CRISTINA ALVAREZ-QUINONES TORRES

Drought in Tharparkar: From Seasonal to Forced Migration

Pakistan is ranked in the top ten countries most vulnerable to climate change (National Disaster Management Authority - NDMA). According to the Global Climate Risk index, Pakistan, together with Haiti and the Philippines were the most affected countries in 2012 (Zofeen, 2014). Due to its geography, it is greatly exposed to climate-change-related risks. Pakistan's fresh water resources are provided by monsoon rainfalls and the melting of glaciers from the Himalayas, which are retreating faster than in any other part of the world due to rising temperatures (Sattar, 2014). This is likely to cause not only glacial lake outburst floods (GLOFs) but also increasing water flows into rivers. In addition, according to the Director of the Pakistan Meteorological Department, monsoon patterns are also changing partly as a result of the well-known "Asian brown cloud[1]" derived from air pollution. Proof of this change of pattern might be found in the 2010 floods in Pakistan, when monsoon rains occurred in the northern part of the country, which is normally monsoon free. Had this level of rainfall occurred in arid zones, the rainwater would have been absorbed by rivers, thus avoiding the devastating consequences of the floods. On the whole, Pakistan's climate is arid, with levels of precipitation that are low (average rainfall in below 240 millimetres) and uneven, as 81% of river flow and 65% of precipitation take place in the 3 months of the monsoon season (Sattar, 2014). As a result, the country is prone to droughts, which have been increasing in number and intensity over the past few decades. In a country highly dependent on agriculture (as well as on natural resources such as natural gas from the desert zone of Baluchistan) all these extreme environmental situations are having severe impacts on this sector, and thus on food security, but also on migration patterns. Historically, Pakistan has been a country with high levels of migration, both internal and international, linked to both its geography and environmental changes. For instance, during the colonial period, the British introduced canal irrigation in what is now Punjab province, bringing farmers from the East; and in the post-colonial period, following the construction of the Mangla Dam the British offered to relocate the population displaced from the project to Britain (Sattar, 2014).

This paper will analyse the drought that occurred in the region of Tharparkar, in Sindh province starting in 2013 and reaching its most devastating point between March and August 2014. The region of Tharparkar is traditionally prone to droughts, and its population, which is dependent on agriculture and livestock, has long suffered from extreme environmental conditions that have led to problems of food insecurity

1. "Asian brown cloud, a large atmospheric brown cloud that occurs annually from about November through May over eastern China and southern Asia. The Asian brown cloud is caused by large amounts of aerosols (such as soot and dust) produced in the combustion of fossil fuels and biomass across the region. It has been linked to decreases in summer monsoon rainfall in India since 1930, the southward shift of the summer monsoon in eastern China, declines in agricultural production, and increases in respiratory and cardiovascular problems in the people inhabiting the region". http://global.britannica.com

and chronicle malnutrition, increasing neo-natal mortality and diseases and death among livestock, all causing an increasing degree of forced migration. This paper will focus on the development of the drought and its consequences for the population, both in terms of migration and livelihood. It will also analyse the response and measures undertaken by the Government and will attempt to set out a series of recommendations to address the problem.

