

Persistent drought spells since 1997 and its socio-economic impacts on small holder farmers in lower highlands of Balochistan, Pakistan

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Abstracts

The Balochistan province of Pakistan has been drought prone for more than two decades. A series of mild to severe drought spells since 1997 have impacted the livelihood of farming families in lower highland regions in the north-west of the province. This study aimed to assess the overall situation of drought in the lower highlands of Balochistan and its socio-economic impacts on the livelihood of small holder farmers. The study is descriptive in nature. A total of 332 small scale farmers were interviewed in Nushki and Pishin districts of the province through structured questionnaire. The results reveal that a high proportion of small holder farming families in the selected districts is highly vulnerable to drought spells due to increased dependency on water related economic activities such as agriculture and livestock. The adaptive capacity of farming families is poor thus increasing the severity of risk factors. Consecutive spells of drought highly affected the employment rate, income patterns, savings, food, education and housing resulting in high dependency on loans to meet basic needs of life. The study comes up with policy and practice oriented suggestions for potential stakeholders.

Key words: Drought; socio-economic; impacts; small holder farmers; Balochistan

1. Introduction

Drought is usual in many parts of the globe and the predictions of climate change forecast that it will increase in recurrence and severity to a substantial degree throughout this century (Dai, 2010; Hennessy et al.,

2008). Drought situation has attained adequate consideration globally because of rapid climate change and the need for water (Mishra and Singh, 2010). The recurrence of drought events and their intensity vary both spatially and fleetingly. Drought has been characterized as high scarcity of water for a particular and long time period in a particular area. It has social, economic and environmental effects (Pérez et al., 2009). The events of drought vary from each other taking into account their severity, length and the region affected (Wilhite et al., 2014). Because, the beginning and end of a drought period is difficult to be determined, therefore, it is difficult to determine the beginning and the end of drought's impacts as a whole. Its impacts grow gradually, and last for longer period of time even after it has finished (Shaw and Nguyen. 2011).

In last couple of decades, the world has observed more extreme and intensive natural disasters such as droughts and floods (Mishra and Singh. 2010). All continents have encountered serious dry spells, influencing larger parts in Australia, Asia, North and South America, Africa, and Europe (Le Comte, 1995; Le Comte, 1994). Around 60 million human souls in Southwest and Central Asia were affected by durable drought season during 1999-2000. It was among the biggest dry seasons of the globe (IRI, 2001). The dry spell's extreme effects immersed Iran, Tajikistan, Turkmenistan, Afghanistan, Uzbekistan, and Western Pakistan (Mishra and Singh, 2010).

As in other regions of southwest Asian, the phenomenon of drought is very much common in the Balochistan and Sindh provinces of Pakistan (Ahmed et al., 2016). Recurrence of this inching disaster in Pakistan is 2-3 years in every decade (Mazhar et al., 2015). All areas of Pakistan have encountered a number of drought seasons in the history. Among all, the last episode of dry season 1998-2006 was the most extreme one at national level that severely influenced the socio-economic and environmental conditions.

Balochistan remained severely inclined to severe spells of drought since 1998 (Ahmed, 2007). PDMA (2013) states that after the overwhelming period of dry spell of 1998-2006, the region is still

experiencing another on-going spell of drought which is influencing agriculture, livestock, and in general the socio-economic status of the area. At least twenty three districts of Balochistan experienced mild to moderate socio economic impacts of drought (Shafiq et al., 2007, PDMA, 2012. UNDP, 2015. Ashraf & Routray, 2013). The social and economic sectors of these districts are still suffering from drought impacts. (UNDP, 2015)

2. Review of Literature:

2.1 Understanding Drought as Disaster

Drought is a complex natural disaster which is broadly spread event and can be observed in low precipitation as well as high precipitation regions and in fields as well as in mountainous locales. Drought is a complex term that has different definitions, subject to individual point of view for instance in the language of farmers drought is defined as “a shortage of rainfall or a long period of time without any rainfall” It is evident from studies that there are more than one hundred and fifty (150) definitions of drought in different literature (Boken et al., 2004). For example, a drought can be characterized as climatological, meteorological, water management, socio-economic, absolute, partial, dry spell, serious, severe, multiyear, design, critical or regional.

