Teleconnection of Drought and Migration: Afghanistan Case Study

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***Abstract*-Afghanistan is a drought prone country and located in mostly semi-arid and arid regions of the world. Nomads (Kuchi) and rural farmer communities are the most vulnerable to this natural disaster, because their life is totally dependent on agriculture and livestock. Meteorological anomaly information shows that drought occurs in every 10 or 15 years in southwestern and central areas of Afghanistan. Annual precipitation is very low in these areas and people who live there depend on agriculture. They lost their crops and livestock when drought occurs. Drought forces people to move larger cities first (internal displacement) and then migrate to neighboring countries. Most of the precipitation occurs during the winter as snow and rain. Snow melting is a good water resource during the spring and summer seasons. Melted water is used for irrigation purposes. Farmers and nomads lose their cereal productions and livestock in case of winter season precipitation deficiency. They would face to famine if precipitation deficiency turns into a severe drought. The concerned communities are forced to migrate for food and water safety. Environmental degradation is, exacerbated by climate change and, another concern for farmers and nomads. Political conflict is not the only reason for migration. The phenomenon of drought is another major reason of migration beside of conflict, and droughts trigger civil turmoil and political conflict. Many people in Afghanistan migrated to neighboring countries during 1998-2002 severe droughts. In this study, Afghan refugee numbers in Pakistan and Iran and the precipitation anomalies have been analyzed in order to investigate the teleconnection of drought and migration. Many Afghan refugees prefer these two countries for lingual and cultural similarities, besides easiness of travel. Nowadays Afghan refugees prefer the industrialized world for migration, especially to Turkey and European countries for seeking safer life in better conditions.**

Keywords- Drought; Migration; Afghanistan

I. INTRODUCTION

Afghanistan is a landlocked country of about 65 million hectares and 33 million people, there are no any connections with sea, most of the people 24.5 million (%74) live in rural areas. Only 20% of Afghanistan land is arable and approximately 80% of the land is mountainous or desert. Approximately 75% of Afghanistan's lands are vulnerable to desertification, because of that Afghanistan is more vulnerable to drought and climate change. Approximately 85% of the country's water is taken from surface water resources, and 15% from ground water resources [1]. Afghanistan is turning to more desert-like land due to drought exacerbated degradation of agricultural lands and heat waves are becoming more harmful to crops and grazing animals.

Afghanistan was a country of trade between the East and the West in the past and a key location on the Silk Road trade route. For this reason, migration and mobility has always been an integral part of Afghans' living and livelihood. The past 30 years of conflict, environmental hazards, drought and famine have contributed extensively to the various incentives for emigration. Migration patterns in Afghanistan are marked by huge migration and refugee flows to foreign countries, as well as internal migration and displacement. Pakistan and Iran are the main target destinations for Afghan migration in terms of cross border migration due to geographical, social and cultural similarity.

Climate change has created a new class of migrants; that is 'climate refugee'. If the migration flow is caused by a natural disaster, so, it is categorized as 'distress migration' or 'forced migration'. Afghan and Syrian refugees may make up the largest number of migrants which migrate to Turkey and European countries nowadays. As a result of climate change, migration patterns throughout the developing world have significant changes. More attention has to be paid to water security and food security which needs providing more resources for climate adaptation. Therefore migration doesn't become the primary option [2]. Climate change may cause more intense precipitation events besides higher maximum temperatures and increased risk of drought.

Droughts have been occurred in various years almost everywhere in Afghanistan. The most significant and relevant droughts have been recorded during the last century were: 1898-1905; 1944-1945; 1970-1972; 1998-2002 [3]. Unemployment rate grows due to the economic difficulties in the rural communities and this contributes to the poverty. Many families have migrated from rural to urban areas especially to the capital (Kabul), and further to Iran, Pakistan, Turkey and European countries. Southwestern part of the country is vulnerable to soil erosion while northern part of the country is vulnerable to landslides.

