

Understanding climate change from rural women's perspective

Study report by MAKAAAM (Mahila Kisan Adhikar Manch)

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Introduction

Impacts of climate change on rural livelihoods are well recognised. Especially in a country like India, where majority of the population depends on agriculture and allied activities, and most of the agriculture is rainfed, the impacts of climate change have been severe.

Nagraj Adve in the booklet 'Global warming in the Indian context: an introductory overview' details out how climate change has impacted Indian agriculture¹. Rainfall pattern has considerably changed and has become erratic over the last twenty years. There is often a shortage of rainfall in the critical period of beginning of agriculture cycle. That forces farmers to do sowing twice or thrice, increasing their production cost. Late sowing also affects the yield. Also heavy rainfall in the later stages of the crop has been increasing, affecting the crops severely. Rainfall which used to be scattered over the four months of Monsoon, now falls over a shorter time period. That kind of heavy rainfall makes that water to run off rather than seep into the ground, affecting the post Monsoon groundwater availability. While in some parts there has been heavy rain, areas of central India have been suffering from continuous drought for the past 15 years.

Change in rainfall is not the only affecting factor: increase in maximum temperature during winter has also been a major factor affecting size of grain and quantity of the yield. Increased temperature is also making crops more vulnerable to pests and worms. A recent report published by International Labour Organisation (ILO) (Title: Working on a warmer planet: the impact of heat stress on labour productivity and decent work²) estimated that due to increase in heat stress – heat in excess of what the body can tolerate without suffering physiological impairment – resulting from global warming, India will lose an equivalent of 34 million jobs².

Farmers – mostly marginal and poor farmers who practice rainfed agriculture – are affected by increased costs of production, decreasing land holdings, government policies favouring industrial development over agriculture, and credit withdrawals from banks. Climate change aggravates this crisis. Effects of climate change are much more adverse for poor, marginalised communities: marginal farmers from dryland areas, dalit and adivasi households, landless labourers, urban poor, and especially so for women from these communities. Because they are not only the ones heavily involved in agriculture and agriculture labour, but are also responsible for fulfilling water, fuel, and fodder needs of the household.

A synthesis report published by United Nations³ which is based on submissions by 21 countries states that Impacts of climate change especially increases vulnerability of women due to existing gender inequalities, discriminatory laws, unequal access to and control over resources. Compared to men, women are more vulnerable to impacts of climate change discriminatory patriarchal norms and customs, exclusion from decision making and community processes, limited awareness of legal rights, limited or no access and control over resources and assets, unequal burden of unpaid domestic and care responsibilities, limited access to sexual and reproductive health care, increased exposure to gender based harassment and violence, and effects of male migration.

¹Adve, N. 2013. Global warming in the Indian context, an introductory overview

²Indian Express, 3 July 2019, <https://indianexpress.com/article/explained/global-warming-climate-jobs-india-temperature-humidity-5811761/>

³ Framework Convention on Climate Change, UN. 2019. Differentiated impacts of climate change on women and men; the integration of gender considerations in climate policies, plans and actions; and progress in enhancing gender balance in national climate delegations

Indigenous women are particularly vulnerable to the impacts of climate change, primarily due to their reliance on natural resources for their livelihoods and the multiple forms of discrimination they face due to their gender, ethnicity and level of poverty. It also acknowledges barriers to women's participation in decision making around climate change, and therefore the need of empowering women in these in order to achieve improved climate and gender equality outcomes.

It is in this background that MAKAAAM (MahilaKisanAdhikarManch⁴) undertook the study on understanding climate change from rural women's perspective. MAKAAAM (Forum for Women Farmers' Rights) is a national level alliance of networks, campaigns, movements, organisations, and individuals who advocate for the right to livelihood of women farmers.

Across India it is women who are toiling in the fields, working long hours and accomplishing most drudgery laden tedious tasks. And yet they lack recognition as farmers. If we look at the 2011 census figures for Maharashtra state we see that 40% out of total cultivators, and 50% out of total agriculture labourers are women. Out of total women workers 30% are cultivators, and 40% are agriculture labourers, whereas the percentage for their male counterparts are 23% and 30% respectively. On the other hand Agriculture Census 2010-11 calculates percentage of women as operational holders as mere 15%. While it is apparent that women farmers are critical to agriculture in the country, and agriculture is central to most rural households' livelihoods, yet women farmers remain invisible and unsupported, despite their significant contribution to farming and food security. When we talk about farmers, it is mostly men who are categorised as that. The recent data of the Periodic Labour force Survey (PLFS 2017-18) shows a worrisome trend of decline in rural women's employment to 18%.

MAKAAAM's mission is to visibilise women farmers. MAKAAAM recognises the wider definition of the term farmer, which includes not only cultivators, but also those who are involved in agriculture allied activities like agriculture labour, fishery, pastoralists etc. It endeavours to create and secure rights over productive livelihood resources as well as entitlements over variety of support systems with equal participation of women in decision making in various institutions. MAKAAAM has presence in 24 states, and is actively working in 12 states, Maharashtra being one of them.

In Maharashtra MAKAAAM has been actively involved with the issues of women farmers from suicide affected households, forest workers and sugarcane cutters. Increasing number of farmer suicides in India is a serious manifestation of the agrarian crisis. Maharashtra is counted amongst the states with the largest number of farmer suicides in the country. Fourteen districts from Vidarbha and Marathwada have been declared as suicide afflicted districts. As per the statistical data from the National Crime Records Bureau (NCRB), about 65,000 farmers killed themselves in Maharashtra between 1995 and 2015. Around 20% of the total farmer suicides in the country took place in Maharashtra. About 90% of the farmers who committed suicide were male. This shows us the increasing number of women farmers from suicide affected households in Maharashtra⁵.

These women farmers from suicide affected households are one of the most vulnerable groups. With no land in their name but engaged in agriculture in large numbers, women often are ill equipped to handle the climate crisis. Rise in temperatures, erratic and sometimes reduced rainfall has also meant a steep rise in health issues, which again is a burden on women as caretakers. Overall the vulnerability due to climate change gets mapped on to the existing inequalities due to the patriarchal mindsets.

⁴www.makaam.in

⁵ MAKAAAM. 2018. Social security of women farmers from suicide affected households: a situational analysis

Understanding issues around climate change from women farmers – especially from the women farmers from suicide affected households – was the entry point for MAKAAAM to undertake this study. How this study unfolded is discussed in detail in the next section.

About the study

The focus of the study was to understand the changing climate and its impact from the women farmers' perspective. However the team recognised that the impacts of a changing climate need to be understood in the broader context of changes taking place in society through policies and practice as well. Our enquiry with the women was thus around a narration of stories of change in their lives and livelihoods over the last decade or so. We looked at livelihood in a broader sense to include their own health and also the health of assets like land, water, forests and importantly their own labour.

Initially two consultations with rural women were proposed by MAKAAAM – one for Vidarbha and one for Marathwada region – as these are the regions affected by farm suicides. After the consultation in Vidarbha had taken place, it was decided that instead of another consultation, the next part of the study would be a field based study. Both the consultation and field based study were supported by SOPPECOM (which currently hosts the secretariat for MAKAAAM Maharashtra) in collaboration with MAKAAAM network partners from the respective regions.

Scope of the study

Methods

The consultation

Around 100 women from 6 districts of Vidarbha attended the consultation. The consultation was divided into six sessions: agriculture with a focus on cotton farmers, forest, nomadic and settled pastoralists, fishery, agriculture labour, women farmers from suicide affected households. In each session six-seven women panellists shared their experience followed by a discussion. Members of MAKAAAM helped facilitate the discussion, asking women relevant questions, and encouraging them

to express themselves. But their role was intentionally kept limited, and the focus was on sharing by rural women.

Field study



1 Panel of rural women in Wardha consultation



2 Meeting at Laman tanda, Beed district

MAKAAM partners who supported the field study were JagarPratishthan, SamataPratishthan and EkalMahilaSanghatan in Beed and Ankur Pratishthan and Manas Foundation in Raigad. We visited seven villages in Beed district, and six villages in Raigad.

In both the field sites our focus was on interacting with women from some of the most marginalised groups, like cane cutters in Beed and Katkari tribal community in Raigad which is listed as the particularly vulnerable tribal group (PVTG). Focused group discussions (FGDs) and interview methods were used for collecting data. The enquiry was made around their various livelihood practices (agriculture, labour work, fishery, forestry etc), and how they been affected by climate change. Details about the villages visited and data collection are given in table below.



3 Group discussion with Katkari women at Indiranagar, Raigad district

Table1 Details of data collected

Sr. No.	Block	Village	Method	No. of women in FGDs
District Beed				
1	Wadvani	Deogaon	FGD	17
2	Beed	Dokewada	FGD	38
3	Beed	Kumshi	FGD	34
4	Beed	GhodkaRajuri	FGD, interview	15
5	Georai	Padalsingi	FGD, interview	23

For the study in Marathwada, Beed district was selected, which has highest number of farmer suicides in Marathwada and also a large number of migrant labour involved in sugarcane cutting. The second field site – Raigad district in Konkan region – was also included to get a comparative picture from a different context. In both the places villages were selected in consultation with

MAKAAM partners, based on the area of their work.

