



Climate Change and its Impact on Agriculture in Maharashtra - A Gendered Perspective

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In the opening paragraph of her Introduction to her book *Staying Alive: Women, Ecology and Development*, Vandana Shiva writes "The age of enlightenment and the theory of progress to which it gave rise were centered on the sacredness of two categories: Modern scientific knowledge and economic development. The unbridled pursuit of progress guided by science & technology began to destroy life without any assessment of how fast and how much of the diversity of life on this planet is disappearing."¹ The systematic destruction of nature in the name of development has led to climatic changes which is threatening the very existence of life on the planet. The sector which is deeply affected by changes in the climate is agriculture - a sector which is heavily dependent on weather conditions at least in India. Agriculture is not simply an economic activity confined to something related to land, crops, irrigation etc as it is also closely linked to the social structure of rural India. Thus the term implies the entire socio- economic life of the villages which is centered on agriculture as an occupation. This paper is primarily aims to provide an overview of the agricultural situation in Maharashtra in the context of climate change from a gendered perspective. In an attempt to emphasize on the deep interconnection between climate change, agriculture and women, it will focus on three aspects: a) the agricultural situation of Maharashtra in the context of prolonged period of dryness due to scarcity of rainfall leading to drought like situation in the region. b) How gender disparity in the agricultural sector during normal situation become more pronounced during droughts c) The need to include a gender perspective in drought mitigation and relief measures. One of the major issues of contemporary global debate is the fast depleting natural diversity which is causing a threat to survival. "The earth is dying, her forests are dying, her soil are dying, her waters are dying, her waters are dying, her air is dying. Tropical forests, the creators of world's climate, the cradle of world's vegetation wealth are being bulldozed, burnt, ruined or submerged."² Two reasons have been rightly cited by Vandana Shiva that has led to the destruction of natural resource base: Patriarchy and gender discrimination. Through its development projects patriarchy has systematically removed from women's management and controls the land, water and forest resources from which they produced sustenance on which the survival of the family depended. Patriarchal categories have defined the active as masculine and the passive as feminine, valuing the former and denigrating the latter. Resource destruction being active has been valued as positive activity and the activities of women, nature and life itself have been denied value and have also led to increased male -female inequality.³ The Agricultural sector, not only in Maharashtra but throughout India, serve as a case study of unequal political and socio-economic relations -a sphere of limited democracy. Within this industry participants have disparate status and unequal opportunities to contribute to the processes and power relations at work. Women are one heterogeneous group that contributes to the productivity and social sustainability of farming yet they have very little access to the networks, arena and processes of decision making in the industry. Moreover along with the broad marginalization of rural women farmers, media and government organizations have frequently interpreted women's farm work as secondary or subservient in comparison to the 'real' work done by men. This attitude genders the farmer as male and constructs farm women as wives and secondary support workers.

Agriculture is one of the main sectors of the Maharashtra's economy. It is heavily dependent on monsoons as barely 15% of the gross cropped area (GCA) is irrigated. This is even less than half the national average where 38.7% of gross cropped area is irrigated. But agriculture emerges as the key sector in the state especially with respect to workforce barring a few districts such as Mumbai, Thane, and Nagpur, Pune. A comparison of the state with the National figures shows that at all India level 59% and at the state level 55% of the workforce is employed in agriculture. Although the share of workers in agriculture in Maharashtra is lower compared to India, a district wise analysis presents a different picture. In 2000-01 almost 20 out of 35 districts had more than 70% of their workforce in the agricultural sector while 29 districts had more than 60% workforce in agriculture. The states cropping pattern is shifting towards commercial crops. According to World Bank Report 2008, Maharashtra's Horticulture Development Programme generated employment by diversifying agriculture into Horticulture and high value crops. From 1996 to 2006, the program created roughly 213 million person days of work or 807000 person years. From 1989 to 2001 it accounted for 96% of the increased area planted to fruits in Maharashtra. The state is renowned for its exclusive production of Alphonso mangoes ,ranks first in the country for grape ,cashew nuts, pomegranate ,orange and banana production and has also has the highest share in onion production.⁴ The share of oilseeds increased from 9% in 1980-81 to 12% in the later decades. Cotton also showed an increase and its share went up from 12.4% in 1990-91 to 14.3% in 2000-01. Area under sugarcane also gradually moved from 0.3 million hectares in Triennium ending 1980-81 to 0.6 million hectares in 2000-01. The increase in area was more marked in case of fruits and vegetables and increased rapidly from 0.27 million hectares in 1980-81 to 1.26 million hectares in 2000-01. Likewise it is found that though food grains constitute 60% of the gross cropped area; its contribution to the SDP was only 25.5%.Whereas sugarcane which constitutes only 3% of the gross cropped area contributes to 19.3% of the SDP. But it is estimated that due climate change sugarcane yields in Maharashtra may go down by 30% as a result of increased moisture stress caused by warmer climate.⁵

