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Investigating Importance and Effects of Climate Changes in Agriculture in South Khorasan Province and Recognizing Appropriate Extension Education Activities in Confronting Them

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Abstract

In this article, author state a brief to drought management as an essential approach for regional development and maintaining employment in South Khorasan province in Iran. Rainfall is the ultimate source of water, affecting production of crops and other biomass by direct falling on the fields as well as supporting surface and ground water irrigation. However, possibilities of drought occurrence in Iran vary from once in 20 years. The frequency and intensity of extreme weather events like droughts, floods, heat/cold waves, cyclones, delayed or early onset, long dry spells, early withdrawal, and floods in drought frequented areas and droughts in flood afflicted areas have increased during the last two decades due to global warming. Since drought is defined by deviation from the normal rainfall, it can happen in all regions. Assessment and management of drought is complex due to its gradual appearance and long lasting impact or recoveries. Characteristics and impact of drought vary from region to region and year to year. Drought affects human, livestock, wildlife, bio-diversity and degrades the quality of natural resource base. This article is part of a research project titled: ((Investigating importance and effects of climate changes in agriculture in south khorasan province and recognizing appropriate extension education activities in confronting them)) that by author has been done in the Agricultural Research, Education and Extension Organization_ Birjand Branch – Birjand, South khorasan province of Iran.

Keywords: Drought, Impact, desert, south Khorasan province, Iran.

1. Introduction

Drought is universal phenomenon that can occur everywhere and can cause harmful impacts on human beings and natural ecosystems. Growing public awareness of the issue of global climate change has raised enormous concerns regarding its potential impacts and consequences. Although there are inconclusive findings on the specific impacts of climate

change on regional water resources, many scientists have suggested that climate change is likely to increase the frequency and intensity of extreme climate events such as drought. Drought based on frequency of occurrence, severity, affected area, economic damages, environmental and social affects and severe long term impacts is very important and dangerous phenomenon compared to other disasters. Drought is one of the most important natural disasters which could be defined as: less than average annual rainfall and discordant distribution of rainfall in the region. With lack of rainfall for a long period of time; farms, gardens, pastures, and forests which their required water resources are provided from the atmosphere rainfall are damaged directly. Particularly, agriculture which has an important role in national economy and is a set of activities that its aim is supplying food needs of community and produce raw materials for other sectors including industry. Iran, with a rainfall average about 252 mm in year is among the dry regions in the world. Low rainfall, irregular distribution of rainfalls and climate warming, causes economic, environmental, political and social crisis in different areas. In recent years, impacts of drought were high on water sources, agriculture, livestock production, pastures, migration, rebellion of pests and disease. Drought can also reduce water quality, because lower water flows reduce dilution of pollutants and increase contamination of remaining water sources. Studies indicate that drought has priority to other natural disasters in the frequency of occurrence, duration, extent, loss of life, economic and social impacts and severe effects in the long run. Damages of drought will affect economic, environmental and social status of communities. Drought includes a set of negative effects which not only affect economic and social activities of farmers and related industries, but also affect those who are not actually employed in agriculture but are living in agricultural regions. Despite the relatively small share of agriculture in Australian GDP, the drought has reduced GDP by 1.6%, and has contributed to a decline in unemployment and to a worsening of the balance of trade. In a surveyed environmental, economic and social effects of drought and effect of solutions applied in order to reducing its effects in Sistan Province (Iran) and concluded that between the effects of drought (environmental, economic and socio- psychology) the economic effects are more than others, then environmental impacts and at last the least impacts were socio-psychology effects (Golmohammadi, 2006,2007,2011). Rezavi et al. (2011) surveyed economic, social, environmental, and ecological impacts of drought in Zanjan province and concluded that these impacts were economic, environmental, social and ecological respectively. Nuri and Bazrafshan (1996-2004) investigated direct and indirect effects of drought on rural economy of Sistan, and stated that direct effects include damage to crops, horticulture and animal husbandry and indirect effects include an increase in the population covered by the support relief organizations, an increase in migration from rural regions, reducing price of agricultural lands and orchards and also change rural economic structuring. South Khorasan Province in -East of Iran is one of the Provinces that in recent years have caught with very strong drought and water shortage. This problem has created many limitations and negative impacts for farmers. Drought and water shortage has more effect on this region. Reliable statistics indicate that South Khorasan Province in -East of Iran will face with severe

water shortage and drought in the future and these problems, more than anything, would affect Barberry and Saffron production.



Figs 1., 2. Barberry as one of main agricultural product that are resistant to drought conditions in South Khorasan Province in -East of Iran (by author, 2010).



Figs 3., 4. Saffron as one of main agricultural product that are resistant to drought conditions in South Khorasan Province in -East of Iran (by author, 2010).



Figs 5., 6. seasonal floods that not properly storing as a main source of water for resistant and living people in drought conditions in South Khorasan Province in -East of Iran (and author Jun 2012).



Figs 7., 8. Some locally and medium dam projects that recently building for gathering and storing seasonal floods as a main source of water for resistant and living people in drought conditions in South Khorasan Province in -East of Iran (and author Jun 2011).

2. Materials and Methods

This article is part of a research project titled: ((Investigating importance and effects of climate changes in agriculture in south khorasan province and recognizing appropriate extension education activities in confronting them)) that by author has been done in the Agricultural Research, Education and Extension Organization_ Birjand Branch – Birjand, South khorasan province of Iran.

3. Results

Drought is one of the most important natural disasters which affect on economic, environmental and social conditions of communities. Also it might occur even in all humid and semi-humid areas, although the details and rates can be different from one region to another. south Khorasan province in -East of Iran is one of the high deserted provinces of Iran that in recent years caught with drought and water shortage. This problem, in addition reduce yield of barberry and saffron in this province, led to other direct and indirect environmental and socio-economical problems for barberry and saffron farmers. The results of this research indicated that between environmental, economic and social impacts of drought, the economic effects were more than others, then environmental impacts and at last were social effects. This result is consistent with the finding of shokri (2005) and Rezayi et al (2011).

In viewpoint of barberry and saffron farmers, in economic part, drought leded to; increase in costs labor and eradicating weeds, increase in costs for water supply, decrease in purchasing power, decrease in savings, non-payment of bank loans and obligations, increase in the false financial relationship, decrease in price of crops due to reduction of quality, decrease in income due to reduction of cultivation, decrease in land price, decrease in income from side jobs, respectively.

In environmental part, drought resulted in; Decrease in rivers flow, groundwater levels, Decrease in surface water reservoirs and ponds, Increase in weeds growing in fields, Increase in mortality of fish and other aquatic in ponds, Decrease in water quality, Increase in pest attack,

Increase in plant diseases, Increase in soil erosion, Increase in amount and intensity of fires, Decrease in diversity of plant species respectively.

In social part, it resulted in increase in frustration, anxiety and emotional problems, feeling of poverty and decrease in life level, decrease in recreational activities, increase in local divisions to supply water, weakened position of institutions and cooperative unions, weakened traditions of cooperation, increase in tend to migrate, decrease in social ceremonies, decrease in the level of education in children and juveniles, disintegrate of consistency and continuity in family system respectively. We also recommend following solutions:

- To accept the risk of assigning the responsibilities to people for management drought conditions in South Khorasan Province in order to empower them;
- Constructive interaction with the offices, plays the most critical role to achieve for objectives of management drought conditions in South Khorasan Province in order to empower them;
- Formation of management drought conditions is the most important factor for participation of local communities towards sustainable rural development;
- Multidisciplinary and integrated planning in addition to bottom-up approach decision making are the most important factor in the success of management drought conditions and realization of sustainable rural development;

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