of the Caspian Sea were not confined to economic and social problems. Residents of coastal communities were particularly articulate about their concern with ecological damage caused by the sea. Indeed, there was far greater agreement among residents of all regions about this damage (Table 6). Less clear to all was whether any of this damage was reversible – many sought clarification and scientifically valid explanations to address their concerns.

### **Migration versus Relocation**

Migration to other regions unaffected by the rising sea was not seen as a desirable option by most households in the coastal communities. In Neftchala, only 24 percent of the households were willing to migrate. Thirty-five percent in Lenkoran, and 17

**Table 6. Perceived Ecological Impacts of Rising Sea Levels in Coastal Communities of Neftchala, Lenkoran, and Astara**

<u>Problem</u>	<u>% Households who find a particular problem important</u>		
	<u>Neftchala</u>	<u>Lenkoran</u>	<u>Astara</u>
Fish species endangered	81	82	49
Water pollution became acute	88	98	96
Salinization of land increased	100	98	99
Formation of swamps spread	99	99	100
Humidity increased	95	99	96

Source: Caspian Sea Communities Household Survey, 1996.

percent in Astara had the same view. For those who wanted to migrate, the most important reason was the level of damage to their homes. The second reason was the lack of support provided by the regional and central government to their situation. Many households indicated that while they did have confidence in the future, they also knew that they would have to continually rely on family, relatives, and friends to be able to survive. Moving elsewhere was not an option as it would result in loss of social capital. In Neftchala the majority of people felt that living conditions elsewhere were better. This perception was less dominant in other regions.

The households that did not want to migrate offered, as a reason, their unwillingness to change their lifestyle. As mentioned earlier, to many this meant the deprivation of social networks and the fear of losing their community. Also, some families felt that they could stay in their homes until they were more directly affected by the rising sea. There were fears that life in other regions would be similar to life in their own region. Therefore, a large portion showed willingness to move to other areas of the same village or region only in the event that their homes and plots were completely inundated by floods. People

were also worried about employment opportunities or bad living conditions in other regions, and were reluctant to migrate without prior reliable knowledge or guarantee of employment, income and assets.

An important portion (82 percent) of those who did not want to migrate felt that even if things change for the worse, they would rather stay in their home towns and move to places where water would not affect them, than leave their communities (Table 7). The facts that Neftchala has oil wells and foreign companies that produce oil, and Lenkoran and Astara are on an important international railway (which the government hopes to restore), increase the perceived opportunity cost of migration. However, even relocation within a narrow geographical area is a source of concern to many, with implications of high opportunity costs in terms of potential loss of access to social networks and basic infrastructure. Thus, while both the donors and government were interested in relocation as a potential remedy to the disaster, few people who were actually facing the related problems were eager to move. Table 7 presents the attitudes of people with regard to relocation.

**Table 7. Attitudes toward Migration (percent of households)**

	Neftchala	Lenkoran	Astara
<i>Willing to migrate. Priority reasons to migrate (among those who want to migrate)</i>	24	35	17
Home seriously damaged	41	34	52
Lack of government support	21	36	13
Better life conditions in other places	7	2	0
No trust in the future	24	27	13
Other reasons <sup>a/</sup>	7	1	22
<i>Reasons for not wanting to leave settlement (among those who do not want to migrate)</i>			
Unwilling to change lifestyle	40	36	44
Home not affected yet	34	24	29
Potential employment problems	2	6	8
Potential bad living conditions	6	12	9
Would not migrate; move to other parts of village	18	22	10

a/ Other reasons for migration include family and health reasons.

Source: Caspian Sea Communities Household Survey, 1996.

## The Situation in Baku

There are very few cases reported in Baku in which the rise of the Caspian Sea brought direct damage to households in the city. These were mainly in the Govsany suburb of Baku and in summer cottages. However, participants mentioned some damage to industrial enterprises of Baku. A number of industrial enterprises on the coast were seriously affected such as a ship yard, harbor, and the Govsany fish plant. This plant used to have a large production capacity. Now its capacity has considerably diminished and it is practically out of operation.

Social infrastructure in Baku has also been affected by the rise of the Caspian Sea. A number of beaches, boulevards and other recreational areas have fallen into disrepair partially due to the rise of the sea level. Residents of Baku used to spend the summer

in summer houses at the coast—many of these recreation places are flooded now and trees and vegetables in their gardens have been killed by salty water.

The rise of the Caspian Sea level affects the level of ground water under the city of Baku. The water table in some parts of the city is reported to have risen by two meters and its effects can be seen on the vegetation in the city. Pollution from Baku City and its surroundings goes directly into the sea and results in diminishing the number of fish in the sea. Some types of fish that can live in polluted water have been reported.

