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Thousands forced to migrate as sea swallows coastal belt

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Master of Science in Journalism



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This Capstone Project report is submitted to the Faculty of Journalism as partial fulfillment
Masters of Science in Journalism degree

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Dedication

To my Mom, Dad and Sister; without their unprecedented love and support, this project would not have been possible.

I would also dedicate this project to my very special person in my life, Ahmed Saeed. He has inspired me in many ways. Sometimes I felt I was on a sinking ship, but Ahmed not only kept that ship afloat, but also kept it pointed in the right direction.

Acknowledgement

Would like to acknowledge my teachers, who guided me in right direction and all the sources who helped me tell their story.

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Abstract

Pakistan is one those tropical countries that faces a major climate change challenge. People are generally less concerned about the issue but a great effort is required to face this growing threat. Extreme weather events can already be seen. In 2015 more than 2000 people died because of heat wave which heat in Karachi, the capital of Sindh province.

Karachi, the Arabian coastal region has area of approximately 3,640 km². The impact of global warming can be measured in the coastal region as sea levels have risen by approximately 10 centimetres in the last century. The sea levels are expected to rise more than 50 centimetres by the end of this century. This will have possible flooding in the lower south region of Karachi before it moves upwards. The change in the sea level is due to two main reasons, thermal expansion and glacier mass loss.

Climate change also threatens increase in coastal erosion due to rise in the sea levels. Possible impacts would be on the coastline infrastructure like power plants, real-estate, housing etc. The slightest rise in the sea-levels could trigger sea storms which could cause massive flooding. The change can also cause the salinization of fresh water from creeks flowing from Indus Delta reservoirs along the coastal belt. Most of the coastal population could face dire fresh water scarcity as much of the coastal population gets from these reservoirs. As water becomes salty, its use for human and for domestic purpose diminishes.

Pakistan is ranked on seventh position among countries affected by climate change with death toll being approximately 523 lives per year. The newly elected government has promised to take climate change seriously. Prime Minister Imran Khan, in his inaugural address to the nation on 19th August addressed the issue of global warming and said that the government would champion “green growth” by starting a massive tree plantation campaign. No other prime minister has addressed the issue in his or her inaugural address. Making policies that makes environments of the cities sustainable is one of the biggest challenges Pakistan faces today. It is any ongoing struggle to at least prepare ourselves to battle the threats and take necessary actions to stop climate change for occurring. The Climate Change Act 2017 lists all the obligations under international convention to address the impact of climate change but, only time will tell whether the government

is willing enough to act upon it to stop the climate change in country, most importantly Karachi as it serves as the economic backbone of the country.

STORY

Life has not been easy for people living in Pakistan's coastal belt. Abdul Majeed's house was a few kilometres from the beach in Keti Bundar. He earned his livelihood by catching fish.

The sea provided him his bread and butter, yet it was the sea that threatened to wipe away his property. One afternoon, the 47-year-old fisherman went on a stroll along the shore to assess the situation and ascertain how long before the sea swallowed his land. He could see the waves were getting closer with each passing hour, but it was still far from his house.

But, he was wrong. Later that evening sea had intruded in his village.

"I woke up with the sound of the waves hitting our house, "remembers Majeed. "Water level was rising with every passing moment. Me and my wife carried our children above our heads and went to safety. All of us watched our house, our village getting swallowed by the sea from a distance each passing minute."

The streets which linked to coast was completely submerged in to the sea as waves after waves came crashing down. A donkey cart floating with the torrents hit one of the road signs and somehow got stuck in it. Crockery, fire wood, clothes and other household items could be seen floating by. Slowly, their belongings now belonged to the sea as the darkness fell upon the sky. Sound of crushing water, rushing wind and cracking of muddy homes along with wood haunts Majeed till this day. *"When the sea-water receded after a few hours we went back to our house,"* said Majeed. *"I could not comprehend what had happened. The water was still knee-high. Everything that was not taken by the tide just lay there scattered. There was sand everywhere and we could taste the salt in the air. We scavenged what we could."* (Majeed, 2019)



Abdul Majeed telling about the day sea water intruded his home.

It was that day when Majeed realised that his village in Keti Bundar, now swallowed by the sea was not a safe place for his family. He decided to migrate to another village. Soon, he was followed by his neighbours and then the entire village.

The grand debate

With the world is still stuck in the debate on whether climate change is real or not, those most affected by it are facing a difficult time dealing with the consequences.

Due to the rise in sea level and sea intrusion, entire communities living in the coastal areas have been forced to move from their village as the conditions become unbearable. Fishermen communities tend to live like gypsies in search of livelihood. Even after moving, migrants find it difficult to find a steady source of income.

If the current situation is not curbed, the number of climate migrants is likely to increase and since these migrants do not have the status of refugees, they are not protected by any law, hence their right to live is like a ship without a sail in the open sea.

Over the years, scientists have pointed out a number of reasons for climate change and most of them seem to be man-made. It is like a cause and effect scenario. You build something without taking into consideration its long term consequences and slowly that thing starts to take its toll on the very people that thing was built for.

Under threat

Coastal areas in the district of Thatta like Keti Bundar are facing similar problems. The area seems isolated from the rest of the city. Once a beautiful harbour, which dealt in the export of goods of royal stature, the Keti Bundar is a now barren marshy land.

The path leading to Keti Bundar is dotted with isolated patches with not a single human being in sight. Crows circle in the sky over the body of a half-eaten cow. As we made our way to the harbour, ignoring the ominous signs and the alarms ringing in our heads, the car tyres burst as they could not bear the sharp stones that were in the path.

People are suspicious of newcomers. While heading towards the harbour, a middle-aged man in a grey shalwar kameez, and donning the traditional Sindhi cap, flanked down our vehicle. At least three of his comrades stood at a distance.

