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RESEARCH PAPER

Community Perception and Adaptation about Climate Change in Trible Village of Madhya Pradesh

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ABSTRACT

Climate change is one of the most pressing global environmental challenges, with significant implications for food security, water supply, and ecosystems. In Madhya Pradesh, India, rising temperatures, erratic rainfall patterns, and shifting monsoon dynamics are affecting agriculture and water resources, exacerbating vulnerabilities in both rural and urban communities. This Paper examines the direct and indirect impacts of climate change on agriculture and water resources, and local ecosystems in Madhya Pradesh, focusing on the adaptation strategies employed by communities dependent on natural resources. We explore the role of indigenous knowledge in predicting seasonal weather patterns, which helps farmers adapt to changing climate conditions, such as drought or excessive rainfall. Additionally, we assess agricultural practices that have evolved over generations, such as the cultivation of drought resistant crops and crop diversification, which enhances resilience to climate variability. The paper also discusses the challenges faced by forest-dependent communities due to increased forest fires, water scarcity, and degradation of natural resources. Climate change adaptation is thus crucial at the local level, where community-based approaches, including the promotion of climate-resilient crops and sustainable water management are essential for mitigating the impacts. This study emphasizes the need for integrating traditional knowledge with scientific research and policy to foster a more resilient agricultural system and enhance community capacity to cope with climate change.

HIGHLIGHTS

- Agriculture in Madhya Pradesh is highly sensitive to climate change, affecting crop yields and food security.
- Shifting weather patterns create challenges like droughts and excessive rainfall, threatening productivity.
- Traditional knowledge helps farmers predict seasonal weather patterns, enabling better adaptation to climate fluctuations.
- Indigenous practices guide farmers in managing drought or heavy rainfall, thus enhancing resilience.

Keywords: Climate, temperatures, agriculture, water resources, weather, agricultural system

Climate change is one of the most important global environment challenges with implications for food production, water supply, drying up of lands due to loss of moisture. This can be defined as global warming with the change in distributional pattern of whether over different time periods that may rang to few year to several decades and hydrological cycle with resultant increase in precipitation. Rising global average temperature, increasing ocean temperature, erratic rainfall pattern and gradual

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melting of glaciers are the most prominent effects of climate change (UNFCCC, 2007). Atmospheric CO_2 concentration have increased from 280 to 378 ppm over the past 150 years and now crossed causing increase global temperature by 0.6 degree over 100 years.

Community perception about climate change plays a vital role as they are affected directly and living close to nature. The extent of perception varies from the better understanding of impact of climate change to the factor responsible for degree of impact of whether factors of a particular location and climate affects ecological, social, economic point of view. The observed impacts have made different perception in the community whose life and livelihood are dependent on sensitivity of natural resource and ecosystem services.

Climate change adaptation is in priority and is fundamentally about sound and resilient development tailored to local conditions and needs. Climate adaptation can broadly be defined as community based adaptation to tackle climate change by capturing the wealth of knowledge and capacity, which should empower people to plan for and to cope up with the impact of climate change (Reidplam *et al.* 2009).

India belongs to group of countries considering highly vulnerable to climate change with the projecting changing temperature rate of precipitation, increasing the likelihood of extreme whether event such as cyclones, droughts and more intense rainfall. India's population remain overwhelmingly depend upon climate sensitivity sector, such as agriculture, fishery, forestry, horticulture. Madhya Pradesh is the second largest state of Indian Union, being situated in the central part of the country. The state is bestowed with the huge area of dry deciduous forests having huge bio-diversity. The state has 95,922 sq.km of forests land, about 31 percent of the total geographical area. It constitutes 12.30% of the forest area of India. Legally this area has been classified into "Reserved Forest" (65.3%), "Protected Forest" (32.84%). Per capita forest area is 2,400 m^2 (0.59 acre) as against the national average of 700 m 2 (0.17 acre) (MPSDMA 2011). The total human population (as per the Census of 2011) is 72.6 million 7.26 crores, out of which 5.25 corer are located in the rural part of the state. During 2013-2014, MP has recorded 25 per cent growth in production. Climate variability is the challenge for community of state, general problems related to decline in soil fertility and ground water levels, climate related factors like droughts, and excess rainfall, frost and hailstorm are causing significant year-to-year variation in production and productivity. But in present scenario the productive is increase in most of the part of the state. Because of expansion in irrigation, farmer favorable policies, excellent market support/ procurement and finally efficient delivery of extension services. Wheat, rice, soybean and pulses are the major crops in the state. Madhya Pradesh has produced 193 lakh tons of wheat, 50 lakh tones of soybean and 69.59 lakh tons of rice in 2013-2014. Madhya Pradesh also produces nearly 50 lakh tones of pulses, of which Bengal gram and red gram are the most important (Rao, 2012). Average rainfall of the state is (1200 mm). The major categories of soils found in the state can be divided into 4 categories namely; alluvial, medium and deep black, shallow and medium black, mixed red and black (MPSDMA, 2011). The state of Madhya Pradesh has four major rivers namely Narmada, Tapti, Sone and Mahanadi Availability of water in the state is more than 81,000 million cubic meters out of which approximately 56,857 million cubic meters (MPSDMA, 2011). The most important crops are rice, wheat, sorghum (Jowar), corn (maize), pulses (legumes such as peas, beans, or lentils), and peanuts (groundnuts). Rice is grown principally in the east, where there is more rainfall, while in western Madhya Pradesh wheat and sorghum are more important. The state is the largest soybean producer in India.