6	Majalgaon	LamanTanda, Talkhed	FGD	20
7	Dharur	KASARI	FGD, interview	18
District Raigad				
1	Pen	Bari wadi	FGD	6
2	Pen	Indiranagar	FGD	9
3	Pen	Tagachi wadi	FGD	10
4	Karjat	Bhagtachi wadi	FGD	11
5	Karjat	Mograj	Interview	2
6	Karjat	Solanpada	FGD	5

We approached this study from a feminist perspective. The focus of the enquiry was on bringing in women's voices to the discussion around climate change. Women who are the backbone of rural livelihoods, often are excluded from the decision making process. Women are actively involved in agriculture, and take up primary responsibility of collecting water, fodder, and fuel for household. Their role gives them a unique position to comment on the effects of climate change. On one hand this makes them more vulnerable to climate change, but on the other, they are also the ones who are part of the solution and mitigation. It is important to capture women's experiences of vulnerability as well as their knowledge. We made our enquiries with the objective of bringing those to the forefront.

Organisation of the report

Detailed proceedings of the consultation for Vidarbha region have already been prepared. So this report primarily focuses on sharing the findings from field study. Next two sections discuss insights from field study in Beed and RAigad districts respectively. Each section after discussing the context of that particular field area, goes on to detail out perceptions of climate change among the communities we studied, and follow it with discussion about their current practices of agriculture, labour, livestock rearing, forestry and fishery, and how they have changed over the last few years. The report closes with a section on people's responses to the current crisis of climate change.

Beed story

Background

In Beed the study team discussed with women farmers and agricultural labourers across various caste groups to understand the process of change in climate over the last few years and the impacts on humans and the environment.

Profile of the participants

Sr. No.	Taluka	Name of Village	Methodology
1	Wadvani	Deogaon	FGD: No. of women present: 17 All the women were from ZhingaBhoi community which are traditionally fishing community. They are landless and consider water as their land for ages.
2	Beed	Dokewada	FGD: No. of women present: 38 All woman were Marathas and belonged to small or marginal landholding families. All were agricultural labourers as well and some go for sugarcane cutting.
3	Beed	Kumshi	FGD: No. of women present: 34 It was a mix of upper caste and lower caste women. Some were landless and some women were from land holding families with small and marginal land holdings.
4	Beed	GhodkaRajuri	FGD 1: No. of women present:15 Mix of upper caste and lower caste women with majority of lower castes. Many of the lower caste women were cultivating grazing lands. FGD 2: No. of women present:3 SC Women from families cultivating encroached or regularized grazing lands.
5	Georai	Padalsingi	FGD 1: No. of women present: 23 Mix of women from lower caste landless families and landholding families. Some of them also had irrigation facilities. The age group of women ranged from 25 to 65 age. FGD 2: No. of women present: 6 All women from Matang (SC) community. They were all landless and work as agricultural labourer, go for sugarcane cutting and in remaining time prepare small brooms.
6	Majalgaon	LamanTanda, Talkhed	FGD: No. of women present: 20 Mix of men and women all from Laman community who work traditionally as sugarcane cutters. Some of them have also

			bought land and are small to marginal farmers.
7	Dharur	Kasari	FGD: No. of women present: 18 Mix of upper caste and lower caste women with majority of lower castes. Many of the lower caste women were cultivating grazing lands. Some also were going for sugarcane cutting.

Context



Beed district is part of the rain shadow area of Maharashtra, and is characterised by persistent droughts, especially so in the last 5-7 years. This has had deep impacts on agriculture and other rural livelihoods of the district forcing people to migrate to other areas in search of work. Women are often at the receiving end of this crisis that is manifested in terms of farm suicides and forced migration.

Beed is one of the eight districts in Marathwada region which is a drought prone area of Maharashtra. The region is

characterized by poor development, high agrarian distress, large numbers of farm suicides and seasonal migration for sugarcane cutting. In spite of being a rain shadow area we can find large number of sugar factories running in this region. The agrarian distress is also the result of misplaced policies and unregulated practices around industrial growth, water usage, cropping patterns etc.

As per the agricultural census (2010-11) Beed district comprises mostly of small or marginal landholders with little or no irrigation facilities. The average land holding of a household is 0.4 to 2 ha. The small land holders are mostly dependent on rainfall. Large landholders with irrigation facility mostly go for sugarcane. Increasing number of wells and borewells has resulted in depleting groundwater table. Many farmers who are dependent on rainfed agriculture, also have to migrate seasonally as sugarcane cutters, to other parts of Maharashtra, and in many cases as far as Karnataka. This migration happens across communities- SC, ST, OBC, denotified and nomadic tribes.

The SC or the dalit population in Marathwada is mostly landless primarily an outcome of the caste system and also a reason for its continuance. Those who have land have small land holdings. Inspired by Dr Babasaheb Ambedkar the SC community in Marathwada has struggled to claim their rights over land, but most importantly for their self respect and a life of dignity since 1950. The struggle for renaming the Marathwada university after Dr Babasaheb Ambedkar, struggle for claiming gairan (grazing) lands or community grazing lands, fighting discrimination at the hands of the upper castes have been part of the dalit struggles in the region. This community is largely dependent on wage labour for their survival. Agriculture, cane cutting and construction work are the main sources of work for them. They have also migrated to big cities in search of work and as a strategy to avoid the exploitative caste system in villages.

Perceptions about climate change

Women talked about different changes in weather, as well as natural resources that have occurred over the last two decades, and how it has affected their livelihoods in different ways.

Changing patterns of rainfall

In Beed, discussions about declining rainfall, frequency of drought and the resultant non-availability of water for agriculture and drinking water dominated the discussions. Elder women in villages remembered the days of water abundance in their villages.

“Previously we had to walk through knee deep water. The wells were full with water. There was good rainfall. I came in this village after marriage nearly 40 years ago. The rainfall has been reducing year after year, but last 10-15 years were especially difficult.” – An old woman from Padalshingi.

“The wells used to be filled with water. But recently we have only seen droughts. When I came in this village (after marriage), there were hand-pumps. Now for the last 10-15 years there is no water in the wells or the hand-pumps. They are all dry.” – A woman in her 30s from Padalshingi

Women as well as activists said that in last few years frequency of drought has increased: previously events of drought occurred once every six years, but now the frequency has gone up and the event occurs once in every three years.

The women also talked about the erratic rainfall, and how it affects agriculture.

“When I was small, there was enough rainfall. Now the rainfall has reduced and has got erratic. It rains even in summers and winters. Now the erratic rainfall damages the crops.” - A woman from Padalshingi

“For crops to grow properly, we have to do sowing in June. If we are late in sowing cotton, then the plants get affected by bollworm. So, we start sowing around 7th June. But these days monsoon doesn't start until late, and so we often have to do the sowing one more time. There are no signs of rainfall yet this year (end of May). On the other hand, temperature has risen” – A woman from Padalshingi

“Farmers work hard, but if there is no rain on time, then all the efforts are wasted. Late rainfall results in flowers shedding and going to waste” – A woman from Padalshingi

“There are changes in climate now. There is no timely rainfall and hence no crop produce. This year nothing grew on the fields. We are sitting idle for the last 7-8 months.” – A woman from Kumshi

Reduced rainfall has also affected rabi crops. .

“If the pond in the village gets full, we take rabi crop too. From the last 4-5 years we have not taken rabi crop.” – A SC woman from GhodkaRajuri.

“With the rainfall so low, we can take only one crop in the year. But for last few years, even that one crop gets burned, because it doesn't rain when it should. This year the crop didn't grow more than knee high. We had to pluck it by sitting down. We didn't get any grain out of it.” – A SC woman cultivating gairan land

So it shows that reduced or untimely rainfall has affected the crops in many ways one of which is the reduction in the height of the crops. Cotton crop which used to grow up to five feet, is only two feet high these days.

“Last year, our bajra was completely destroyed due to sudden heavy rain. The rainfall doesn't allow us to take any crops” – A SC woman from GhodkaRajuri

"It rained heavily after we had harvested tur and bajra. It completely destroyed the stacks of produce we had kept in the open. These days there is no guarantee when it is going to rain" – A woman from Padalshingi

Depleting groundwater and drinking water crisis



Line for drinking water

Despite the water scarcity Marathwada has several sugar factories. Sugarcane is a water intensive crop and hence the region also has a growing number of borewells and tubewells. Often they are owned by the upper castes and classes. Intensive cultivation of sugarcane has been responsible for depleting the groundwater tables, leading to a drinking water crisis as well.

