

**A SURVEY OF DROUGHT IMPACTS AND COPING MEASURES IN
HELMAND AND KANDAHAR PROVINCES OF AFGHANISTAN**

Asad Sarwar Qureshi
Mujeeb Akhtar

IWMI Internal Report

December 2004



This report is part of the research project “Drought Assessment and Mitigation Potential in South West Asia”, implemented by IWMI and partners organizations, and sponsored by US State Department Regional Environment Office for South Asia through an agreement with the USAID. The report was prepared with the help of University of Agriculture, Peshawar, Pakistan. We gratefully acknowledge the support provided by Prof. Dr. Jamal A. Khan of the Peshawar University for making necessary arrangements to conduct survey in Kandahar and Helmand provinces of Afghanistan. The efforts of two Afghan students of this University - Mr. Waheedullah and Mr. Obaidullah - in conducting a one-month long survey in Helmand and Kandahar provinces are highly appreciated. Without their fieldwork, this study would not be possible. Mr Waheedullah and Mr. Obaidullah have made photos included in this report. This report was reviewed by Dr Hugh Turrall of IWMI, Colombo, Sri Lanka

Authors: Asad Sarwar Qureshi is the Head of IWMI-Iran Office in Tehran, Iran, and Mujeeb Akhtar is a Researcher at IWMI-Pakistan Country Office in Lahore, Pakistan.

TABLE OF CONTENTS

SUMMARY.....	4
INTRODUCTION.....	5
DESCRIPTION OF THE STUDY AREA.....	5
METHODOLOGY.....	8
THE RESULTS OF FIELD SURVEY	11
THE ROLE OF NGOs AND GOVERNMENT IN PROVIDING RELIEF	16
CONCLUSIONS AND RECOMMENDATIONS FOR DROUGHT MITIGATION IN AFGHANISTAN	18
LITERATURE CITED.....	21

SUMMARY

The paper presents the results of a field survey conducted in two severely drought-hit southern provinces of Afghanistan to get the first-hand information on the impacts of droughts on livelihood systems and personal security of the population at the household and village level. Kandahar and Helmand provinces were selected for the representation of rain-fed and irrigated areas respectively. During the recent drought of 1999-2001, these two provinces received less than 50% of their normal rainfall.

The field survey was conducted during the first half of 2004. Three different questionnaires (for village level, household level and for Government/NGOs) were developed. The questions regarding perceptions about drought, their effects, coping strategies, causes of drought, role of NGOs and government agencies, in addition to basic information about the structure and characteristics of the villages, were included in the questionnaires. Interviews were done both at formal group or community level and household level. In total, 34 villages were surveyed from each selected province. From each sample village, 5 respondents were interviewed. Therefore, about 170 respondents from two provinces were interviewed. In addition to this, most of the agencies and departments working for drought relief and mitigation measures were interviewed.

The majority of the villagers in the study area are dependent on agriculture and livestock. More than 50% of wheat, barely and orchards were damaged due to this drought. On average per household, about 45 goats / sheep in Kandahar died during the drought period of 1999-2001. About 31 goats / sheep sold at two times lower than normal prices due to sickness and loss of weight.

The most impeding effect of drought in rain-fed areas was reduction in household incomes, which forced farmers to migrate to nearby towns and cities in search of off-farm income. From rain-fed areas of Kandahar province about 36% of the population migrated to nearby irrigated areas or towns to find alternate off-farm activities to supplement their household incomes. In irrigated areas, migration was negligible. The burden on women increased as they were forced to engage in household income generation activities in addition to their other duties.

Lack of drinking water for humans and livestock were reported as major reasons for migration. Women and children in rainfed areas have to walk about 3.5 km daily to fetch water from wells or hand pumps. This leads to even greater stress on women, especially where male family members were away from home in search of additional income.

More than 70% of household respondents living in drought-affected areas received some help from NGOs (national and international). The help was mostly provided in rain-fed areas, but the quantity and quality were not sufficient for an average family. Food items were mainly distributed in easily accessible areas whereas remote areas remained out of reach.

The survey results suggest that drought coping activities in the future should focus on improving access to potable drinking water, infrastructure development, provision of small credit facilities to drought-affected areas, adoption of water conservation and expansion of rainwater harvesting measures and improved coordination between different NGOs and government agencies.

INTRODUCTION

Drought is often defined in climatic terms as a continuous interval of time during which the actual moisture supply at a given place is consistently less than normally is expected. However, the consequences of a drought, have to be placed in the context of socio-economic activities of a given country or region. An already precarious food supply situation in Afghanistan, due to continued civil strife and reduced production over years, was further aggravated by an extended recent drought in much of the southern and central parts of the country. The worst affected areas were the provinces of Kandahar and Helmand, where droughts are known to occur frequently. While people living in drought prone areas cope with droughts using their indigenous wisdom and means, their coping potential is severely undermined due to war and unrest. During the drought of 1999-2001, many NGOs attempted to reduce the impact of drought and provide relief to affected communities. However, a large number of people in drought-hit areas were not able to get relief assistance on time, which resulted in casualties and migration of people and livestock to other areas.