1. RAINFALL AND DROUGHT CONDITIONS IN PAKISTAN

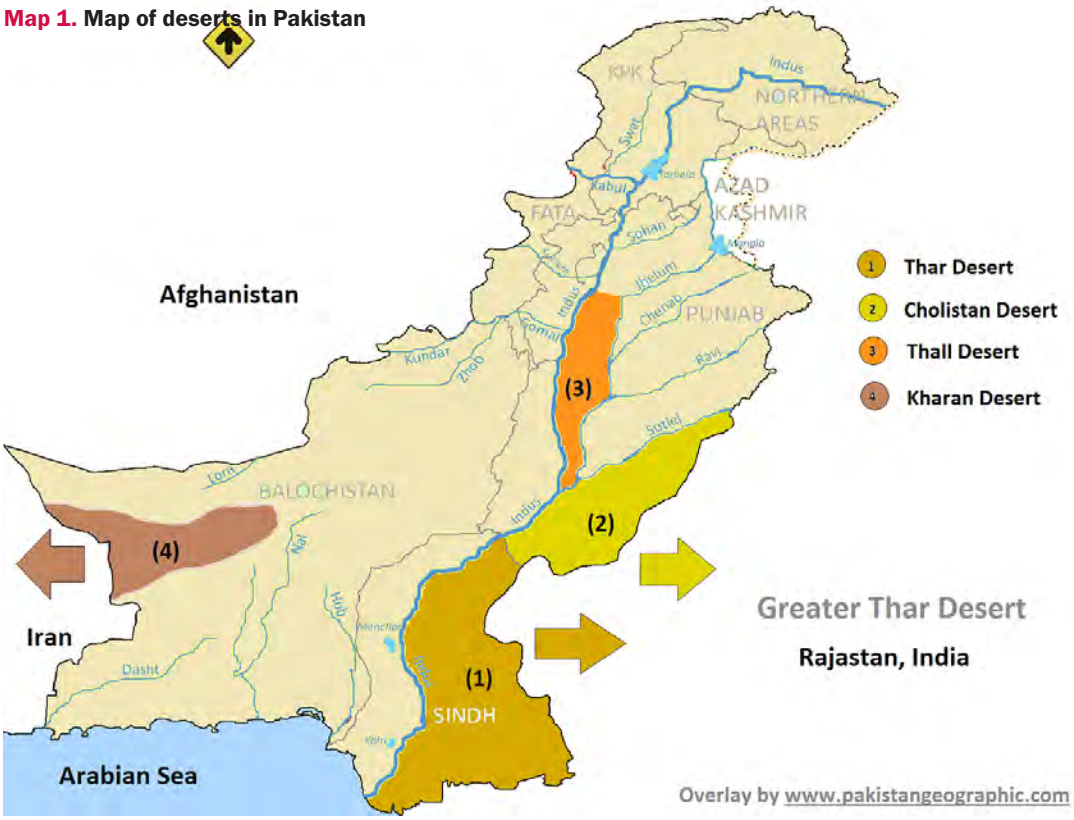
Rainfall variability in Pakistan is high. While the northern half of the country is semi-arid to very humid, the southern part, in which Tharparkar is located, is arid to hyper-arid. Drought is a slow onset event: its effects can be less obvious as they usually accumulate slowly over a long period of time. Consequently droughts normally affect a higher number of people than other natural hazards (Pakistan Meteorological Department). According to the Pakistan Meteorological Department a drought "is an extended period of months or years when a region notes a deficiency in its water supply. Generally, this occurs when a region receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region". Droughts can be meteorological – defined by the dryness and duration of the dry season; agricultural – mainly affecting food production and farming; hydrological – associated with the effects of low levels of precipitation on the water supply; and socio-economic – occurring when the demand for an economic good exceeds supply, due to weather-related water shortages (Pakistan Meteorological Department).

According to the Jaggarta organization, the worst drought that has taken place in Pakistan in the last 50 years is that of 1998-2002, of which the El Niño[2] phenomenon in 1997 was an important starting point. The Meteorological Department of Pakistan has also established a link between El Niño and instances of drought, as over a period of 100 years (1871-1988), 11 out of 21 droughts occurred in El Nino years. It also associates droughts with factors such as the prevalence of high-pressure systems, winds that carry continental instead of oceanic air masses, deforestation, and global warming. Climate change is part of the causes of drought, as can be seen in both the changing patterns of precipitation (the monsoon occurring in September rather than in July and August) and in the intensity of events (waves heat, floods cyclones, etc...). But are other factors have also been identified (United Nations Pakistan, 2014), such as the demand for natural resources and institutional apathy. A growing population increases the demand for natural resources, which are largely non-renewable such as groundwater or land among others. The use of and drilling for groundwater increases salt contamination and thus reduces the amount of fresh water. Population growth also increases the exploitation of other natural resources such as minerals, present in the region of Sindh, further reducing the amount of available land and water, and urbanisation and the growth of urban areas affect the supply of water to the surrounding region.

Public institutions do not, however, seem to actively respond to these issues. As the Pakistan Meteorological Department recognises, "no organisations dealing with the drought issues exist in Pakistan and the responses to drought for the distressed economic and social sector, whenever such situation arose, are taken on emergency

2. "A climatic event occurring every two to seven years, characterized by warming of surface waters and reduced upwelling of cold, nutrient-rich water off the western coast of South America, causing die-offs of plankton and fish and influencing jet stream winds, altering storm tracks and affecting the climate over much of the world". http://www.thefreedictionary.com

Map 1. Map of deserts in Pakistan



Source: Sindh Provincial Disaster Management Authority

and on ad hoc basis". There is also a lack of communication and coordination between institutions (Di Nunzio, 2014) as well as limited budgets for mitigation, or even development. The Government of Pakistan controversially classified the 2014 drought in Tharparkar as socioeconomic (Hashim, 2014), and it was only when different media and NGOs started to report infant mortality and loss of livestock due to disease that the Government began to recognis"e the seriousness of the situation (Pakistan Water Partnership, 2014).