Other crops include linseed, sesame, sugarcane, and cotton, as well as inferior millets (MPSDMA 2011). The state has largest tribal population in India, i.e. 122.35 lakh according to the Census 2011, which constitutes 20.27 percent of total state's population, comprising 46 Scheduled Tribes. Madhya Pradesh is the home of tribal population of about 40 percent of India's tribal population. The population of Madhya Pradesh constitute over 20% constitute over the tribe. Tribal are mainly concentrated in southern part of the state they live here for past many decades. There are three major distinct tribal groups in the state. The largest chunk is formed by Gonds, who once ruled a major part of the state and after whom Gondwana, the central portion of the state is known. Western Madhya Pradesh is

inhabited by the Bhils. Eastern Madhya Pradesh is dominated by the Gonds and Baigas. Most of the trials are traditionally forest dwellers and due to upcoming new forest laws and forest department regulation on forests, they try to shift selves as agrarian group. Government of Madhya Pradesh provides land rights in 1970 & 2000. Government provide the land for cultivation but our study area beneficiaries are very less they either don't have conquered his land or they give his land for other for cultivation. The frequency of drought is high in state most of the community involves in Bio-resource based livelihood. Therefore, vulnerability of community is high because bio-resources are impacted with climatic variability. Seven districts of state have been identified as chronic drought prone districts. The districts have been classified into highly drought prone, moderate drought prone and less drought prone, on the basis of the rainfall data, which has been referred during this state level analysis. The area of Bundelkhand is famous for frequent drought prone area (MPSDMA, 2011). Due to climate change tribe community of Madhya Pradesh is vulnerable because they stay and live in most of these area of state where impact of climate change or extreme whether event is high.

METHODOLOGY

This study principally based on primary data which we collected in different part of the state information regarding their perception about climate change .its impact on bioresource and livelihood of community and adaptation taken by community in different sector own or government intervention.

Descriptive statistics has been used to provide insights into community perception while Microsoft and Excel have been used to analyze the primary data.

Selection of Districts-District Alirajpur, Sagar, Datia according to (state action plan on climate change-2012) vulnerability index due to climate categorize and four categories — very high moderate, low - we select three district according to vulnerability index and different agro-climatic zone Alirajpur is most vulnerable Sagar is high and Datia is moderate so we select all three categories according to vulnerability.

Selection of village: the villages are selected in the following criteria:

(a) Geographical setting and topography;

(b) Percentage of farmer and forest dependent peoples;

(c) Erratic rainfall and temperature increase as per local metrological station;

(d) Migration of farmer outside the district or state.

Sampling: 10% household we selected on the basis purposive or random sampling with special focus on land holding, wealth, education, savings.

Climate indicator community perception PRA

Chaitra	Spring with pleasant atmosphere, later half little warm Dry and warm (wheat harvest complete) harvesting of crop wheat, flowering in *Buteamonosperma* tree, flowering in Madhucalongifolia tree
Baishakh	First half dry, second half hot dry and very hot, stormy weather, ripening of *Diospyrosmelanoxylon fruit*
Jeth	Hot Very, hot and dry, loo, stormy loo, sound of koyal is the indication of mango repining start falling of repining fruit of neem tree
Aashadh	Mango harvesting complete is the indication for staring paddy sown, Onset of monsoon, rain, dry, delayed monsoon (paddy sown), sowing of Cole crops seed in nursery, repining of jamun fruit, bamboo tree shuts are coming
Savan	Sound of frog is the indication of rain season, rain Very humid, less rain (late paddy sown in first half), transplanting of Cole crops in main field
Bhadaun	Total rainy days, celebration of Karma Puja, humid, early harvesting of Cole crops.
Kwar	Paddy harvest is the indicator for winter arrivals, potato sowing, field preparation for wheat sowing.
Kartik	Mostly clear weather, wheat sown and mustard sowing, celebration of Chatahpuja, showing of *kharif* crop
Agahan	Full boom of winter, potato harvesting
Paush	First half cold, second half very cold with fog, celebration of Makar Sankrati
Magh	Cold with occasional fog, very less rain, celebration of Sarhul puja, leaves fall from trees is the indication of spring season, fall out the leaves of tree, fruiting in mango tree, and fruiting in Buchananialanzan tree (chirongi)