The glossary of Meteorology defines drought as a “period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrological imbalance in the affected area, on the degree of dryness and the duration of dry spell” (Huschke, 1959). Yevjevich (1967) states that because of the different perspectives upon the meanings of drought the study of drought has been a noteworthy hindrance. Wilhite and Glantz, (1987) recognizes the theoretical and operational meanings of drought. Theoretical means long and dry period is called drought, on other hand, operational means the beginning, harshness and end of drought time spell. Drought in climatic language implies when the real moisture supply is always not as much as would be expected at a specific area/region for a long time period (Qureshi et al., 2004).

2.1.1 Types of Drought

Due to huge variety and lack of universal definition of drought, it may be categorized into different types. The National Drought Mitigation Centre (NDMC) USA, classified drought in three types, namely meteorological, agricultural and hydrological (Miyan. 2015), while others (American Meteorological Society. 2004; Wilhite and Glantz. 1985) add with it the socio-economic category which, in fact, is a consequence of weather-related shortfall of water.

2.2 Major Droughts of Pakistan

Studies reveal that Pakistan has regularly been in the grasp of serious drought spells. Punjab encountered the most exceedingly terrible droughts in 1899, 1920 and 1935. Sindh province experienced most awful droughts in 1871, 1881, 1899, 1931, 1947 and 1999 while the Khyber Pashtoonkhwa province faced worst droughts in 1902 and 1951. The most serious droughts at the national scale were perhaps the latest, which happened in 1999-2000 delaying up to 2002. The precipitation was inconsistent and the flow of water in rivers dropped. (Ahmed et al. 2004). As per the discouraging findings of World Disasters Report in 2003, 6,037 individuals lost their lives and 8,989,631 were directly or indirectly affected by the drought spell that kept going on from 1998-2002 (Mazhar et al 2015). The drought spell of 1999-2000 was one of the most devastating drought spell in South-west and Central Asia that terribly affected Pakistan, Turkmenistan, Tajikistan, Afghanistan, Uzbekistan and Iran (Mishra and Singh, 2010).

According to Anjum et al. (2010), the 2000-02 drought spell was perhaps the most intensive drought in Pakistan affecting more than 2.2 billion human souls in the country. This drought resulted in large number of deaths, loss of crop and migration. Lower parts of the country were affected by drought during 2004-05. There was moderate variation in the overall rainfall and snowfall in country accounting 40 percent decrease in rainfall and 25 percent decrease in snowfall as compared to the figures of normal years, while Mazhar, et al (2015) reports that northern parts of Pakistan and northern region of Balochistan experienced mild drought spell during 2009-10. It has been reported that there is a crucial growth in

the recurrence of heat waves that indicates the forth-coming intensification and expanding severity of drought (Zahid and Rasul, 2012). The impacts of drought in Pakistan are more severe due to high dependency of her economy on agriculture and those regions of the country are mostly damaged by drought where rain-fed agriculture is more common. In Pakistan, drought events occur two to three years in every decade. There is developing attention about the expanding recurrence and intensity of drought in Pakistan (Ahmed et al., 2016).

Most of Pakistan land consists of arid and semi-arid land that is 88 percent out of 79.6 million hectares. According to Anjum et al. (2010) “only 9% of Pakistan’s land receive more than 508mm of rain, 22% receive between 254-508mm of rain, and 69% less than 254mm”. Agriculture, livestock, fisheries, inflation rate, transportation, unemployment, forestry, energy, and banking are sectors of Pakistan’s economy that have faced significant impacts of drought.