1.1. Tharparkar: description of the drought

According to the Sindh Relief Department, the district of Tharparkar has been declared calamity-hit in 1968, 1978, 1985, 1986, 1987, 1995, 1996, 1999, 2001, 2004, 2005, 2007 and 2012. The desert of Tharparkar covers more than 22.000 km² and is the largest in Pakistan and the 18th largest in the world. Its population numbers 1.5 million people, living in 2300 villages and urban settlements. It is composed of six *talukas* – Mithi, Islamkot, Chachro, Dihly, Diplo and Ngarparkar – each of which receive different levels of rainfall. The land, although arid, is highly fertile but depends on the July to September rainfall. Unfortunately, Pakistan's rainfall pattern is known to be highly variable and this variability seems to be increasing as a result of global warming (Sattar, 2014). Rainfall in the desert varies between 100mm and 700mm (Pakistan Water Partnership, 2014), of which the summer monsoon (July to September) accounts for 60% to 70% of the annual rainfall (Pakistan Meteorological Department). This is illustrated by a comparison of monthly rainfall levels in 2013 versus average levels in the province of Sindh: March -89%, April +82%, May -100%, June +292%, July - 83%, August +50% and September -41%. The figures for 2014

highlight the worsening of the drought: March -17%, April -18%, May -98%, June -40%, July - 84%, August -17% and September -99% (Pakistan Meteorological Department). This translates into a rainfall deficit of around 30% between March 2013 and February 2014 with some towns barely receiving a drop of water (JSWO, 2014). The vastly reduced monsoon season is thus the main cause of droughts in Pakistan, in an area already prone to droughts. And pollution and climate change are making of them a common phenomenon in the area (JSWO, 2014). For the preceding three years Tharparkar had been faced with a drought-like situation, but it was not until October 2014 when the Provincial Disaster Managing Authority (PMDA) declared the zone as an "impending emergency" (WFP, 2014). Interestingly, the zone would usually be declared as a disaster area as of mid-August if rainfall is below normal levels and consequently some assistance in terms of water, food, fodder and medicines is provided. But in 2014 this only happened when the spiral of deaths of humans and animals became too alarming (Shaikh, 2014). In fact, in 2014 the monsoon season, which arrived towards September, brought an insignificant quantity of rain leading to a worsening of the already severe drought-like conditions prevailing in the area. In the monsoon season of 2014 Tharparkar received an estimated 124mm of rainfall, compared with 190mm in 2013 and 220 mm in 2012 (WFP, 2014).

2. THARPARKAR: LIFE AND THE IMPACTS OF DROUGHT

The people of Tharparkar live on agriculture, livestock and daily wages. Estimates suggest that 30% to 40% of population is dependent on agriculture and cattle respectively, with the remainder dependent on daily wages from services, local trading and transportation in urban settlements (Consortium Management Unit, 2014).

2.1. Impact on agriculture

Agriculture is largely dependent on monsoon rainfall as there are few zones in Pakistan where irrigation is practiced (United Nations Pakistan, 2014) and high yields are only possible with a significant amount of rain, in spite of the fact that rural communities have adapted over time by using water stress resistant and efficient crops such as millet or sugar. Given that Tharparkar, unlike other areas, has only one crop season (Sattar, 2014) three years of drought-like conditions have meant three years of crop failure for some families, leading to lower incomes and malnutrition. According to an assessment carried out by the Thardeep Rural Development Programme (TRDP, 2014), 28% of the families interviewed (holders of land) were able to cultivate their land, and the majority (54%) bought their seed on credit. Around 30% purchased in cash and only 15% had seed stock already available. The study also indicates that for a good crop four to five periods of rainfall are required. In the case of the majority of the farmers (86%), their seed was completely destroyed before the first rains.

2.2. Impact on livestock

Livestock also falls victim to droughts in various ways: water shortages and their impact on grazing make animals weaker and more prone to disease. The consumption of herbs mixed with sand causes digestive problems, metabolism disorders (Khangharani, 2014) and viral infections that are highly contagious. As such, prices of livestock fall and farmers are either unable to sell their animals or do so at prices that jeopardize their income. Seeing as there is barely any kind of veterinary service in Tharparkar, the final outcome of disease is often death, and given that the population depends on livestock for milk and meat, this inevitably increases their vulnerability to malnutrition and reduces their resilience. In 2014 a serious sheep pox outbreak occurred, causing a large culling of herds and significantly reducing farmers' income and further deteriorating the already tough situation facing the population (United

Nations Pakistan, 2014). The sheep pox outbreak reportedly led to at least 42,000 deaths (Di Nunzio, 2014).