“Where are you headed?” he inquired with his eyes wide open. “Turn this car around. You cannot go any further.”

After half an hour of argument, we were finally allowed to go forward.

Residents of Keti Bundar say that over the years, the sea has intruded on their agriculture lands and it has ended their livelihoods. What were once fertile cultivation plains where bumper crops such as rice, wheat and fresh vegetables were grown besides serving as grounds for livestock, have now barren wastelands.

The cause

According to environmentalists and local residents, who speak on the basis of conventional knowledge, the major reason for the sea intrusion is the decrease in the flow of river water. The threat is further exacerbated by building dams, which causes the water level to drop even more. Locals say that the government builds dams just for political scoring and nothing else. They also decry the unequal distribution of water in accordance with the 1991 water accord.

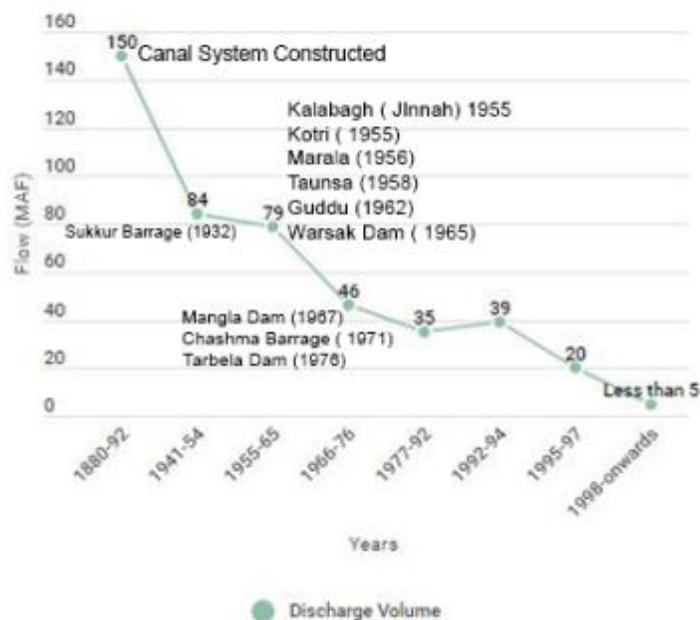
According to water experts, storage units such as barrages, which is a type of low-head, diversion dam consisting of a number of large gates to control the amount of water passing through, should be built instead of dams. This allows the structure to regulate and stabilize river water elevation upstream for use in irrigation and domestic use.

There are 12 barrages in the Indus ecoregion. The river Indus does not fall directly into the Arabian Sea. It is divided into smaller rivers which are called creeks. In all, the River Indus has 17 Creeks. The area where creeks begin to take form is called the delta. For the coastal region of Sindh, the water is taken from Kotri Barrage, which is the lowest barrage on the River Indus and discharged into the Keenjhar Lake.

For industrial, irrigation and municipal purposes Sindh and Baluchistan take water from Hub River. The dam which is built on that river called the Hub Dam. It is about 50Km north-west from Karachi. The catchment area of the dam extends across the two provinces covering more than 8000 square kilometres.

There is an agreement between the two provinces regarding distribution of water. As much as 60 % of the water flow is diverted to Sindh and remaining will be diverted to Lasbela Canal, Baluchistan. But the unequal distribution of water has caused the sea to intrude into the creeks. The amount of river water that used to fall into the sea has formidably decreased from 1998-2004. The annual flow downstream Kotri Barrage has been reduced from 77.3 MAF (Million Acre Feet) to 39.2 MAF.

Average Annual Discharge volume Downstream Kotri Barrage



Source: S. Ahmad, n.d. Water Resources of Pakistan and Strategy for Climate Change Adaptations.

This has consequences for the Indus Delta region such as Thatta, Badin, and Hyderabad as the sea water intrudes the agriculture lands and destroys the fields. The sea intrusion also makes the groundwater more acidic, making it unfit to drink. The River Indus brings silt that fertilizes the land and also makes islands.

According to an environmental journalist, Amar Guriro, the water of Arabian sea used to be sweet till three nautical miles and had an abundance of marine life.

“Groundwater was also sweet and there used to be fish in large numbers here,” he said. “Two historical harbours, Keti Bunder and Shah Bunder, were used to export goods to various countries that contained agriculture commodities like rice, honey, wheat, fish and clothes.”

According to Guriro, the once rich delta has become a victim of sea intrusion due to the construction of dams which stopped the flow of water.

“The Arabian sea is flowing up to 200km upstream from the creeks,” he said. “So as the sea water crept in, the fertile land on either side of the Indus became barren and because of expanding sea the sea levels are also rising contributing to the intrusion. The sea is eating the land and it will continue to do so because there is nothing to push it back”

One of the natural process as the river flows into the sea is that it brings silt which is a fine sandy material carried by the flow of water. Silt is deposited as sediment from where the river water flows and acts as a fertilizer for the land. The land has fertility for up to three to four inches. When something is grown it uses the fertility of the land. Silt restores fertility as the river or flood water flows through that area.

If the flow of the river is stopped though dams, the silt settles down. Once the water is released, it will not bring silt with it.

“The water was coming from the mountains and while cutting the mountains it gained silt and came here,” said Guriro. “When you allow the water to flow again after stopping it then it is of no use.” (Guriro, 2019)



Thatta, where once there were Red Rice fields.

According to Sindh TAS agreement or Indus Water Treaty, the upper riparian rights of the three eastern rivers that are Beas, Sutlej, and Ravi that has an approximate flow of 33 MAF, belongs to India. Pakistan has the rights to the western rivers, Indus, Jhelum, and Chenab that has a mean flow of 80MAF. Since Pakistan was getting more flow, a large dam was built by India called KrishnaRajaSagara Dam or KRS dam. Because of this dam, the three rivers have all but dried up. India only releases water when they have it in

excess. To store the excess water, Pakistan has also built dams and the government is now planning to build more.

