



## The social experience of drought in rural Iran

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### ABSTRACT

Using qualitative social research methods at the farm family level, this paper considers the social impacts of drought on two purposefully-selected villages in Fars Province, Iran. It examines the experience of drought on different types of farm families, specifically the less vulnerable, the resource poor, and the very resource poor. Our results show that all three groups experienced economic impacts of drought, but more importantly they all suffered major social impacts as well. The less-vulnerable families sought diversified sources of income in order to cope with drought. The vulnerable families (resource poor and very resource poor) were more affected by social and emotional impacts than less-vulnerable families. The economic and social impacts that were experienced included: reduced household income; shortage of alternative income sources; increased workload; conflict of water access and water use; food insecurity, shortages and associated malnutrition; health impacts and reduced access to health services; reduced access to education; inequitable drought relief and associated stress and conflict; rural to urban migration; impoverishment and reduced quality of life; psychological and emotional impacts including depression, frustration and alienation; changed family plans such as delaying marriage; and family and community disharmony and disintegration. Recommendations and implications for drought management policy are offered to reduce the negative social impacts of drought.

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### Introduction

Over the last decade, Iran has experienced its most prolonged, extensive and severe drought in over 30 years. This drought of 2003–2011 (at least, as it is still ongoing) has affected many farm families and rural communities across most of the central, eastern and southern parts of Iran. Although Iran has a history of drought, critical features of the current drought are not only its widespread nature and severity, but the fact that the impacts of the current drought have been exacerbated by its proximity to the previous drought (1998–2001). Consequently, farm families lacked the opportunity to recover and have therefore been severely affected by the current drought. From their perspective, the two droughts are in effect one very long drought, and will be treated as such in this paper.

There is no doubt that drought has a major impact on farm families around the world, however the focus of assessment has typically been on economic impacts. Only a small amount of research (much of it from Australia) has considered the social impacts of drought (e.g. Stehlik et al., 2000; Alston and Kent, 2008; Easdale and Rosso, 2010; Alston, 2011; Drought Policy Review

Expert Social Panel, 2008). While it is noted that disaster impact ratios (the amount of damage compared to available resources) (Lindell and Prater, 2003) increase as the unit of analysis moves from the national to the regional, community and household levels (CDRSS, 2006), drought impact studies have mainly focused at national and regional levels with less emphasis on farm level analysis. As a result, there is a lack of information at the farm family level. A lack of recognition of the far reaching impacts of drought on farm families has been an impediment to obtaining adequate knowledge about how to recover more efficiently and about what mitigation strategies might be appropriate. Without this information, it is difficult to convince policy and other decision makers of the need for additional investments in drought monitoring, prediction, mitigation, and preparedness (Wilhite et al., 2007). Although it is generally accepted that drought causes social impacts, there is a lack of understanding about the actual experiences of farm families and how they cope. This study, therefore, focuses on the social experience of drought among Iranian farm households.

This paper first explains the social impacts of drought, and then proceeds by outlining the drought impacts in Iran. These initial sections provide an understanding of drought as a complex event which makes arid and semi-arid regions of the world like Iran vulnerable. The focus then shifts to the design of the study and the investigation of drought impacts on farm families in Fars Province, followed by an analysis of the results and concluding remarks.

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## Understanding the social impacts of drought

Drought is an insidious phenomenon that is a normal part of the climate in virtually all regions of the world (Wilhite and Buchanan-Smith, 2005). It results in serious economic, social, and environmental impacts that are complex to understand and difficult to anticipate. Statistics compiled by the secretariat for the International Decade for Natural Disaster Reduction indicate that drought accounts for 22% of the damage from all disasters worldwide, 33% of the number of persons affected by disasters, and 3% of the number of deaths attributed to natural disasters (Wilhite et al., 2007). Although drought has not been well documented recently, it would appear that the impacts of drought are increasing in magnitude and complexity (Wilhite and Pulwarty, 2005). Drought is the most complex of all natural hazards, and more people are affected by it than any other hazard. Unfortunately, few studies have identified the complexity of these impacts at varying scales, and databases to document impacts and track trends by region or sector are virtually nonexistent (Wilhite et al., 2007).

A complicating factor in characterizing drought impacts is that they vary in spatial and temporal scales. Each region is unique, and the response at any point in time is dependent on many factors including in changes in societal characteristics. Thus, the impacts that occur from drought are the result of interplay between a natural event (precipitation deficiency) and social response (Wilhite et al., 2007). Drought differentially affects women and men (Stehlik et al., 2000; Alston and Kent, 2008; Alston, 2011), and the impacts vary across different types of households (Keshavarz et al., 2010). The impacts of drought are diverse and can be direct and indirect (Paul, 1998). In societies where agriculture is the primary economic activity, the immediate impacts observed are in the form of decreases in surface and groundwater resources which lead to reduced water supply, deterioration in water quality, crop failure, reduced productivity (Riebsame et al., 1991), production shortfalls and associated food crises (Speranza et al., 2008), and increased livestock and wildlife mortality (Wilhite et al., 2007). The food crises indicate that “rural livelihoods and conditions do not enable people to produce, store and access enough food in non-drought periods and are therefore unable to build up enough buffer to cushion crop and income loss due to drought” (Speranza et al., 2008, p. 220). This is especially the case with respect to small farmers and landless laborers. People who experience drought hardships adopt various strategies (e.g. technical, economic and social) to cope with the negative consequences of drought. Often they are compelled to borrow money at exorbitant rates or to sell land, livestock and even personal belongings at depressed prices in order to survive (Paul, 1998).