For long-term drought management, the social impacts of drought and associated costs, propagation of these effects throughout the society, the structure of affected population, etc, need to be better understood. This study focuses on two drought-hit provinces (Helmand and Kandahar) of Afghanistan and attempts to understand and/or examine

- the first-hand knowledge on perceptions of the droughts among the rural population,
- socio-economic impacts of drought,
- existing and potential coping mechanisms and
- the role of different government and non-government organizations in drought mitigation in the country.

DESCRIPTION OF THE STUDY AREA

Physiography and irrigation

The Southern region of Afghanistan is made of five provinces (Kandahar, Zabul, Nimroz, Urozgan and Helmand – Fig.1) and constitutes one third of the country area (199,000 km²), with a total population of about 3.2 million. These provinces are sparsely vegetated. In Kandahar, the land is mostly covered with shrubs and in Helmand, the land is partially covered with shrubs and partially barren.

Temperatures in Kandahar Province are highly variable, precipitation is very low (100-200 mm a year) and sporadic, while annual potential evaporation exceeds 1700 mm (Qureshi, 2002). The main source of livelihood in this province is rain-fed agriculture. However, with protracted reduction in rainfall, farmers are extracting more groundwater to irrigate crops. Currently, about 22,000 ha (18.5% of agricultural area) is under groundwater irrigation. Table 1 provides details of the distribution of different irrigation systems in Kandahar and Helmand provinces (Qureshi, 2002). Kandahar is a market for sheep, wool, cotton, food grains, fresh and dried fruit and tobacco. Woolen products, felt and silk are major products. The surrounding irrigated region produces fine fruits, especially grapes and Kandahar city has plants for canning, drying and packing fruit.



Figure 1 Provinces of Afghanistan (circles show the two provinces, where field surveys were conducted)

Table 1 Distribution of different irrigation systems in Kandahar and Helmand provinces (Qureshi, 2002)

Irrigation system types	Kandahar	Helmand
Canals	279	227
Springs	258	135
Karezes	631	276
Wells	252	60

Helmand Province covers an area of about 57,862 km². Helmand River is 1,130 km long, rising in the Hindu Kush Mountains, North East of Afghanistan and flows generally south west to the Sistan basin, a marshy lake that extends into Iran. The main source of livelihood in this province is irrigated agriculture. About 27,280 ha (16.8 % of agricultural area) is under groundwater irrigation. Helmand's ancient irrigation and river-control systems were destroyed by Jenghiz Khan (13th century) and Timur (14th century). Modern irrigation works are vital to both Iranians and Afghans, and in times of drought there are disputes over water rights. The Helmand Valley Authority has extensively developed the region, improving irrigation and flood control.

Extent of the recent drought in two provinces

The drought of 1999-2001 was the worst in the last 50 years. Almost all parts of the country were affected by the drought except for few places located in the valleys of big perennial rivers. Preliminary estimates of FAO suggest that about half of the population was directly or indirectly affected by drought. About 3 to 4 million people were severely affected and another 8 to 12 million were under the threat of famine and stranded. Around 300,000 people fled to neighbouring Iran and Pakistan and more than 400,000 moved to safe places within the country. Many others who were stranded in drought hit areas, faced inadequate supply of water and food resulted starvation and disease. The major reasons for families to remain in drought hit areas were lack of financial resources and transport facilities and lack of job facilities in other rural and urban areas of Afghanistan.

The southern region has been the worst affected by the recent drought of 1999-2001. About 200,000 people (23000 families) have been internally displaced. The effect of drought on Nomads was especially significant. Nomads (*Kouchees*)¹ are displaced in large numbers from their normal grazing route (Islamic Relief, 2001). The Helmand River has dried up for the first time in living memory and the water table sank to an all time low. The average rainfall in Kandahar and Helmand provinces varied from 24 to 224 mm per year. Water levels in existing reservoirs fell to critical levels. Some reservoirs and canals completely dried up (Fig.2).



Figure 2. Dry Bughra Canal in District Marjah, Helmand Province.

¹ Nomads are people who have no fixed home and move according to the seasons from place to place in search of food, water, and grazing land

Most of the traditional groundwater irrigation systems experienced reduced discharge or completely dried up. About 60 to 70 % of karezes are not in use and 85 % of shallow wells have dried up. The population dependent on these traditional irrigation systems and shallow wells (*locally called Arhad*) has suffered particularly due to failure or reduction of discharges of these systems. The main reasons for low discharge or failure are low precipitation and consequently low recharge of groundwater. Boring of deep wells close to karezes and shallow wells has had an adverse effect on the discharge of these traditional irrigation systems. This has threatened the sustainability of these systems, as most of the karezes are present in drought-affected areas. Due to severe drought conditions, hand dug-wells were almost dry and people were forced to drill deep wells. The karez system was reduced to almost 20 % of its normal capacity.

