

Gender Differences Of Farmers In Conflict With Climate Change

Shahla Choobchain, Azam Mahmoodi Momtaz, Homayoun Farhadian

ABSTRACT: Farmers throughout Iran are facing the more and tougher task of adapting to the consequences of climate change that embrace warming temperatures, exaggerated precipitation and storms, and new pest and illness challenges. Farmers should adapt their farming practices so as to become more resilient. Resilience is the ability of a person or system to absorb change whereas still maintaining basic structure and performance. Many organizations operating to extend resilience to climate change with local communities additionally acknowledge the importance of gender, however, the degree to that gender is really integrated with climate change projects is unclear. In the meantime, women are more vulnerable than men to counter climate change, and there has been no research on the extent to which women are resilience facing climate change. Also, male and female adaptation measures against climate change have not been compared. That is one of the most important researches for future policy-making and planning.

Index Terms: Climate Change, Gender Differences, Resilience, Local communities, Vulnerable, Iran.

INTRODUCTION

Iran, as part of arid and semi-arid climates, is vulnerable to climate change, and it seems that climate change in Iran has a significant impact on agricultural production systems [1]. Climate change is detectable by changes in indicators such as precipitation, temperature, evaporation [2], snow depth [3], and dust [4]. According to the Hamadan province of Iran, Meteorological Administration Data, within the period of 1982 to 2017, the average annual humidity ranged from 55.19 to 43.4 percent, the average annual snow depth ranged from 41.83 to 1.34 cm, and The average annual precipitation has been reduced from 34.06 to 21.77 mm, as well as the average annual evaporation rate changed from 0 to 152.040 mm, the sum of days with dust from 38 days To 48 days and the average temperature increased from 11.59 to 12.94 ° C [5]. The following figures show the status of some of the listed indicators in Hamadan province. Based on Fig. 1, the average annual precipitation rate in Hamadan within the period of 2017-1982 has decreased.

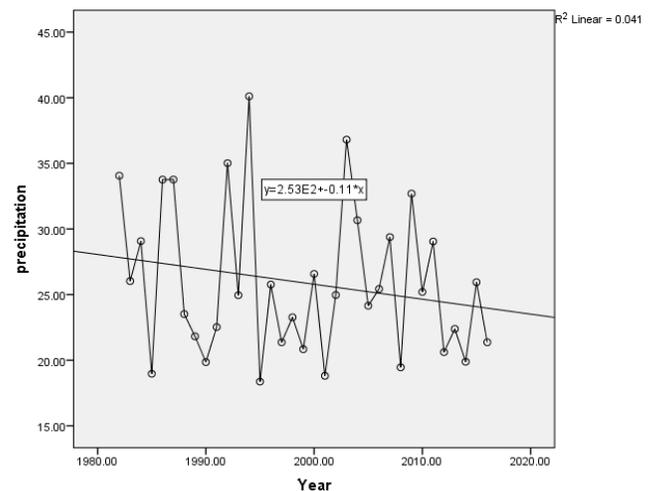


FIG 1 THE AVERAGE ANNUAL PRECIPITATION RATE IN HAMADAN WITHIN THE PERIOD OF 2017-1982 (HAMEDAN METEOROLOGICAL ADMINISTRATION, 2018)

Figure (2) shows the average annual evaporation in Hamadan, during 1982-2017, the following chart depicts a dramatic increase in annual evaporation.

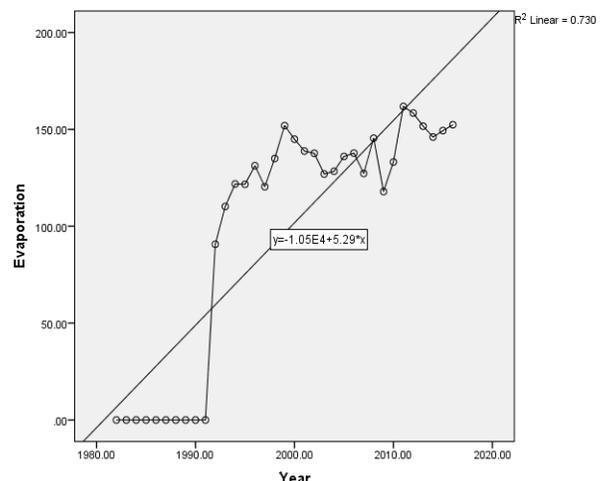


FIG 2 THE ANNUAL EVAPORATION AVERAGE IN HAMADAN IN THE PERIOD OF 1982-2017 (HAMEDAN METEOROLOGICAL ADMINISTRATION, 2018)