But people have reservations about building dams. One of it is the unequal distribution of water downstream towards Sindh. When the Chashma barrage was built, the government made a small canal from Chashma and linked it with Jhelum. This is called the Chashma-Jhelum link canal. The government made more canals after that, which diverted even more water from the Indus river to Punjab. The main objection of the people of Sindh regarding the construction of more dams is that the government should not make more canals from it and let the river flow as it is.

“The water of river Indus is not of one province,” said Guriro. “The share of water is calculated on which all provinces have agreed upon. The provinces also agreed that the canal will be active only when there is excess of water but it is active throughout the year.”
(Guriro, 2019)

The Water Apportionment Accord was agreed upon on March 16, 1991 at Karachi in a meeting of the Chief Minister's of the four provinces along with several provincial representatives. The accord allocates the following share to provinces:

Province	Kharif (MAF)	Rabi (MAF)	Total (MAF)
Punjab	37.07	18.87	55.94
Sindh *	33.94	14.82	48.76
NWFP (a)	3.48	2.3	5.78
** (b) Civil Canals	1.80	1.2	3.00
Balochistan	2.85	1.02	3.87
Total	77.34	37.01	114.35
**	1.8	1.2	3
* Including already sanctioned Urban and Industrial uses for Metropolitan Karachi.			
** Ungauged Civil Canals above the rim stations			

The Water Apportionment Accord – 1991

The same objection is being made in the construction of Kalabagh dam that a backdoor canal should not be made. If there are 100 litres of water, Punjab takes 40% via canals and later also asks to share from the remaining 60%.

“Because the water is not being distributed properly, it is not reaching these creeks,” said Guriro. “Because of that, many species of fish have become extinct, and agriculture land has been wasted. Water is a whole habitat; it can contribute to national GDP. Pakistan should make money from the exports, not one province.”

As Pakistan is an agriculture-based economy country, water storage along with effective water management is required to build up the agricultural economy.

“We need 2400 litres of water to grow 1 kg of rice and you are exporting it in just 300 rupees, you are exporting 2400 litres of water, so this is not economical,” explained Guriro. “We are saying that we will make dams, grow rice and export them even if our Delta is destroyed! It is about the mind-set.”



Fishermen offloading the fresh catch.

The economy of crops has to be kept in mind while growing them. If rice is not an economical crop there are other products that can be grown more in quantity using lesser water. It seems that water is being used in the wrong places be it rice, wheat, etc. With

2400 litres of water, 2 tons of dates can be grown and exported along with dairy products, flowers, and spices.

“We should grow rice and wheat for our own use only,” said Guriro, “We should not export them. We should export products keeping in mind the measurement of water. Some country will always buy these products. If not Malaysia, then it will be Indonesia who will buy. The point is there will always be a buyer.”

There is a general perception among the public that Pakistan will soon run out of water and there would be nothing but barren lands. However, according to a report by International Centre for Integrated Mountain Development (ICIMOD), by 2030, Hindukush and Himalaya glaciers will melt by 30%. After Arctic, Pakistan has the most glaciers and there are 135 countries after that have less. This means that first, those 135 countries would dry up then it will be Pakistan’s turn. (Bajracharya & Shrestha, 2011)

“If we clear the dams to let the rivers flow, revive the agriculture, grow more mangrove forests then it will have a huge impact on our GDP,” said Guriro. “There is the whole cycle in making dams. First, you need a lot of money to build dams, after you have built them, canals are needed to be carved out then little streams from those canals for that particular part of the land, then you need fertilizer seeds, machinery to grow that crop then you need to harvest and pack and then export. Instead of that if you improve the ecosystem it can be beneficial for the Indus Delta region, it can have eco-tourism as well. It can provide us with wood, honey, medicinal plants, etc.”

Making dams is also not cheap, especially for an economically struggling country like Pakistan. For the construction of the two dams, Diamer-Bhasha, and Mohmand, a dam fund has been started by the government of Pakistan. The total requirement is almost Rs.1400 billion and up till now approximately Rs.10 billion have been collected. If the water is not allowed to reach the lower streams of Sindh, it seems that building the dams will benefit a select group of people.

Quetta, Mithi, Sahiwal, Vehari, and Mailsi all are cities of Pakistan which are not getting water because it is restricted to central Punjab. If dams are to be constructed then a proper distribution plan along with distribution channels like barrages, canals, streams must be made so the cities can get their due share.

“Quetta is at a high level we need solar power pumping stations, otherwise there is no river near Quetta,” explained Guriro. “The city might migrate after 30-to 40 years. So if we distribute the drinking water only and we grow economical crops then the ecosystem can be revived. Delta and Kutcha can be revived as well. Is this plan good or is the plan of making dams and growing rice good?”

According to Majid Motani, who is the general secretary of Pakistan Fisher Folk Forum, there is a natural system in place. The snow-peaks are melted, the streams flow through all over the country and then it falls into the sea. But the theory came that the water that is falling into the sea is being wasted.



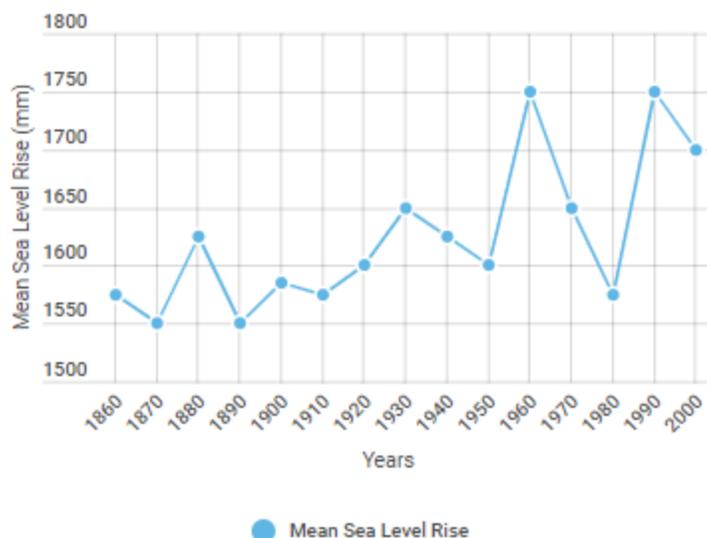
Crabbing, an alternate source of livelihood for the residents.