METHODOLOGY

Data collection extent and methods

Table 2 Villages selected for field survey

Province	District	Villages	Type
Helmand	Garm Ser	Baqi Khan Killi	Irrigated
		Door Khair Killi	Irrigated
		Haji Nimatullah Killi	Irrigated
	Grisk Nahre-e-Siraj	Deh Musa Karez	Irrigated
		Muhammad Jan Killi	Irrigated
		Kuchani Yakowlang	Irrigated
		Ghause-ud-din Killi	Irrigated
	Washier	Tal Qila	Irrigated
		Shoonaki	Irrigated
	Khanashin	Khair Abad	Irrigated
		Upper Kartaka	Irrigated
	Nad Ali	Loe Bagh	Irrigated
		Chahe Mirza Baluchan	Irrigated
	Nawa	Khalaj	Irrigated
		Buland Aawah	Irrigated
Nawab Jan Killi		Irrigated	
Kandahar	Panjwayi	Lal Khan Killi	Rainfed
		Muhajerin	Rainfed
		Hasanabad	Rainfed
	Daman	Sahibzada Kalacha	Rainfed
		Azam Killi	Rainfed
		Ghaibi Kalacha	Rainfed
	Maiwand	Deh Banak	Rainfed
		Gach Karez Killi	Rainfed
		Safozai	Rainfed
	Dand	Murghan	Rainfed
		Gundigan	Rainfed
		Bibi Hawa Kalacha	Rainfed
		Khokaran	Rainfed
	Arghandab	Minara	Rainfed
		Koak	Rainfed
Paishin		Rainfed	
Ghafoor Killi		Rainfed	
Surkh Challa		Rainfed	

Field data were collected through focus group discussions with vulnerable groups and by structured household interviews. The survey covered the issues related to impact of drought on ownership of assets, alternative livelihood, formation of self-help groups and their role in people's empowerment, water conservation and harvesting practices, land ownership patterns and implications on access to water, communal lands and other common property resources.

Table 3. Characteristics of villages of Helmand Province

Village	No. of Houses	Population	Accessibility ²	Facilities	Affect of Drought	Relief efforts
Baqi Khan Killi	68	800	Difficult to access	No School, No Dispensary	Moderate	No relief measures
Door Khair Killi	35	400	Accessible	No School, No Dispensary	Moderate	No relief measures
Nimatullah Killi	30	300	Difficult to access	Primary School, Dispensary	Severe	NGO presence, relief measures
Deh Musa Karez	87	900	Accessible	No School, No Dispensary	Severe	NGO presence, relief measures
Muhammad Jan Killi	71	927	Accessible	Primary school, No Dispensary	Moderate	No relief measures
Kuchani Yakowlang	40	600	Accessible	No School, No Dispensary	Severe	No relief measures
Ghause-uddin Killi			Accessible	Primary School (Boys & Girls)	Moderate	NGO presence, relief measures
Tal Qila	43	450	Accessible	No School, No Dispensary	Severe	No relief measures
Shoonaki	29	300	Difficult to access	No School, No Dispensary	Severe	No relief measures
Khair Abad	38	500	Accessible	Middle School	Moderate	NGO presence, relief measures
Upper Kartaka	107	1000		Primary School	Severe	No relief measures
Loe Bagh	62	800	Difficult to access	No School, No Dispensary	Severe	NGO presence, relief measures
Chahe Mirza Baluchan	31	350	Accessible	No School, No Dispensary	Severe	No relief measures
Khalaj	78	900	Accessible	No School, No Dispensary	Severe	NGO presence, relief measures
Buland Aawah	68	800	Difficult to access	No School, No Dispensary	Severe	NGO presence, relief measures
Nawab Jan Killi	83	995	Difficult to access	Primary School	Moderat	NGO presence, relief measures

Discussions with other stakeholders like government officials and NGOs were also held. The appraisal team consisted of two field investigators supported by local informants. The survey was conducted in 34 villages in different districts of Helmand and Kandahar provinces and a total of 170 households were interviewed. Team members were conversant with the local culture and sensitivities and had experience and understanding of the issues and impact of drought and drought relief measures in the area.

² Accessible means “easily approachable village through proper metal road” and “Difficult to access” means “complicated route to reach a particular village”

Selection of villages and their characteristics

The rainfed villages were selected from Kandahar province and the irrigated villages - from Helmand province. The villages finally selected for the survey (Table 2) were mid-sized and relatively accessible. Due to security and accessibility reasons in Afghanistan, more remote villages could not be included. The basic features of sample villages in the Helmand and the Kandahar provinces are given in Tables 3 and 4.

Table 4. Characteristics of villages of Kandahar Province

Village	No. of Houses	Population	Accessibility	Facilities	Affect of Drought	Relief efforts
Lal Khan Killi	35	160	Accessible	No School, No Dispensary	Severe	NGO presence, relief measures
Muhajerin	109	880	Accessible	No School, No Dispensary	Moderate	NGO presence, relief measures
Hasanabad	27	250	Difficult to access	Dispensary	Moderate	NGO presence, relief measures
Sahibzada Kalacha	62	825	Accessible	No School, No Dispensary	Moderate	NGO presence, relief measures
Azam Killi	59	515	Accessible	Primary School	Moderate	NGO presence, relief measures
Ghaibi Kalacha	79	700	Accessible	Primary School	Moderate	No relief measures
Deh Banak	165	1600	Difficult to access	Primary School	Moderate	No relief measures
Gach Karez Killi	58	484	Difficult to access	No School, No Dispensary	Severe	NGO presence, relief measures
Safozai	180	1500	Accessible	Primary School, Dispensary	Severe	NGO presence, relief measures
Murghan	120	1100	Accessible	No school	Severe	NGO presence, relief measures
Gundigan	59	25	Accessible	No school	Severe	NGO presence, relief measures
Bibi Hawa Kalacha	17	100	Accessible	Primary School	Moderate	NGO presence, relief measures
Khokaran	187	1496	Accessible	Primary School	Moderate	NGO presence, relief measures
Minara	95	580	Inaccessible	No School, No Dispensary	Moderate	NGO presence, relief measures
Koak	62	739	Accessible	No school, No Dispensary	Moderate	NGO presence, relief measures
Paishin	108	976	Accessible	No School, No Dispensary	Moderate	NGO presence, relief measures
Ghafoor Killi	98	650	Accessible	No school, No Dispensary	Moderate	No relief measures
Surkh Challa	160	800	Accessible	Primary School	Moderate	NGO presence, relief measures