2.3 Drought assessment in Balochistan

The climate of Balochistan is diversified which contains characteristics of both semi and hyper aridity. The temperature of the province also varies depending upon the specific region. It consists of cool temperature and tropical weather, ranging from mild summers to cold winters. The province is classified into four zones on the basis of agro-climatic characteristics, the plains, coastal, desert and uplands (PARC, 1980). Due to agro-climatic division of the province, there are sufficient opportunities for cultivation of variety of crops and vegetables.

The province is highly dependent on two main sectors for its economy i.e. agriculture and livestock. These sectors have engaged almost 67% of the workforce of the province and more 50% of the provincial GDP is dependent on these two sectors (GOP 2003). Some of the rest of fields that add into the GDP of the province are minerals, transport and construction and industry (GOB, 2015).

Compared with other provinces of Pakistan, the social and economic sectors of Balochistan are facing overwhelming issues and challenges. Pertaining to social sector achievement, such as education, economic development, health, physical infrastructure and gender related issues, the state of province is relatively lower. Naveed and Ali (2012)

discuss that Pakistan's poorest districts belong to Balochistan and inside the province the regional differences are very high. The score of MPI (Multidimensional Poverty Index) of the province is highest in Pakistan. The major contributor to MPI has been the lack of assets in the province. (Naveed and Ali. 2012)

The irrigated agriculture in the province depends upon underground and surface water resources. Khirther, Pat Feeder and Lasbela canals are the major sources of surface water irrigation in the province. Flood water that streams in various small and large watercourses is also a significant source of surface water. In Balochistan almost 30 percent of flood water is utilized for farm purposes via small storage dams, small irrigation systems, and “*sailaba*” diversions (UNDP. 2015). While tube-wells, springs and “*karez*”¹ schemes are the main systems through which underground water is used for irrigated agriculture. (MDTF-WB, 2012); (UNDP, 2015)(GOB, 2011)

Balochistan is among the most drought-inclined provinces of the country where serious drought spells have been recorded in 1967-1969, 1971, 1973-1975, 1994, 1998-2002, and 2009-2015 (Ahmed et al., 2016). Among the different spells of drought, the most serious one was drought of 1998-06. The main reason behind long spell of drought was a continuous shortage of rainfall in the province. In most extremely influenced regions, even not a single drop of water was received in 1998-2002 season. In some areas the rainfall in winters decreased by 60-70% for several years. The condition of those regions was more alarming where underground water was either very deep or salty and surface water resources were not accessible. Ahmed et al. (2004) states that there are obvious reasons of the adverse impacts of drought which includes violation of underground water sucking rules, poor management of water, deforestation, lack of management in grazing of animals and lack of systematic cropping systems.

¹ *Karez* is a method of underground tunnels that are constructed to gather subsoil water, through gravitational pull, at the foot of hills. This water is then either taken to the field through vertical shafts which are sunk underground, or it is drawn out at the foot of hill where it has been gathered.

Upland Balochistan is the most vigorously influenced territory of the province. The abrupt reduction in rainfall in most of the northwest areas of the province has resulted in a gloomy situation. This situation has resulted in paucity of the surface water assets for human use, diminished water resources from springs, *karezes* and tube-wells. Additionally, the underground water table has been declining in majority of the areas and low-laying zones.

2.3.1 Impacts of Drought on livelihood of small holder farmers in Balochistan

The severe spell of 1998-2006 drought affected people of Balochistan both directly and indirectly. The impact categories include social, economic and environmental. Since all categories of drought impacts are interrelated and interdependent, therefore, understanding the impacts of drought is complex in nature. Indeed, there is a close cause and effect relationship among all short-term and long term impacts of drought in Balochistan. Because the scope of this research focuses the socio-economic impacts of drought; therefore, the following discussion is an effort to discuss the same;