“It is a natural process that the salts of the sea water are being balanced by the sweet river water,” said Motani. “If the salt level increases in the sea, it would be difficult for the marine life to live there.” (Motani, 2019)

When the balance of nature is disturbed, nature has a way to hit back in the form of natural disasters such as floods, droughts, heatwaves, etc. The degradation of natural resources causes this misbalance which in turn causes mass damage and destruction to communities which are most vulnerable. Sea intrusion is one of those phenomena which has affected millions of lives along the coastal belt.

The sea intrusion is not the only reason the sea levels are rising. The planet is facing global warming and changing climate patterns are also causing sea levels to rise. The rise in the temperature is causing glaciers and polar ice sheets to melt. According to a report published by Intergovernmental Panel on Climate Change (IPCC), since the middle of the 19th century, global sea level rise or GSLR has gone up to 2.8 to 3.6 mm/yr. At this rate, sea levels are projected to rise more than 6 feet by the end of the year 2100.

Mean Sea Level Rise Recorded along Karachi Coast, Pakistan (1850-2000)



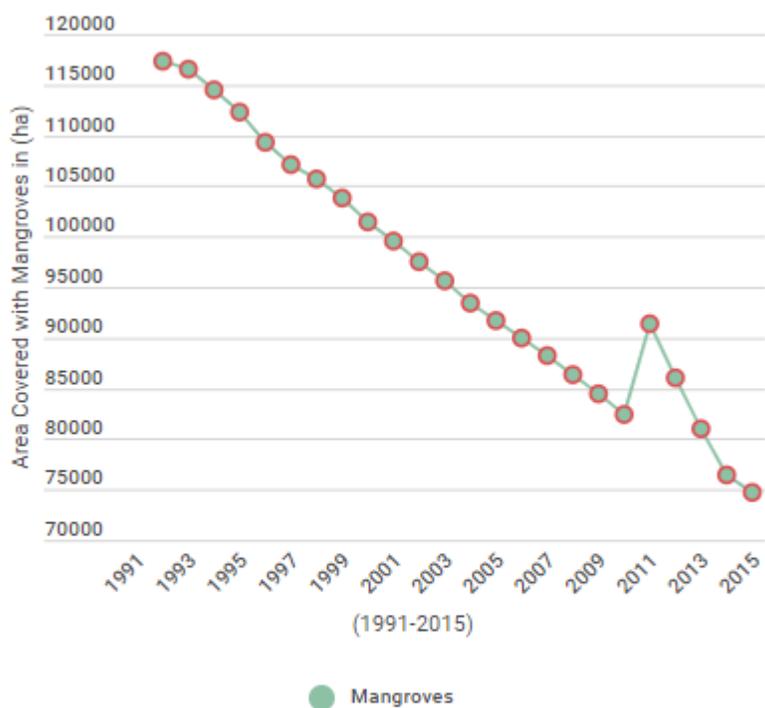
mm=millimeter

Source: M. M. Rabbani et al. 2008. The Impact of Sea Level Rise on Pakistan's Coastal Zones

Due to a slow and gradual rise in the sea levels, the intrusion of saline water up the River Indus has proven to be one of the most disastrous cases of environmental degradation and coastal areas of Sindh are the major victims of this disaster. The Indus delta spreads on an area of approximately 600,000 ha. The Indus Rivers falls into the sea through 17 major creeks of the delta. These major creeks are also having several minor creeks along its belt with mangrove forests. These mangroves provide a breeding ground for various kinds of fishes and shrimps. People living in the coastal regions depend upon these mangroves as it provides them with firewood and fodder requirements.

As the flow of freshwater decreases in the creeks livelihood of people living in the coastal regions is at stake. The reduced flow of sweet water is of grave concern to the people as it is affecting their occupation which has been there since generations. A large number of migration has taken place by the people of coastal regions because places, where they used to live before, have now been swallowed by the sea. The problem is not about who is right and wrong, but what is obvious about the ever-changing climate.

Indus Delta Mangrove Covered Area



ha= Hectares

Source: Degradation Of Mangroves Ecosystem Of Indus Delta, INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 6, ISSUE 02, FEBRUARY 2017.

As the populations increased, the water started to be used for agriculture, the river Indus started to get man-made a distribution, and after that country made two dams, Tarbela

and Mangla. For the people living in the coastal regions, livestock and agriculture were the main sources of income and to some extent fishing. Cultivation of various kinds of vegetables, fruits, and wheat was done and even exported.

Laal rice or Red rice were cultivated in its season in such abundance that farmers from all over Sindh used to come during harvesting season. Fishermen were not in abundance and fishing was not considered a source of main income, it was just a part-time job for some people.



Ship waits for the intruding sea

“When the river water did not flow into the creeks the farmers and the livestock owners started to look for alternate means of living,” said Motani. “The land started to get barren and grass did not grow. People looked for a livelihood and one that was closest to them was fishing. So, the agriculture and the cattle farm people, which were more in number shifted to fishing. This also affected the sea, as the pressure on the sea increased the bigger fish started to disappear.” (Motani, 2019)

The traditional occupation of the people of the coastal region has been broken down. Waterlogging and salinity lands have left many farmers jobless as the lands become

deteriorated and barren. This has caused a massive migration of people in various parts of the Sindh and even Punjab in search of alternative livelihoods.