Household characteristics

From each village, only five households were selected for interview. Average *family size* of the households varied from 5 to 6 people (Table 5). The variation in family size in rain-fed (Kandahar) and irrigated areas (Helmand) is negligible. In the irrigated areas of Helmand province, about 70% people are associated with the agriculture whereas in rain-fed areas of Kandahar province, about 80% people depend on agriculture. In the event of a shortage of water, people turn their attention to livestock and animal husbandry and a small fraction of population opt for mixed enterprises (agriculture, livestock and animal husbandry and non-agricultural activities), especially in rainfed areas (Table 6).

Table 5. Family sizes of the sample household in Helmand and Kandahar.

Size of Family	Kandahar (Rainfed)	Helmand (Irrigated)
Male	6	6
Female	5	6

Table 6. Occupation of the household respondents

Occupation	Percentage of respondents	
	Helmand (Irrigated)	Kandahar (Rainfed)
Agriculture	69.1	79.7
Livestock & Animal Husbandry	28.9	12.5
Mixed activities	1.3	7.8

Animal ownership refers here to how many livestock is owned by a household. The average number of goats/sheep owned by a household was 25 in Helmand (irrigated areas) and 17 in Kandahar (rainfed areas). It was also found that more than 90% respondents have goat/sheep ownership in Helmand and Kandahar areas because this is their subsistence security under different conditions. The other most important animals are camels and cows.

THE RESULTS OF FIELD SURVEYS

General perceptions of drought at household level

Farmers perceive that drying of streams and reservoirs and inability of tubewell to pump groundwater due to falling groundwater tables are important perceptions of farmers for the incidence of drought in irrigated areas. However, this is not the case in rain-fed areas as groundwater tables are usually deep and not accessible to farmers. Therefore fluctuations in groundwater tables in rain-fed areas have no direct and immediate impact on the life of farmers. The prolonged dryness of the area is considered harmful for the environment and human health. In rain-fed areas, non-availability of drinking water for humans and livestock is considered as a more serious indicator for the occurrence of drought (about 13% in rain-fed areas as compared to only 5% in irrigated areas). Indicators such as sickness of livestock, fodder shortage and less water availability for agriculture are also considered more serious in rain-fed areas than in irrigated areas. Because any deficiencies in the rainfall in irrigated areas is usually supplemented by the groundwater or canal water whereas in rain-fed areas the effect of reduced rainfall becomes apparent immediately.

Most of the households think that drought conditions are not completely over yet and their suffering may continue for some time. The frequency of drought in irrigated areas is perceived to be once in 12-20 years whereas in rain-fed areas, drought is believed to be a more recurrent phenomenon, occurring every 5-10 years.

Vulnerability to drought and personal security

The drought of 1999-2001 and war have taken a heavy toll on Afghanistan's economy and increased vulnerability and hardship for many (predominantly rural) communities. There has been widespread damage to productive potential of land and extinction of livestock. In some isolated districts the people have exhausted their wheat stock and started using dried mulberry and chickling peas locally called "*Kolol*". This grain is usually used for livestock fodder and its consumption by human being has paralyzed the actual consumer.

The overall impact of impending drought and ensuing reduction in water supplies is a fall in household incomes. Under-employment became the main threat to household food security. Female-headed households are susceptible to food insecurity as the main source of income is provided by child labor (collecting scrap and paper for sale, selling water at taxi and bus stands, repair tires, shining shoes...etc.), while women beg for money. The survey results indicate that women and children are most vulnerable to drought. Men are usually the heads of families, and have the responsibility of all financial matters. When employment opportunities for male members of the family are reduced, the whole family starts suffering. The respondents in irrigated and rain-fed areas consider it a desperate situation for the whole family.

The impact of drought on women is worst due to their socio-cultural and economic positioning in the family and community. Women and children in most parts of Helmand and Kandahar play a central role in home economics. Lack of food, poor nutrition and poor sanitation typically result in decreased resistance to diseases. Due to out-migration of male members of the family for income supplementation, women have to involve themselves in household income generation activities such as embroidery and handicrafts. The need to carry water, wherever it is from, has increased women's labor. On average, a woman must carry more than 200 liters of water every day and usually they have to wait for long hours for their turn due to low yields from communal/private wells. This has much increased their workload and they are working hard to sell their traditional products to earn cash for their family.

Impact of drought on agriculture

Farming families reported that a significant reduction in crop yields and loss of livestock. Due to lack of rainfall in the spring, the production of rain-fed wheat and barley was reduced significantly, about 40% lower than in average years. This caused an acute shortage of seeds for wheat and other crops because most of the wheat and barley was consumed for food supply and nothing was left as a seed for the next crop. The UN agencies like FAO and World Food Program (WFP) came to help farmers but they could not meet their demands (see also section *Role of NGO/Government in Providing Relief Measures*). Table 7 gives details of loss in crop failure due to drought both in irrigated as well as in rain-fed areas.