According to a Hands assessment (Hands Pakistan, 2014) the livestock mortality rate due to the 2014 drought reached 70%. More than 300,000 animals died from different diseases caused by the unavailability of fodder, the quasi-inexistent water supply and sheep pox. Another survey indicates that the livestock death ratio during the three-month period from July to September was recorded at 14% in sheep and goats and 4% in cows and large domestic animals (TRDP, 2014). Finally, another assessment (Consortium Management Unit, 2014) showed that part of the population lost one third of their cows and camels, while for others two thirds of small ruminants (sheep, goats) were lost to diseases that were unable to be treated because of lack of capital to buy vaccines coupled with their limited availability. In 2014, the sale of livestock, which is generally turned to as a strategy of last resort to cope with a lack of resources and famine, decreased significantly as the weak conditions of herds caused prices fall (Consortium Management Unit, 2014).

2.3. Impact on nutrition

Tharparkar's drought undoubtedly greatly affected and deteriorated its population's sources and levels of income and had a direct and debilitating impact on food insecurity, malnutrition, which mostly affected women and children, and deaths. Many media reports indicate that the alarm regarding the 2014 drought was only sounded when the child death toll had reached around 120, a figure which ultimately reached 400 (Khangharani, 2014). According to the Thardeep Rural Development Programme, 82% of the population surveyed in their assessment (TRDP, 2014) were found to suffer from food insecurity (food available for a maximum of 15 days), 17% had food security for up to six months and only 1% had food security for one year. This situation was exacerbated due to the indebtedness of families, which according to the same study reached 69% at the moment of the assessment.

Indebtedness has a significant impact on the ability to cope with these situations of distress. In 2013, 70% to 80% of families surveyed had decided to go into debt in order to buy seeds for cropping and land preparation for the monsoon season as well as vaccinations for livestock; a similar situation was observed in 2014, between the monsoon seasons. As no rainfall occurred in either of the two seasons, the situation of families inevitably became even more delicate, being unable to pay back their debt (Consortium Management Unit, 2014). This cycle is further exacerbated when higher castes or families with greater socioeconomic resources give food loans to lower income families in exchange for the gains from future harvests: as drought results in crop failure, these families become further indebted, and start to have to cut food and medical expenses, thus worsening their food insecurity as well as their health. The spiral becomes fatal where those most vulnerable to droughts and famines become even more vulnerable when revenues from harvests or other sources of income shrink due to drought.

2.4. Impact on migration

The latest population census of Pakistan in 1998 indicates that during the 1980s and 1990s the region of Sindh witnessed around 10% of the internal migration in the country while accounting for 23% of the country's population. Punjab, another arid region, accounted for more than 50% of the country's internal migration (Sattar, 2014). These figures illustrate that the larger part of internal migration occurs in areas where there is significant pressure on land and resources, and zones where there are low levels of industrialisation. The historical lack of mobility has prevented social networks from developing within urban centres, resulting in urban migration due to linkages to be more limited. Yet this seems to be changing as a result of the drought-like conditions from which the region has been suffering in the last decades (Sattar, 2014), as is illustrated in this case.

Both the sale of livestock and migration have been reported as coping strategies to deal with situations of drought. According to a senior official in the Provincial Disaster Management Authority of Sindh (PDMA), approximately 175,000 families have fled the drought-blighted region (Shaikh, S. & Tunio, S., 2014). Temporary or seasonal migration is a recurrent phenomenon in Tharparkar, but whether or not this migration was seasonal was not assessed. During the dry winter months (December to February) or during years of drought, families migrate to barrage areas in the province of Sindh to harvest sugar crops, wheat, and rice, and to feed their livestock. But in normal years migration takes place in April and May, which is when the wheat is harvested (Sattar, 2014). According to Care and the Relief Foundation (Khangharani, 2014) in a normal year seasonal migration is practised by 15% to 20% of families, a figure that increases to 35-45% in years of drought. In 2014 it was estimated that an additional 25% of families resorted to migration, both with and without livestock. But not all inhabitants migrate: a recent study shows that families with livestock are more inclined to migrate to look for grazing and water for their animals, while owners of land are more reluctant to do so, due to fears of losing their land (Kolhi, 2014). And there are also those who do not migrate for socioeconomic reasons. In some cases the family does not have sufficient means to travel long distances in search of irrigated areas. During such long distances the chances of livestock survival are low due to either a lack of water or to their weak condition. This inevitably makes migration a worse solution. Some families do not view definitive migration as possible either, as their degree of poverty is such that they do not have the means to relocate (Rahma Islamic Relief, 2015). In some cases of this nature, only one member of the family migrates to cities or urban settlements in search of alternative sources of income.