House in a fishing village in Keti Bundar

People started to fish for the smaller fishes,” said Motani. “To catch the little fish they started to make thinner and finer nets. When they started to fish for the little ones, the bigger fish started to disappear faster because the little fish is in the food chain of the bigger fish. The way it is going, it seems like there might be no fish left in the sea.”

According to Motani, after 1971 a finer net was invented called, “Bula Gojai”, which came here from Bangladesh. People who had land near Indus River made finer nets were also landlords. There is a huge forest for mangroves that covers these 17 creeks. Mangroves are useful as 35 to 40 species of fish use Mangroves as their breeding ground from crabs to shrimps. When shrimps are born they are thin as a hair and attach themselves from the roots of mangroves to feed.



Using finer nets to catch smaller fish

“The finer nets are used to catch these shrimps from mangroves,” said Motani. “What will be left if you start to hunt from the place where fish is generating from? Our forest department and Sindh fishery department are so weak. They have the ministers, but they do not have the manpower to curb this situation. These departments need to concentrate on these matters. If they do their job, they can help prevent climate to change, they can help in deforestation of mangroves, and fishing from the finer nets.” (Motani, 2019)

As pressure on marine life has increased, many species of fish have become scarce. Fishermen now have started to look for smaller species of aquatic life to fulfil their needs. Snails which eat the pollutants from the surface of the sea are now the new target. Adding insult to injury, the method used to catch snails is polluting the sea as well.



Fishing for Snails

“To catch snails, fishermen, put garbage and leftover chicken and beef in the cage and the throw it in the sea,” explained Motani. “Since snails eat garbage, they will get caught in the cage. This process is repeated several times and due to this, the pollution started to rise in the sea bed. Humans are the worst enemy of nature as it is being destroyed by them.”

Communities living in the Indus Delta Region have been greatly affected by climate change. Coastal areas like Thatta, Badin, Sujawal, etc. have witnessed mass migrations over the past years and still are migrating due to many disasters caused by climate change, like sea intrusion, coastal flooding, erratic rain patterns. It has caused scarcity of clean drinking water and degradation of fertile land up to hundreds of thousands of hectares.



Barren lands of Keti Bundar

Looking towards the barren land where once there used to be lush green rice fields, Muhammad Siddique Ronjo , 77, recalls his early days when he used to go fishing with his father. Once a very active young boy, Ronjo is now ragged old man roughed up by the sea.

“I was 11 when started fishing with my father,” recalled Ronjo, “We had huge ships with sails, we used to go abroad also through the sea to sell rice and vegetables that we used to grow. Slowly learned fishing and then I did it on my own and I am doing it ever since.”

It is not as simple as Ronjo puts it in words. Over the past years, sea intrusion has caused him to migrate from one place village to another. An island in Keti Bundar, as Ronjo points to the sea, was his ancestral home now nearly submerged by the sea.

“As a young boy, I was mainly a farmer. I used to do fishing to enjoy myself,” said Ronjo. “It was all populated, all this land you see behind me used to be a big creek, this is all dried up now, all this used to have rice, this very moment, the air was filled with rice fragrance. When the sweet water stopped to flow, all the creeks that had sweet water had

dried up. There was no sea water for hundreds of miles but, now it's here. Agriculture was finished, all the fields were destroyed, so the farmers started to go towards fishing.”
(Ronjo, 2019)

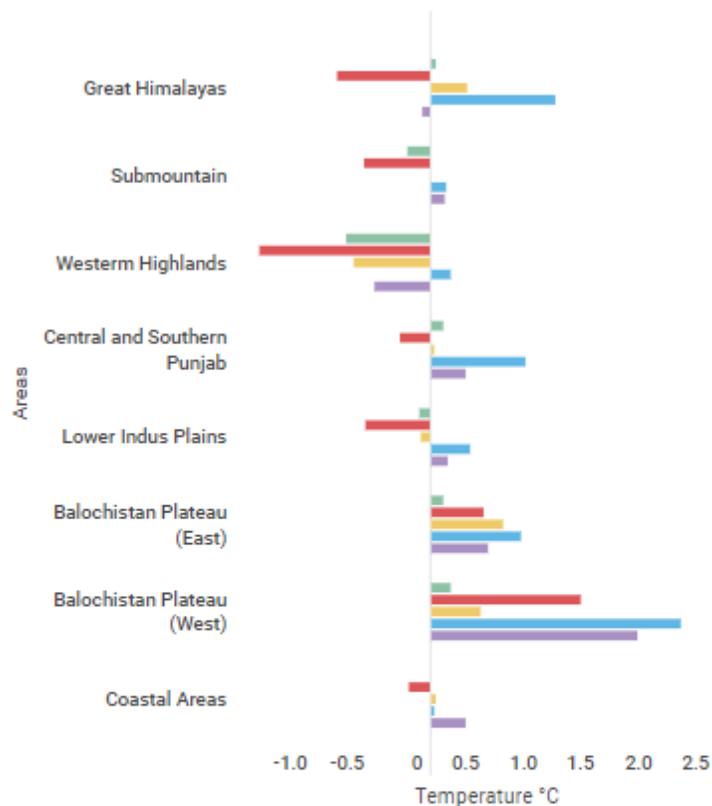


Muhammad Siddique Ronjo remembering his childhood days.

Little did Ronjo know that his hobby would one day keep him and his family fed. *“My ancestors used to do fishing before but it was just a hobby,” he said. “Now we just go to the sea catch fish to fill our bellies and satisfy our hunger.”*

As the sea levels started to rise more, Ronjo had to take precautionary measures to make sure his family survives the intruding sea. He had to move with his family to a new location where seawater could not easily reach.