Balochistan drought from 1998 to 2006 affected people in terms of loss of livelihood sources, that is, agriculture, livestock and related enterprises. Several studies indicate that the rate of poverty is higher in dry areas of the province. Drought affected areas are less diversified and are dominated by agriculture, farm and other rural labor (Roy and Hirway, 2007). Poverty rate is normally higher in those areas where people are mostly dependent on agriculture. Drought affected many parts of Balochistan and caused a rise in food prices, resulting in widespread unavailability and unaffordability of food. Consequently, food consumption reduced, causing malnutrition and different diseases to the affected populations (PDMA, 2013). The agriculture and livestock sectors were also affected. Apple and other fruit orchards were devastated by almost 80%. According to FAO/WFP (2000), the drought spell of 1997-2005 decreased farm products of rain-fed areas by 60 to 80 percent, while 15 to 20 percent decrease in the irrigated farm products and the situation resulted into mortality of almost 2.0 million livestock in the province. Similarly, Asian Development Bank reported that approximately 43

percent of livestock animals died in that drought spell (ADB, 2005) and not more than one-third land of the province is considered to be productive for grazing (GOB. 2003).

The losses to agriculture and livestock made thousands of people jobless, who were then compelled to migrate to urban areas of the province/country. Although, people of urban areas are not directly under the risk of drought due to the facts that most of the people's source of income is not related to agriculture and livestock. However, the rapid migration of people from drought affected areas indirectly effects urban population. The urban population is mostly dependent on rural regions in terms of agricultural and livestock products. For example in case of district Quetta does not have any particular area which is under the risk of drought situation. But in one or two union councils in rural areas drought situation may be considered as hazard. On the whole being capital city which depends lot on other districts for its food supply (like meat, wheat, vegetables) the drought had bad impact on it in 1997-2002 (DDMA Balochistan, 2008). Internal conflicts among people on water resources have been observed in drought hit areas of the province. Drought caused food insecurity, malnutrition, increased mortality rates among children and impacts on education in the province. The government invested substantial amount on providing relief supplies to the drought affected districts in Balochistan. According to figures, twenty districts were in urgent need of water and food assistance.

United Nations Development Program (2015) categorized intensity of drought impacts in the province as mild and moderate. Mild impacts included reduced incomes from agriculture and livestock, malnutrition and decrease in health conditions, unemployment, forced sale of land and household assets, and increase in crime while moderate impacts engulfed loss of sources of livelihood, forced migration, seeing labor and other jobs in other sectors and areas. According to Ahmed (2007), the obvious reason was scarcity of rainfall. However, there were other contributing factors including deforestation, depletion of grazing pastures and rangelands, environmental degradation and global warming. Recurring drought is one of the major challenges faced by Balochistan. Drought conditions and untimely rains are still prevailing in several regions of the province. Many

areas of the province are experiencing drought as rainfall since 2013 has hardly been a quarter of the usual amount.

3. Methodology

On the basis of data sources, this very study is quantitative in nature while on the basis of the purpose of the study the study is descriptive. The study was carried out in two selected districts located in the north-west of Balochistan province of Pakistan. A total of 332 small holder farmers (having up to 5 acre cultivated land) were interviewed by implying multiple techniques of sampling including Random, Quota and Purposive sampling to select Union Councils/Villages, Households and Farmers respectively. Structure questionnaire was used to muster data from the HHs. Primary data was analyzed with the help of latest version of SPSS to draw findings and conclusion.

4. Results and discussion

4.1 Socio economic profile of small holder famers (N=332)

The minimum number of family members is 5 while maximum is 28 persons per family with an average of 12.7 persons per family. There is variation in family size of both districts where average family size of Pishin district is higher than that of Nushki. The minimum number of family members per family in Pishin is 8 and maximum is 28 with an average of 13.3 persons per family. On other hand in Nushki district, the situation is different as indicated in the table that minimum number of family members is 5, maximum is 19 with an average of 9.6 persons per family. This confirms that a higher majority of respondents live in joint family system in both selected districts.

Data in the serial 1.2 of table 1 further shows that there was huge difference of number of family numbers attachment with agriculture during normal years and drought years. During normal on average 3.9 persons per family were attached to agriculture while in during drought years the number decreased to only 1.8 persons per family. The attachment of number of family members to agriculture is higher in Pishin district (4.5 during normal years and 2.1 during drought season on average) as compared to Nushki (3.2 during normal years and 1.4 during drought season on average) both during drought years and normal years. This

indicates that drought spell forced a notable number of people in both districts to quit agriculture and search for other sources of income.