Drought impacts can be classified as economic, environmental and social. The environmental impacts include damage to natural habitats, reduced forest and crop productivity, increased daytime temperature, increased evapotranspiration, decreased soil productivity, lowered water resources, reduced water quality, increased pollutant concentrations, increased incidence of wildfire, and degradation of landscapes. Economic and social impacts include: reduced household income; shortage of alternative income sources; increased workload; conflict of water access and water use; food insecurity, shortages and associated malnutrition; health impacts and reduced access to health services; reduced access to education; inequitable drought relief and associated stress and conflict; rural to urban migration; impoverishment and reduced quality of life; psychological and emotional impacts including depression, frustration, alienation and suicide; changed family plans such as delaying retirement; and family and community disharmony and disintegration (Alston and Kent, 2008; Alston, 2011; CDRSS, 2006;

Changnon and Easterling, 1989; Gupta and Gupta, 2003; Vanclay, 2002).

## The experience of drought in Iran

Iran is a country of over 1.5 million km<sup>2</sup> (making it the 18th largest country in the world) with a population of around 76 million (Statistical Center of Iran, 2012). It experiences various climatic conditions due to its range of geographical regimes. Its long-term average annual rainfall is in the range of 224–275 mm/year, making Iran one of the most arid regions of the world. By way of comparison, annual precipitation in Iran is less than one third of the world average (ca 990 mm) (Semsar Yazdi and Labbaf Khaneiki, 2007). The lack of water is a major limitation for agricultural development. The pressure on water resources is increasing as demands for water consumption expand. Increases in population, socially-demanded rises in living standards, and the expansion of irrigated agriculture have drastically increased water use to the extent that the sustainability of the water resources of Iran is being threatened (Riahi, 2002).

A review of long-term annual precipitation trends (over a 32-year period) indicated that in some parts of Iran drought has a return frequency of every 5–7 years, while the national expectation was every 20–30 years (Eskandari, 2001). Drought can therefore be regarded as a normal part of the Iranian environment. Nevertheless, the latest (and at the time of writing in 2011 still current) drought is unparalleled over that time and millions of people residing in the 18 most drought-affected provinces have been seriously affected (OCHA, 2000). Below is a discussion of the most important impacts of the drought in Iran.

### Environment

Many internationally-renowned wetlands and lakes have completely dried up, e.g. the Hamoun wetland in Sistan and Baluchestan Province, and Lakes Kaftar and Bakhtegan in Fars Province. In all other rivers, water levels have fallen to critical levels. Most of the traditional groundwater irrigation systems (*qanats*) have experienced reduced discharge or have completely dried up. The increasing number and severity of bushfires and sandstorms has negatively impacted wildlife and the livelihoods of local people. Many plant and animal species are severely affected and some face extinction (OCHA, 2000, 2001).

### Safe drinking water

Water supplies have been affected in rural and urban areas impacting on 90% of the population. In 12 provinces, people are facing critical shortages of safe drinking water and have to rely on water tankers to deliver water (OCHA, 2001). In many villages, saltwater has percolated into wells making them unusable. In some cases, people have migrated to other villages or cities (OCHA, 2000).

### Irrigation and cultivation

Agriculture typically utilizes around 93% of Iran's total water consumption, of which around half is from surface resources and half from groundwater reserves (Ardakanian, 2005). Drought is directly affecting more than 2.6 million hectares of irrigated farms and 4 million hectares of rain-fed agriculture (OCHA, 2001). A national assessment of water utilization identified that the rate of extraction from aquifers was more than what was permitted in 223 plains (IWRMO, 2011).

### Crop yields

Production of rain-fed wheat and barley has been significantly reduced, by 35–75% (OCHA, 2001). Agricultural losses in irrigated areas have also been severe, with about 2.8 million tons reduction in wheat production and 280,000 tons in barley per year during the drought, as well as the loss of the value of stubble as fodder. Production of alfalfa was down 38% (OCHA, 2000). Many fruit trees (e.g. banana plantations in Sistan and Baluchestan Province) have perished and 1.1 million hectares of orchards growing almonds, apricots, mangoes and other fruit have been heavily affected (IRI, 2001).

### Livestock

The drought severely affected the number and productivity of commonly-raised livestock as it reduced the quantity and quality of forage available on rangelands and pastures (Salami et al., 2009). Over 75 million head are affected by the drought. Over 200,000 nomadic herders have lost or continue to lose their only source of livelihood (OCHA, 2001) and an estimated 800,000 small animals have died due to malnutrition and disease (OCHA, 2000).

### Methods

Qualitative research embracing the naturalistic paradigm (Lincoln and Guba, 1985) was used as the overarching research strategy. This study was conducted in a drought-affected rural area of Fars Province in south-western Iran. Fars has experienced a severe drought between 2003 and 2011. Zarindasht County, normally one of the most productive agricultural regions of Fars Province, was selected as the study area. It has experienced severe drought conditions, with a 3.4 m drop in its watertable, and a reduction in the area under wheat cultivation of more than 50%.

Initial fieldwork revealed that the likely impacts were quite different between the many villages in the County even though these have experienced a similar intensity and duration of the drought. Therefore, three staff members from the Fars Province Agricultural Organization, who were in a position of knowledge, were consulted to nominate villages where agriculture was the primary economic activity and which had suffered greatly from the current drought. Of the villages identified, two were ultimately selected for the research – one which was severely affected and the other moderately affected by drought. The names of the villages are not revealed for ethical reasons. Principles of informed consent and ethical research practice were followed, and we thoroughly believe that the interviewees were honest and frank with us. We felt that they were glad that someone was listening to their stories. In being understanding and compassionate, we contributed in a small way to their well being.