"Drought of 1972 was very different from drought today. There were wells at that time, and so even during

drought there was water available. But these days there are so many borewells. How would water remain if we keep doing that? Back then there was water but no food, now there is food but no water." – An old woman

In Dokewada farmers are increasingly going deeper down and drilling multiple borewells. The depth of the borewells in the village on an average is 500 ft. Farmers have spent up to one lakh rupees developing groundwater sources, only for those sources to fail soon. They are facing acute water crisis in summer.

"We dug a 200 ft deep borewell seven years ago, but it dried up in two years" – A woman from Padalshingi

"All four borewells in our field have now dried up." – A woman from Kumshi

All these villages are facing drinking water crisis. Government supplied water tankers provide water once in a fortnight, and in between people have to purchase water for their daily needs.

"All the handpumps in the village have dried up since last 4-5 years. The tanker comes every 10 days, and gives 200 litres of water. Is that water enough? To make matters worse, government has now constructed toilets. How should we use them without water? We have to buy water for that." – A woman from Padalshingi.

"2-3 months of summer, we have to buy water. For a 500 litres water tank, we have to pay 150 Rs. For a month the cost of water is Rs 3000." – A SC woman from Padalshingi

Increase in temperature

Another thing that came up in discussion about climate change was rise in temperature.

"It gets too hot in the summer. We feel dizzy working in the field, but we have to continue with covering our heads" – A woman from Deogaon

"Temperature is increasing every year. How should infants and new mothers cope with this? They suffer a lot in this heat. Without water, we can't even use coolers" – A woman from Padalshingi

"The heat is too strong these days. It feels as if the land is burning from the inside. Earlier there were trees, but we have cut them down. We don't feel like working in the fields these days. We sweat a lot when we work, our feet burn, and we get cracks in the feet." – A SC woman from GhodkaRajuri

"I have been going for cutting sugarcane for past 35 years, and one can feel the changes. Earlier it used to be pleasant. These days it is so hot. Doing heavy work is hard in this heat." – A cane cutter woman.

Change in quality of soil

Women in Beed mentioned that due to less rainfall and increasing temperature there are changes in soil quality like cracks on the land, hardening of soil. This makes weeding and harvesting harder for women.

"Earlier ploughing once in 4 years was enough for cultivation but these days we have to plough the land every year. If not ploughed the soil becomes hard." – A woman from Kasari

Climate change and biodiversity

Effects of climate change on biodiversity were also shared by women. They said that number of snakes in the fields have reduced as compared to earlier times.

"Now there are no *manduls* (sand boa) in the fields. They used to be there when we used dung fertilisers. We used to say that when mandul makes noise, it is going to rain." – A woman from Padalshingi

"When we used to grow jowar and kardi (safflower), it used to attract honeybees. Because those grains have high sugar content. There used to be honeybee hives everywhere. But in last 10 years their numbers have reduced. As the area under those crops is reducing, honeybees are also declining." – A woman from Padalshingi

"These days you hardly see sparrows or other birds. They don't have anything to eat." – A woman from Padalshingi

"As the birds have reduced, worms have increased. Bollworms and larvae destroy tur, harbhara and bajra. In the past 2-3 years they are getting bigger in size." – A woman from GhodkaRajuri

"Excreta of snake used to be good fertilizer. But due to the increase in temperature snakes are no longer found and thus their excreta is no longer available as manure. Reduced number in birds has meant that the worms have increased. They have spread from bajra to corn. If we come in contact with these worms, body starts itching, and it doesn't stop until we take a bath with cold water with salt." – A woman from GhodkaRajuri

Increased menace of wild animals

In all the villages in Beed the attacks from wild animals were discussed in a heated manner. Women said that since wild boars and deer destroy food crops like jowar and bajra, they have now shifted towards cotton. Lack of food and water in forest areas for wild animals and their wandering into the habitations has a definite connection to climate change.

"We have a huge problem of wild boars and deer. It has increased over the last 2-4 years. They were always there, but not in herds like this. A herd of 25-30 deer suddenly attacks, and eats away entire crop. Since this year we are also facing problem of wild boars. They not only destroy the crops, but also attack people." – A woman from Kumshi

"Wild boars have migrated here, because they can hide in sugarcane. They eat everything except cotton. Even cotton they pluck out from the stem. Corn is their favourite." – A woman from Padalshingi

"Our village was famous for its groundnuts. But no one takes groundnuts or jowar these days because then these animals destroy them." – An activist from Limgaon

Agriculture

Changes in cropping pattern

In Marathwada farmers practicing rainfed agriculture, practiced multi cropping, cultivating many food crops. But with increased frequency of drought and market influence have now shifted to mono cropping, cotton being the dominant crop.

In all the villages, women reported the shift from food crops to cotton, and from multi-cropping to mono-cropping. The earlier crops that are now mostly extinct include: wheat, millets like bajra jowar and yellow jowar, and bhagar (jungle rice) pulses like hulga, matki (moth bean), moog (green gram), harbhara (gram), udid, lakh, oil seeds like groundnut, erandi (castor), javas (flax seed), mohri (mustard), til (sesame), sunflower, and rale.

They still grow few crops as inter crop with cotton but only for household consumption.

"When we were young, people sowed a little of everything. Moog, bajra, rale, udid, bhagar, til. Then in winter they cultivated wheat. Now none of these crops exist. We only cultivate cotton and tur."

Farmers who have irrigation facilities are going for water intensive cash crops like sugarcane, along with cotton and soybean. In Padalshingi, 2-3 years ago, some large land holders tried cultivating potatoes and ginger, but it did not go well.

SC women who are cultivating gairan land, have been taking bajra/jowar, but in recent years they too are shifting towards cotton.

"We take bajra, jowar and tur. If there is sufficient rain, we take jowar, otherwise bajra. We have been cultivating this gairan land for 25 years, but it was only last year that we started growing cotton. We received 6 quintals and 6 kg. We sold it at a local shop."

"We take some green gram and sesame on the border of our field. We also take coriander, chillies and tomatoes as intercrop with chickpea. These are for our own consumption. But for these crops to grow, there has to be sufficient rain. This year we couldn't get any of these, they all were burnt. Only the green gram that was sown with cotton survived, but it wasn't sufficient." – A woman from Padalshingi

Reasons cited by women for this change include market-oriented economy, increased nuisance of wild animals, changes in rainfall pattern, and reduced land holding.

"Jowar requires water, now with change in rainfall, no one grows it. Look at the prices of jowar. At time of my wedding, price was 200-300 Rs per quintal. Now it's 3000 Rs. This is because the cropping area under jowar has reduced." – A woman from Padalshingi

"Now that the land holding size has reduced, we can't afford to take crops other than cotton." – A woman from Padalshingi

"We take cotton because it gives us cash income. It affects our health, but what can one do? We require money in hand. Everything is so expensive these days." – A woman from Padalshingi

"Cotton is favoured because that is the only crop that wild boars don't eat." – A woman from Padalshingi

Changes in the varieties of crops

In Beed too women reported that they don't have traditional seeds anymore, and buy them from the market.

"We buy all the seeds from the agricultural centre. We don't use traditional seeds at all. We have not even seen them." – A young woman from Padalshingi

"We buy everything from agriculture centre except jowar. But earlier all the seeds were preserved at home. There was no cotton then. There was no expense for the seeds in those days." - An elder woman from Padalshingi

Reasons cited by woman for this change were traditional varieties take more time to grow, and that is a risk they can't afford with unreliable rainfall. They prefer hybrid varieties from market because they grow in shorter span and give more production in smaller land holdings.

"Traditional variety of sesame took five and half months to grow. This new hybrid variety is ready in two and half months. During the time of flowering it needs to rain. With the erratic rainfall we can't take the risk of sowing traditional variety." – S woman from Kasari

"We have both traditional and hybrid varieties of bajra. . We sow them together. Recently if we only sow traditional seeds, we don't get enough yield. If we mix them together the produce is comparatively good." – A woman from Kasari

"If they have a big family, farmers prefer hybrid variety of bajra. Yield from traditional variety is not sufficient for a large family. Where traditional variety produces 5 quintals, hybrid one produces 8." – A woman from Kasari.

These days only certain crops remain where farmers are still holding on their traditional seeds like *pivli*(yellow jowar), bhagar, gavran mug, javas, gavran garlic in Beed.

Extensive use of fertilisers and pesticides

Another downside of the shift from traditional varieties is need for application of chemical fertilisers and pesticides in high doses. It has become necessary for maintaining the yield.

"Due to chemical fertilizers, the quality of soil has reduced. Now the crops only grow if we use chemical fertilizers. The land has got used to the chemicals now." – A woman from Padalshingi

Earlier, cow dung was used as a fertiliser, but, it has now been replaced by chemical fertilisers. The other reasons for increase in chemical fertilizers is the decrease in the number of cattle due to which manure is not easily available.