The average landholding of respondents of the field survey was 4.5 acres per family with minimum 1 acres and maximum 5 acres. The average landholdings in Pishin district (4.5 per household) is higher compared to average in Nushki.

Table 1 Socio-economic profile of respondents' families

S#	HH Characteristic	Year	District Pishin			District Nushki			Total		
			Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
1.1	Average family size		8	28	13.3	5	19	9.6	5	28	12.7
1.2	Average number of family members attached to agriculture/livestock	NY*	1	8	4.5	1	6	3.2	1	8	3.9
		DY*	0	5	2.1	0	4	1.4	0	4	1.8
1.3	Average household landholdings***		1	5	4.5	1	5	4	0	5	4.5
1.4	Average number of livestock animals	NY	1	80	12.8	1	120	18.6	1	120	15.5
		DY	0	5	2.2	0	12	3.1	0	12	2.6

* NY= Normal Year

** DY= Drought Year

*** Landholdings are in Acres

It was found that on average each family possessed 15.5 livestock large and small animals during normal years with minimum one and maximum 120 animals. However, the number reduced to 2.6 animals on average per family during drought years in both districts with minimum 0 and maximum 12 livestock animals. Data also indicates that livestock rearing is higher in Nushki district (18.6 during normal years and 3.1 in drought season on average) as compared to Pishin (12.8 during normal years and 2.2 during drought years on average). Thus, it can be sought out that drought conditions severely affected livestock sector in both selected districts.

4.2 Type of agriculture as source of living

The data in table 2 illustrates that 45 percent respondents had irrigated annual crops and vegetables and almost similar figures that is 42 percent had irrigated orchards as type of agriculture. A minimum percent

of respondents only 11 percent cultivated dry land crops as rain-fed, *Khushkaba* or *sailaba* agriculture.

The findings indicate that there are variations at district level in both selected districts. Irrigated annual crops and vegetable were more common in Nushki (59 percent) as compared to Pishin (38 percent), while dependency of farming families is higher on irrigated orchards in Pishin (54 percent) contrary to Nushki (20 percent). Another important point to be noticed is higher ratio of dry-land/*khushkaba/sailaba* in district Nushki (20 percent) as compared to Pishin district (06 percent).

Table 2 Type of agriculture (N=227)

	Type of agriculture	District Pishin	District Nushki	Total	
				Frequency*	Cumulative Percent
Valid	Irrigated annual crops, vegetables, etc.	58 (38)	45 (59)	103 (45)	45
	Irrigated orchards	81 (54)	15 (20)	96 (42)	87
	Dry-land crops (rain- fed/ <i>khushkaba/sailaba</i>)	9 (6)	15 (20)	24 (11)	98
	Total	148	75 (0)	223(98)	
Missing	System	3	1	4 (2)	100
Total		151	76	227	

*Values in parentheses show percentage

The data in this table confirms the figures of secondary sources that imply that irrigated orchards of various fruits are more common in District Pishin while irrigated annual crops and vegetables are more common in district Nushki (GoB, 2011. UNDP, 2015). A notable thing observed during field data collection was that a gradual shift has been observed in Pishin district from orchards to annual crops such as wheat, barley, vegetables and tobacco etc. due to lack of water resources both surface and underground during drought season.

4.3 Drought Assessment in North-west Balochistan

Main source of water (for human use, agriculture and livestock)

Findings of field data in table 3 show that main sources of water during normal years were evenly distributed in various type of water sources such as tube-wells 39 percent, *karezes* 24 percent, springs 20 percent and 11 percent other sources. On other hand, the situation is quite

different during drought seasons in which 64 percent received water from tube-wells, 24 percent had no such sources in their particular villages, instead, they brought water from other nearby areas or people were forced to migrate, and the rest of 11 percent respondents managed to get water from other sources but with minimum quantity. It was found that none of the respondents received water from *karezes* and springs during severe spell of drought in both selected districts. Thus almost all *karezes* and springs got dried during drought years.