Water supply in Afghanistan is reliant on snow and rainfall for domestic and agricultural use. The rural economy is based on agriculture. Agriculture is also the source of income for about 80% of the labor force in Afghanistan. Most of the precipitation occurs during the winters. Farmers use snow melt water for irrigation purposes during the spring and summer seasons. Farmers and nomads would lose their cereal production and livestock if precipitation in winter does not occur.

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Metrological information shows that drought occurs in every 10 or 15 years in southwestern and central areas of Afghanistan. The annual precipitation is very low in these areas. Drought forces people to internal displacement and migration to neighboring countries. In this study; connection between drought and migration in Afghanistan is studied.

II. MATERIALS AND METHODS

The approach followed in this study is focused on two important issues in Afghanistan: drought and migration.

A. Drought

Drought is a natural disaster and occurs when precipitation under the average value occurs in a specific region. The most significant and relevant droughts have been recorded during the last century were: 1898-1905; 1944-1945; 1970-1972; 1998-2002 [3]. And other droughts occurred in southern part of the country in 1948 and 1955, central parts in 1961-62, central and northern regions in 1973 and northwestern regions in 1977. Minor droughts have been recorded in 1981 and 1992 in Ghazni, Ghor and Farah provinces. Fig. 1 shows the annual precipitation of Afghanistan during the period of 1900-2012. There is an increase in the amount of precipitation during1900-1960, but after 1960 there is a decrease in the amount of precipitation with an average rate of 2 percent per decade.

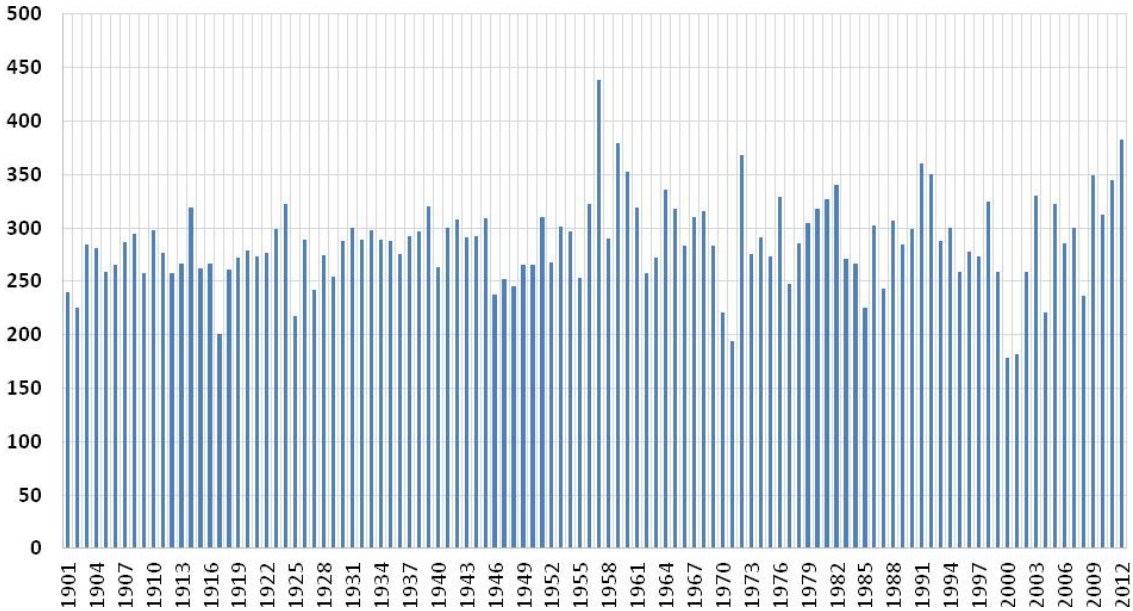

Fig. 1 Average annual precipitations (mm) in Afghanistan between 1900-2012 years

Long and severe drought affected about 12 million people in Afghanistan as of September 2001. It is estimated that 5 million Afghans lacked access to water and food. Cereal deficiency in Afghanistan doubled the shortfall from previous years and exceeded 2.3 million tons in 2000. Rain-fed crops also failed in 2001. Irrigated agricultural products were reduced due to the failure of infrastructure and lack of water. The number of livestock was significantly changed in drought time and reduced by 40% from 1998 to 2001. About 1 million people internally displaced in Afghanistan and several million more refugees migrated. Ongoing civil conflict coupling with drought conditions and the US led military operation forced millions of Afghans toward the borders with Iran, and particularly Pakistan [4].