According to a survey from the Thardeep Rural Development Programme (TRDP, 2014) carried out in 74 villages in Tharparkat and Umerkot at the end of 2014, 73% of migration to barrage areas for livestock grazing or in search of agricultural labour involved a single family member (partial migration), while in 27% of the cases the whole family migrated. There are more than 20 different communities in Tharparkar, a mixture of Muslims (64%) and Hindus (36%), the largest denominations being the Bheel, Kolhi and Meghwar. The Bheel and Kolhi, pertaining to the Hindu religion, have been the most affected, according to different surveys. These communities are used to migrating every year, during the harvest season, but not from August to September as they did in 2014. One of the surveys carried out (Consortium Management Unit, 2014) revealed that a large portion of the people that had migrated with their entire family in 2014 came from the Bheel and Kolhi communities (64% in total), the next largest community being the Meghwar (6%). The first people to migrate often move to nearby districts (Sanghar, Badin, Umerkot and Mirpurkhas) in search of work opportunities and available fodder. The later ones usually have more means and are more inclined to migrate with only one member of the family, to irrigated areas to search of in-farm and out-farm labour, and the head of the family sends back remittances to support the rest of the family that remained at home. Indeed, of those partially migrating, the majority come from the Meghwar (25%), followed by the Bheel (21%) and the Kolhi (11%). The rest (42%) are from 22 other, mainly Muslim communities. Muslims usually migrate to urban centres such as Karachi and Hyderabad, but do not leave their houses, and send their earnings back home. Many other families indicated that they were ready to leave in the following weeks as they saw their sources of income, including the sale of livestock, shrink. It goes without saying that if no measures are taken by the authorities before the next monsoon, the situation of the population will deteriorate even further, provoking more migration. Partial migration is basically associated with livestock grazing, and, as mentioned, in Tharparkar this kind of seasonal migration takes place every year during the dry period (April and May). In 2014, according to the same survey (TRDP, 2014), 19% of the

existing livestock accounted for in the assessment was taken to barrages areas versus 12% that perished and 4% that was sold.

3. POLITICAL RESPONSE

Whenever rainfall is below normal levels in mid-August, the authorities of Tharparkar declare the zone a disaster area and as such assistance to the population in the form of food, fodder, water, and medicines is provided. Tharparkar had been facing a drought-like situation since 2011, but in the estimation of the authorities, it was only the lack of rainfall during the 2013 monsoon season that led to the drought-like situation in December 2013/January 2014 (Pakistan Nutrition Coordination Working Group, 2014). The Meteorological Department had stated that even with a 30% lower level of rainfall in 2013, the situation did not qualify as a drought. Instead, as mentioned above, it was declared a "socioeconomic disaster" (Hashim, 2014), and it was only in March 2014 after domestic and international media and NGOs increasingly reported a state of famine and a significant increase in infant mortality as well as diseases and deaths among livestock, that the provincial authorities declared the area "calamity-hit" (Hashim, 2014). And it was not until October 2014, after another three months' (July, August and September) rainfall levels below normal, and an "alarming" level of human deaths and animals (Shaikh, 2014) – some figures point to 400 to 500 deaths – that the zone was declared an "impending" zone and the drought was recognised as such (WFP, 2014). Over a period of one year, a zone traditionally prone to drought where rainfall levels had been below normal levels and where chronic malnutrition and poverty affects many households, was initially treated as "drought-like conditions", followed by the status of "calamity-hit" and "impending zone" to finally be declared as suffering from drought. As such, there was a clear and founded consensus amongst journalists, researchers, NGO's and other civil society groups about the negligence and the lack of governance that the authorities of Pakistan, both central and provincial, had displayed in the classification and handling of the drought (Di Nunzio, 2014). This lack of governance and coordination was particularly apparent in the accusation from certain critics of the National Disaster Management Authority (NDMA) that in Sindh province 60,000 bags of wheat intended for the relief of the population were not distributed at the end of March due to an administrative error (Di Nunzio, 2014). The same institution had already been the subject of criticism during the 2010 floods, as it had been unable to coordinate aid between international NGOs and other agencies (Di Nunzio, 2014). The reality is that the authorities themselves demonstrated negligence when referring to the issue: local officials placed the blame on higher level authorities' lack of response, claiming it had considerably worsened the unbearable living conditions of Tharparkar's population, while the higher authorities blamed district officials for alerting them to the situation too late (Shaikh, S. & Tunio, S., 2014). Furthermore, the Tharparkar Deputy Commissioner's office claimed that in mid-August they had advised the Sindh provincial government about the risk of famine and advised that the district of Tharparkar be declared a disaster zone, but that they received no response (Shaikh, S. & Tunio, S., 2014). Such contentions clearly show the lack of response and the inability to compromise on the part of the authorities regarding the problem of the drought. Immediately after these incidents, in a context of a "flurry of visits by political leaders" (Hashim, 2014), two separate emergency relief aid packages totalling $10 million and $1 million were approved. Following some dismissals and changes in the provincial government, a former Pakistani senator agreed that the government had failed to distribute food to part of the population on time, acknowledging that there were cases of malnutrition especially among mothers and infants. But he in turn blamed the media for inaccurately reporting the nature of a seasonal phenomenon,