"Earlier we used to apply dung fertilizer, but people don't have livestock anymore. There is no water and fodder for the cattle." – A woman from Padalshingi

"The production has gone down, but it takes double the effort to toil that land." was said by women from Ghodkarajuri,

because of the excessive use of chemical fertilisers, the soil has hardened. It becomes harder to pull out the crop as per the earlier practice of harvesting. Now use of some tool, or even machines is necessary for harvesting. The use of latter also replaces the human-power with machines, thus leaving many without any form of employment. Women further added, that even the application of all these fertilisers doesn't guarantee yield anymore, because of the change in rainfall pattern.

Older women said that due to these fertilisers there has been an increase in new kinds of weeds, especially the grass popularly known as the congress grass and the older weeds and grasses have reduced in numbers. Earlier, the grass that was available included kunda, kombda, kurdu, barbada, kena, gajarpalak, harli, shipi, pavna, tarota. Many of them were used as vegetables previously.

Excess use of fertilisers has replaced these varieties with poisonous grass and weeds. Woman from Padalshingi mentioned different kinds of new weeds that have emerged,

“These days congress grass is everywhere. The good kind of weeds like chival, ghol, pathurda and patri is rarely seen these days. We use them as vegetables. Paturda is rich with iron, and patri is good for eyes.”
– A woman from Padalshingi

“The good grass that grew earlier like harli, shipi, pavna has been destroyed by insecticides. Cattle don’t eat the new grass that grows these days. Even tandulja has become harmful now. Last year 2-3 buffaloes died after eating it” – A woman from Padalshingi

“Earlier we never used to buy vegetables and fodder, whatever we got from fields used to be enough” – A woman from Kumshi

With rainfall decreasing, new crop pests have emerged. Women mentioned pests like fungal growth, bollworm, white flies, dheknaya, laalya have increased over the years. Because of that they have been using pesticides and insecticides more and more. In last two years they have had to spray 10 times during a crop cycle. This is also increasing cost of cultivation, as each spraying costs around 3000 to 4000 rupees. It also has adverse effects on health.

Effects on women’s health

The other kinds of effects on health reported by women were increase in knee pain, leg pain, problem of arthritis, back pain, acidity, burning of eyes, rashes on skin etc.

They reported an increase in new pests as a result of climate change that is leading to body itching, swelling of body, rashes on skin, inflammation of eyes etc.

While weeding, due to the new kinds of weeds, they experience itching of their fingers. There are new kinds of weeds that stick to the body. Similarly, women also said that the cotton plant height has reduced forcing them to bend down and pluck the cotton and that leading to back aches.

Due to the high temperature, they also experience cracks on their legs. Women mentioned that the reason for increased diseases is due to the increased use of hybrid varieties of seeds.

“When cotton is infected with bollworms, it makes the body itch, and we get skin rash. Even with the shirt we wear, it affects the skin. It itches whenever we sweat. But we have to work, so we take medicine, and get back to it.” – A woman from Padalshingi

Farmer suicide

Maharashtra is counted amongst the states with the largest number of farmer suicides in the country. Fourteen districts from Vidarbha and Marathwada have been declared as suicide afflicted districts. In Marathwada Beed district is one of the most suicide affected districts. The data received from the Divisional Commissioner’s office show that 725 farmers have committed suicide during three years, between 2015 and 2017. Most of these farmers were men.

Frequent drought and crop failure have been major contributing factors to these suicides.

While the question of farm suicides is serious the plight of the women from farm suicide affected households is even worse and often neglected. After the death of her husband, the wife faces problems at three levels. Getting over the trauma of her husband's death, repaying the debt, and taking over the responsibility of single handedly running her household, along with the stigma of widowhood due to which she faces discrimination at family, societal and cultural levels. Although there is some attention to farmers' suicide at the policy level, the questions of women farmers from suicide affected households however, have not been given much attention. Although due to constant follow ups of MahilaKisanAdhikarManch (MAKAAM), Maharashtra Government has come out with a GR specifically for suicide affected women farmers in June 2019.

Labour practices

Agricultural labour in the village

All the landless and the small and marginal farmers of Beed are mostly dependent on agriculture labour for their livelihood. The women in the discussion mentioned that previously due to the variety of crops taken and the good produce due to good rainfall resulted in more work for a longer span in the year. Now the total days of agricultural labour work has reduced. Some women reported that work was available earlier till the month of May while others mentioned it till April or January. But in all the villages there was a unanimous voice that this year they only got agricultural labour work till Diwali leading to a reduction in work by several months.

"This year, we didn't get any work after Diwali. Because of the drought, farmers have not taken any crops. What are they going to ask us to do, pick up stones from the field? Even they don't have money to pay the labourers." – A labour woman from GhodkaRajuri

"There is not much work available in the village. There is work around sowing, and then around harvesting. Not much in between. But during those times, we also have to work in our own fields, and therefore can't go for labour work." – A small farmer woman who also works as labourer.

Mechanization has also affected the amount of agricultural labour work available.

"Big farmers have equipment for everything – ploughing, sowing, irrigating, applying fertilisers etc. The work that women used to do, is now done by machines. So, we don't get enough work." – A woman from Padalshingi

"When people used traditional varieties of seeds, the crop cycle was longer, so work was available for a longer period of time." – A woman from Padalshingi.

"We work from 10 a.m to 7 p.m, and only get 100 rupees for that. If it starts raining around 4 or 5 in the evening, they pay us only half day's wages." – A woman labourer from Padalshingi

A woman from Kumshi village explained their dependency on ration for food as production of food grains has reduced and so has availability of work.

"We get something to eat, only when we get the coupon. We invested all our money in agriculture, but it didn't give any returns. Additionally, there has been no work available this year. This has been situation more or less for past three years." – A woman from Kumshi

Sugarcane cutting

Sugarcane cutting is an arduous task which involves not just cutting cane, but also tying cane bundles, loading, unloading and transporting these to the factory. A couple known as the Koyta (sickle) - usually the husband and wife are expected to perform all the tasks together- such as harvesting, loading, unloading and transporting to the factory. The contactor or the mukadam engages the cane cutters for a few months and pays the wages as an advance (Rs. 50,000-60,000 per season) thereby making it attractive for the vulnerable labourers to opt for this work over NREGA or other work if available locally. Persistent drought, deepening agrarian crisis has meant non availability of work forcing people to migrate in search of work.

Sugarcane cutting involves heavy work and the work day is usually about 12-14 hours with no weekly offs. Women have to additionally work for 4-5 hours to fetch water, cooking, cleaning and taking care of the children often at the cost of their health.

"The truck that carries sugarcane to the factory arrives in the early hours of the morning. Sometimes as early as 3 am. Once the truck is there, we have to start working. We work till 8-9 pm. Sometimes even until midnight. After finishing work, we prepare food. We make it only once in a day, and keep it for the next day. Then in the



FGD at Laman tanda

afternoon, we just eat stale bhakri with some chutney. After returning from work, if a woman doesn't do her work properly, she is beaten by her husband. Once my husband had attacked me with a sickle, because I was unable to tie sugarcane bundle properly. I had three stitches." – A sugarcane cutter woman from Dokewada.

The timings are usually dictated by the sugar factories and the contractors. Missing a day usually means a loss of Rs. 500-1000/- hence workers usually work through their illness. Women are seen to work till the last stages of pregnancy. Single women workers face even worse conditions, often suffering sexual harassment at the work place and having to carry their young children around during work.

The pressure on the koyta to harvest two tonnes of cane everyday so that the couple earns at least Rs. 300-400 per day is enormous and often takes a toll on their health, especially for women. The work conditions are poor, with no proper housing and sanitation facilities. Children have to leave school and are exposed to a range of vulnerabilities at the work site.

"When we go for cane cutting there are no schools for children. We can't get ration there either. There are no facilities." – A cane cutter woman from Dokewada.

For women much of the work they do is free labour as the advances are handed over to the men who often squander it away on alcohol and other forms of entertainment leaving little money for household expenses.

"My husband takes the advance from the mukadam, and gives it to me when he returns home. Some alcoholic men, spend all of it by themselves. Then their wives and children suffer because of that." – A cane cutter woman from Dokewada.

Married at an early age of 12 or 13 the young girls go through early pregnancies, abortions or miscarriages. Continuous heavy physical labour during pregnancy and post-delivery period, lack of adequate nutrition and rest, lack of facilities to enable menstrual hygiene contribute to ill health among women, especially aggravating reproductive health issues.⁶

In recent times, like all other crops, sugarcane has undergone many changes. This has had implications on these sugarcane cutters.

“This year we were back within 2-3 months. Sugarcane yield has also reduced this year because of reduced rainfall. Government also procured sugarcane for fodder camps, so factories were closed earlier than usual. Therefore, we didn’t get as much work as we usually do.” – A cane cutter woman from Kumshi.

MNREGA

To tackle the condition of non-availability of work in rural areas, there is MNREGA at the national level and also EGS at the state level but its implementation leaves a lot to be desired. Employment Guarantee can be a good way to avoid migration, in addition to creating assets in village, if implemented successfully. However, we saw that many of the villagers knew very little about the Act and the procedures required to get work into their villages. If some were aware of it, they had no means to avail its benefits, in the absence of a job card. Some of them tried to apply for a job card but were unsuccessful in this endeavour.