Mean Temperature Trends in Pakistan (1951-2000)



Temperature in °C/year

Source: Global Change Impact Studies Centre. 2005. Final Technical Report for APN CAPaBLE Project. Islamabad. http://www.gcisc.org.pk/2005-CRP01-CMY-Khan_CAPaBLE_FinalReport.pdf

“The place where I am standing did not have any signs of the sea,” said Ronjo. “It did not matter if there was high tide or low, the sea just did not reach my house. But once it almost did so, I made this sea wall so the water couldn’t reach my house. The houses used to sink in the sea. Now we do not have any more option to move further away if the sea level rises more. We have to migrate from this place. There is no point in staying here. It will be all under water like before.”

Keti Bundar was not an ordinary harbour. People used to come from various cities to a food festival that used to be held. There was a variety of food on display, according to Ronjo, there was the famous red rice, various kinds of vegetables and fruits, various kinds of oil, (Asli ghee).

“This place was heaven and there were so many cattle and farms,” claims Ronjo. “People used to beg to take milk from them because they had so much in excess. They used to beg to take it for free, and the reply they get is that they already have it and now when you pay for the milk you get water. Now we get tea in the morning before there was no tea, there was fresh butter and lassi with bread, now we have to serve tea to our guest even.” (Ronjo, 2019)

Since sweet water has become scarce, Ronjo claims that residents are being exploited to get clean water for drinking.



Water storage area for residents.

“I cannot begin to describe the condition of water that we get for drinking,” said Ronjo with grief. “It is like sewerage water from which people won’t even like to wash hands or

face. There are so many bugs and insects in it. I have to pay Rs.2000 rupees for this water and it is not even clean. I have to boil it many times before all the insects die and the smell goes away. Since it evaporates there is little left to use. Sometimes we do not even get this dirty water. All the sweet water has been eaten by the sea. My money is being mostly spent on the water. I also have to buy firewood since there is no gas or electricity here.” (Ronjo, 2019)

According to Water and Power Development Agency (WAPDA), the availability of water in Pakistan has gone down from 5260 cubic meters per year in 1951 to a level of less than 1000 cubic meters per year. Due to the lack of sweet water yield of crops per acre has drastically reduced.

According to an environmental activist, Shakeel Memon, building dams is not the problem but the unequal distribution of water is.

“Building dams is a good thing but the agriculture would flourish and our country will prosper and our (upper kay bahi) politicians will also benefit from it,” said Memon. “But to snatch someone’s right and give it to another just so that he/she can politically score is not acceptable. Previously the sweet water used to be in excess but now we have to pay even for drinking water which we can’t even drink.”

Due to climate change, irregular weather pattern has emerged. Memon believes that since there is an unequal distribution of water there is cause and effect.

“People make dams and it affects the coastal regions,” said Memon. “Tsunami affects 40 to 100 kilometres. The tsunami that came in 1945 did not affect the Keti Bundar, this shows that the sea used to be 1000 of kilometres away.” (Memon, 2019)



Waiting for their friends to play.

Hajamoro creek used to be river previously and there were a lot of villages in its proximity. There were forests along its belt which is now it is mostly underwater.

“The Dablo community people used to live near Hajamoro creek,” said Memon. *“But due to sea level rise, the people migrated to Keti Bundar. Maybe the sea will rise more and all the people who are living in Keti Bundar have to migrate somewhere else.”*

People are living on small islands are not oblivious to the danger of the rise of sea levels. There are approximately 30-50 households living on the islands. Siddiqui Dablo, Ayub Dablo, Achar Dablo etc. Most of the people, who could afford to migrate from these Islands have. The rest are still in the path of danger because they cannot afford to migrate. *“Even if you make a wooden house, you still need about 80 to 90 thousand rupees,”* explained Memon. *“If one family migrates from somewhere, they need at least 2 to 3 lack rupees so once they move, they can provide for themselves and their families. People who do not have this kind of money are still living on those Islands.”* (Memon, 2019)



A fishing village in Thatta.

A fisherman, Muhammad Khan Shaikh, 45, recalls the days when there was land as far his eyes could see. He remembers the meadows where he and his father used to take a walk. As there was a lot of fresh vegetation and rice, fish was cooked as a delicacy. This place is not being actual home from where he recalls his childhood.

“This is our third village,” said Shaikh. “The village where we used to live before has been intruded by the sea. I still remember the taste of the sweets that were made in our village. It was so delicious that it used to be exported from the harbour to various counties in Asia. Some people are not aware of the danger they are in. They will lose everything if they do not move now.” (Shaikh, 2019)

Irregular storms did not bother Shaikh and his family before as they did not affect them, but now it is the cause of great concern as it damages their property.



Muhammad Khan Shaikh talking about his problems due to rise in sea levels.

“The land has sunk and the sea has risen. We did not bother when there were storms before,” claimed Shaikh, “But now we can predict when it will come but we still cannot do anything. Ships sink, houses get destroyed, people die. If the sea keeps intruding more, this Keti Bundar would be the same as the other two, which are swallowed by the sea.”

Over the 15 years, the sea has been intruding in the coastal regions. Shaikh complains that the government is doing nothing to help them or even come to their aid when required.

“All this population is living here on Allah’s help,” said Shaikh with despair. “The government will do the same thing as they did before, nothing. When it is time for elections, they treat us like kings and queens to get a vote. But, when they are elected, they do not even look at us. They make false promises, they say we will do this and that but they treat us as if we do not exist.” (Shaikh, 2019)

As people feel that their right of sweet water has been taken away from them, they will do whatever they can in order to make sure they survive.

“The fish we get from our boats, we do not pay tax on them, why should we?” asked Shaikh, “Why should we not take it for ourselves when the government has taken our right and given it to someone else. We even do their work at the fishery; they do their work for

someone else and then tax us! They give all the bigger and better quality fish to big companies and the fishery will get nothing. And the fishery people do not do anything because they have a lot of money, they do not care. If there is one drinking water from the sea, there is no use of it, it will not affect anyone.”