The particular farm families to be interviewed were selected as follows. First, five local key informants were selected using snowball sampling. Participatory Rural Appraisal (PRA) was undertaken with these key informants to determine the main factors that make farm families 'vulnerable' during drought. Then informants assigned weights to each factor. These factors and their average weights were: the level of water in boreholes (0.44), income resources (0.25), and the natural capital (0.18) and physical capital (0.17) of farm families. After that, the local informants used the weighted factors to classify farm families in the villages into less vulnerable (24) and vulnerable (42) groups. Because the vulnerable group included people with major differences regarding their past and current access to natural and physical capital, the informants further divided this group into two subgroups named "resource poor" and "very resource poor". While the very

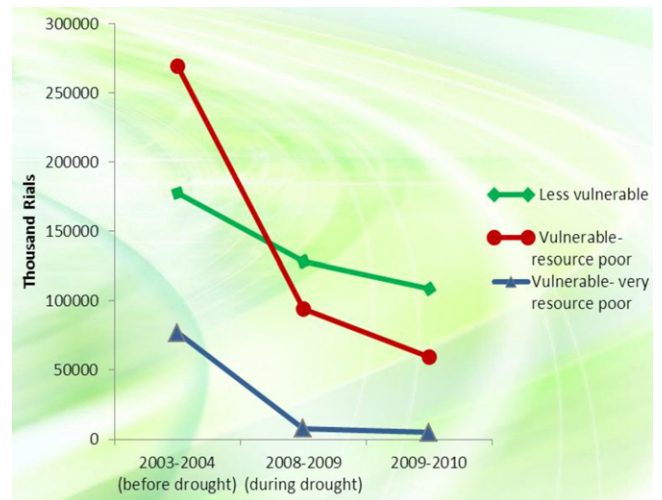


Fig. 1. Farm family annual crop income (standardized on 2003 prices). Note: 10,000 Rials (or 1000 Toman) is approximately equal to 1 US\$.

resource-poor families had limited access to natural and physical resources such as farmland, irrigation water, agricultural machinery, water-saving technology etc., the resource-poor families had lost their resources as a consequence of drought.

From the rankings of the local key informants, the top listed families for each group were selected. A total of 15 farm households were selected comprising: 4 less vulnerable, 6 resource poor and 5 very resource poor. In each household, male and female adults were interviewed separately, and where appropriate, some older children were also interviewed. The 15 farm families can be regarded as case studies in a multi-case analysis (Herriott and Firestone, 1983).

Given the sensitive and potentially distressing nature of the information to be discussed, we conducted face-to-face interviews. Our research was also informed by observation (to cross validate the interview results), archival research (to investigate debt levels) and quantitative techniques (to determine quality of food consumption). The use of multiple methods allowed a wider exploration of the phenomenon of drought experience and assisted in the identification of converging lines of inquiry, giving rigor to the study.

### Results

Analysis of the interviews led to a classification into several categories of the social impacts of drought experienced by farm families in Iran. These will be discussed below and include: economic impacts, workload, basic needs, other social impacts, and emotional impacts. An analysis is also undertaken by the degree of vulnerability of the farm family, specifically those who were 'less vulnerable' or 'vulnerable'. The category 'vulnerable' is further broken down into 'resource poor' and 'very resource poor' (as discussed above).

#### Economic impacts

##### Loss of farm income and income diversity

Since farming is the primary source of income for most farm families, low precipitation and depletion of groundwater has led to a major reduction in income (see Fig. 1). Less vulnerable families experienced a loss of income due to reduced area of cultivation and because of pest infestation (especially of cotton). One respondent said:



*Our cotton crop has failed because of the drought. Our irrigation water is limited. So we can only cultivate those parcels of land which are nearest our wells. . . . Our land is too weak, it becomes infected very soon. How can we obtain enough money from infected land?* (Case No. 4, male, less vulnerable).

Most of less vulnerable families could only cultivate about a third of their land. As a result, they were greatly affected by a loss of agricultural income. Although the vast majority of vulnerable families also reported a major loss of farm income during the drought (see Fig. 1), their conditions were completely different. Resource-poor families believed that their production was down by about 60%. The prolonged drought had created significant hardship for them. The loss of income through reduced cultivation area, insufficient irrigation water, low quality of water and failure of cotton crop (because of diseases and pests) meant that their farm income was seriously eroded. This was often coupled with increases in expenses such as the need to dig new wells, deepen shallow wells, or replace irrigation equipment. While many resource-poor families indicated a serious loss of income during drought, one third of the very resource-poor families said that they had been without any crop income for 6 years. Limited access to irrigation water and an inability (lack of resources) to improve their access to water or their irrigation system led to the drought affecting them extremely hard.

*Drought is responsible for all of my woes. I have many things but I own nothing. I have high quality land without a drop of water. It is terrible to own a three hectare farm, but to have to work as a laborer on someone else's farm* (Case No. 11, male, very resource poor).

The very resource-poor families faced many obstacles. As shown in Fig. 1, their farm income approached zero. Poor soil, lack of irrigation water, money, tools and equipment intensified their hardship during drought.

Some farm families perceived diversification as a means of remaining viable. For most of the less vulnerable families, farming was not the only source of income before the drought. Although a diversity of income sources helped them to survive during drought, they experienced a critical transition in lifestyle from on-farm work to off-farm activities during drought. The less vulnerable families had secured their income by investment in off-farm enterprises such transport and real estate. These off-farm investments, sometimes gave the families of this group the opportunity to increase their farmland by buying land from vulnerable farmers, usually at heavily discounted prices.

*I probably would have died in the early days of the drought if I didn't have another source of income. However, I not only was able to keep my properties, I was able to increase them in a secure way. I have also bought two trucks in these drought years* (Case No. 1, male, less vulnerable).