Participants of the focus group in Baku evaluated environmental conditions in the city, in particular, and in Azerbaijan, in general, as very bad, placing special importance on education. They mentioned that the rise of the sea level led to increases in the number of contagious diseases and

created favorable conditions for the spread of infection. Water pipes in the city of Baku are old and in poor shape. Leaks cause polluted water to mix with the drinking water supply. And the rise of the sea level only hastens the destruction of the city's pipes.

Members of the focus group believed strongly that the resolution of the environmental problem caused by the rising sea level should not to be left to Azerbaijan alone, but should be handled at the international level. They felt it important that an international institution or center be set up in the Caspian Sea area to research the periodicity of the rise in the Caspian Sea level for future forecasts and devise protection mechanisms.

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- <sup>1</sup> These settlements are as follows: Neftchala town, Banke, Hasanabad, Sarigamysh, Mikaili, Gyzgayitli, Hakhverdili, Yenikend, Mayak-I, Mayak-II, Subh, Shirvankend, Yeni Gyshlag, Khazar, Mirzabanly, Dalga, Kurdili and Sahil villages.
  - <sup>2</sup> Neftchala fish breeding plant; Kura mouth (Upper Kura) sturgeon breeding plant; Kura mouth fishing industry; fish processing plant (750 tons of fish annually); Oryat pool facilities (800-1,000 tons of fish annually).
  - <sup>3</sup> For example, the plant used to release 10.7 million fingerlings a year. Currently, the production is down to 2.7 million fingerlings per year.
  - <sup>4</sup> Exchange rate at the time of the survey was 4,050 manats per one dollar.
  - <sup>5</sup> About 40 percent in Neftchala, 13 percent in Lenkoran and 44 percent in the interviewed settlements of Astara say that they lost their jobs directly as a result of the Sea rise.
  - <sup>6</sup> According to focus group participants, Lenkoran region was one of the best regions in

Azerbaijan before the sea started to rise. It was a popular place for people from around the Soviet Union to come and spend their vacations. Because of that, there are many beautiful houses in the village and people sometimes do not want to leave these houses because of their previous value. The region is in a sub-tropical zone and the soil used to be good for agriculture. Even though the ground water is salinized in coastal villages, there are still areas in which small-scale agriculture can still be undertaken.

- <sup>7</sup> "Private Economies" refer to mostly informal economic activities such as selling produce at the market. It can, in some cases, be illegal i.e. fishing and selling fish to neighbors and relatives.
- <sup>8</sup> At first, people did not want to talk about being engaged in illegal fishing because fines are heavy and there is favoritism on the part of some local authorities, who sometimes "fine people they do not know well (or do not like) and turn a blind eye to their friends and relatives doing the same thing." Local people say that whenever they feel they will not be caught, they go for open sea fishing, that is, if they can find a boat in working order. Even though people understand that the sturgeon population is decreasing and fishing is doing harm to it, they see fishing as the only way to sustain their livelihood while waiting for the economic conditions to improve in their villages.
- <sup>9</sup> People living in coastal regions think their situation is as bad as the conditions experienced by the Internally Displaced People (IDPs) who are dispersed throughout the country because of the conflict with Armenia. However, they say "we can't voice our complaints because it would not be appropriate while there are 600,000 refugees all over our country." Even though they need help, they are hesitant to ask for it.
- <sup>10</sup> One woman in a focus group in Neftchala region said "Once, during Soviet times, there was an increase in mosquitoes around our village. Special people came from the capital and exterminated the mosquitoes and then

took care of the swampy areas. Now, the situation is much worse. We, our health, are all suffering because of mosquitoes and all kinds of other bugs, but no one seems to care about it. We need help to deal with this problem and we need it urgently.”

- <sup>11</sup> In addition, favoritism is said to be an important problem in the affected communities. People claim that local state enterprises favor their own people who are usually relatives or close friends of managers of these enterprises. In some cases, people are put out of their jobs because somebody else who knew an important person was placed in the same job. This naturally decreases trust in local administrations and increases the sense of helplessness that appears to prevail in these once dynamic coastal communities.
- <sup>12</sup> A resident of Lenkoran region said “...Only this morning I saw a snake with its tongue out staring at me. My son told me not to come close to the snake . . .”

- <sup>13</sup> Some people live on second and third floors of houses in which first floors are flooded. They say, “. . . we have snakes all over the place. As I go to my bed at night, I always check under my mattress to see if there are any snakes hiding there, and almost always there is one there . . .”
- <sup>14</sup> Electricity is usually the only source of energy available. Before, there were trees which could be cut down and burned to obtain heat in emergencies; however, salinization of the land has caused all these trees to die and new ones are not growing, so the wood supply is gone. Most households use their ovens as a heater, trying to obtain heat while food is being cooked. The unreliability of the supply of electricity is another serious threat to these people’s livelihood.
- <sup>15</sup> According to the survey and in-depth interviews, most residents felt that it was important for scientific studies to be carried out to identify protective measures.