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So according to the facts and figures the province of Hamedan is not an exception in the face of climate change and this phenomenon shows itself more and more in this province, which needs special attention of officials. The impact of climate change is not the same for all people and in addition to the place of residence, gender differences is also effective in this regard. Research has shown that women and children are 14 times more likely to die than men in natural disasters. In 2015, the World Bank released a report stating that climate change in poorer regions such as Africa and South Asia could lead to more than 100 million people in extreme poverty by 2030. The United Nations estimates that there will be 200 million refugees by the year 2050, but it also emphasizes that it is still possible to stop most of these effects with an all-embracing and gender-sensitive development agenda focused on adaptation to climate change. Women and men farmers living in rural areas are very vulnerable in developing countries. In this regard, Women in developing countries are particularly more in danger to climate change because they are highly dependent on local natural resources for their livelihood and are more vulnerable due to limited access to resources and because their sustenance depends on agriculture and natural resources, that are extremely at risk of climate variability [6]. Research shows that being attentive to gender matters not only for the equity of global climate change adaptation programs however conjointly for their efficiency and effectiveness [7]. There is a relationship between gender equality, women's adoptive measures and climate [8]. On one hand, women are disproportionately at risk of the consequences of global climate change that may, in turn, exacerbate existing gender disparities. On the opposite hand, women have distinctive information and skills that may facilitate the response to climate change simpler. Climate change could be a world challenge that burdens all humanity, however not equally. The world's poor, the bulk of who are women, are encumbered disproportionately. The distinct impacts of global climate change on people are exacerbated in settings that also are affected by violent conflict, political instability, and economic strife so being resilience facing climate change is so important for rural women. With regard to individual resilience, this word is used when the person is not disturbed while at risk. Resilience makes people, in difficult circumstances, and with risk factors, uses their existing capacity to succeed and grow and use these challenges as an opportunity to empower themselves[9]. Resilience is a process in which individuals, use internal and external resources to manage or adapt to the stresses and shocks [10]. A gendered understanding of resilience is important to the development of gender-sensitive analysis tools and effective practices to optimize opportunities to promote psychological state and well-being of people [11]. In our country, there have not been any reports that the authorities have taken into consideration these issues and usually they have been briefed on the importance of the topic and these have been neglected in policy making. A lot of research has been done on the effects of climate change and mitigation strategies and numerous cases have led to more vulnerability of women to climate change, however, unfortunately, there has been no research on the role of women in tackling climate change which this research is trying to answer.

MATERIALS AND METHOD

This research is applied in terms of objectives and is a survey research with respect to methodology, and a questionnaire has been used to collect information. To determine the face and content validity of the questionnaire a panel of experts were used. In order to calculate the reliability of the research tool, pilot test was carried out and the Cronbach's alpha was 0.71. In this research, the statistical population consists of 115160 farmers in Hamadan province. Of these, 10739 were woman and 104367 were men. To determine the sample size, the Krejsi-Morgan table (1970) was used, according to which the sample size was 384 and the sampling method was proportional stratified random sampling (Table 1).

RESULTS

According to Table 2, the majority of respondents are married and about 30 % of the respondents had elementary education.

TABLE 2. INDIVIDUAL CHARACTERISTICS OF RESPONDENTS

Variable	Variable Levels	Frequency	Percentage	Mode
Marital status	Single	49	12.8	Married
	Married	335	87.2	
Education level	Illiterate	35	9.1	Elementary
	Elementary	117	30.5	
	Cycles	96	25	
	Diploma	60	15.6	
	Associate	9	2.3	
	Degree	32	8.3	
	Bachelor	7	1.8	
	MA	28	7.3	
	No response			
Total		384	100	

RANKING INDIVIDUAL RESILIENCE ITEMS OF FARMERS IN THE FACE OF CLIMATE CHANGE

Table 3 ranks the individual resilience of farmers according to mean of each item. The average of total individual resilience of farmers against climate change was for women 3.45 and for men 2.87. Among the items according to women view point, the highest rank was related to the "Things happen for a reason" item with a mean of 3.83 and the lowest rank was related to "I tend to bounce back after hardship" item with a mean of 2.66. But from men viewpoint "I work to attain my goals" item with a mean of 3.91 had the highest mean rank and "I am able to adapt to change" had the lowest average 2.25.