Some of the less vulnerable families chose another approach to increase their income during the drought. They lent money to vulnerable families, profiting not only from the interest earned but also by possessing the land (loan collateral) of those who were not able to repay their debts in terms of the loan conditions. Thus, in some ways, the drought was a good opportunity for some of the less vulnerable families to advance their financial situation and to diversify their income sources.

For some of the resource-poor families, farming was still the main source of income. However, their limited farm income forced them to cope by selling their assets such as agricultural machinery, livestock, household items and keeping their expenditure at a survival level. While such a strategy assisted these farmers to manage

their cash flow and to retain key assets, it was not sustainable in the long run.

*I had a tractor. It helped me to cover some of my costs. But I had a debt and I had to repay it at an exorbitantly-high interest rate. Therefore I sold my tractor very cheaply to get rid of my creditor* (Case No. 15, male, very resource poor).

*Poverty is a harsh outcome of drought. This is the third year that I'm suffering from drought. Because I sold all of my livestock, now there is nothing left to sell* (Case No. 9, male, resource poor).

For the very resource-poor families, farming was not the main source of income in drought years. Some of them left farming and worked as a laborer on other farms or found non-farm occupations such as construction work in order to survive. They also tried to rent their farmlands to less vulnerable farmers. Although the rental income was low, it covered some of the debts they may have had, for example on the machinery they used to plough their lands in previous years.

*My shallow well completely dried up, while my neighbor's deep well was still fresh. He has rented my land over the past two years. The rent is very low and it is only enough to pay part of my debt* (Case No. 11, male, very resource poor).

It is important to note that some of very resource-poor families relied on charitable organizations, like the Imam Khomeini Relief Committee, to survive. Obtaining money from their very limited resources and savings, and the impetus to quit farming as a consequence of the drought, led to an increase in their dependency on government support. Without the assistance of the government and NGOs, many would be in a much more precarious position.

#### *Increased debt*

Drought-related debt put further pressure on vulnerable families. While many less vulnerable families tried to refinance their operations through government assistance, some vulnerable families could not access such support. Therefore, they had to borrow from private moneylenders (usurers), which worsened their financial situation.

*Thank God for the government that refinanced our loan during the drought. The unscrupulous moneylenders do not care whether you are in drought or not. They just want their money and if you cannot pay, you will end up in jail* (Case No. 9, male, resource poor).

The majority of less-vulnerable families had benefited from government loans and only one less-vulnerable family had borrowed money from non-government sources (their relatives). In addition, as indicated in Fig. 2, the amount of their loans was higher than that of the vulnerable families. This helped them to cover some of their costs and to adopt drought management techniques such as establishing drip irrigation systems, deepening wells, constructing on-farm water storages and leveling their land.

Although some resource-poor families received government loans, in general it was not enough and they still needed more money to cover their expenses. Therefore, they borrowed money from moneylenders. Many of them, who would normally have no debt in non-drought years, found themselves under huge financial pressure as a result of the drought. About half of the very resource-poor families did not receive any government-backed drought loans. Their inability to provide a guarantor was the main reason for refusal.

*Even if I wanted to, I cannot get a loan because nobody is willing to be my guarantor. We are poor, and people are afraid we may not be able to pay it back. The guarantor needs to be a government worker, and I do not have any relatives who work for the government. I am*

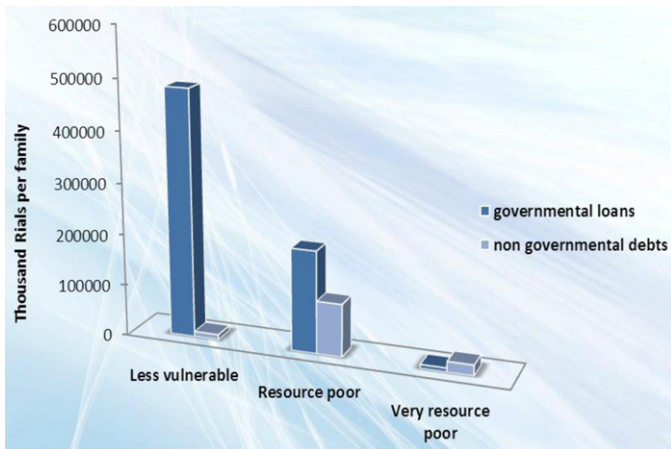


Fig. 2. Drought impact on farm families' debt levels.

even willing to pay them 300,000 Toman [about 300 USD] [to be my guarantor] but still nobody will be my guarantor (Case No. 13, male, very resource poor).

Of those very resource-poor families that could get a loan, the amount they were able to borrow through the government scheme was very low and it was not enough to cover their desired drought management activities. Although the debt levels of the majority of the very resource-poor families increased due to further borrowings or extensions of their overdue loans, their absolute debt level was much lower than the other two groups (see Fig. 2). The reason for this was their inability to obtain a loan. They were often unable to pay off their previous loans which, in some cases, led to harsh consequences including loss of their property and imprisonment.

*I borrowed one million Tomans [about 1,000 USD] from the moneylender which I could not pay back because of the failure of my cotton crop. With the high interest rate, it soon added up to three million Tomans. The moneylender sent me to jail. Fortunately, my relatives soon paid my debt and I was released. But I ended up in jail because of the drought!* (Case No. 14, male, very resource poor).

Money lenders are filling the vacuum that has been created due to inadequacy of government support. More loans and better regulations to support the vulnerable farmers are needed.