namely migration, and described the situation as a "media made disaster". He went further stating that the delay of government's response did not cause any loss of life nor migration (Hashim, 2014). According to the NDMA, in one week after recognising the area as calamity-hit at the beginning of March, 3,582 tons of wheat (worth approximately $2.5m), 201 tons of rice, and 1,484 tons of emergency food packs and other food aid were distributed in Tharparkar. In addition, 58 medical staff were deployed on emergency duty and 5,318 people treated at emergency medical relief camps. Other measures announced were investments in health facilities of around Rs 30m ($302,000) and compensation of Rs 200,000 ($2,000) to the families of each of the 70 infants who had died in the district of Tharparkar from December onwards (Hashim, 2014). The latest data provided by the NDMA in 2014 indicates that a total of 126,790 bags of wheat (100kg/bag), 320 bags of rice (50kg/bag) and the equivalent to 231 tons of food items had been distributed to mitigate the consequences of the drought. Mineral water and fodder was also provided. In terms of medical assistance, around 50 medics, paramedics and doctors from neighbouring cities were deployed with medicines for emergency duty; 6 medical camps were established by the Army, and other mobile medical teams and dispensaries were in evidence. In total 153,385 people were treated, evenly split between men, women and children. In addition, 17 mobile veterinary teams were deployed to vaccinate and treat a total of 4,2 million cattle. The latest drought situation report released by the NDMA, with provisional data up to January 2015 sets the number of wheat bags distributed at 625,849, and the number of people treated at 446,596. These figures show that despite the fact that the situation was addressed belatedly, with a delay of at least one year, assistance has improved since initial action was taken in March 2014.

4. PAKISTAN'S MIGRATION POLICY

According to the Internal Displacement Monitoring Centre, the majority of the Internally Displaced Persons (IDPs) in Pakistan are related to environmental disasters or to the lack of appropriate mechanisms to deal with such disasters. A figure illustrates this: between the 2010 and 2011 monsoon floods, a total of 15 million persons (out of a population of 182 million) were displaced across the country (Shaikh, 2014). And yet Pakistan still has no environmental migration policy. Pakistan's main challenge in addressing environmental migration is thus to develop a national policy, covering both internal and international migration. The only current legislation related to these issues is the Emigration law passed in 2009 (Sattar, 2014), which does not deal with internal migration or displacement, nor does the National Climate Change Policy, developed by the Ministry of Environment and approved in September 2012. Indeed, Pakistan seems to deny the existence of human displacement due to environmental events, as shown in the response to the Tharparkar drought. The importance of implementing a policy on migration instead of the reactive actions that the Government of Pakistan currently carries out when natural disasters take place rests on the need to get to the roots of the problems and avoid migration taking place as a solution of last resort. The policy debate should thus be oriented towards avoiding forced migration, and ensuring that migration should be perceived and employed as an adaptive measure. Climate change-induced migration should be framed within the context of a development policy (ADB, 2012).