Table 7. Impacts of drought on the major crops per household in Helmand and Kandahar

Name of Crop	Percentage of farmers that grow crops		Average Area Sown (ha)		Average Area Damaged (ha)	
	Kandahar (Rainfed)	Helmand (Irrigated)	Kandahar (Rainfed)	Helmand (Irrigated)	Kandahar (Rainfed)	Helmand (Irrigated)
Wheat	79.70	84.60	2.3	5.8	1.5	3.3
Maize	20.30	9.00	0.3	0.8	0.2	0.3
Barely	29.70	46.20	0.6	2.2	0.3	1.2
Fodder	15.6	34.7	0.6	0.8	0.5	0.4
Vegetable	34.4	7.70	0.6	0.3	0.3	0.1
Orchards ³	92.2	10.3	2.8	1.4	1.3	0.9

Most of these cropping systems are followed under normal conditions. Due to drought conditions, changes in cropping patterns were made. More than 15% of Afghanistan's irrigated land gets water from traditional underground systems such as *Karezes (Qanats)*, *Springs* and shallow wells (locally called as *Arhads*). This system completely depends on the amount of rainfall during the year. Because of prolonged multi-year drought, about 60-70% karezes stopped functioning and 85% of the shallow wells were dried up.



Figure 3 Almost dry grape orchard in District Panjwayi.

³ These are pomegranate, grapes and almonds orchards, which mainly based on rainfall, localized runoff from a very small catchment area and springs. Some orchard owners also have a very limited access to groundwater.

The second source of irrigation is groundwater, but a very few farmers have access to this source. Most of the shallow wells dried up during drought period. The only option for them was to increase the depth of well, which was financially beyond the reach of many farmers. Due to water shortage, orchards of Apple, Pomegranate, Almonds, Apricot and Grapes were mostly affected. The survey results indicate that about 50-75 % orchard area of each farmer was damaged due to drought during 1999-2001. In rain-fed areas, not only orchards, but other crops were also affected due to low precipitation.

The reduced crop yields and farm incomes forced male family members to migrate to nearby cities or even to cross the border to neighboring Pakistan and Iran in search of jobs. Households, whose primary source of income is waged employment with minor agricultural income, have shown some resilience to drought related economic stress. This shows the importance of income diversification and employment creation in the non-agricultural sector for the rural communities. Mostly respondents blame poor rainfall as the major reason for their migration.

Impact of drought on livestock

Lack of food and grazing opportunities in rangelands resulted in migration of livestock in Helmand and Kandhar. High livestock mortality rates and losses of weight significantly reduced the income of the people in the drought-affected areas. The impact of drought in rain-fed areas of Kandahar was much more severe. More than 80% of respondents reported that high costs and unavailability of feed and water and lack of clinical facilities were the major reasons for the death of their livestock.

The impact of drought on the life of *Nomads* (locally called *Kuchi*) was much more significant than other segments of populations. Due to low germination or drying out of pastures and lack of drinking water in the grazing areas, nomads sold about 40% of their animals at throw away prices and in some cases they even exhausted their herds. The situation was further compounded by the fact that farmers and nomads could not store enough fodder for the coming seasons. In irrigated areas, the *Karez* system and access to groundwater helped farmers to maintain minimum levels of fodder or vegetation for their animals, and loss of animals was negligible. During the drought period of 1999-2001, livestock was sold almost at one quarter of their original price due to sickness and loss of weight. Losses of livestock in rainfed areas of Kandahar during the drought period of 1999-2001 are listed in Table 8. Low prices were due to fact that the bulls were sick and have lost weight due to fodder shortage. Farmers sold these animals at low prices under fear that animals can die.

Table 8 Loss of livestock due to drought in rainfed areas of Kandahar

Livestock Type	Households with livestock (%)	Present Ownership, Units	Died/ Slaughtered during 1999-2001, units	Sold during 1999-2001	Average Price (Afghan Rupees)	
					Actual	Normal
Goat/ sheep	70.31	25	45	31	329	529
Cows	42.19	2	0	1	1158	2590
Camel	4.69	3	0	4	2210	3510
Bull	1.56	1	0	1	789	1875

Coping strategies at the household level

Households have responded to the drought differently and attempted to manage their financial resources, in different ways, according to their social liabilities. Due to reduced agricultural activity, on-farm jobs such as fruit picking, harvesting, packing and transportation were no longer available. The war further aggravated the problem. Therefore most of the people are surviving on relief donations from NGOs.

In irrigated areas (Helmand), reduction in cropped area, changing cropping patterns (high delta apple crops were replaced by pomegranates), sale of livestock and their products and doing casual labor were common coping strategies under drought conditions. Sale of safe assets such as jewelry, watches, domestic items and productive assets such as land, livestock, farm machinery and sewing machines, were seen frequently during the three years of severe drought. The survey results indicate that in Helmand, selling of livestock and their products is the most reliable drought coping strategy, as more than 25% of the people practice it. More than 30% people limit their irrigated area and change cropping patterns to compensate for drought conditions. This ultimately reduces the crop production and threatens the food security. As a result, more than 5% people choose to do off-farm jobs in nearby cities and towns especially in Pakistan to supplement their household income to buy other necessities of life.