#### Impact on workload

##### On-farm work

The drought had a significant impact on workload. Only one of less vulnerable cases hired labor during the drought while the majority of families experienced an increase in their workload due to laying-off hired workers which led to a dependency on family members, including children, to provide the labor needs of the farm.

*Our income does not cover our expenses and we have to do all the work ourselves. We do not have the money to hire labor, therefore my sons and I do the weeding and thinning. One of my sons is a teacher in the city – even he comes on the weekend to help* (Case No. 2, female, less vulnerable).

The majority of vulnerable families reported that they had always managed farm activities with the contribution of family members. However, they noted that the hours of work had increased significantly, partly as a result (they said) of using lower-quality seed which in their view causes weed growth.

Drought had significant impacts on women's on-farm activities. While all women of the less vulnerable and some resource-poor families stressed that they did a few on-farm activities before the

drought, they noted a dramatic increase in their workload during the drought.

*During normal years we were not involved in cotton cultivation. Now [during drought] we have to take care of our cotton farm no matter how hard the job is* (Case No. 8, female, resource poor).

In situations where men had emigrated in search of off-farm jobs, the pressure on the women became more intense.

*When my husband goes to Dubai to work as a blue-color laborer, I have to take care of the farm myself. I cannot ask my brothers to irrigate my land every time and so I have to do it myself. I have to do all the farmwork and all the housework, and at the end, no gain* (Case No. 14, female, very resource poor).

##### Off-farm work

The reduction in farm income resulted in the majority of families seeking off-farm work. While all of the less vulnerable farmers had off-farm work during the drought, only few resource-poor farmers managed to secure work. Despite their financial needs, various physical and psychological barriers constrained them. As one said:

*I am a well-known man. My family has a good reputation. How can I work on someone else's farm? How can I tell them, "Please let me work as a laborer for you?"* (Case No. 8, male, resource poor).

More than half of the very resource-poor farmers had moved to nearby towns to seek work. These families had encountered hard times during the drought. These farmers are always worried about their families' financial, health and food situation. Moreover, the drought led to a rising supply of laborers, while the demand for work was diminishing. Consequently, many very resource-poor families were exploited by less-vulnerable farmers and they received below minimum wages.

In most cases, the women and children of the vulnerable families also had to do casual or seasonal off-farm work in order to secure sufficient income for the family. The harsh reality of the drought is that it led to considerable unemployment of men among the very resource-poor families. Thus women especially had an important role in providing income to survive. They did all forms of hard work, including weeding or thinning cotton, all for minimal wages. For many of these women, their workload increased considerably during the prolonged drought:

*Two years ago, we didn't have any water at all. We had to carry the dishes and clothes on our heads a long distance to wash them. We had to cry because of our sore feet and backaches. Some neighboring farmers didn't allow us to wash our dishes or clothes using their well-water because they thought if we use their water, they would not have enough water for irrigation. It was a very difficult time indeed!* (Case No. 9, female, resource poor).

##### Basic needs

##### Food consumption

Paradoxically, while farmers are the producers of food in society and have an important role in providing food security, the drought reduced their own access to safe food. Though our research findings indicate that all less vulnerable and vulnerable families had sufficient access to food for adequate survival, the most vulnerable families suffered from food insecurity because of poverty.

*When I ask my husband for money to do some shopping, he easily answers "I'm broke". He just leaves the home. He doesn't care. I am left with a mass of problems and I am the one who is worried about it. He doesn't think for a moment when I don't have any money, how can I prepare food? Regardless of all the problems, I try to serve my family in the best way I can* (Case No. 6, female, resource poor).

Our findings show that using cheap and less nutritious food was one of the most common coping strategies used. As a result, most of the vulnerable families did not receive sufficient protein and vitamins. They just tried not to starve.

*Now we often eat potato. Rice is too expensive so we buy cheaper foods. When you buy three kilograms of potato that costs 1,000 Toman [about 1 USD], you can feed up to nine people. You would spend 5,000 Toman to buy rice and afterwards your family members would still be hungry (Case No. 7, female, resource poor).*

The drought leads to hunger (prolonged hunger) especially for the women of the very resource-poor families. Traditionally, the headman and other male family members would eat first and sometimes nothing would be left for the women, who would then only have bread to eat – even though the women may have earned all the money used to buy the food from their off-farm work or were responsible for getting support from the government or relatives.

### Health

Drought has had serious health consequences, especially for vulnerable families. High levels of stress were evident among men, women and children. Almost all spoke of their overwhelming tiredness and disappointing attempt to battle the drought.

*I feel so exhausted. I'm always under stress. I'm always concerned about the future – how can I earn money? What should I do if the drought continues? . . . I would like to forget these melancholic thoughts (Case No. 14, male, very resource poor).*

The majority of people tried to deal with their stress in isolation so as not to upset others. Women were even more likely to hide their stress from their family. As one woman said between tears:

*I don't like my children to see me upset because it upsets them. I have gone to the farm and I'll stay there for hours and cry loudly. I'll cry for my son's woes, my daughter's destiny, my husband's hopelessness and my family's poverty. Then I go home and act as if nothing has happened (Case No. 9, female, resource poor).*

Some members of the vulnerable families suffered from chronic diseases. But their ability to seek treatment was constrained by a lack of funds. Even families who did not suffer from chronic diseases did not attend properly to their health because of the high level of deprivation. As a result their health situation became exacerbated.