Subarctic mountain climate is dominating climate in many parts of Afghanistan except the lowlands which have arid and semiarid climate. Afghanistan has cold and dry winters. Annual temperature in Afghanistan has increased at an average rate of around 0.13°C per decade and by 0.6°C since 1960 while mean rainfall over the country has decreased slightly at an average rate of 0.5 mm per month or 2 percent per decade [5]. It is important to evaluate how climate has varied and changed in the past.

B. Migration and Conflict

Migration patterns in Afghanistan are marked by huge emigration and refugee outflows, as well as internal migration and displacement. As a result of decades of unrest, millions of Afghans have left the country (Fig. 2) [4, 7-12]. Conflict is going on in Afghanistan since 1979 Soviet invasion until now. Conflict is the main reason of migration, the first large movement of migration started in 1979 right after the Soviet invasion, and people migrated mainly to Pakistan and Iran.

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Soviet invasion ended by withdrawal of their troops in 1989. Some refugees returned back after Soviet withdrawal but in 1990 Mujahedeen (warlords) took power and civil conflict started, and caused another large movement of migration.

In 1995 Taliban took power, during the period of Taliban 1995-2001, Afghanistan was hit by a severe drought, the severity and duration of this drought was different than previous droughts. The duration of drought in Afghanistan is generally one year, but the duration of this drought which occurred in 1998 was about four years. Its impacts was very devastating than previous droughts.

Karzai administration took power in 2001 and NATO coalition forces came to the country to defeat Al-Qaida and Taliban. Bombardment of NATO coalition forces forced Afghan people to migrate again.

Presidential elections and withdrawal of NATO coalition forces from Afghanistan caused another great migration movement during 2014-2015. Afghan refugees tried to migrate especially to Turkey and European countries. As of 2015, Afghan refugee number was in the second row after Syrians in the International Migration Organization (IMO) annual report.