### 3. Recommendations Proposed by Residents of Affected Communities

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The people involved in in-depth interviews, focus groups, and household surveys were eager that measures be taken to improve their livelihoods. To this end they hoped to receive international assistance. They proposed many ideas for improving their situation. However, they felt that they did not have the required information to make informed decisions.<sup>1</sup> For example, due to the seasonal fluctuations in the sea level, most people falsely believed that the sea would not rise any more, and therefore, did not invest in shore protection. In fact, forecasts showed that the sea is likely to rise another 1 - 1½ meters. When presented with these forecasts, people felt it important to receive timely and accurate information on the sea level rise and on protection measures.

Specific protection measures suggested by the coastal communities of Neftchala were particularly interesting: these were based on the assumption that the sea level would cease to rise. Residents here suggested the following recommendations:

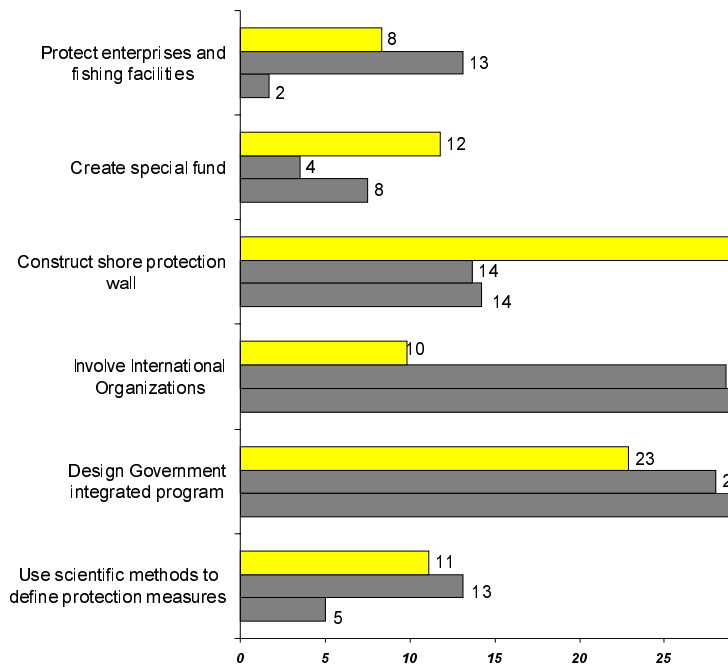
- Constructing drainage works in the delta of the Kura River to deepen it and to restore the operation of fishing boats. This measure, residents believed, would allow fish to swim into the mouth of the river and to revitalize the operation of fishing stations

- Digging a new canal from the Kura River to the sea, to ensure the flow of the Kura's waters into the sea, enable the fishing boats to move, and restore fishing stations
- Supplying necessary means (boat, fuel, net, etc.) to help create fishing teams. Reconstruction of the fish plant would help the local economy through sales of fingerlings.

Participants of the focus group discussion in Lenkoran stated that Goyshaban village in Lenkoran was good at raising vegetables and crops, and fishing, and that it was possible to promote these industries in the village. Villagers have the necessary know-how for fishing. It was clear from the focus group discussion that residents of both Goyshaban and Lenkoran used to have higher incomes. Their main sources of income were salaries earned in the state sector, revenues from fishing, and yields on their personal plots. However, currently, the potential for all these activities is severely limited. Figure 6 summarizes people's recommendations for measures to mitigate problems caused by the Sea rise.

Many of the priority improvements expected by people require heavy involvement of the central government and international organizations. Trust in the

**Figure 6. Priority Interventions to Cope with Sea Level Rise**



Source: Caspian Sea Communities Household Survey, 1996.