Women and Agriculture in Maharashtra

Women play a pivotal role in agriculture in Maharashtra. In fact they constitute the backbone of agricultural labour force in Maharashtra. Not only do they comprise the majority of agricultural labourers, they are also actively involved in all aspects of agriculture – from crop selection to land preparation, seed selection, planting, weeding, pest control, harvesting, crop storage, handling marketing and processing. They are also critical to the well being of farm households'. Apart from raising children, they are expected to prepare meals, maintain homestead assist in crop and animal production and look at the general health of the families. Their importance has been growing as men have moved to non-farm jobs because of diminishing food security in the rural areas. Yet the image of the 'Farmer' in our minds is always the male, almost always in a loincloth. Her hard work goes unrecognized and unpaid for. Their work in the agricultural field becomes an extension of their domestic work at home. They face severe disadvantages due to lack of land titles. There is also a wide gap between de-jure constitutional provisions for land rights and de-facto situation.⁶

The National Agricultural policy 2000 sought to mainstream gender and to empower women farmers and workers. More recently the plan sought to address the needs of land, poor household, provide support services to reduce drudgery and provide women land rights. However such measures have not been adequately implemented. Bina Agarwal in her famous book 'A Field for One's Own: Gender and Land Rights in South Asia' has discussed in detail the issue of land rights of women. She says that women's access to this crucial asset has become increasingly difficult mainly because of religion based family laws and customary laws which play an important role in determining women's Rights to land not only in Maharashtra but throughout India.⁷ In regions where the female labour force participation rate is high, women work more as agricultural labourers. In Vidharba region of Maharashtra, cotton as a commercial crop requires regular labour supply for sowing, picking and processing operations which is primarily done by women. The eastern regions of Vidharba have a high rainfall rice growing area where demand for female labour is high. But

women are basically landless labourers. Thus we find more of casualisation of women workforce.

There is also a great disparity so far as agricultural wages are concerned. This is primarily because of the unorganized nature of farm labour, the ease with which hired labour can be substituted by family labour, the seasonal nature of the demand for labour and the traditional classification of some jobs as the monopoly of women. As per the minimum wages Act 1949 (2nd Schedule) minimum wages are to be fixed by the state governments for agricultural labour and the rates are to be reviewed periodically at intervals not exceeding five years. But there is again an inadequate implementation of the Act. The reason for this lies in the poverty and illiteracy of agricultural labour, the casual nature of their employment and their ignorance of the law, all of which apply particularly to the women. The average daily Wage Rate in Maharashtra of various agricultural occupations clearly shows difference in wages in all the occupation. The table below gives the wage structure of various agricultural occupations in Maharashtra as well as the all India figures. The study is based on two data sources namely Rural Labour Enquiry Report on Wages and Earnings (RLE) and Agricultural Wages in India (AWI).

Wage Rates in Maharashtra - 2006-07

Average Daily Wage Rates in Agricultural occupation in Maharashtra during July 2006

Occupation	Maharashtra		All India	
	Men	Women	Men	Women
Ploughing	68.87	37.00	76.15	40.45
Sowing	61.80	38.29	68.40	39.12
Weeding	57.65	36.29	63.98	50.29
Transplanting	66.83	47.26	66.50	54.47
Harvesting	66.13	41.29	68.32	55.84
Winnowing	@	40.00	65.74	49.74
Threshing	69.11	38.56	66.05	51.82
Picking*	@	@	61.47	49.96
Herdsmen	41.92	@	42.38	33.31
Well -digging	83.57	43.33	96.59	54.04
Cane Crushing	@	@	67.88	44.75

@ = number of quotations are less than five

* = Picking includes picking of cotton balls/seed pods, jute stalks and tea leaves etc.

The existing inequalities in the agricultural sector especially in relation to land ownership, wage discrimination, inheritance customs etc become more magnified due to climatic changes and gender inequality is among the most pervasive.