Table 3 Main source of water

Source of water	District Pishin				District Nushki		Total ***	
		NY*	DY**		NY	DY	NY	DY
Tube-wells	87 (43)	147 (72)	43 (34)	64 (50)	130 (39)	211 (64)		
<i>Karezes</i>	49 (24)	0 (0)	30 (23)	0 (0)	79 (24)	0 (0)		
Springs	41 (20)	0 (0)	25 (20)	0 (0)	66 (20)	0 (0)		
None	0 (0)	35 (17)	14 (11)	45 (35)	14 (4)	80 (24)		
Any other	23 (11)	17 (9)	12 (9)	15 (12)	35 (11)	32 (10)		
Total	200 (98)	199 (98)	124 (97)	124 (97)	324 (98)	323 (97)		
Missing	4 (2)	5 (2)	4 (3)	4 (3)	8 (2)	9 (3)		
Total	204	204	128	128	332	332		

* NY= Normal Year ** DY= Drought Year ***Values in parentheses show percentage

The finding reveals that tube-well installation rapidly increased in both selected districts during drought years particularly in Pishin district where an increase of 29 percent was observed in selected villages as field data shows. Due to increased load-shedding of electricity, more farmers have started to use solar energy to suck water from ground through tube-wells.

4.4 Comparison of livestock loss / forced sale in drought year and normal year

According to data in table 4, the average number of livestock animal loss / forced sale per year during normal years was 10.5 with minimum 01 and maximum 25 animals, while during drought years the figures are very different. A minimum of 5 and maximum 140 livestock animals were lost or forcefully sold according to respondents. The average number accounted is 44.4 per year. Livestock loss was higher in district Nushki as compared to Pishin both in normal as well as drought season. It reveals that livestock is more common in Nushki district. The average annual livestock losses and forced sale in Nushki district during normal years was 13.7 while during drought season the average number reaches a drastic change of 57.7 with a difference of 44.5. On the other hand, the situation in Pishin was also very alarming. The average number of livestock loss and forced sale during drought years was 34.5 while in normal years it was 5.5 with the difference of almost 29. The figures indicate that drought conditions severely affected the livestock sector in both districts. The same is discussed in various other secondary sources related to drought.

Table 4 Comparison of livestock loss / forced sale in drought year and normal year on average

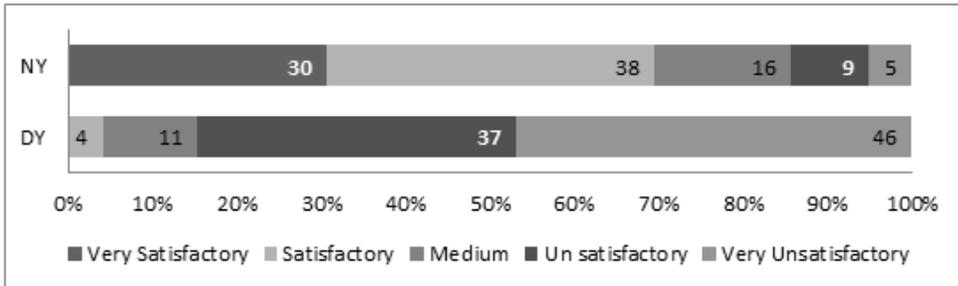
Year type	District Pishin			District Nushki			Total				
	Min	Max	Ave	Min	Max	Ave	Min	Max	Mean	SDev.	Median
During Drought Year	5	80	34.5	5	140	52.7	5	140	44.4	47.01	14.5
During Normal Year	1	15	5.5	1	25	13.3	1	25	10.5	7.15	9.5

4.5 Comparison of drought and normal year quality of harvest/products each year on average

There is a huge difference between the quality of harvest in normal and drought years. The data reveals that 38 percent of respondents were of opinion that the quality of harvest and products from agriculture during normal years on average was satisfactory and 30 percent said that it was very satisfactory which accounts for a cumulative total of 68 percent of respondents. On the other hand, 46 percent of respondents were very unsatisfied and 37 percent were unsatisfied with the quality of agriculture harvest and

products during drought years which accounts for a cumulative total of 83 percent. Drought spell severely impacted the quality of yields that people got from agriculture which consequently decreased income sources, low market rate for yields, quitting of agriculture, search for alternate and additional sources of income etc.