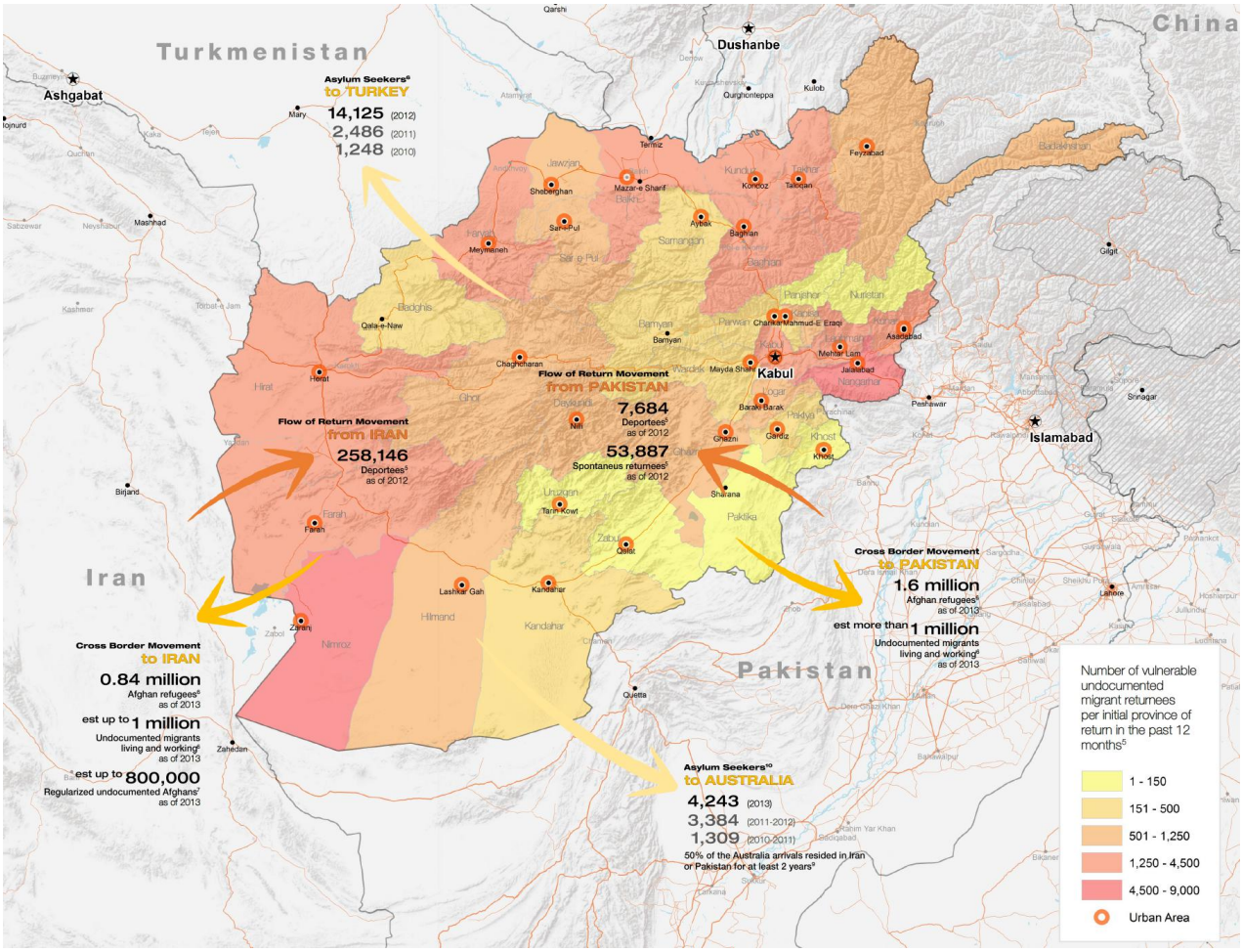

Fig. 2 The number of displaced Afghans inside and outside of the country [11]

III. RESULTS AND DISCUSSIONS

The conflict is the main reason for migration in Afghanistan. Natural disaster "drought" is also one of the most important reasons for migration beside the conflict because Afghanistan is an agricultural country and according to the estimations made by the Afghan government in 1990, 80% of labor force was designated for agriculture and 60% of Afghans depend on agriculture for their livelihoods and their family's sustenance.

The number of Afghan refugees in Iran and Pakistan and the annual rainfall amount during the years 1993 – 2012 are investigated to find a relationship between migration and drought, as shown in Table 1.

Drought occurred almost everywhere in Afghanistan during 2000-2001. So, drought caused displacement of population, loss of animals and severe food shortages (Fig. 3). A decrease in precipitation among the periods of 1998-2001 can be seen

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clearly. This long precipitation deficiency caused a severe drought; so many people migrated to Iran and Pakistan as seen from the rising in the number of refugees in the same years (Table 1).

TABLE 1 ANNUAL RAINFALL AND THE NUMBER OF AFGHAN REFUGEES IN IRAN AND PAKISTAN

Year	Rainfall (mm)	Number of Refugees in Iran	Number of Refugees in Pakistan
1993	288	1850000	1467876
1994	300	1623331	1053000
1995	258	1429038	1200000
1996	278	1414659	1200000
1997	274	1411759	1200000
1998	325	1400722	1200000
1999	259	1325724	1200000
2000	179	1482000	2000000
2001	182	1482000	2197821
2002	258	1104909	1226569
2003	331	834699	1123647
2004	221	952802	1290408
2005	323	920248	1084208
2006	286	914260	1043984
2007	300	906071	888666
2008	236	935595	1780150
2009	349	1022494	1739935
2010	313	1027577	1899842
2011	345	840551	1701945
2012	382	824087	1637740