Climate Change, Agriculture and Women

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change stated with reference to Asia, that water and agriculture sectors are likely to be most sensitive to climate change -induced impacts in Asia. Agricultural productivity in Asia is likely to suffer severe losses because of high temperature, severe drought, flood conditions and soil degradation. Production of Rice, maize and wheat in the past few decades has declined in many parts of Asia due to increasing water stress arising partly from increasing temperature, increasing frequency of El-nino and reduction in the number of rainy days.⁸ In a study at the International Rice Research Institute, the yield of rice was observed to decrease by 10% for every 1 degree centigrade increase in growing season minimum temperature.⁹ When we turn to Maharashtra, this increasing dryness and water stress is visible with the growing incidence of drought in the region. Occurrence of droughts is usually explained as an

extended period of unusually dry weather which becomes severe if several months pass without significant precipitation resulting in extreme heat destroying vegetation. In periods of severe drought, forest and range fires can destroy the economic potential of timber and livestock industries and wildlife habitat adjacent to the fire areas. Under extreme drought conditions, Lakes, reservoirs and rivers can be subject to severe water shortages which greatly restrict the use of their water supplies.

In recent years due to large scale deforestation, excessive use of water resources like wells etc, droughts have almost become a regular phenomenon. In 2001, droughts affected about 20,000 villages in 23 districts, 28.4 million people and 4.5 million hectares of crops in the state. According to a report from Government of Maharashtra, the number of districts affected by droughts in the year 2002-2003 and 2003-04 were 33 and 11 respectively. Deficient rainfall in western MarathaWada regions for successive years has severely affected agriculture in the region which is the main source of livelihood and employment. The situation of droughts in Maharashtra continued to deteriorate in 2004.

Following the failure of monsoon in 2003, the Government of Maharashtra declared droughts in 11 districts In Pune, Nashik and Auaranagbad Division as drought stricken¹⁰

Thus is clear that in Maharashtra a large part of its population face severe water crisis. In nearly 70% of the state's villages water is either not available 500 metres or is not available within 15 m below the ground or is not potable. In order to solve the problems of water shortage the State government had to resort to short term and long term measures ;one which was the sinking of Borewells. The table below indicates the average number of Borewells sunk each year during the years 1971-75 on an average 706 borewells was sunk each year to tackle the problems of water shortage. The problem became more acute from year to year .In 1999-2003 the state government had to sink 11000 bore wells each year indicative of severe water shortage in the state.

Years	Borewells	Year	Borewell
1971	143	1999	5349
1972	697	2000	16609
1973	1312	2001	8945
1974	773	2002	11016
1975	605	2003	14000
Average	706	Average	11183

Source: Groundwater Survey and Development Agency.

Household surveys for world bank projects indicate the average time spent in collecting water by rural households in Maharashtra is two hours a day using 'opportunity Costs' principles that translate into Rs 12 per household per day.¹¹ This water crisis is further aggravated by the decreasing expenditure on water management, mismanagement of funds, and the absence of a prevention-oriented approach. Even as late as October 2003, grape-growers in Sangli district of Maharashtra had not lost hope of a delayed spell of rain. By November more than 80 per cent of the crop in Sangli and Tasgaon tehsils had perished. Other areas too fared as poorly. The kharif crop failed in 71 tehsils of 11 districts and distraught farmers did not even plant the Rabi crop. It was the fourth consecutive year of drought in these parts of western, central and southwestern Maharashtra.¹² The State government took until November to recognize this and declared the districts scarcity-affected. Comparing the drought of 2003 to the one that ravaged the entire State in 1972, Chief Minister Sushil Kumar Shinde listed the measures taken by the government. These, he said, included a daily expenditure of Rs.1.5 crores for distributing drinking water and Rs.3 crores on providing employment under the Employment Guarantee Scheme (EGS), and Rs.1, 108 crores spent in the last six months on different relief measures. But the inadequacies of the

State government stood exposed, particularly in respect of the EGS. Once the pride of the State, the scheme is now seen as more of a liability rather than the helping hand it was designed to be.¹³ Professor H.M. Desarda, a member of the EGS Review Committee, said the State had not contributed its share for the past three years. So far Rs.3, 500 crores had been collected as professional tax for the fund. With a matching amount from the State there ought to have been Rs.7, 000 crores in the fund.¹⁴ According to the Chief Secretary, the opening balance in the fund at the end of March 2003 was about Rs.5,400 crores. Apparently, the money was diverted into various other works, which the government claimed were generating employment but which did not fall under the purview of the EGS. At the core of the problem of recurring drought is the decreasing expenditure on water management by the State. Said Dr. Ashok Dhawale, State joint secretary of the All India Kisan Sabha: "Such expenditure has been cut drastically in this period of globalization. High-technology and infrastructure projects like roads and power are given precedence over something as basic as water. Low spending on basic necessities is the trend now, and expenditure on water management has dropped drastically even in times of extreme drought."¹⁵ Decreasing expenditure on water management by the State is another reason for reoccurrence of drought. Dhawale cites statistics to show that the share of water management and irrigation in the total budgetary expenditure has fallen phenomenally in all States. In Maharashtra, it fell from 14.7 per cent in 1995-96 to 5.1 per cent in 2002-03; in Punjab, from 9.7 per cent to 5.2 per cent; in Gujarat, from 15.3 per cent to 9.5 per cent; and in Karnataka, from 12.2 per cent to 9.2 per cent. Overall, in the 29 States, water management expenditure fell from 8.5 per cent in 1995-96 to 5.6 per cent in 2002-03.