Food security at the household level is under considerable stress in Helmand and Kandahar. People are managing by changing their eating habits and reducing caloric intake, which in turn has affected the overall nutritional status of population (especially on livestock) and their health. Nutritional levels of poor men, women and children are inadequate in normal times: drought reduces the availability of food and compromises its quality. Maternal and infant mortality and morbidity rates rise, as do stunting and wastage. The effects of diseases which are not otherwise life threatening are intensified by malnutrition.

In rain-fed areas (Kandahar), use of stored grains, farm ponds to store rain water, sale of livestock and their products, seasonal migration of humans and livestock and change in eating habits are most common methods to live with drought conditions. Sale of livestock and their products is even a stronger phenomenon in rain-fed areas as more than 25% people use it as a shield against drought. About 36% of the respondents consider it safe to migrate together with the livestock to their relatives living in irrigated areas during the drought period and come back after the situation is improved. During the drought period, people also change their eating habits e.g. eating two times a day instead of three times. Their main food also reduced to bread and yogurt shake (*locally called Lasi*). This causes serious malnutrition problems especially for women and children.

Nutritional levels of poor men, women and children are inadequate in normal times. Drought reduces the availability of food and compromises its quality. Maternal and infant mortality and morbidity rates rise as do stunting and wastage. The effects of diseases which are not otherwise life threatening are intensified by malnutrition. UNDP (2000) found that some 36% of the people they surveyed were suffering from malnutrition, as measured by Body Mass Index (BMI) figures. This study also notes that the absence of data, and the inability to correlate co-existent factors, such as drought and poverty, makes analysis difficult. There is no comprehensive data on the level of diseases associated with drought and poverty (TB for instance) or those related to poor

sanitation and the lack of potable water. However, life-threatening viral diseases, such as viral hepatitis have also broken out in some of the drought-affected areas.

Laboring in nearby towns and groundwater irrigated areas is also a well-established way to cope with drought in rain-fed areas. Women earn some income by making hand-made embroidery and handicraft items. Women spend a lot more time on these activities now to make up for the lost income due to non-farming situation. This is usually considered a woman's job, but now many women reported that their men are also taking part, as they do not have anything else to do. These off-farm income generation activities have been adversely affected by drought. The sale of their products has decreased due to low purchasing power of the people in general. The middlemen are also exploiting their weak bargaining position by offering lower prices for their products. Household income is almost entirely spent on buying essential food items and they are barely left with the money to buy raw material for their handicrafts.

In most of the urban and rural areas of Helmand and Kandhar, shallow wells are used to get water for drinking and agricultural purposes. As the water table continues to fall, the poorer families are unable to dig their wells deeper. More than 70 % of the respondents from irrigated areas believe that their coping strategies failed due to a decline in groundwater tables. However, this percentage was only 35% for rain-fed areas as the dependence on groundwater in these areas is relatively low. In rain-fed areas, lack of labor and other off-farm opportunities and drying of shallow dug wells were considered as the major reasons for the failure of coping strategies.

More than 75 % respondents in irrigated areas and in rain-fed areas were of the view that NGOs helped them in developing these coping strategies. However, more than 60 % respondents believe that these coping strategies were only partially successful in solving their problems.

ROLE OF NGOS/GOVERNMENT IN PROVIDING RELIEF MEASURES

Despite heavy risks of droughts, no emergency plans are available for monitoring, regulation, management and mitigation of drought. About 60% of the respondents reported that there are no on- ground arrangements for the management or mitigation of droughts. People could not get any relief assistance from provincial or federal governments due to the war situation during the drought years of 1999-2001. However, people indicated that they got some help from NGOs. The survey results show that more than 80% households received help from different NGOs (national & international) i.e. Danish Committee for Aid to Afghan Refugees (DACAAR), Islamic Relief, UN agencies etc, working in the drought areas. They provided flour, oil, sugar, tea and pulses etc. Most of the respondents were of the view that only international NGOs came to their rescue from drought conditions. Some villages also received help in the form of hand pump installation. During the survey, people indicated that they received help only once or twice during the three years of drought.

Unfair distribution of relief items was major concern for most of the respondents. Influential people of the area received stocks of relief items for further distribution. However, they did not do justice to their fellows and most of the aid was given to their hand picked persons. Another complaint was that the needs of women were ignored both in assessment and relief distribution. The families headed by women were left out from distribution process as relief items were given to men only. It was learnt during the survey that the distribution strategies of most of the NGOs were not well organized and coordinated. In places it created more chaos than support and

therefore there is a need for strong linkages between national agencies and NGOs for long-term planning of drought forecasting and mitigation strategies.

Most of the NGOs provided relief assistance to areas, which were relatively more accessible. NGOs provided relief material 1-3 times in an area, but the quantity delivered was insufficient to meet people's needs. Government agencies and NGOs did not provide any credit facility to drought affected people of irrigated and rainfed areas. About 60% respondents were able to get credit in rainfed areas through local landlords and their relatives.