On the other hand, on the MNREGA website, we saw many names registered under this scheme in the villages we visited, such as GhodkaRajuri, Kasari, Kumshi in Beed district. Many of the names in the list were of upper caste people in the village, especially in the case of GhodkaRajuri. According to the women we met (many belonging to the SC community), the people whose names were in the list were rather well-off and did not require ‘employment guarantee’. On the other hand, none of the poor, marginalised farmers featured in the list, let alone in the column showing how much work they were provided. Meanwhile the names featuring in the list had received substantial amount in the form of wages (financial year 2019-2020).

As mentioned earlier, many of the people from different villages were unaware of the scheme. But, some women told us about an officer coming around and collecting their signatures. He assured them that this was for the employment scheme and that they will get a job card soon. But, no such document has been made available to them so far. In all likelihood, he took the signatures for different reasons. Interestingly, the women in Kumshi told us that some of them had job cards but they were with the Gram Panchayat. Meanwhile, some others in the same village spoke of having signed some papers for job card, but to no avail. Women in Padalsingi informed us that their photos were taken for employment guarantee scheme, but there has been no further action since then.

Livestock

In Beed, women reported that the number of livestock has reduced due to lack of water and fodder.

A woman from Padalshingi said, ““Previously there used to be 10-10 animals now we don’t even have one. There is no grass and rainfall. There used to be big embankments previously. Now they are no more.”

⁶Shiralkar et al, 2018, Shukla and Kulkarni, 2019



A fodder camp

“Earlier we used to have 10 or so cattle, but now we don’t even have one. Due to drought, there is no grass available for fodder.” – A woman from Padalshingi

This has affected availability of manure as fertiliser in agriculture, as well as income from milk and nutrition level. The Government has responded to this crisis by arranging for cattle camps which we could see at regular intervals in Beed. The farmers have to produce their land record to keep their cattles in the camps. They are given specified quantity of fodder

each day for each cattle. Atleast one person from the family has to stay over there to take care of the cattle. The manure becomes the possession of the land owner on whose land the camp has been set up.

Fishery

Drying up of rivers, dams, lakes in summers is how the fishing community called the zingabhoi in Beed perceives the climate change’s effect in the area studied. Since there is less rainfall, the inland water resources such as rivers, lakes, dams, dry up during the summers. Earlier, they used to have water all year round. Now because of less water availability, it is hard to carry out fish farming using seeds, let alone natural reproduction of fishes. Since the Majalgaon dam was built on the Sindphana River more than 30 years ago, fishing is carried out in the reservoir. Earlier, fishing was done on the river itself. Tanubai, a fisherwoman in her 70s, reminisced about going for fishing with her mother when she was barely 5 or 6 years old, and catching abundant fish in the river. However, dams were constructed on the river and the entire community had to migrate in search of fish farms. Some of them moved to the Jaikwadi reservoir and others to the Majalgaon reservoir.

“Water is like our land, which is being encroached by the big contractors. They first dried up our rivers and forced us to fish the tanks. And now they want to grab that away from us as well.” – A woman from fishing community.

Many of the women were positive of getting more income if the rainfall is not scarce and fish types like the prawns and shrimps are available in the dam. When asked about the increase in temperature, they retorted that even if the heat increases, the water on the surface heats up, but the water below the surface remains cooler, so the fish can survive. But the problem is scarcity of water itself. There have been no new varieties of fish ever since the water level has deteriorated according to them. Apparently, when the government undertook fish seed culture here, they did not come up with any new species; rather, they were harvesting the species already available like katla and rohu. The home-grown/natural varieties of fishes traditionally available here are wambat, malga, muri, gugali, katla, rohu, bendki, virul, etc. Now there has been a decrease in the availability of all the variety.



A fisherwoman showing her fishing net

of
in

Earlier they used to consume fish almost every day. Now they cannot eat fish every day (owing to the scarcity), hence, they cook vegetables at least 2-3 times a week. This was also done earlier, but for the sake of variation in daily meals. Women did not mince any words when they spoke of how they were doubly exploited in their labour at home and at work.

These discussions with the women brought out the complexity of the problem that is a combination of climate change, patriarchy and misplaced policies that have allowed a free play for the contractors and big players.

Other livelihoods



Women from phad making community, Beed district

The Matang (SC) women from Padalshingi village of Beed district are for generations preparing 'phad' (small sized brooms used in villages) to sustain themselves in slack seasons. The phads are specifically made by women of the community and men are not involved in making or selling the product. Presently preparing phads is a slack period activity for them. When they have work available as agriculture labourer, they prefer going to work on others field, they also go as sugarcane labourers. When there is no work

available, then they prepare these phads and sell them in the local markets. Women also

said that only the older women prepare the phads. The younger women do not make them. These phads are prepared out of the leaves of 'sindhi' or palm tree. The women previously used to cut the branches of the trees, dry them under sun and then prepare phad out of the leaves of the tree. The woman said, 'Previously there used to be dense forest in which these trees were available in abundant numbers. Hence, we used to get enough branches to prepare phads. But now for the last 5-6 years we don't get enough branches as there are no trees left.'

This according to the women is the result of reduced rainfall. The trees also used to be available on the farm boundaries that used to be comparatively broader before. Now in order to bring more and more land under cultivation, the size of farm boundaries has reduced and hence less trees are available. Presently these women have to purchase the branches of sindhi-a wild palm tree which is bought from Karnataka. This has increased the cost of production and hence reduced the profit margins.

Raigad story

Background

MAKAAM partners with whom we collaborated – AnkurPratishthan and Manas Foundation – work primarily with tribal communities of Katkari and Thakar(both listed as STs), therefore focus of the field work in Raigad district was on these two communities. The field work included visits to six villages, and FGDs with women and men from these two communities. Details of FGDs conducted could be found in following table

Sr No	Block	Village	Details of FGDs
1	Pen	Bariwadi	FGD, Women present: 6 All women belonged to Katkari community and were between age group 25 to 50 5 of them had small land holdings and one was landless, they all were cultivating on forest lands
2	Pen	Indiranagar	FGD, Women present: 9 All women belonged to Katkari community and were between age group 25 to 50 3-4 of them were landless and depended of labour work 5-6 had small land holdings They all were cultivating forest lands
3	Pen	Tagachi wadi	FGD, Women present: 8, Men present: 2 All belonged to Katkari community All had small land holdings, and 5 of them were cultivating forest lands
4	Karjat	Bhagtachi wadi	FGD, Women present: 6 Men present: 5 All belonged to Thakar community, and were from land holding households.
5	Karjat	Mograj	Interview, 2 men farmers from Thakar community, who have irrigation facilities and cultivate vegetables throughout the year
6	Karjat	Solanpada	FGD, Women present: 3 Men present: 2 All from Katkari community, and part of a fishery group – temporary stay near the tank for fishing

Context

In both Pen and Karjat blocks, proximity to Mumbai and Pune city, industrial development, and road and railway infrastructure building has been rapidly changing socio-cultural milieu in last two decades. As other land owning communities like Agris and Marathas are gradually withdrawing from agriculture, it has had an adverse effect on these tribal communities who have been dependent on the other communities for their livelihood.



A typical Katkari house, Raigad district

Both the communities we focused in the study, and especially Katkaris, are marginalised communities. All Katkariwadis (hamlets) visited during the field work, were separated from the main village, often located on top of the hills. They were far off from the roads, making access to health care, education and other services more difficult.

They did not have access to water supply scheme that served the rest of the village, and had to depend on public wells for their water requirements. Situation was especially difficult during summer.

"We have a 30 feet deep well. If you try and fetch water from it, you will know how difficult it is for women here. It is easy for men. They take

bath and go for work. But women have to pull that water out of well by hand, and then bring it back home." – A Katkari man from Bhagtachiwadi

"The GP members took 3000 rupees from us, saying that they will dig a borewell for the wadi, but summer has gone, and still they haven't done anything." – A Katkari woman from Bhagtachiwadi



There is no road to access Tagachiwadi

"After last election, the sarpanch said that since we didn't vote for him, he will cut our water connection. After that we had to walk to the far away well to fetch water. It gets more difficult during the summer." – A woman from Bariwadi

Currently Katkaris in Bariwadi have worked out an arrangement with a rich farmhouse owner who has his farmhouse nearby. He is lifting water from a well near river, and the pipeline goes through this vasti. So people here negotiated with him: in exchange for letting the pipeline pass, he would give them water for drinking and domestic purposes. All the households currently get water from the connection this farmhouse owner has provided. Without that source they have to walk a long distance to fetch the water.



Women in Bariwadi fetching water from the connection provided by a farmhouse owner

They were underrepresented in GPs and therefore could not get access to schemes in spite of their socio-economic status.