This recurring drought like situation in Maharashtra, be it for natural or man-made reason, have severely affected women who form the majority of the rural workforce. Being primarily a rural phenomenon, Droughts leads to decreasing agricultural productivity may increase women's workloads, diminish their crops, livestock and puts an additional burden on their health. Most often we see men from drought stricken villages moving out to the cities in search of livelihood while the lives of the women revolved around their donkeys' goats and malnourished children. There is hardly any social structure to address this gap. The increased burden on women to find food and shelter after disasters occur often correlates with decreasing access to resources such as credit and productive land. Droughts mean that women and girls have to walk farther to fetch water and they may resort to environmentally unsustainable coping strategies such as collecting and selling firewood. In addition, droughts often sees girls and boys dropping out of schools due to shortage of funds and hunger. Leslie Gray¹⁶ in her study of Bireka village in western Sudan describes how inequalities in agricultural production reflect social and economic constraints. These differences make it more difficult for women to accumulate assets and savings that are the primary insurance against poor agricultural season. Similarly a study of disasters in 141 countries provided the decisive evidence that gender differences in deaths from natural disasters are directly linked to women's economic and social rights. In equitable societies, women are more vulnerable to disasters, for e.g., boys are likely to receive preferential treatment in rescue efforts and both women and girls suffer more from shortages of food and economic resources in the aftermath of disasters.¹⁷ In other words, women who are marginalized and disempowered under normal circumstances because of their socio-economic status; barriers to choice and lack of access to resources become even more vulnerable during droughts. Thus Disasters are profoundly a gendered phenomenon.

In such situations, any gender neutral disaster management policy results in discrimination and marginalization of women because relief efforts rely on existing structures of resource distribution that reflect the patriarchal structure of society. It needs to be noted that climate change does not affect women and men in the same way and it has and will have a gender differentiated impact. Therefore all aspects related to climate change (i.e.

mitigation, adaptation, policy development, decision making) must include a gender perspective. In all disaster relief and mitigation methods, women are always depicted as the most vulnerable group, as a liability and the primary target of assistance. The still prevailing image of women as victims not only reinforces stereotypes but also poses formidable barriers to the most efficient use of female talents and full and equal participation of women in disaster management and economic rehabilitation. Noleen Heyzer, Executive Director of UNIFEM, while speaking on the conditions of the Tsunami affected victims said, "Women must be at the heart of all recovery and reconstruction processes. For decades they have been the lifetime of their communities leading survival systems and mutual aid networks including among the internally displaced and refugees' communities. Women are not just victims, they are survivors and they need to be part of the solution. The reweaving of the social fabric of life is the foundation for reconstruction and a necessary part of the healing process. It is women in their families and their communities who are playing this role."¹⁸

The interconnection between climate change, agriculture and gender is well established. The major economic sector which is directly affected by climate change is agriculture. While rise in sea water levels due to melting of the ice and glaciers leads to floods destroying crops, the decreasing duration of rainfall due to global warming resulting long periods of dryness is leading to droughts not only in Maharashtra but also in most parts of India. Ironically Women make up the majority of the world's agricultural labourers and rely heavily on fertile land and regular rainfall. As a remedy to such a situation one needs to understand that if women are the most vulnerable to natural disasters, they are also the best poised to curb the effects of climate change.¹⁹ The only thing that we need to do is to question and challenge the western concept of nature and revert to the traditional Indian notion of Nature or *Prakriti* which is not only a living force but inherently active and a productive force capable of sustaining all living beings on the planet²⁰. Therefore all government and intergovernmental policies regarding climate change should be planned with a gender perspective in mind. Women should be perceived as positive agents of change²¹. Perhaps the future of our ecologically devastated world may depend on the recovery of the feminine principles of respect for life and nature. Women, as carriers of the feminine principles, should be perceived by policy makers not as passive beneficiaries of relief measures but as positive agents of change.

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