*My daughter suffered from headaches and vertigo. She was in pain most of the time. I said to my husband that she needs to go to a specialist. But he was penniless and told me that we must wait till harvest. But then it was too late. The doctors told us she had cancer and they couldn't treat her at all. My darling daughter died last year and I believe that if we had the money, my daughter would still be alive (Case No. 14, female, very resource poor).*

*I'm a diabetic. I must not have starchy foods. But you know meat is so expensive and it is impossible not to eat bread, potato and so on. I had to have eye surgery, but I could not afford it, and as a result I lost sight in one of my eyes. The doctors amputated four of my toes last week. I'm terribly sick of it all, and of having to ask God to help me all the time (Case No. 11, female, very resource poor).*

One of the issues is that many people place their own health at a very low level of priority.

*My husband has been diagnosed with cancer in his leg. Doctors told us that he needs an emergency operation. We borrowed some money from our relatives and friends. But we preferred to dig a new well to salvage our farm. Unfortunately it dried-up quickly. Now he can't walk at all and all of our relatives and friends ask why he doesn't have the operation. I try to hide the truth and I only*

*say that he is scared of operations (Case No. 5, female, resource poor).*

### Education

The impact of the drought on access to education is considerable. Farm families who suffered from drought do all they can to find a future outside agriculture for their children. In this regard, education is considered as a key pathway to a better future.

*Despite my bad financial situation, I do whatever I can to send my kids to university. My children should continue their education. I do not want them to be like me. I know that drought will continue for ever and I have heard that it may even get worse. I should not allow my children to be miserable (Case No. 7, male, resource poor).*

For vulnerable families whose children were at university, the cost of education was a significant financial burden. It was less of a burden for the less-vulnerable families. For some vulnerable families, drought made them seek off-farm work, reduce expenses to a minimum, short-sell crops,<sup>i</sup> and/or borrow money from relatives or moneylenders to cover the university fees. Where parents or family members were not able to pay the university fees, the children would often endeavor to meet their own costs by finding part-time or seasonal jobs. In some cases, children reported reducing their attendance at classes to reduce commuting costs. As a last resort, some vulnerable families had no choice but to abandon their children's education.

### Marriage

People reported that a noticeable consequence of the drought was on marriage and family formation, which happened in several ways, including the criteria to select partners. Some boys married girls from wealthier families specifically to benefit from any financial support that might be available. In some cases, in order to reduce their costs, vulnerable families would encourage the engagement of daughters to normally-undesirable persons, e.g. drug users, much older men or polygamous men. A major impact, especially for the vulnerable families, was that many families had to defer the marriage of their children. This meant that the average age of marriage increased, and the number of older single girls now perceived to be above marriageable age (about 28) had increased. On the other hand, the majority of girls of the less-vulnerable families were married when they were teenagers. Although some vulnerable families had tried to send their children away to work, sell their assets or pieces of land, or borrow money from relatives and friends to pay for a wedding ceremony, some families did not have a wedding ceremony, which would have been a major embarrassment because it is normally considered to be great importance and a source of pride.

*My son has been engaged for seven years. His fiance's family tries to accept because they do not want to put any more pressure on us. However, our relatives told me, "God will become angry because you're a barrier to their marriage and happiness". They suggested dropping the ceremony and sending them on a honeymoon trip instead (Case No. 6, male, resource poor).*

The need to provide a dowry for newlyweds placed additional pressure on vulnerable families and led to them having to hock possessions to a greater extent than normal. In some cases where families were under great financial pressure, they have accepted the shame of not providing their marrying daughters with any

<sup>i</sup> Short-selling a crop means to sell a crop before it is harvested. The benefit to farmers is the cash up-front. But the downside is that the price is usually low, and the farmer is usually obligated to provide the product even if the farm can't produce it. Thus, a farmer can actually be worse-off.

household items or appliances. Some vulnerable families chose to ignore their children's marriage because of financial problems. Some young adults adapted to this situation and would not talk about it with their parents. They tried to get jobs and save money to make an opportunity to get married in the future. Others insisted on getting married and expected their family to support them. This could lead to intense disputes between children and their parents.

*He is cranky with his brothers, sisters and me all the time. I feel that if he doesn't get married soon he will go mad* (Case No. 15, female, very resource poor).

#### Other social impacts

##### Family and social conflict

A number of families reported a rise in conflict among family members, relatives and neighbors as a result of the drought. As the drought continued, water became a much more valuable commodity and it provoked a 'water debate' between farmers who shared access to groundwater. Sometimes this debate led to intense anger and despair.

*There is a lot of resentment because of water issues. For example, my brother-in-law and my husband haven't been talking to each other now for two years. They share the same well. His turn was before his brother's. My husband asked my brother-in-law to wait for half an hour before he irrigated his remaining plots. But he refused, and after that my husband has not spoken to him* (Case No. 10, female, resource poor).

Financial issues have also created tension in the community. Low interest loans have been provided to help the drought-affected communities. However, as mentioned previously, many vulnerable families have not been able to benefit from this opportunity. An inability to repay previous loans and to provide an acceptable guarantor made it difficult for vulnerable farmers to benefit from this assistance.

Some farm families revealed that the conflict that had risen between family members had hurt them badly. A misapprehension of the impacts of drought between family members and lack of empathy, high expectations of children and parents' inability to meet their wants and needs has been the main reasons for conflict. Some children of vulnerable families who had suffered from a loss of income due to the drought often blamed their parents for the circumstances in which they were in. In general, they perceived farming as unprofitable and unattractive, and were not very keen on inheriting a farm. Limited livelihood opportunities and poverty when combined with aspirations for a better life (which come from increased awareness of the world) can cause frustration and resentment, which leads to conflicts among family members, as illustrated below in an excerpt from a quarrel between a vulnerable farmer and his son.

