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Term Paper EVPP 377

The Shrinking of Aral Sea in Uzbekistan

Spring 2017 I George Mason University

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In Uzbekistan just as all over the world, cash crop production is decimating local ecosystems in the relentless need for the global economy to produce an ever increasing amount of goods. For many areas cash crops such as rice and cotton are consumed by the international market allowing the countries they rely upon to develop and become less dependent on foreign aid. One extreme case of an entire region being devastated by the global economy is the Aral Sea Basin. The boom in cotton production starting in the 1950's has wiped out one of the largest bodies of water in the world. It has only been the last thirty years that there has been an effort by the local and international community to reverse the desertification of the region and restore the Aral Sea back to its original state.



(Image Source: Tashkent International School)

The landlocked Republic of Uzbekistan is in Central Asia whose northern border is with Kazakhstan, at its southeast it is bordering with Tajikistan, Kyrgyzstan to the near east, and Turkmenistan to the southwest. As of July 2016, the population of Uzbekistan was 29,473,614

(CIA World Fact Book). Uzbekistan prides itself in many industries some of which are: chemical production, natural gas and oil production, and cultivation of cotton. The annual GDP of Uzbekistan is \$202.3 billion. Once Uzbekistan called itself the Uzbek Soviet Socialist Republic and today this country is officially a democracy whose economy is still heavily influenced by its government (CIA World Fact Book).

In 1960's the government of Uzbekistan had decided to use its natural resources to generate profit and become competitive in the global economy. By diverting two rivers Syr Darya and Amu Darya away from the Aral Sea to create irrigation systems for cotton production Uzbekistan could become one the leading producers of cotton in the world (Micklin 1988). Previous to the diversion of these rivers the Aral Sea was the fourth largest lake in the world. Its literal translation is the “Sea of Islands.” The Sea of Islands refers to the 1,000 islands that were in the area of Aral Sea. The Aral Sea was once spreading across 68,000 square kilometers (Whish 2002). This area was once a popular fishing hub for the Soviet Union. Today the Aral Sea has shrunk in size and its fishing life is almost non-existent. Many critics argue that this was one of the largest natural disasters in the world.

The history of the area has been dominated by Moscow. In the 19th century the Russian Empire expanded its influence into Central Asia where the Aral Sea is located. Kazakhstan and Uzbekistan became puppet republics of the Russian Empire and later the Soviet Union. In 1950 the population of the region was estimated to be roughly 13.8 million (Mazur 1967). After the Russian Empire collapsed a communist government formed and forced collectivism in the area leading to mass starvation and deportations. Later industrialization and mineral extraction contributed to rapid increases in wealth and population in the area. Eventually the USSR collapsed and its satellite states became independent. The independence of Kazakhstan and

Uzbekistan led to rapid privatization of the area and widespread poverty as those with previous guaranteed employment from the state became unemployed overnight. The lack of state control also led to a widespread exploitation of natural resources (Micklin 1988).

The industries for the people in area of the Aral Sea have changed dramatically over the last century. The traditional industries of the area were fishing and food crops. Many cities, towns, and fishing villages sprouted up around the lake supplying a sixth of Soviet fish catches. Along the Syr Darya and Amu Darya rivers partly irrigated food crops (i.e. fruits, vegetables, and grains) sustained the populations. In the 1950's the Soviet leadership decided to focus on water intensive cash crops of cotton and rice. The collective farms relied on the population instead of mechanized tractors to produce agrarian products. In Uzbekistan 41 percent of cultivated land was devoted to cotton making the country the second largest cotton exporter in the world. The volume of water needed for the crops was immense. Until the third quarter of 20th century this was the world's fourth largest saline sea. It contained 10 grams of salt per liter. On both the Syr Darya and Amu Darya rivers only a fifth of the water reached the Aral Sea. With little water being fed to the Aral Sea it shrank rapidly. This rapid shrinkage led to a decrease in the fishing industry (Micklin 1988). The collapse of the fishing industry and communism led the population without an alternative but to rely heavily on the water intensive cash crops further escalating the decline of the Aral Sea.

The changes from what the Aral Sea once was were evident in the drop of water since the diversion of two rivers. The level of water has dropped around 23 meters. This includes the water from the river, evaporation, precipitation rates, and groundwater inflow. The Aral Sea dehydration period was accompanied by climate change. Before this period, the area of the Aral Sea regulated the climate in the region by softening strong Siberian winds in the winter, and

cooling off the area in the summer (Zavialov 2003). The current temperature in Aral Sea has increased but it is difficult to measure it because the entire Central Asia region has seen an increase in air temperature. Although some statistics are vague on numbers, the desertification of the Aral Sea can be seen clearly on satellite imagery showing the effects of the loss of water in the area.