"We haven't got access to any benefits from GP. When one of us gets access to housing scheme, they reallocate it to someone from their community. I have been married for 14 years, and since then no one from the community has received house." – A Katkari woman from Bariwadi

"Gramsevak and Sarpanch don't pay attention to our issues. They call us for meetings, and then insult us. Some people just run away from the meetings, but I always stay and say what I want to say." – A Katkari woman from Bariwadi

Katkari communities from these vilalges had ongoing conflicts with other upper caste communities from their villages. People from dominant communities had been harassing them for years: not treating them with respect, destroying their crops and trees in the forest, excluding them from the village level decision making.

"We had bought 26 fruit trees from tai (leader of the organisation Ankur), and have planted them in the forest land. They were growing well. But those people cut them down during the night. Not even a single tree remains." – A Katkari woman from Bariwadi

"I got into a fight with another woman from the village, who was trying to destroy my plants. When I confronted her, she started cursing me. Said that I will die from snakebite. But I didn't pay attention to her cursing. This happens a lot. Every year we plant trees, vegetables, and the people from village destroy them." – A Katkari woman from Bariwadi

Perceptions about climate change

Conversations on climate change revolved around changes in rainfall pattern and changes in forest in Raigad. They talked about late arrival of monsoon, less rainfall, reduction in the number of rainy days, a longer dry spell in between, and sometimes heavy rains in the early stages of monsoon and how these changes have been affecting their agriculture.

"Earlier it used to rain on 7th June, but when was the last time that has happened?" – A Katkari woman from Indiranagar

"Why the rainfall has changed, God only knows! But it has changed over the years. Now there is less rainfall, and it starts late in the year. Once it starts, then stops for 10 days, so all the works ceases. It also affects vegetable produce."

"Earlier they used to finish sowing before vat pornima (a festival). But this year, vat pornima is next week, but it has started raining only yesterday. So, people haven't even finished ploughing yet." – A Katkari woman from Bariwadi

"Earlier people could predict accurately when it will start raining. There were *shevari* trees in the village, and once their new foliage sprouted, farmers began sowing their crops, because they knew with certainty that it will rain soon. But not anymore! Now a days we rely on TV news for weather forecast," – An old Thakar man from Bhagtachi wadi

"Last year around this time, we were out of village selling mangoes. And suddenly it started raining heavily. We crossed the bridge and saw the rivulet overflowing, a sudden water flow destroying the bridge. Two people we know were lost in the current. We narrowly avoided the same fate. It rained that heavily for half an hour and then stopped." – A Katkari woman from Bariwadi

"Last year we had to do the sowing twice for paddy. Vegetables also get affected. But we carry water on the mountain and try to keep them alive. But that can't be done for paddy, so paddy crop gets affected if it doesn't rain on time." – A Katkari woman from Bariwadi

"Last year it started raining around 10th June, and so people sowed paddy. There was good rain till around 20th, and then it went away for days. Some farmers who have fields near river, lifted water and saved their crop, but rest of them had to do sowing again." – A Thakar woman from Bhagtachi wadi

In Bhagtachi wadi people said that reduced rainfall combined with construction of checkdams upstream, sand mining in riverbeds and industrial effluent has affected river flows. In a couple of villages people reported that their rivers run dry earlier in the year than they used to. This has adverse effects on drinking water availability, as well as agriculture and fishing practices.

Livelihood of Katkaris is dependent on forests, and forests have been changing rapidly over the last few years.

"Earlier people used to go 4 to 5 kilometres inside the forest to collect produce, but there is not that much forest anymore." – A Katkari woman from Bariwadi

"Earlier if one went into the forest, there was a guarantee that they will come back with some produce to sell. But that is not the case anymore." – A Katkari woman from Tagachi wadi

Destruction of forests has also had impacts on wild life.

"Most of the wild animals have moved away from the forest. Earlier there used to be all sorts of animals, tigers even. But now that the forest has thinned, and there is no water in the forest. So they have moved away from the area. Now you can only see monkeys around here." – A Katkari woman from Bariwadi

"The birds from the forests are now extinct. Earlier we used to see many rabbits around the vasti, but not anymore. We also don't hear peacocks like we used to in the forest." – A Katkari man from Tagachi wadi

"In our Konkan, there is water scarcity. Except for Monsoon, there is water scarcity throughout the year. We need tankers even for drinking water. You won't get water even if you go 50 feet deep. There is no water in the river. Therefore, they went to the areas where there is water. Also, pardhi people have been killing birds, so they got scared and left the area." – A Katkari man from Tagachi wadi

Livelihoods

Women we talked with are either landless or have small paddy fields. Their agriculture is mostly rainfed, and post Diwali, they have to depend on labour work for livelihoods. Forest is an important source for their livelihood needs. They collect fruits, vegetables and tubers from the forest for their consumption as well as for selling in nearby villages and towns. During monsoon season, many cultivate vegetables on the forest land, which are used for consumption as well as selling.

Other landed farmers of the village also may not have irrigation sources themselves, and availability of work in the village is insignificant. In that case some people go to work at brick kilns for meagre payments. Forest is also the source for firewood and medicinal plants.

Although they have been using these forests for generations, there is resistance from the local upper caste communities (listed as OBCs) to their use. Also though many have filed for forest claims under 2006 Forest Rights Act, almost none have yet been sanctioned. Their struggle for livelihoods increases with this resistance and denial of their rights.

Their dependence on natural resources, combined with their socio-economic status, makes them more vulnerable to the effects of climate change. What women and men from these communities had to say about that is discussed below.

Agriculture

Land holding

Katkari men and women we talked with are either landless or have small agriculture plots located at foothills. Many have gained these lands through Tenancy Act.

"My mother had 1.16 acres of land, from which one acre is gone for canal work. Now only 16 R is remaining. My grandparents cultivated it, then my mother, and now I am doing it. My mother's name is mentioned as a tenant in 7-12 record. The land is not in our name yet." – A Katkari woman from Bariwadi

Many of them are also cultivating forest lands during monsoon, where they grow vegetables.

Irrigation practices

In Raigad, tribal people we interacted with were mostly practicing rainfed agriculture. There were only a couple of exceptions where people had access to irrigation source and were taking crops in Rabi and summer. In Bhagtachi wadi, farmers reported that 20 years ago they used to lift water from their river, and cultivate vegetables during Rabi season. But now the river flow doesn't last that long post Monsoon, and they can only manage Kharif crop.

Share cropping practice

Some of them lease in land from the farmers who have migrated out of the village for work, and don't cultivate their own land. The usual arrangement is the land owner gets 1/3 share, and the cultivator gets 2/3, with cultivator investing all the inputs and labour.

"We have to bear all the expense for inputs, plus the labour charges. Hiring labour costs a lot. You have to pay breakfast, lunch with fish/chicken, cigarettes, alcohol if they demand. So the expense increases. And labour charges for a day during monsoon is Rs 300. One cannot do the work on their own, and has to hire labourers. The land owner comes only at the time of harvesting. This is not really a beneficial arrangement. But everything is so expensive that we have to take up work like that." – A Katkari woman from Bariwadi

"Some people are also really nice, and say that you cultivate our land and keep it fertile, and don't pay us a share. But to most farmers we will have to pay 1/3 share." – A Katkari woman from Bariwadi

Cropping pattern

Paddy is the predominant crop in the area, and that's what these women were also cultivating both in their own paddy fields as well as leased in land. On the forest land they were cultivating vegetables like cucumber, okra, snake ground, eggplant, sweet potato, bitter gourd, karand (a tuber like potato), marigold flowers, ridge gourd and *shirala* (local creeper vegetable).

Changes in cropping pattern

In Raigad cropping pattern has changed significantly in the last decade. Earlier finger millet (called nachni in local language) and jungle rice (called vari in local language) were two major crops they cultivated on forest land/lands up in the hill (called warkas land in local language), and were major part of their diet. But almost all women said that they don't take these crops anymore.

"Currently many farmers have fallow lands, where earlier they were producing nachni and wari. This started happening around 2000. The way we delete a number from mobile, people dropped nachni, wari crops." A Thakar man from Bhagtachi wadi

Change in the rainfall pattern was cited as the main reason for not taking these crops.

"People used to grow finger millet and jungle rice and keep it for themselves. Both those crops are not grown on flat fields like paddy, where water is accumulated. These are taken up in the mountains, and require good rains. Since rainfall pattern has undergone changes in recent years, people have stopped taking those crops." – A Katkari woman from Tagachi wadi

In another village women said that it was frequency of sudden heavy rains and landslides that caused the change in cropping pattern. Another reason mentioned for this change was increased number of wild boars. Wild boars frequent this forest area, and destroy those crops. Farmers have to go up hill and stay on the farm to keep a watch on the crop. Since all that is too much work, they have abandoned those crops.

Changes in the varieties of crops

It is not just certain food crops which are going extinct, but also traditional varieties of the other crops. In Raigad farmers told about various local varieties of paddy they used to cultivate earlier: garvakolam, ghosali, dodaki, mahadi, bhadacha, halakolam, bhora, thelshi, madi. Back then they used to preserve their own seed for the cultivation next year. Women lamented those traditional varieties saying that using just cow dung fertilizer was enough for their cultivation, not to mention the taste of the rice made from such traditional organic grain.