Human intervention has acted as a catalyst in climate change. They have acted selfishly without taking into account the harm they will cause to the ecosystem in return to their actions. Deforestation of mangrove forests, which are an important life-supporting system providing habitat, shelter and breeding ground for marine life, is one of those harms. They clean the water, keeping it fresh and provide important nutrients to the aquatic life. They also are a source of timber, but now they are being used as fuel-wood for fire by the coastal population. Most importantly mangroves are the first line of defence in the coastal region for any naturally occurring phenomena like cyclones, flooding, soil erosion. Their roots are such that they provide natural and very effective erosion protection. They trap the suspended particle in the silt and fuse it with the soil thus protecting the coastal regions from erosion.

The flow of water into the Arabian Sea is linked with dams and so is the balance of the ecosystem. Tahir Quershi, who is a consultant at International Union for Conservation of Nature(IUCN), is of the opinion that water has become a political issue whereas political point scoring has only hurt the ecosystem over the past years.

“All this has an adverse impact. When Kotri barrage was constructed in 1958, there as a time when Indus River flows into the Arabian Sea was about 150 million acre-feet (MAF),” said Quershi. “But due the construction of dams and barrages the water has been directed towards the agriculture (for food security) lands canal system and reservoirs. From that area water has become scarce and it was reduced from 150 MAF to 35 MAF over the years.” (Qureshi, 2019)



Avicennia Marina: Mangroves

In 1892 when the British dug the storm canal it was in that time when river Indus used to contain four million tons of silt load which went into the sea. As a result, Indus delta was building towards the sea at the rate of 30-35 meters per year. According to the Quershi, dams have stop the flow of water progressively. When the water flowed at its peak, the Indus Delta had 600,000 hectares of mangroves. Then water started to deplete, industrialization, urbanization and then agriculture also started to get affected. Water down the Kotri barrage started to become very scarce which resulted in the decay of Indus Delta. *“There were 160,000 in 1991 now there are reduced to 86,000 in 1997,”* claimed Quershi. *“The work we did with Sindh Forest department has restored the mangroves to some extent. The collaboration has helped to take the numbers of mangroves up to about 300,000 hectors along the coast of Pakistan.”*

Climate change has affected the species of mangroves to the point of extinction. The reason being the salt-water tolerance of some species is very less. Traditionally mangroves grow in fresh water. There are about eight species of mangroves, only three remains. Avicennia Marina, which is salt tolerant of most species, covers about approximately 95% of the mangrove crop. The importance of mangroves can be

comprehended when people understand the various functions they perform in the ecosystem.



Bacha Band (Rocky Barricade) to protect from sea intrusion

“Mangroves support plant and animal life,” said Qureshi. “Other than providing shelter and food to the marine life, they reduce the impact of waves and stabilize the coastline. They filter sewage waste and heavy metals from the industrial plants. They help protect seaports from siltation and reduce the intensity of cyclones. They are the shelter for migrating birds in winter. They are a source of livelihood for hundreds of thousands of people living in the coastal areas. They are a source of heating wood and cooking.” (Qureshi, 2019)

But people living in the coastal areas do not rely on mangroves for their main source of income so they have to migrate towards the city. Life is not easy for these migrants as they are not welcomed by the people with open arms. They are treated as aliens.

“The climate migrants have still not been settled,” said Quershi. “The girls get abducted by the landlords, they are facing social problems, they migrated from Keti Bundar, Thatta, Badin, and their own fishermen, their own people, who came from the interior of Sindh, they did not accept them. Those who migrated towards the interior in search of livelihood were beaten and asked to leave.”

Some climate migrants are not even working as fishermen now. They work as labours in some factory and their wives lend a helping hand by working as maids in various homes. According to Quershi, IUCN has rehabilitated them in various capacities and made them aware of what climate change really is and how it has affected them. If they do not do something about it, climate migrants have been briefed about how it will affect their future generation.



10 year challenge PHOTO:World Wild Life Federation

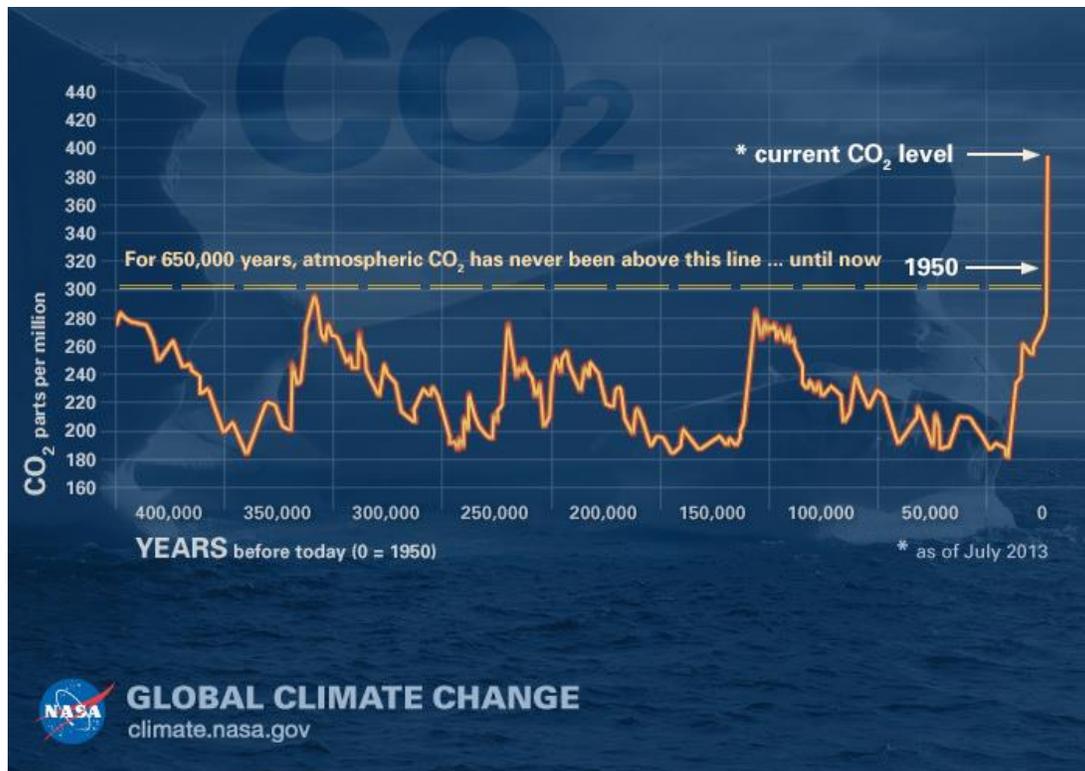
“We involve the climate migrants in planting when there is no fishing season they come to us,” said Quershi. “We involve them in various capacities, assign them roles like supervisor, assistants and give them a salary as well. We train them and raise their awareness about climate change. They get to realise that these trees are not planted very easily and they require a lot of care so we should be careful in about cutting them. Some of them now understand the importance of these trees and how they should be planted.