Today the Aral Sea Basin is experiencing a process known as desertification. The loss of a large body of water results in the loss of vegetation and wildlife which then leads to soil erosion and the creation of a desert. In the case of the Aral Sea the drop in the Aral Sea decimated the fish populations, kelp beds, and other wildlife. The climate of the area became hotter leading to more evaporation loss. In the Aral Sea, the farmland in poorly aggregated fields became saturated with salt with decreased mineral nutrients for further crops to grow (Cai 2003). To compensate for this saturation farmers used more fertilizers and pesticides which further polluted the water in the lake. The increasing pesticide and fertilizer use, pollution of the drinking water, and dust particles in the air led to dramatic spikes in sicknesses in the area population. One researcher found that anemia, brucellosis, bronchial asthma, typhoid were at approximately eight times the national average (Conant 2006). The officials and population in the area began to see the effects of the loss of the Aral Sea and have attempted multiple solutions to fix this environmental problem.

In the last 30 years there have been several attempts to save the Aral Sea from complete collapse. In 1990, the Aral Sea began splitting into two parts. It was only then that local officials began constructing a sea level of sand to stabilize the northern section of the lake known now as 'Little Aral' (Glantz 2007). The dam succeeded in its efforts to preserve the Little Aral before rupturing. Later improvements funded by the World Bank and Kazakhstan in the dam

construction led to a growth of the Little Aral as other sections of the lake have dried out. In addition to the dam construction improvements in agricultural canal efficiencies have increased the flow of the Syr Darya and Amu Darya rivers allowing for water to again start filling the southern sections of the Aral Sea (Whish 2002). The growth of oil and natural gas in Kazakhstan and Uzbekistan has allowed for a decreasing dependence on agriculture for both countries. Incidences of disease such as anemia in young women has decreased from a high of 70-80 to 50 percent (Kotlyakov 1991). A big issue with solving the crises in the Aral Sea is the dominance of prominent world corporations in deciding the faith of the area.

A reckless regard for cheap consumer goods is directly contributing to the environmental disaster of the Aral Sea. The American consumer hypnotized by vast commercials consumes cotton at the remarkably unsustainable rate. For instance, we all sleep in cotton made sheets while we wear our soft pajamas made from cotton, we then change into cotton clothing to go to school, to gym, and another set to meet up with friends and family. The average American family spends \$1,700 on clothes annually (Johnson 2016). The average American throws away 65 pounds of clothing per year (Joung 2013). In 1971, global cotton consumption averaged about 7.5 pounds per person. It spiked in 2007 at 9 pounds per person (Wallander 2010). The unseen actor contributing to this crises ie. the consumer, plays a powerful role in the shrinkage of the Aral Sea due to our need for cheaply made cotton goods.

Some may argue that the problem of the Aral Sea is too deep and far from ever coming back to its pre-1960s levels. One thing is sure that the body of water is now physically separated into two parts. Oil and natural gas reserves have now been taken from sections of the dried seabed. Fisherman are ignoring fishing quotas in the already depleted stocks leading to further decimation of the fish population. Increasing populations in the area are consuming more water

and increasing pollutants. Cotton production and demand is rising across the world which leads only to greater usage of water resources. The countries of the Aral Sea area, Kazakhstan and Uzbekistan while pledged to restore the Aral Sea repeatedly fail to keep their promises. (Whish 2002).

In 5-10 years from now, if the Aral Sea has the chance of returning to its natural size, we must first decrease the water being diverted from it. The high demand for cheaply produced cotton is still diverting 80 percent of the water from the Aral Sea. The public has very little knowledge on how much water it is used to produce cotton. It takes about 2,700 liters to make 1 cotton t-shirt. Cotton production also uses more chemicals than any other crop (World Wildlife Fund 2013). Rain water in a Brazilian cotton region contained 19 different pesticides - 12 of which were used in cotton production. (Laabs 2002). A demand from the public that textile companies produce organically grown cotton needs to be a priority. The population of the Aral Sea region are driven more towards meeting international demand than valuing their natural resources and personal health.

Uzbekistan is trying to bounce back its economy from a post-communist governance state, however it is recklessly destroying its eco systems. The area between Uzbekistan and Kazakhstan is known as the Aral Sea and it was once the fourth largest lake in the world. The population of Uzbekistan is close to 30 million and its GDP today relies heavily on cotton production. The government of Uzbekistan and its neighboring states have diverted the two rivers that feed into the Aral Sea to promote the agricultural industry, which has led to the shrinkage of the Aral Sea. The Aral Sea has shrunk by 90 percent in the last 50 years resulting in desertification of the area. Aside from the environmental damage of the Aral Sea, the health of Uzbek population has diminished as well due to growth in respiratory diseases. The economy of

Uzbekistan today is heavily dependent on cotton production. Maybe next time we pick something off a SALE rack we need to keep in mind that cotton production counts 40 percent of world textile demand (Saicheua 2012). The global need for cheap cotton produced items is only increasing with flash fashion trends that promote a throwaway of unwanted items habit. A broader consumer awareness for the environmental effects caused by our indirect actions could reduce the future damage of our planet.

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