TABLE 3. RANKING INDIVIDUAL RESILIENCE ITEMS OF FARMERS FACING CLIMATE CHANGE

Items	Female			Male		
	Mean	SD	Rank	Mean	SD	Rank
Things happen for a reason	3.83	1.36	1	3.40	1.32	5
I can deal with whatever comes	3.76	0.80	2	2.30	1.16	24
I have close and secure relationships	3.75	1.20	3	2.36	1.25	23
I am able to adapt to change	3.72	0.61	4	2.25	1.12	25
I feel obligated to assist others in need	3.68	1.07	5	2.92	1.24	8
Past success gives me confidence for new challenges	3.67	0.93	6	2.60	1.26	19
When things look hopeless, I don't give up	3.62	1.04	7	2.90	1.25	9
I have to act on a hunch	3.61	0.99	8	2.68	1.12	17
I work to attain my goals	3.59	1.42	9	3.91	1.15	1
I think of myself as a strong person	3.58	1.31	10	3.09	1.21	7
I prefer to take the lead in problem solving	3.57	1.18	11	2.86	1.35	10
I have a strong sense of purpose	3.54	1.48	12	3.52	1.21	3
I give my best effort no matter what	3.50	1.36	13	3.30	1.33	6
Sometimes fate or God can help	3.48	1.54	14	3.71	1.30	2
Under pressure, I focus and think clearly	3.47	1.15	15	2.82	1.30	13
I have pride in my achievement	3.46	1.20	16	3.46	1.17	4
I am not easily discouraged by failure	3.45	1.13	17	2.72	1.20	15
I can achieve my goals	3.44	0.89	18	2.48	1.08	20
I like challenges	3.36	1.32	19	2.45	1.20	21
I can handle unpleasant feelings	3.35	1.17	20	2.79	1.14	14
I know where to turn for help	3.27	1.23	21	2.69	1.27	16
I can make unpopular or difficult decisions	3.22	1.12	22	2.44	1.11	22
I have few regrets in life	3.00	1.53	23	2.62	1.26	18
I see the humorous side of things	2.82	1.24	24	2.83	1.24	12
I tend to bounce back after hardship	2.66	1.26	25	2.85	1.27	11
Total average	3.45	-	-	2.87	-	-
Total						

T-test was used in order to investigate the differences between female and male farmers in terms of individual resilience to climate change. The results of this test, given in Table (4), indicate that there is a significant difference between male and female farmers regarding resilience against climate change, at 1% error rate. As it can be seen, the resilience mean of women (3.45) is higher than those of men (2.87), therefore women are more resilience to climate change compared with men.

TABLE 4. RESULTS OF THE COMPARISON OF MEAN T-SEX (FEMALE AND MALE)

dependent	independent variable	Group	frequency	mean	SD	t	Significant at level variable
Individual resilience of farmers in the face of climate change	Sex	male	348	2/87	0/424	6/038**	0/000
		Female	36	3/45	0/524		

*Significant at level 5% ** Significant at level 1%

Source: Research findings

RANKING ADOPTIVE MEASURES OF FARMERS AGAINST CLIMATE CHANGE

Table 5, rank the adoptive measures of farmers against climate change according to the mean of each item. The results showed that among women's adoptive measures Adjusting planting time and techniques had the highest

mean (4.20) while this measure ranked 4 for men's adoptive measures (3.74). And seasonal migration was the last adoptive measure was done by women (3.66) while this measure was the first choice for men (3.87). This is due to gender differences between men and women (Table 5 & Figure 3).

TABLE 5. RANKING ADOPTIVE MEASURES OF FARMERS AGAINST CLIMATE CHANGE

Items	Female			Male		
	Mean	SD	Rank	Mean	SD	Rank
Adjusting planting time and techniques	4.20	0.66	1	3.74	0.93	4
Fallow the cultivated land for 2 or 3 years	4.15	0.92	2	3.77	1.12	3
Diversifying income sources included livestock, poultry and duck rearing, small business and off-farm employment	4.04	0.92	3	3.83	1.12	2
Seasonal migration	3.66	1.39	4	3.87	1.11	1
Total average	4.01	-	-	3.80	-	-