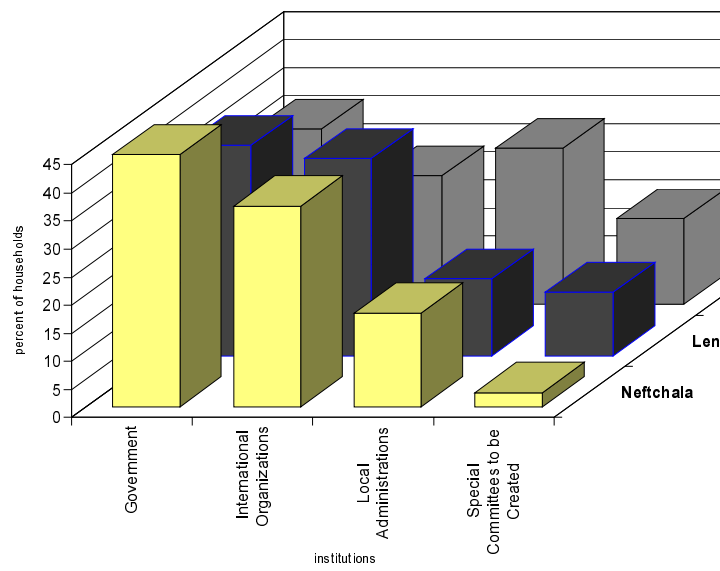
local and regional government institutions has been shaken. Because the natural disaster coincided with a period in which the government lacked the means to provide people with appropriate assistance, people felt particularly abandoned by the government. The government was able to provide only a minimal amount of aid to those who were severely affected by the sea rise and the recipients were largely unsatisfied. In spite of that, the majority of the households favor government-led integrated projects, which encompass a large set of measures as compared to stand-alone prevention methods. They also favor the idea of international organization and experts' involvement in protection measures. Figure 7 presents the priority of stakeholder responsibilities as identified by the respondents in coastal communities.

Coastal settlement residents also believe it would be possible to adopt measures through use of modern technology. Specifically, they mentioned that it is possible to perform shore reinforcement works and referred to efforts undertaken on their own and successful experience of the railway agency. People in the settlements included in the SA have already undertaken some shore reinforcement works on their own, but these efforts are piecemeal and are not adequate to protect the large-scale damage to houses in the villages.

<sup>1</sup> According to the survey and in-depth interviews, most residents felt that it was important for scientific studies to be carried out to identify protective measures.



Figure 7. Responsibility with Respect to Environmental Pro



Source: Caspian Sea Communities Household Survey, 1996.

## 4. Epilogue

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The SA presented in this report lacks the rigor and depth of analysis of many other SAs carried out in the ECA Region of the World Bank. Therefore, it is important to reiterate the reasons for this publication and explain why the SA team wanted to share the results with a broader audience.

As summarized in Part I of this report, this SA represents a partial effort in two senses. First, instead of providing an understanding of environmental concerns of many different groups in Azerbaijan as an input to the preparation of the NEAP and to the identification of follow-up priority actions to be included in an investment project, the SA focuses on the victims of the Caspian Sea environment disaster. This did not happen by design of the SA; rather, the inadequacy of funding made it impossible for the SA team to complete its work once the Caspian communities were consulted. Secondly, the SA fell short of addressing all four of the basic principles of good SA practice and concentrates more heavily on making information available about the affected communities, their needs and perceptions, and the actions that they recommend be taken. It does not sufficiently deal with institutional issues, the participatory framework for investment projects, or with monitoring and evaluation to measure development effectiveness of actions adopted to improve environmental conditions in the Republic. This situation too

is partially a result of lack of funding of the NEAP and the follow-up investment project; the SA team's participation in the work of the technical team assessing the investment project was not solicited because of lack of funds.

The SA has a third weakness relating to the effort devoted to analyzing the relatively large body of information gathered on the Caspian communities. The data were presented only with sub-regional breakdowns, rather than exploring differences in the views of significant social groups (men and women; younger and older residents; and occupational groups). This was by design; there was a high level of agreement among residents of each region on perceived needs and recommended action; thus, analyses of data by gender, age, occupational group did not reveal significant differences. Rather, the more direct the adverse impacts of the environmental disaster on the household, the higher was the level of deterioration of living standards, the perceived failure of public institutions to provide useful support, and the reliance on the central government and international financial institutions for mitigation action.

There were, nevertheless, good reasons for sharing the SA results with a broader public despite the above mentioned deficiencies.

- Many SAs carried out by the Bank-financed projects are partial in terms of geographical coverage, rigor in information collection and analysis, and adherence to the four principles of SA “Good Practice.” It is therefore useful to make available explicit information about a partial SA.
- The information contained in the report deals with the problems and expectations of direct victims of one of the world’s best known environmental disasters: the rising of the Caspian Sea. It is therefore important to make this information public.
- While the SA might have been partial in terms of the preparation of the NEAP, it nevertheless provided a direct input to the investment project that resulted from the NEAP process. Of the three major components of the investment project, one—restoration of the sturgeon hatchery—directly responds to the calls of the victims of the disaster and provides mitigation against some of the adverse economic and ecological impacts of the rising sea level. Another component—capacity building—also partially addresses the need of the affected populations for timely and reliable forecasts on changes in the sea level.
- The report also shows how broad the needs of the affected populations are, and how difficult it would be to formulate affordable mitigation measures to deal with the remaining damage caused by the Caspian Sea disaster. Indeed, the SA shows that the investment project will only address a very modest part of the needed investment package required to mitigate the disaster.