Figure 1. Comparison of drought and normal year quality of harvest/products each year on average (%)



4.6 Occupational change

Data in table 4 presents that 46 percent of respondents started daily wage labor as a result of failure in agriculture crops during drought season. 25 percent respondents stated that some family members started other small commercial activities / small business of various types such selling items at road sides, in carts, opening shops of small investments, and other small trades in the urban areas. 15 percent respondents said that people of families were compelled to strive for employment of private and government sectors in different areas of the province and in some cases outside the province.

Table 5. The type of occupational change (N=289)

Type of occupational change	District Pishin*	District Nushki*	Total	
			Frequency*	Cumulative Percent
Valid Home based self-employment activities	11 (6)	10 (9)	21 (7)	7
Daily wage labor	82 (47)	51 (44)	133 (46)	53
Other commercial activities	45 (26)	26 (23)	71 (25)	78

Govt. / pvt. Employment	25 (14)	19 (17)	44 (15)	93
Any other	8 (5)	8 (7)	16 (6)	99
Total	171	114	285 (99)	
Missing System	4	0	4 (1)	100
Total	175	114	289	

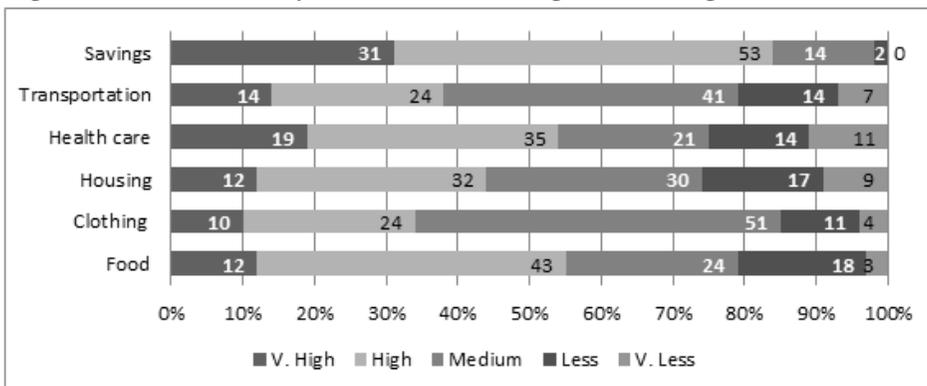
*Values in parentheses show percentage

The data in table 4 implies that since most of the people in agriculture sector were unskilled in other fields, therefore, most of the people who changed occupations were forced to start daily wage labor, private employment and began small commercial activities.

4.7 Drought on living standards

The data in figure 2 analyzes the impacts of drought on various sectors related to living standards of people. According to field survey as shown in table, respondents expressed their point of view against each indicator of living standard and the most affected segments were 1-savings, 2-food, 3-health care, 4-housing, 5-transportation and 6-clothing ranking from 1 to 6.

Figure 2 Intensity of effects of drought on living standards (%)



4.8 Loan and amount of loan

Field survey shows that 56 percent of respondents responded that they were not compelled to take loans during drought years while 42 percent respondents gave affirmative response. The data further reveals that the ratio of taking loan in drought years was higher in Pishin district (51 percent) as compared to Nushki (27 percent).

Table 6 The amount of loan (N=140)

Amount*	District Pishin			District Nushki			Total				
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	S. Dev.	Median
Amount of Loan	70,000	1,000,000	430,000	400,000	2,10,000		40,000	1,000,000	320,000	299,002	150,000

* Amount is shown in PKR

The minimum amount of loan taken by respondents in drought years was Rs. 40,000 while the maximum amount was Rs. 1,000,000. The average amount is 320,000 rupees.