"Earlier we used to cultivate rice varieties like garvakolam. It used to grow as high as a man. And it was a variety that grew without fertilisers. Now you will not find that variety in the entire district." - - A Katkari woman from Tagachi wadi

"There was another variety of rice called Mahadi, the grains were black in colour. That variety is also gone now." - A Katkari man from Tagachi wadi

Over the years these varieties were abandoned, and now they purchase from market hybrid seeds for varieties like Jaya, Ratna, Kanchana, Komal, Gangotri etc. These varieties have short term productivity, so seeds can't be preserved, making farmers dependent on the market every year. This is also the case with vegetable cultivation.

"Current varieties of paddy that we purchases from market are Jaya, Ratna, Kanchna, Komal, Gangotri etc. These varieties don't grow without fertilisers. These are short term varieties, you can't keep them for seeds next year" - A Katkari woman from Tagachi wadi

Change in the rainfall pattern has been cited as the reason for this change. Paddy varieties they used to cultivate required longer time and assured rainfall. But increasingly there are times during the months of Monsoon, where it doesn't rain for 10 to 15 days at a stretch. These dry spells can affect paddy severely. Therefore, these days farmers prefer these hybrid varieties of seed, which can provide more yield in shorter time.

"Earlier it used to rain on time, and there was enough water throughout the season for paddy crop. Varieties like garvakolam took time to grow, they got ready late in the season. But the new varieties that we grow these days are ready in 90 days. As the monsoon changed, the older seeds gradually disappeared. And now these new varieties are there everywhere." - A Katkari man from Tagachi wadi



Few traditional seeds still maintained by Katkari farmers – from left lundi, karand, and garlic, Raigad district

"When we first started using these seeds we realised that it gives more produce than the traditional seeds. Also, the new seeds of cucumber produced small size cucumbers, which are favoured by the people. The traditional variety was the large one. The traditional variety used to give cucumbers around ganpati festival, but the new variety gives produce quickly. Sowe shifted from traditional to the new one. We

disposed of the traditional seeds. So once one woman got more and quick produce, others followed, and soon everyone had given up the traditional seeds." - A Katkari woman from Bariwadi

Some farmers have still maintained seeds for tubers they have been traditionally cultivating. And they mentioned that they wish they had done the same for paddy and vegetables.

"We have kept traditional seeds of sweet karand. It is a potato like tuber, which people eat during fasting. They get ready around the time of Ganapati. There is also another tuber called kanak, which gets ready at the time of Diwali. We have also maintained traditional seeds for that. We sell these in the Penu market." – A Katkari woman from Tagachi wadi

Extensive use of fertilisers and pesticides

Another downside of the shift from traditional varieties is the need for application of chemical fertilisers and pesticides in high doses. It has become necessary for maintaining the yield. Earlier, cow dung was used as a fertiliser, but, it has now been replaced by chemical fertilisers. The other reasons for increase in chemical fertilisers is the decrease in the number of animals reared due to which manure is not available anymore.

"With the old varieties of paddy seeds, we didn't use any chemical fertilisers, just cow and goat dung. Even vegetables we used to grow without fertilisers. And the seeds were so powerful. All the seeds these days require fertilisers. And these fertilisers are the main cause for illnesses." – A Katkari man from Tagachi wadi

"Land holding has reduced. Families have grown, and the land has been divided among brothers. If there were 4 people in a family two generations ago, now there are 20. Therefore, people are going for seeds that will give them maximum produce from their small plots of land. So, they apply as much fertilisers as they want." A Thakar man from Bhagtachi wadi

"In the last 2-3 years we have been facing this new type of pest, which affects vegetables like cucumber, shirali, and bhopla. They grow crooked. We have to use pesticides to avoid that. We can't grow vegetables from these new seeds without using pesticides. These days we have to spray pesticides 3-4 times a month. It has increased in last 2-3 years." – A Katkari woman from Bariwadi

Earlier we used traditional seeds, now each year we have to purchase new seeds. Those traditional seeds didn't need much inputs. They would grow wherever we planted them. But not anymore. The new seeds require fertilisers, and pesticides in ample amounts. Crops can't grow otherwise. Earlier crops could grow even with just cow dung fertiliser. Earlier we used to use vermiculture and cow dung." – A Katkari woman from Bariwadi

Women understand that extensive use of fertilisers had adverse effects on health of the soil, but they don't see a way out in the current situation either.

"Quality of land has decreased. If it used to produce 100 sacks of paddy per acre earlier, now it only produces 20 sacks. This is happening because of excess use of fertilisers and pesticides. The more you use, the more it degrades your land. Now the efforts and inputs have increased, but production has lessened." – A Katkari woman from Bariwadi

Changes in diet

Changes in cropping pattern, has naturally brought a major shift in their dietary practices. In Raigad, since they don't cultivate finger millet anymore, they don't use it in their food either. Finger millet contains high levels of calcium and has become expensive, and therefore not affordable to purchase from market. So now they have eliminated finger millet from their diet and eat more rice.

"During last year I had nachnibhakri only twice. It used to be main part of the diet earlier. In those days we made rice bhakri and dal from red gram only when there are guests in the house. Otherwise people used to eat nachnibhakri and dal made from wal, udid or chavli. But these days all we eat is rice and red gram." – A Thakar woman from Bhagtachi wadi

Labour practices

In Raigad the tribals practice mostly subsistence farming and they also depend on labour work to earn cash. During Kharif season along with cultivating their own paddy and vegetables they also work as labourers in the fields of other upper caste farmers of the village. Labour charges during this time are Rs 300 per day, and the land owner also has to provide breakfast and lunch (that includes either fish/chicken/mutton) to the labourers. This is a good way for them to get at least one full and nutritious meal in the day. But recently farm labour work during paddy season is on decline. These upper caste communities have been increasingly selling off their lands for different development projects as well as to be turned into farm houses. This has caused decline in labour work for the tribals, who now have to depend even more on other labour work like construction and brick factories.

"Summers are difficult of people here. There is no work in the village, so they migrate for work - like brick kilns. Some of the men go to work for fishing companies. They are gone for months without contact. Some go to work for coal mines. Some people work at farm houses that have come up in the area." – A Katkari man from Tagachi wadi

"We don't have land, so during monsoon we work as labourers, and grow vegetables in forest. After Diwali, we go to the brick kiln, and stay there for the rest six months. This year too we have taken an advance of Rs 25000" – A Katkari woman from Bariwadi

"People who go for brick kiln, take advance around this time, and then go there after Diwali. The advance they give is hardly anything for the 6 months' work. Once the advance is paid they only pay small amounts during the stay there for purchasing ration etc. But people don't have much choice, there is no work in the village" – A Katkari woman from Bariwadi

Many members of Katkari community migrate post Monsoon to work on brick kilns. An advance is given to a couple beforehand and once their paddy cultivation is over they go to brick factory and set up a temporary shelter there. There they have to live in difficult conditions, working long hours to complete the target. The wages are often unfair, and subject to change anytime.

Livestock



Cattles roaming around the village, Raigad district

In Raigad, once the paddy cultivation is over, people don't keep their cattle tethered around the house all the time, but let them roam around the village. Earlier Katkaris used to have some of their own cattle as well took in cattle of other upper caste communities for a price. But this practice is slowly diminishing. Neither Katkaris nor other communities are keen on maintaining livestock these days. There are few reasons for this change: ploughing is increasingly done

by tractor which reduces value of bullocks, there is a shortage of fodder and water so maintaining livestock is difficult and a dedicated person has to be appointed to look after them, which is becoming difficult.

"Earlier each household had livestock, so there was ample dung available for fertiliser. But now we don't have livestock. We don't have much space, to keep livestock. Providing fodder and water is also an issue." – A Katkari woman from Bariwadi

"Here we don't keep livestock at home, they roam around the village. So, if they go in someone else's field, and destroy their crop, there are problems with other people. There used to be many conflicts in the village. So people have sold off their livestock. This started happening 2002-03." – A Katkari woman from Bariwadi

"One has to pay the shepherd (the person who looks after the livestock) a sack of rice per livestock, so people can't afford it. And there is no one at home to look after livestock. When we were young, and went to school, we used to look after the livestock. But children today don't do it. So that has to be outsourced." A Thakar man from Bhagtachi wadi

"I had 30-40 goats. Once I had to come back home to tend to my son, and left the goats alone. The goats ate leaves from trees that belonged to someone. That woman started arguing with me. So I offered her that I will compensate her with dung from my goats. But she didn't listen, and kept harassing me. In the end I just sold all my goats." – A Katkari woman from Bariwadi

"Now we think that we should have some goats. If we sale a goat it earns 5000 Rs. If there is a need for cash, we can sale a goat and get cash quickly." – A Katkari woman from Bariwadi

"Some of us take in bullocks from other farmers in the village during monsoon. We use them for ploughing, and take care of them for the season, in exchange for a share in our paddy. This used to happen a lot earlier. But these days people don't keep bullocks, and prefer to plough with tractor." – A Katkari woman from Bariwadi

During a discussion in village Bhagtachi wadi people said that around ninety percent of the households in their wadi don't own any cattle now and therefore don't have easy access to milk.