*Son: If you were wise, you would have emigrated to the town many years ago.*

*Father [to the interviewer]: When I returned to Iran [from Dubai], I had enough money to buy a house and a shop in the town. But agriculture was my way of life, so I bought land and a tractor.*

*Son: You were not wise, that is why we are here today in this backward situation.*

*Father: I didn't know then what would happen in the future. You can gain experience from your failures.*

*Son: You were silly. Water is a main issue in our village. When drought happened, everything gets worse and you spent all your money on buying agricultural land!*

*Father: If we had bought a house in the town, we couldn't buy land and tractor.*

*Son: If you go to a doctor and say "I don't have any money, but I have farmland" – he doesn't treat you. Why you don't understand what I am saying?* (Case No. 13, very resource poor).

##### Isolation

The stress and solitude associated with having little or no income from farming, increasing debt levels, and conflict has led to increasing social isolation particularly among the men of vulnerable families.

*I have a terrible sick feeling all the time. Everyone in the family ignores me. If I don't come home for several days, nobody cares and nobody calls. My wife used to respect me a lot when everything was okay. Now she is like a corpse to me. She is uninterested and indifferent. In the past, chatting and laughing with my family was a simple thing that made me happy. Now I feel isolated and lonely. I'd now rather be by myself, that is why I stay at a cottage on the farm [instead of going home]* (Case No. 8, male, resource poor).

While men of vulnerable families reported that they had cut back on social interactions because of a lack of money and not wanting to see people, women stated that social interactions helped them to cope with the hardships brought about by the drought.

*Two or three months before the start of cotton harvest [which is mainly harvested by women], I am excited because we will be out on the farm and will have the chance of chatting and laughing with other women. It's a good feeling to know that you are not alone and if there is poverty and misery, it is for all. This helps a lot* (Case No. 15, young female, very resource poor).

Most vulnerable families reported a reduction in community participation and a withdrawal from social activities during drought periods.

*I do not go away from the village, because it costs a lot – unless my child becomes sick and I have to take her to the doctor* (Case No. 12, female, very resource poor).

Further, only two of the interviewed less-vulnerable family members reported going on their normally-annual religious pilgrimage during drought years, and none of the families reported having had a holiday in the last three years.

*Before the drought we were very happy and we used to go for a trip every year. Now we need to battle the drought in our daily life and have no time or money for a holiday. I promised my family to take them to Mashhad [a pilgrimage town] five years ago. Each year I tell them if it rains and we have a good harvest, we will go to Mashhad, but we have not been able to make it yet* (Case No. 6, male, resource poor).

##### Government dependency and mistrust

The severe poverty associated with the multiple natural, physical, social and emotional pressures on vulnerable families and their increasing debt levels led to significant reliance on government support. While in normal years getting help from government charity organizations would generally be seen as humiliating, the prolonged drought and its severe consequences increased the number of vulnerable families who relied on this support to survive. For example, amongst the 15 families studied, the number who relied on help increased from 2 to 8 families.

While the losses caused by the drought were intense, the government has not allocated enough funds in drought management and mitigation activities. Therefore, most of farm families had not received adequate financial support. The government responses have mostly concentrated on relief interventions. Other forms of drought support (e.g. providing money to dig new wells, deepen



shallow wells, or replace irrigation equipment and improve water transfer system), and low interest and subsidized loans were also available to mitigate drought impacts at the farm level. Government policies and problems associated with determining eligibility for benefits created significant levels of mistrust especially amongst the vulnerable families who found themselves ineligible or unable to access assistance.

*Drought periods are difficult for all the farmers. But government does not pay any attention to some of us. Those who had a good relationship with the Rural Service Centers and the Agricultural Organization were supported – those who are well known are supported. But who cares about unknown people like me? We are forgotten, the government does not do anything for us!* (Case No. 7, male, resource poor).

### Emotional impacts

Drought had significant emotional impacts on the vulnerable families. While all the vulnerable people noted the devastating impacts of drought on themselves and their families, some less-vulnerable families believed that the drought was a good opportunity to do something for their family and farm. They were the least-affected members of the community.

*Nothing has changed for me. Thank God that we are living as happily as we were before drought. We trust God and know that God preserves us from calamity* (Case No. 3, female, less vulnerable).

It is important to note that there is a gender difference with regard to emotional impacts of drought. Men suffered watching the crops fail, being aware of the loss of farm income, and in thinking about how they will be judged for their failure. Feeling lonely and forgotten, and feeling that they had failed was a frequent psychological consequence of drought for them.

*The year 1386 [2007] was the worst. It was dreadful. When I looked at the farm, I lost a bit of my heart. My wheat crop was destroyed as a result of drought* (Case No. 5, male, resource poor).

*I sent my son to the town to work as a laborer. One day, my friends and I went to the town. Suddenly I saw that my son was sitting in the street waiting to be hired. It was terrible. I was afraid that my friends would see my son. I was worried about their judgment. I knew that if they saw my son, they would say to themselves: "He has a 50 hectare farm, and yet his son has to work as a laborer!"* (Case No. 8, male, resource poor).

Women, on the other hand, were more concerned about the impacts of a lack of income, the struggle to support their families and to keep their children at university, to help them to get married, attempt to make them happy and satisfied, and finally the hard work they experienced doing farm labor.

*I'm always worried about money and financial issues. It is a stressful situation. I always think about how to feed our children and buy them clothes and how pay their education fees.* (Case No. 15, female, very resource poor).

Children are also victims of drought. Hard farm work, along with obstacles to marriage, getting an education, and a growing sense of a hopeless future put immense pressure on them.

*My daughter has become crazy because of the misery of the drought. All the time she thinks that we had an acceptable life before, but now we have nothing. She thinks our life will never get better. Then her level of stress goes up and she becomes aggressive* (Case No. 10 male, resource poor).