They realise that cutting them is not going to help them in any way in the future.” (Qureshi, 2019)

The change in climate is often thought out to be a fictitious problem. Humankind has looked at it the same way for far too long; it still does. It seems that people believe that if we do not look at this problem, it will go away. But science has shown evidence that climate change is here, it is undeniable and it is accelerating. From places like Thar and Baluchistan, where droughts will intensify; to coastal areas of Sindh where sea level will rise and wipe of generations; the manifestation of intense heat waves in Karachi killing thousands of people, oceans acidifying; methane level rising and marine lives become extinct. The very balance of nature is getting destroyed, and it is not taking place on its own; human beings are responsible and are acting as the catalyst. There have been decades of scientific projections that are become true right now whether they are extreme weather events or ice sheets melting.

People need to start believing that climate change is real and it is not rhetoric like “*WE NEED CLIMATE CHANGE*” or hysteria like “*NOISE COMING FROM WINDMILLS GIVES US CANCER*”, said the most powerful person on the earth.

Climate change can be our single greatest security threat; making the ones at our eastern or western borders look like secondary. People in power need to take on this difficult but achievable task. It has surpassed the choices that individuals make like what kind of light bulbs to use, using wind or solar energy, or buying hybrid cars if not electric.



By: NASA

Heavy price tags need to be put on oil and gas subsidies to stop industrial pollution because our ecosystem will collapse. Using renewable energy and putting fossil fuels where they belong; which is in the ground.

Climate change is not an individual's debate but a human one. Clean air, clean water, and liveable climate are inalienable and basic human rights. The issue has to come out of political point scoring sphere as it is the question of survival or living creatures that are on the ground, under water, and in the air. This is the most urgent of climates that need to be addressed not later but now.

When children and grandchildren will look at history and realise that we had a chance to become part of history and answer humankind's single greatest threat, we will either be praised that we saved the world for them or be vilified.

In history, whenever an existential crisis occurred it was resolved by the will of the people who had the power to do so. The government of our time has the power to do so and take action and help those who have been affected by climate change. Make policies

with the existing ones, which are present the shape of National Climate Change Policy (Chaudhry, Malik, & Sohail, 2012) and Pakistan Environmental Protection Act(PEPA) 1997 (Pakistan Environmental Protection Act (PEPA), 1997) and implement them to make sure that nature will remain in balance.

In (Chaudhry & Sohail, 2013) which the government has laid down short-term and long-term plans/goals to overcome the impacts of climate change in Pakistan. Every plan is laid out stating the time period and the institution responsible for executing these plans. Be it water, agriculture, industrial, transport or forestry, the government recognizes that climate change is real. All this looks good on paper but how much of this has been executed, the Ministry of Climate Change and Sindh Environmental protection Agency was unavailable for comment on their achievements despite making several attempts.

If remained unchecked, it will become a runaway train that will bring unimaginable disasters for all living things. It would be a shame that we look back at history and realise that we had the capability to stop climate change but our government lacked the will to do so.



Area where once sweet river water flowed.

A collective massive change in thought and consciousness, and a new sense of inspiration for the human race which, will enable a sense of impatience and urgency to solve this problem, is required. Humans are the last hope for earth to survive. The time of decades of research studies, climate conferences and excuses should be over as now is the time to act.

This is Majeed's third village and now he is barely making ends meet as he has lost everything his ancestors built to the sea unlike few lucky ones who were able to shift their source of income from agriculture, livestock to fishing.

“My father was an informant in the revenue department,” said Majeed . “We had lands before but now since they are gone, I am jobless. I do fishing; sometimes it is there and sometimes it’s not. There is no fixed time that we will catch the fish. We catch it when we catch it, if we don’t we go hungry, we do not have any business,

it is difficult to go by these days. There were lush green fields of wheat and rice and now it is all gone.” (Majeed, 2019)

People like Majeed are thankful to politicians like Benazir Bhutto. He claims that it is because of her that this city has survived. Basic facility like electricity was provided by her and if she wasn't there, the migrants would not have survived. But, Majeed sees his future to be uncertain.

“In approximately 20 -25 years this place will also belong to the sea,” claimed Majeed. “We feel the danger of getting drowned. Being Jobless is the biggest issue, three out of four people are jobless here. I have five children, but no older son to help me with fishing. It is very difficult, to feed them and educate them. The agriculture land we had, we used to harvest it with own hands, now it's gone completely.”

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