Source: Research findings

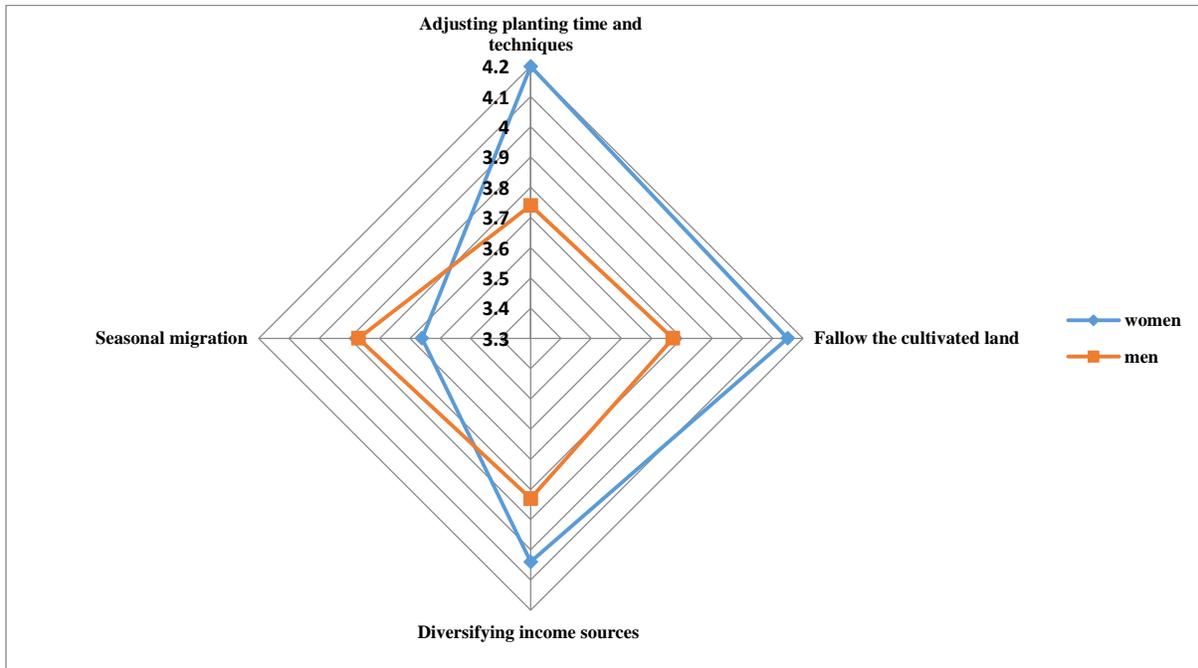


FIG 3 RADAR DIAGRAM OF ADOPTIVE MEASURES OF MALE AND FEMALE FARMERS

T-test was used in order to investigate the differences between female and male farmers in terms of adoptive measures to climate change. The results of this test, given in Table (6), indicate that there is a significant difference between male and female farmers regarding their adoptive

measures, at 5% error rate. As it can be seen, the adoptive measures of farmers for women (4.01) is higher than those of men (3.80), therefore women’s adoptive measures to climate change is better compared with men.

TABLE6. RESULTS OF THE COMPARISON OF MEAN T-SEX (FEMALE AND MALE)

dependent variable	independent variable	Group	frequency	mean	SD	t	Significant at level
adoptive measures of farmers	Sex	male	348	3.80	0.70	3.80**	0/015
		Female	36	4.01	0.78		

*Significant at level 5% ** Significant at level

DISCUSSION

According to the finding Individual resilience of female farmers in the face of climate change is higher than their male counterparts. That’s because of Women’s personality traits facing problems. This finding is consistent with research Lakomy, M. and Marcela P.K (2017) [12]. The results of t-test showed that there is a significant difference

between farmers with different gender in terms of adoptive measures in response to climate change and the average adoptive measures of women is more than men. This finding is consistent with research Alam et al., (2016) [13] [14], and is inconsistent with research Zhai et al. (2017) [15]. From the results, it appears that women tend to be more active in the farm activities facing climate change; this

is while their counterparts are engaged in off- farm activities in the same situation.

CONCLUSION

Achieving sustainable development and social justice without participation and presence of women that make up over half of the population of communities and especially rural communities is not possible. Because the world struggles to grapple with rapid onset disasters similarly as reply to slower degradation caused by global climate change, it's vital to ensure that the plight of women is firmly on the agenda of issues, which women (from completely different backgrounds) are able to lead in negotiations and participate within the style and implementation of gender sensitive programs. About woman's resilience to change it should be mentioned that, People with low resilience are not likely to respond to changes and cannot be successful in controlling themselves. Resilient person are more flexible, adapted to changes in the environment, and after the elimination of stress factors, they quickly recover. In returns people at the low level of resilience adapt themselves to new situations hardly. So it should be considered in educational planes for improving people's resilience to climate change. Recognizing that women play a key role in managing natural resources, and on farm activities, many activities have been planned for women, such as beekeeping, horticulture, installation and maintenance of renewable energy systems. Integrating gender into resilience analyses has implications for strategic plans; program design; monitoring, evaluation, and learning (MEL); and adaptive control. For instance, One of the most significant and foreseeable consequences of climate change is human migration outside of the poorer areas and migrating to developed regions and countries. This is often done by men, and as it was clear from the results, women have migrated less from impacts of climate change, but enrich their field activities, which should be considered in planning and decision making.

CONFLICTS OF INTEREST

No conflicts of interest to declare.

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