### Conclusion and implications for drought management policy

The current prolonged drought in Iran has caused considerable negative social and economic impacts on farm families especially in the central, eastern and southern regions. Unlike sudden disasters such as earthquakes which receive a great deal of attention, drought is an insidious, slow-onset, multi-dimensional disaster which receives little attention and consequently drought victims suffer more and for a longer period. As an extreme natural hazard, drought has various impacts at local, regional and national levels. Few studies have identified these impacts at the household level. Our study indicated that drought has severe social and economic impacts on farm families, including:

- Economic impacts: such as loss of farm income and reduced income diversity, increased debt, increased on-farm workload and decreased options for off-farm employment.
- Basic needs: including food insecurity and health problems due to drought related stresses and lack of income for adequate health care.
- Education: reduced household expenditure on education, which can especially affect younger members of families who may forego the opportunity to continue their education due to economic constraints.
- Marriage: an increase in the age of marriage and a change in mate selection criteria.
- Conflict and dependency: including increased family and social conflict, social isolation and increased dependency on government assistance.
- Emotional and psychological: including suffering from a sense of hopelessness, failure and loneliness.

The impact is not the same for all families. This study indicated that farm families could be classified into two distinct groups: the less vulnerable and the more vulnerable. The vulnerable families have suffered more and their resilience has dramatically diminished. It is important to be aware of the gendered and age-differential nature of drought and how this plays out in relation to the above impacts. In vulnerable families, some impacts like unemployment, increased on-farm work, malnutrition and hunger, loss of education opportunities, marriage difficulties, social isolation, social and family conflict, depression and hopelessness are disproportionately experienced by women, children and older people.

Both vulnerable and less-vulnerable families tried to adapt to the extended drought by using a range of drought management and coping strategies. However, constraints on the physical, natural and environmental assets prevented the majority of vulnerable families from effective drought mitigation and have forced them to select coping strategies which diminish their livelihood options.

We feel that the social experience of drought in Iran is not fundamentally different to the experience elsewhere in the world, and shares remarkable similarity with the experience in Australia, for example (see Alston, 2006, 2007, 2011; Alston and Kent, 2008; Stehlik et al., 2000). There are several implications for drought management policy (discussed below) that arise from our research, which although we have conceived of them in the Iranian context are quite likely to be more widely applicable.

A major determinant of the drought impact experience relates to the amount of assistance available and the mechanisms used to assess eligibility. A shift in drought management from a reactive, crisis management approach to a proactive, risk management approach is essential. More comprehensive schemes to address poverty and to increase family assets are recommended. Typically, vulnerable families, who usually suffer most, are often least eligible or able to receive government support. Therefore, greater justice



is needed in determining eligibility for accessing support. This is especially the case because we observed that most vulnerable families extended their debt during the drought by borrowing money from relatives or moneylenders. The breaking of the drought will not solve their debt crisis in the short-term and they will continue to experience hardship long after the drought breaks while they pay off their debt and rebuild their assets.

While agriculture has remained the main productive activity for vulnerable families, the less-vulnerable group reduced their vulnerability through non-agriculture occupations and investment in off-farm activities. Therefore, the decline in agricultural productivity and loss of farm income as a result of the drought has not been a serious negative impact on these less-vulnerable families. On the other hand, the income loss increased vulnerability to poverty and loss of assets and belonging for vulnerable families. Thus providing non-agricultural job opportunities in rural areas where drought is a constant threat should be a major objective of policy.

The lack of income meant that all families had to cut back on expenditure, even on important things like healthcare. The most vulnerable families were particularly at risk of harming their long-term wellbeing by sacrificing their health during the drought. Therefore healthcare and social support services should be made more accessible to ensure that farm families, especially those most at risk, receive appropriate help.

Due to the inability of younger people to continue their education during the drought, facilitating the continuing education of poor children through subsidized loans and assistance is required. This is particularly important as a future investment for society because the lack of education is a classic poverty trap.

The limited access to the job opportunities in drought-affected rural areas led to an increase in unemployment, and in some cases, to people seeking work elsewhere. This experience encourages the young people of vulnerable families to want to never return to the farm. This loss of the next generation of potential farmers may lead to an undeveloped form of agriculture that is more vulnerable to future droughts and other natural disasters. Therefore, support should be provided to increase the resilience of young people and to allow them the choice to continue farming in the rural areas.

The emphasis in drought management policy and advice has, in general, been of a technical (agronomic) nature or about financial recovery following drought, with little or no attention being given to the likely experience of social issues or how that may be mitigated. While there should be consideration of agricultural interventions to reduce drought risk, policy makers should also consider possible social risk management actions to reduce the serious negative social consequences of future droughts. The impact of drought on families comes not only from asset losses, but from a vast range of dimensions and policy failures, including, for example, inequitable access to government support services, which has made some farm families more vulnerable during drought. It is important to realize that vulnerable families experience different economic, social and emotional impacts of drought than less vulnerable families. Thus, the targeting of interventions such as access to skills, education and knowledge, psychological consultations, public health, food security, and nutrition advice to the different groups (with a specific awareness of the more vulnerable) will make drought mitigation more equitable as well as more effective.

As vulnerable families are less likely to implement drought mitigation strategies because of poverty, they will become more vulnerable in future droughts, and consequently they will be forced to adopt different livelihood strategies. Specific programs to enable the more-vulnerable farmers to adopt effective drought preparation measures are needed to prevent a continuation of their predicament.

Finally, drought policy interventions tend to focus on the direct impacts of drought at regional and national levels with insufficient

attention to its impacts on households and to the different experiences of different people in the household. Future research and policy should seriously consider the impacts of drought at the household level, and should be gender differentiated.

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