4.1. Approaches for a migration policy

In general terms, policies on environmental migration can be addressed through two different angles that can be complementary. The first would cover the scope of protection of migrants (communities of origin) and the second that of adaptation to climate change through migration (Sattar, 2014). In the case of Pakistan, a complete

comprehensive and holistic approach needs to be implemented. In the absence of a migration policy, the first step should be to create the necessary data system to discern migration patterns: Pakistan latest census is that of 1998, and the motives for migration considered within it are education, marriage, business, employment/ transfer, returning home, health and others[3]. Interestingly enough, environmental migration is not included.

4.1.1. Measures of protection for communities of origin

Several measures can be taken to reduce the vulnerability of communities to environmental risks and are related to: 1) disaster risk management, 2) poverty reduction policies 3) resilience and social protection (ADB, 2012).

1) Disaster Risk Management

This is a crucial matter for Pakistan in order to reduce the impacts of climate change. The risk of being affected by disasters is essentially a function of the degree of vulnerability, the exposure to damaging hazard events, and the frequency and severity of hazards (National Disaster Management Authority, 2013). As developing countries' vulnerability to natural disasters increases, an effective national risk management policy is essential. Up until 2005, when an earthquake hit the country, the natural disaster risk reduction policy in Pakistan was a reactive policy, based on emergency relief. This derived from the "Calamity Act" of 1958. As a consequence of the earthquake's impact on the country and population, and in response to the need for an appropriate policy and of more institutional coordination, the National Disaster Management Authority (NDMA) was created in 2006. The Provincial Disaster Management Authority (PDMA) and the District Disaster Management Authority (DDMA) are under the jurisdiction of the NDMA. The DDMA is the first port of call on the alert chain, but it is the responsibility of the PDMA to implement the policies and plans elaborated at the national level, and to coordinate the response in the case of a natural catastrophe. Up until 2012, there was no coordination between the different levels of authority and the response to natural disasters such as the 2010 and 2011 floods were anything but planned. Natural disaster risk was thus not well managed. Indeed, the mismanagement of the flood crises and the unsustainable losses that they caused to the country are at the origin of the Risk Reduction Policy approved by the government in 2013, a policy which was formulated with a broad base of different stakeholders: national and international consultants, relevant federal ministries and departments among others (NDMA, 2013). According to the NDMA: "The policy shall promote priority measures to ameliorate existing vulnerabilities to hazards and ensure that future development initiatives add resilience. The policy also seeks to provide guideline for timely, dedicated and adequate investment on hazard mitigation and preparedness interventions at all levels which will not only substantially reduce the disaster risk but also the consequential damages and economic cost associated with response, recovery and rehabilitation" (NDMA, 2013).

But this policy has encountered certain challenges that have been visible in the Tharparkar drought crisis. The first is the low level of risk awareness and knowledge. The knowledge of risk of Pakistani institutions is limited, both in terms of mapping but also in terms of its dynamics. Models of risk assessment, vulnerabilities, multi-hazard risks, and loss and damage assessments all have to be developed. There is a clear need to ensure the capacity to compile sound data that will help to prevent, efficiently manage and mitigate the effects of natural disasters, such as forced migration. A second issue is the necessity of capacity building at all levels. As has been illustrated

3. Retrieved: http://www.pbs.gov.pk

by the present case study, the lack of coordination between the different levels of public authorities seems to have been part of the problem in the delay in recognising the drought and in taking the necessary emergency relief action to prevent displacement. The decentralisation of the aforementioned natural disaster management authorities needs to be well coordinated. The NDMA has a policy-making role and should have the capacity to provide support and assistance to the other authorities to implement risk reduction action; and the provincial and district levels also need to have the capacity to carry them out. For this decentralisation to be effective it is also crucial that information flows efficiently between levels, so that the district authorities that are normally the closest to the event sound the alarm as soon as possible to reduce the risks of crisis situations and to activate the necessary measures. Finally, a third challenge is the lack of integration of natural disaster risks assessment into development planning and policies due, again, to a low level of awareness but also to institutional commitment and capacity to undertaking it (NDMA, 2014).

2) Poverty reduction policies

It is essential that policies to reduce poverty take a long term stance not only for the sustainability of people's living conditions and development but also for the sustainability of the climate. In the same way that climate change and environmental migration can increase people's level of poverty, a poverty reduction policy can address climate change and thus induce environmental migration. A clear example is that of China, where economic development has significantly increased rural to urban migration. But in several Chinese megacities, that same economic development is now causing environmental problems that are translating into environmental migration: those who now leave the city to avoid the negative effects of the deteriorating environment.