According to the Office for the Coordination of Humanitarian Affairs (OCHA, 2000), in the 7 worst drought-hit districts of the southern region, five local NGOs, with the support of UN agencies, have rehabilitated 52 hand pump-wells and constructed 11 new wells for drinking water supply. Under this action, only 250 large villages can be covered. Many water scarce villages have been left out due to lack of funds. With support from the European Commission Humanitarian Aid Department (ECHO) and DANIDA, DACAAR have expanded their water and sanitation program significantly. They have been instrumental in training local mechanics in manual drilling to save some shallow drinking wells in addition to the maintenance and development of critical water sources in the southern region.



Figure 4: Children of local farmers carrying drinking water from Artesian well by using animal (donkey) and Hand Trolley in Majrah District, Helmand, Afghanistan

The impact of the drought varies from region to region, district-to-district, valley to valley and from one household to another. Parts of the Southern Afghanistan were the worst affected, with drought reaching crisis levels in specific localities where the population has resorted to eating wild grasses and roots and where deaths have been reported. The long-term community-based

development programs of NGOs have provided an important foundation for WFP/ECHO-supported programs aimed to strengthen the agricultural infrastructure through Food for Asset Creation (FOODAC) projects. A long-term approach to funding is essential, based on support to communities at risk, through NGO programs to the extent possible.

The Government of Afghanistan (GOA) has presented a comprehensive plan for reconstruction, *Securing Afghanistan's Future*, requesting US\$ 27.5 billion over seven years in an international conference in Berlin. The pledges made in the Berlin Conference totaled some US\$ 8.3 billion over 2004/05-2007/08 fiscal years, including US\$4.5 billion for 2004/05 fiscal years. Coupled with prudent fiscal and monetary policies, these pledges are expected to go a long way in the reconstruction efforts of Afghanistan and create an enabling environment for the involvement of the private sector in pursuit of rehabilitation and further development of the country and recovering of damages caused by drought (FAO, 2004).

CONCLUSIONS AND RECOMMENDATIONS FOR DROUGHT MITIGATION IN AFGHANISTAN

Afghanistan has a history of repeated droughts and will continue to experience it in future. Therefore there is a strong need to develop an integrated framework of action for the management of drought in Afghanistan. This integrated plan should cover as many aspects of the situation as feasible. Special attention should be given to health, agriculture, modern technologies and poverty alleviation aspects. Each of these complex issues and interactions between them must be taken into account in a comprehensive way for successful drought management. For sustainable efforts of drought management, mobilizing organizational and human resources of communities are of great importance.

Afghanistan is predominantly an agrarian society with 80% of the population living in rural areas and directly dependent on natural resources for livelihoods (small-scale farming, pastures and forest products). There are roughly 3.9 million ha of cultivated land in Afghanistan of which about 1.3 million ha are rain-fed. Although irrigated area produces more than 85 % of all agricultural products, the contribution from the rain-fed areas is of significant importance in meeting food and fiber requirements of the population living in these areas.

The survey results indicate that rain-fed areas are the first and most severely hit by droughts. Livestock is the main sector in the economy of the country and in rain-fed areas it is the main source of income almost for every family. In 1997-98, the total population of livestock in the country consisted of 3 million cattle and 23 million sheep and goats. Livestock and its products are the main contributors to foreign exchange earnings. A decade ago, this sub-sector accounted for about 40% of the total export earnings, but presently, this number has reduced to half. This reduction is mainly due to decreased precipitation in the rain-fed areas, which reduces the production of feed for livestock and causes heavy losses of livestock.

In rain-fed areas, the water availability for irrigation is mainly a function of effective rainfall and groundwater resources, which in turn depends on the amount and distribution of precipitation. The recent succession of dry years has reduced the annually cultivated rain-fed area to less than 0.5 million ha. Currently, rain-fed cereal production has fallen to about 0.6 tons/ha, which is 10% lower than the expected production in a normal year. As a result, food security is becoming a

major challenge, particularly in the northern part of the country where rain-fed agriculture is widely practiced. In irrigated areas, agriculture is under stress due to non-functioning of traditional irrigation systems such as karezes, springs and shallow tubewells. Due to declining groundwater tables, these methods are no longer effective. To sustain agricultural production and to cope with the future droughts, rehabilitation of traditional irrigation systems should be given a priority by the new Afghan government.

During this study, lack of drinking water for humans and livestock also emerged as the biggest issue for the drought prone areas especially in the rain-fed areas of Kandahar province. Although some NGOs and other UN agencies have installed a few communal wells and hand pumps, there coverage is restricted to a small proportion of population. In remote areas of Kandahar, women and children still have to walk 2-5 km daily to fetch water from communal wells to meet their domestic demands. This has increased workload on women and children many folds. Considering the importance of this issue, there is a strong need to develop strategies for improving drinking water situation in drought prone areas of Helmand and Kandahar, through increasing the number of communal wells and hand pumps.

The concept of sharing water shortages is not very common within the farming community. Almost all the respondents were unaware of the improved water management techniques that can be adopted to use scarce water resources for optimizing crop production rather than maximizing crop production. Therefore there is a need to educate farmers to enhance the benefits of available water supplies, and to increase water use efficiency once the rainfall resumes. Farmers should be encouraged to use more water efficient irrigation methods, where possible/feasible - such as pressurized irrigation systems. Small and cost effective pressurized irrigation systems are now available. Considering the costs involved in the land development, the investments required for the installation of these systems could be feasible.