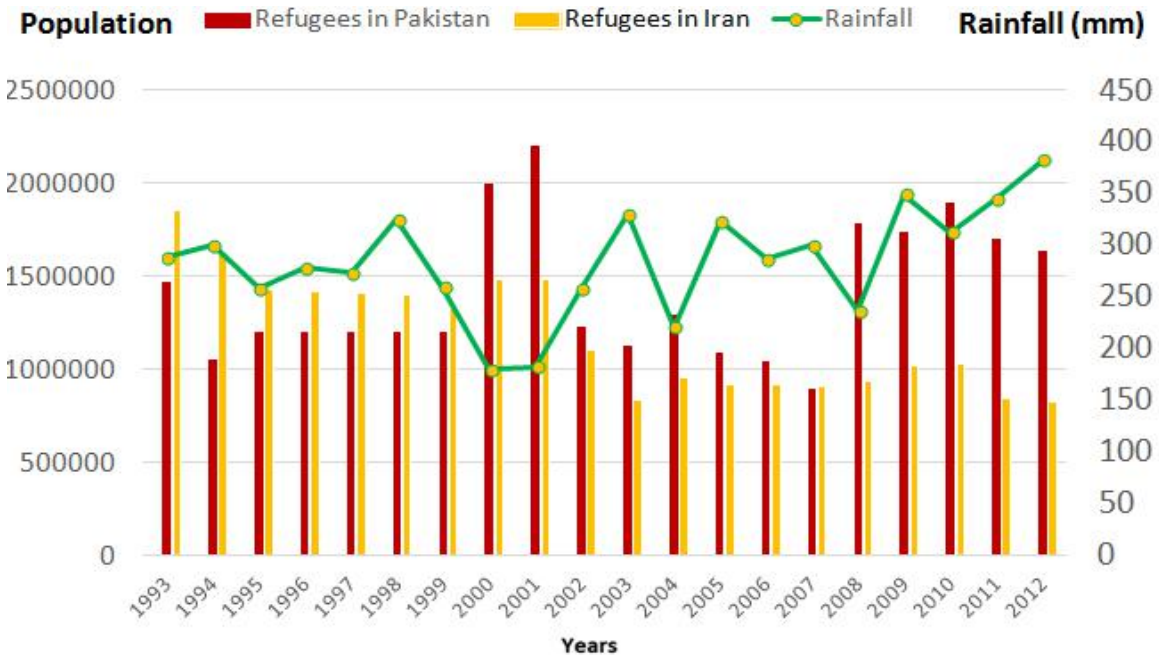

Fig. 3 The number of Afghan refugees in Iran and Pakistan and the annual precipitation between 1993-2012 years

IV. CONCLUSIONS

Agriculture and climatic conditions play a direct role in the deterioration of Afghanistan's economic conditions. Major tribal migrations are due to the conflict, drought and climate change. There was no any large movement of migration in Afghanistan before the Soviet invasion in 1979. Afghanistan was self-sufficient with cereal production till the invasion. The agricultural sector suffered great losses during the Soviet invasion and after that in civil conflict times.

The recent severe and long drought which began in 1998 and finished in 2002 combined with inefficient and nonmodern irrigation systems in Afghanistan caused displacement of large populations from rural areas to the cities, and forced to many people to migrate to neighboring countries especially to Pakistan, Iran and worldwide.

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Key recommendations for policy makers in Afghanistan are the improvements in productivity in agriculture, efficiency in water use, better management of water resources and monitoring of surface and ground water resources.

Afghan government has to construct new dams for both irrigation and hydro electric production purposes. Afghanistan's agriculture may improve to modern standards if there would be sufficient electricity, by that means the number of Afghan refugees may decrease. There are classic irrigation systems in Afghanistan, so, there is an urgent need for modern irrigation systems.

Afghanistan shares approximately 45% of surface water with neighboring countries, the changing climatic conditions might be taken into account during future bilateral agreements on transboundary waters.

Migration is not only due to conflict in Afghanistan. Drought, is one of the main reasons of migration, and forces Afghan refugees to flow neighboring countries (Pakistan, Iran) and worldwide.

Recent debates highlighted that the major drivers of migration are conflict, climate change, drought which force people to migrate. Migration would be threat for international peace.

In this study, it is found that the numbers of Afghan refugees are increasing in Pakistan and Iran while the precipitation is decreasing.

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