3) Resilience and social protection measures

Considering Tharparkar is one of the most vulnerable regions to drought in Pakistan, long term measures must be taken in order to increase the resilience of its communities, make the lives of the people sustainable and avoid forced migration. The need to invest in water infrastructure seems to be inevitable, such as establishing water treatment plants or irrigation systems. Improving peoples' financial resources can also alleviate their hardship in seasons of low rainfall or crop failure, through measures such as low interest rate loans or grants, or conditioned loans that would be returned only if there is no crop failure due to low rainfall; social protection measures such as conditioned cash transfers could also help to increase their means of living as well as human capital (cash transfer dependent upon a medical appraisal and school attendance). Investment in health facilities seems to be necessary in Tharparkar. New sources of income also need to be found, and given that agriculture is the main means of earning income, new varieties of crops that are more resilient to dry areas or suitable for saline water could be promoted (TRDP, 2014).

4.1.2. Migration as an adaptation measure

When discussing migration, due to socio-economic linkages or other reasons, it is necessary to consider at least two types of migrants within this spectrum: those who are forced to migrate and those who want to migrate. But when addressing climate change, planned migration should also be considered as an adaptive strategy. According to several studies (ADB 2012, Sattar 2014) planned migration is barely considered in any climate change policy as an adaptive strategy, and more specifically it is not in Pakistan's Climate Change Policy (Sattar, 2014). But there are certain cases that may shed light on this, and possibly enhance planned migration as a form of adaptation in zones that are extremely and recurrently vulnerable to climate change. This is the case of Fiji, in the South Pacific Ocean, where rising seas are contaminating fresh water and agricultural land rendering some coastal areas uninhabitable.

When adaptation measures such as building seawalls no longer worked, others like planned migration and relocation of the affected population to new land did. An illustration of this is in the relocation of the village of Vunidogoloa where the sea had breached the seawall barriers causing daily flooding and saltwater degrading the soil and destroying crops (UNFCCC). The government undertook a process to move 150 people to a different site and build new houses. Plans for relocation only went ahead after the community had given its consent, and villagers actively participated in the relocation process. Public authorities contributed with funding for the provision of basic services and new livelihoods, and the community also received assistance in re-establishing agriculture and capacity building for alternative initiatives to generate income.

But in the case of Tharparkar, planned migration action seems to be a far off prospect. As has been illustrated, the management of the 2013-14 drought was all but planned. Pakistan's response to droughts has in some cases been "stop gap arrangements" (Consortium Management Unit, 2014), and established contingency plans have not been effective. The usual cycle of drought relief operations starts with a declaration of emergency, which leads to an analysis of the situation that is in turn transformed, if deemed an emergency, into an urgent and immediate provision of wheat, followed by a provision of other relief goods (Provincial Disaster Management Authority, 2014). No permanent action is undertaken in addition to these ad-hoc relief plans. After this crisis, there seemed to be a certain degree of awareness of the fact that the paradigm of crisis management had to be changed from "stop gap arrangements" to a strategy that tackles the problem at its root and that promotes sustainable solutions, from response to resilience. As such, a proposal for the creation of the Thar Development Authority was presented by the Provincial Government of Sindh with the objective to revolve around policies in the water, livestock and health sectors, and the empowerment of people to alleviate perpetual poverty. These policies should be subject to legislative review and approval and may add to the drafting of a draft policy that the government has initiated (Khangharani, 2014).

CONCLUSION

Pakistan has many challenges to face. The country was ranked 146 out of 187 in the 2013 Human Development Index (UNDP). It is one of the most vulnerable countries to natural disasters, and yet, it has only recently approved, in 2013, a risk reduction policy. The majority of its internally displaced persons are due to environmental events, and yet Pakistan has no environmental migration policy. It is ranked in the top ten countries most vulnerable to climate change, and yet the National Climate Change Policy approved in 2012 was only enforced in 2013 and does not deal with environmental migration. But one of the main challenges facing Pakistan in order to efficiently and effectively address all these problems is institutional capacity, which contributes to determining the level of impact that climate change in general and environmental events or natural disasters in particular will have on the population. Since the flooding in 2010 and 2011 and its consequences, the Government of Pakistan seems to have taken certain steps to formulate policies that will address these issues, but now it has to go a step further and integrate environmental migration in these policies. In Tharparkar, the Government has the opportunity to start doing so by implementing measures that will increase the population's resilience and livelihood and thus reduce their vulnerability to climate change, which will help to mitigate forced environmental migration.

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