The survey results have shown that no proper rainwater harvesting techniques are used in rainfed areas of Afghanistan. The small amount of rainfall stored in village ponds is only enough to meet the drinking water or livestock demands and are not sufficient to support irrigation. The main reason reported by farmers for not storing rainwater is the lack of storage facilities and technical guidance to build such shortages. Farmers think that by improving present shortages and installing new systems, more areas can be brought under irrigation. Therefore there is a need to develop and give more attention to the water harvesting techniques, diversion of ephemeral streams and spate irrigation. Government should do a feasibility study to prepare recommendations for introducing rain-water harvesting structures. If considered feasible, special extension centers should be set up to extend technical assistance to the local farmers for improving rainwater-harvesting structures.

Artificial recharge of aquifers with the rainwater is a promising water conservation strategy. In Afghanistan, large numbers of delay action dams could be constructed to accelerate the artificial recharge to aquifers. The technique consists of constructing dams across streams to store floodwater for recharging aquifers. Therefore this approach needs to be looked into more detail in order to improve their usefulness. It may be recommended to evaluate properly the effectiveness of design guidelines from elsewhere.

Farmers should be trained to improve irrigation scheduling of different crops and restrict irrigations to critical growth stages of the crop to mitigate the effects of dry spell and ensure reasonably good yields. While for continuously flowing kares-based irrigation systems this is not

possible, unless water storage is provided, the approach may be suitable for those irrigated areas where canal supplies exist. As most of the farmers in Afghanistan are ignorant of actual crop water requirements at present, studies should be initiated to determine exact crop water requirements for different crops under different agro-climate conditions. These calculations should be based on the optimization of water resources rather than maximizing crop yields. The practice in irrigated areas of Afghanistan is that one farmer will open water to his field and will not let it go to the next farmers unless his fields are fully flooded—these trends should be discouraged by advising the farmers on the depth of water they actually should apply.

In the long-term, government must adopt pro-active approach to address drought-related problems, instead of focusing on provision of emergency relief. There should be a comprehensive needs assessment of different sections of society and quantity of existing resources. These data should be used to prepare projections for different sections of society by keeping in view environmental impact and sustainability of all interventions. Water and health priorities in the country should be pursued together with employment generation through food for work projects. The supply of food items on subsidized rates is essential.

No formal credit facilities currently exist in the study area and in most of the country. Therefore there is a need to establish a permanent bank for the development of drought prone areas in Afghanistan. This bank should extend advisory and financial services to the people not only during the drought period but also in normal years. People should be able to get credit at reasonable interest rates to produce and store food and other necessary items as preparedness for future droughts.

The drought situation compelled thousands of Afghans to migrate to the neighboring areas of Pakistan (Baluchistan) and Iran (Sistan-Balochistan). They feel compelled to return due to deteriorating economic conditions associated with the drought in their countries of asylum. Unless there is a regional response to provide assistance to drought victims, and potable water, food and income-generating opportunities where Afghans currently are, pressure to return will not ease. Voluntary repatriation to areas severely affected by drought is not sustainable and might exacerbate conditions for the local population, as absorption capacity is low or non-existent. Returnees are among the most vulnerable as their attempts to re-establish their livelihoods in Afghanistan are in many areas seriously hampered or made impossible. Under these circumstances, United Nation High Commission for Refugees (UNHCR) strongly advises against return to drought affected areas of Afghanistan and has suspended facilitating and supporting voluntary repatriation to the most severely affected areas. Voluntary repatriation from Iran through the southern region of Afghanistan will remain suspended. Efforts are underway to ease pressure of drought-affected refugees in Pakistan and Iran from opting for voluntary repatriation. In Afghanistan, activities will have to focus on the provision of potable and irrigation water in areas of refugee return to prevent renewed departure to countries of asylum (UN, 2000).

Increasing political stability in the country and governmental commitment (*i.e.* ‘political will’, the commitment of resources, and good governance) is critical to long-term anti-drought measures. Part of a long-term drought program should include analysis of successful experiences in other parts of South Asia as well as in Afghanistan itself, development of relevant federal and provincial institutions and policies. Unfortunately, national institutions dealing with drought are not in place in the country at present. Village level institutions seem to have been deteriorating throughout the last decades and are very weak at present. There is a need to develop a National Drought Management Cell/Commission, which could with time emerge into a coordinating management body and outline the overall plan of action for the future.

LITERATURE CITED

Islamic Relief (2001). *The Afghanistan Drought Relief Project 2001*.
<http://www.reliefweb.int/w/rwb.nsf/0/c88f77c75ecbc3dcc1256a4100328cd6?OpenDocument>

May 02.

FAO (2004) *Special Report of FAO/WFP Crop and Food Supply Assessment Mission to Afghanistan*. September 08.

OCHA (2000). Office for the Coordination of Humanitarian Affairs (OCHA). Situation Report No. 5. Afghanistan-Drought

OXFAM (2000). Drought and Displacement in Afghanistan.
<http://www.pcpafg.org/Programme/drought/documents/>

Qureshi, A. S. (2002). *Water Resources Management in Afghanistan: The Issues and Options*. . Working Paper No. 49. Lahore, Pakistan. International Water Management Institute.

UN (2000). Strategy of the Assistance Community in Response to the Drought in Afghanistan (June 2000 to May 2001).

<http://www.reliefweb.int/w/rwb.nsf/UNID/5F0DD340896A5C92C12568F6004965E1?OpenDocument>