4.10 Source and purpose of taking Loan

Data from field survey implies that 51 percent of respondents took loan from informal money lenders, 17 percent took from banks, 16 percent from co-villagers and 11 percent from relatives. The informal money lender means the informal setup that lends money to people for specific time period such as the businessmen, shopkeepers or conventional money lenders etc. The data indicates the ratio of taking loan from banks is higher in Pishin (20 percent), while from relatives (14 percent) and informal money lenders (54 percent) is slightly higher in district Nushki.

Table 7 The basic purpose of loan (N=140)

Purpose	District Pishin*	District Nushki*	Total	
			Frequency*	Cumulative Percent
Valid				
Agriculture development	21 (20)	8 (23)	29 (21)	21
Establishment of other business	48 (46)	14 (40)	62 (44)	65
Livestock rearing	3 (9)	5 (14)	8 (6)	71
Family expenses	20 (19)	8 (23)	28 (20)	91
Repair and construction of house	7 (7)	0 (0)	7 (5)	96
Marriage/ other cultural ceremonies	6 (6)	0 (0)	6 (4)	100
Total	105	35	140 (100)	
Missing	System	0	0 (0)	
Total	105	35	140	

*Values in parentheses show percentage

According to table 7, majority of respondents (44 percent) took loan for the purpose of establishing other business. Drought first and foremost targeted the income sources of farming families due to which farmers were forced to seek for additional or other sources of income. Due to lack of personal savings, farming families either sold land and household assets or were compelled to take loans in order to invest the amount in establishment of other small businesses. Thus, a large number of respondents took loan for the purpose of starting new business.

The study established that 21 percent respondents took loan for the development of agriculture. Agriculture sector was the most devastated sector by long spell of drought. Farmers in majority of the cases kept their struggle to make living from same sector even during drought, however, due to lack of amount to invest on agriculture, people tended to take loans and invest on various aspects of agriculture such as installation of tube-wells and buying seeds and fertilizers. Further, it is evident from data that 20 percent respondent took loan for the purpose of bearing family expenses. It was observed that people during long spell of drought did not have the capacity to fulfill basic needs of family such as food, health, education, shelter, clothing which compelled them to take loans of varying amounts either from relatives, co-villagers or informal money lenders.

Conclusion

Balochistan has been prone to natural hazards like drought. The socio-economic impacts of drought in the province are severe due to its geophysical location and socio-economic conditions. Since Balochistan is the least developed and poorest province of the country and a high majority of populace is dependent on agriculture (irrigated and non-irrigated) and livestock sectors; therefore, the socio-economic impacts of drought have been severe. Both surface and underground water resources decreased in drought season. *Karezes*, springs and most of the tube-wells dried up. The rain-fed (*Sailaba* and *Khushkaba*) agriculture were highly affected. A variety of reasons increase the vulnerability of farming families to the impacts of drought. The reasons included over-exploitation of water resources; miss-management of underground water; over sucking of water through increased number of tube-wells for agriculture, domestic and

commercial purposes; lack of awareness among community people; poor adaptive capacity and lack of technical capacity among farmers. Drought resulted in loss of on-farm as well as off-farm income of farming families. The loss of livestock animals and poor quality of harvest added into worsening the situation. Due to failure of agricultural harvests, people were compelled to change occupations especially to daily wage labor and small commercial activities in urban areas. Involvement of children in various commercial activities and home based earning of women increased due to loss of income sources of male members of family. Farmers were forced to take loans from various sources to arrange other income sources and to fulfill basic needs of families such as food, shelter, clothing, medicine, drinking water and transportation etc. Examples of selling valuable assets were also observed in both districts. Drought impacted the living standard of farming families in terms of limiting the basic needs of family life. Loss of income, decreased sources of livelihood combined with lack of basic needs during drought forced poorest people to migrate or get displaced.

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