Not having cattle also means no access to milk and milk products, which once had been major part of their diet.

"Earlier we always used to have milk at home. We offered guests tea with milk and jaggery. But these days everyone drinks black tea. New daughter-in-laws don't know how to make buttermilk," an old Thakar woman from Bhagtachi wadi

No livestock also means no easy access to dung. Earlier dung was used as fertiliser but now they use chemical fertilisers instead. Katkaris who are still living in huts made from tree branches they collect in the forest, use dung to apply over the walls of the hut. Since number of cattle in the village has decreased, they have to buy dung from upper caste households who still maintain livestock. These days a small pot of dung costs twenty rupees.

"Earlier when people had livestock, collecting dung was major part of labour work. Labourers used to prefer that work, as they got dung in exchange. But times have changed. That work is not available now, because there is no livestock." – A Thakar woman from Bhagtachi wadi

Fishery

Along with agriculture and forest, fishery is also an important aspect of livelihood for tribals of Raigad. During monsoon, different types of fish are carried from the creek to the river and streams and then into paddy fields. Prominent varieties among them are jitada, chimni, khavai and fantus. During Monsoon, Katkaris catch this fish. Also other farmers catch them and cook them for the lunch they serve to labourers working in their fields. Increasingly number of these fish is declining due to dissipating water flows as well as pollution of creeks and rivers.

In Bhagtachi wadi, people said that the river doesn't have enough water flow these days due to construction of checkdams upstream and sand mining from the river bed. Due to that they don't get as many fish as they used to get before. Fishing practices are also undergoing significant changes due to this. Earlier people used certain plants, leaves and fruits while fishing to sedate the fish temporarily after which they would catch only the required amount of fish. That way rest of the fish were kept alive. But this practice is slowly disappearing. These days to get more fish in one go, people use TCL powder (one that is used for purifying drinking water) which kills all the fish in vicinity.



Temporary shelter of Katkari fisherfolk near tank, Raigad district

A group of Katkaris from Karjat block have made a contract with the government to do fishing in Solanpada tank. About 30 households start fishing around December, and continue until June. Three to four families take shifts of a week to come and stay on the bank of the tank, and catch fish there. They sell fresh as well as dry fish in nearby village. They have started this activity only a couple of years ago, and said that traditionally they used to catch fish in rivers. There was ample water in rivers back then, and therefore they could catch sufficient fish. They also talked about high temperature in summers causing fish to die of heat. Another problem they face is that of declining

water level of the tank. In the surrounding area, many farm houses have been constructed in the past few years. They have dug their own wells, which get water percolated from the tank. Also an outsider farmer has been lifting water from the tank for his agriculture. This water diversion has begun to affect their fishing activity.

Forest

Forest is an important resource for livelihoods of these tribals. Apart from firewood, they get seasonal fruits, vegetables, other edibles, medicinal plants and leaves that they use both for their own consumption as well as sale. Women narrated different kinds of produce they get and even showed whatever was available at the time. The varieties include: fruits - karavanda, mangoes, cashews, jamun, umbar, tandali, alu, ranjana, alim, vegetables – kartul, mushrooms, shevla, kardu, lundi, green leafy vegetables – bharangi, ulu, teri, takla, tandali, kavla, loth, aakud, kolu, tuber - bitter karand, medicinal plants – ulus, hadsan. They collect this produce from forests and take it for sale in nearby towns.



Produce from forest – clockwise from top left – wild flowers used as vegetables, Palas plant leaves of which are used for making plates, karvand tree which produces berry like fruits, alu (a sour sweet fruit), women processing mahuwa fruits. Raigad district

"We get bitter karand from forests. It looks like onion. You have to cut it in rings, boil in water to remove the bitter taste, and then eat it. They grow underground, and are found in the forest. They are very good for health, and are also used in making medicines. These days we go to doctor for everything, but our ancestors had knowledge about things that were available right here in our forest." – A Katkari woman from Tagachi wadi

"There are lots of medicinal plants in the forest, but we don't know which is used for what. For example, now if someone breaks a bone, they go to hospital in Pen. People from earlier generation used to go in forest and bring stems of Hadsan tree. They used to make a lotion from it, and apply it to

the broken bone and then wrap it tightly, just like doctors do with plaster cast. It was a hundred percent effective method to mend the broken bones. The tree is very rare, and people today don't recognise it, so it is not used anymore." – A Katkari man from Tagachi wadi

Earlier they used to take the forest produce to areas near the creek and exchanged it for fish. Thakar women from Karjat block also said that they go to sell these produces to Mumbai. There is demand for certain types of tree leaves, and fruits during certain religious ceremonies, and they can sell their produce. Especially in the summer when labour work is scarce, collecting forest produce is an important source for daily food consumption-although over the years quantity of the produce they can get has reduced, and they ascribed this to both deforestation as well as change in rainfall pattern.

"Earlier we had to use ladder to get fruits from karvand trees, but these days the trees are very short, and we don't get as many fruits as we used to," – A Thakar woman from Bhagtachi wadi

These tribal communities are dependent for their survival on their natural resources, which are rapidly changing. On the other hand they are one of the most marginalized communities. Their dependence on natural resources, combined with their social, cultural and political marginalization make them more vulnerable to climate change.

Responses to climate change

As stated earlier the enquiry was more to understand the changes that have occurred in rural Maharashtra in the past 20 odd years with reference to natural resources. The responses pointed to how a combination of factors is responsible for the persistent drought and crop failure or the crisis in forestry and fisheries and livestock sectors and importantly on the health of humans and the environment. These factors included the changing climate – low and erratic rainfall, increased temperatures, sudden events of floods, hail storms etc; policies that have promoted unbridled misuse of resources and the increasing privatisation of resources leading to widening inequalities in access.

After hearing the detailed stories of the changes that have occurred as a result of climate change and misplaced policies and overall use and practices around natural resources we discussed the ways in which women have been responding to these changes. For many of them the immediate response was related to 'destiny'. "If there is no rain what can we do." However several actions are evident both from the labourers as well as agriculturists. Women farmers reported that depending on the rainfall they decide whether or not to sow cotton. A woman farmer in Padashingisaid "If there is less rainfall, we sow less cotton and increase rabi crops like green gram, Bengal gram"

To improve water security those who could afford have gone in for digging more wells or are going deeper in search of water, or constructing more farm ponds. However most often these have ended becoming rather unsustainable solutions and have only aggravated the water crisis and led to increased inequalities in access to water. Changes are also seen in terms of opting for mono-cropping instead of diverse multi crops or shifting from food crops to commodity crops or shifting from human labour to mechanised labour. These too have deepened inequalities and left a large number of small and marginal farmers as wage labourers with little or no control over their wages or their bodies.

Women farmers were at least not aware of any advisories regarding cropping patterns due to climate change. We asked them if the Krishi Vigyan Kendras had been approached to advise them regarding cropping considering that drought and increased temperatures is now the new normal. However women reported in the negative.

During the consultation at Wardha some important points regarding response to climate change were raised. An important point made was the need for multi cropping to include food grains like jowar and bajra. Niranjana Maru in the plenary session mentioned that depending on one cash crop in this situation is like putting all your eggs in one basket. She also emphasised the importance of traditional seed banks, and women's knowledge in mitigating climate change.

It emerged from throughout the plenary discussion that low input farming is the way to sustain agriculture in the changing climate. It will not only help avoiding indebtedness of farmers, but will also put a stop to environmentally unsustainable practices like use of herbicides and weedicides. Moving towards self sufficient and organic agriculture will be important in the future to deal with climate change.

Along with agriculture practices importance of planting trees was stressed. Investment in agro-forestry will be an important step in fighting against the effects of climate change. Agro-forestry experiment in Mizoram has shown that it can lead not only to environment sustainability but also to increase in income levels for farmers.

In conclusion the consultation in Wardha and the field studies done in Beed and Raigad districts of Marathwada and Konkan respectively bring out the impacts of a changing climate in the backdrop of rising inequalities and misplaced policies. Women farmers also highlighted how these impacts are

forcing them to resort to unsustainable practices in resource use. Yet the small ways in which they are countering the problem in sustainable ways needs to be seen and heard by policy makers.

The study thus clearly argues that solutions need to be sought from the people affected by such a crisis rather than providing technical fixes to the problem in isolation. Consultative process with women farmers and labourers should also move beyond understanding the impacts to understanding how they could become a part of the solution. In this context the recent recognition in the IPCC report of the indigenous communities as being part of the solution is a step in the right direction.

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