Falgun	Less cold (wheat harvest start), flowering in Sal (*Shorea robusta*) plant, full boom of spring starts, I the last of falgun harvesting of masur and gram
Ritual	Climate indicator
Sharad	Clear sky no cloud, night is little cold, kash white flowers are coming, Wagtail birds are coming that indicate Saradritu are coming
Hemant	Early winter, harvesting of *kharif* crop, all fruits are leave the tree, fog are coming, leaves are falling
Shishira	Winter wild animal are active, fog on the atmosphere
Vasant	When it came to buds in Bago, they started fluttering in fields and pans! New cottons on the trees started coming out And in the courtyard, the goraya began to taste, Flowers of rose, marigold, sunflower, mustard etc. Butterflies and whirlpools hang on them zoom zoom, Old leaves fall out of the trees Gentle leaves begin to grow from them
Greeshma	Summer
Varsa	Rainy, caterpillar upcoming, earthworm are upcoming and frog are sound, Weaver ants are coming

Climate Change Adaptation by Community Perception

The impact of climate change on all Bio-resource like forests, agriculture, biodiversity and soil and water and also impact on human life and livelihood so community are adapt something to reduce the vulnerability due to climate change and government policy and program help in the adaptation.

Climate Change Adaptation in Farming Karta Village Sagar

Indicator	Yes	No	Don't know
Agro forestry	11.11%	70.37%	18.52%
Early showing of crop	51.85%	11.11%	48.14%
Showing dates decide due to Hindu calendar	88.88%	11.11%	0%
Showing digital help or metrological station or other help	0%	7.40%	92.6%
Climate resilient crop cultivate	7.40%	51.85%	40.7%
Water harvesting structure develop	25.9%	14.8%	59.25%
Late showing of crop	14.8%	44.4%	40.7%
Crop insurance	7.40%	22.22%	70.37%
Kisan credit card	25.9%	40.7%	33.33%
Drought tolerance crop verities showing	11.11%	44.4%	55.55%
Mix cropping or agro-forestry practices	33.33%	51.85%	14.8%
Pure organic cultivation	14.8%	81.48%	3.703%

Climate Change Adaptation in Farming Majera Village

Indicator	Yes	No	Don't know
Following Hindu calendar for showing	33.33%	8.33%	58.33%
Crop insurance scheme by government benefited	0%	41.66%	58.33%
Kisan credit card	8.33%	33.33%	58.33%
Metrological station help	8.33%	66.66%	25%
Agro forestry practices	0%	41.66%	58.33%
Climate resilience crop on farm land	16.66%	25%	58.33%
Mix cropping on farm land	25%	16.66%	58.33%
Water harvesting structure develop	16.66%	25%	58.33%
Late showing of crop	16.66%	25%	58.33%
Early showing of crop	16.66%	25%	58.33%

Sixty percent respondents of the village Majera is landless or agriculture labor. So impact on those respondent is very less, so they are silent on adaptation process. But in Karata village most of respondents are involved in agriculture as major livelihood. So impacts are observed in the Karta village. We put eleven indicators to analyze the adaptation by the community self or by the government policy. The adaptation towards climate change by the community is very less. The average of responses to all indicators in the community adaptation is 22%. So, we consider the average of those indicators is more than 22%. The accepted adaptation process is given below:

1. Early showing of crop
2. Showing dates decide due to Hindu calendar
3. Mix cropping on farm land

In Sager district less than 20% farmer have kisan credit card or less than 5% respondents have crop insurance. Less than 20% respondent has water-harvesting structures. So most of the farmers depend upon monsoon rainfall for cultivation and most of people are showing according to Hindu

calendar. No metrological help they take in showing or other farming process.

Adaptation in Farming Village Chowaya, Datia

Indicator	Yes	No	Don't know
Early showing of crop	30%	60%	10%
Late showing of crop	30%	60%	10%
Showing according to Hindu calendar	60%	30%	10%
Kisan credit card	20%	60%	20%
Crop insurance	0%	30%	70%
Mix cropping on farm land	30%	50%	20%
Agro forestry practices	10%	70%	20%
Rotational farming	20%	60%	20%
Ignore open bounding	20%	80%	0%
Kapil Dhara	20%	60%	20%

Adaptation in farming Sankuli, Datia

Indicator	Yes	No	Don't know
Early showing of crop	33.33%	0%	66.66%
Late showing of crop	33.33%	0%	66.66%
Showing according to Hindu calendar	33.33%	0%	66.66%
Kisan credit card	0%	33.33%	66.66%
Crop insurance	0%	33.33%	66.66%
Agro forestry practices	0%	33.33%	66.66%
Ignore Open bounding in farm land	11.11%	22.22%	66.66%
Kapil Dhara Yojana benefited	0%	0%	100%
Rotational farming practice	11.11%	22.22%	66.66%
Mix cropping on farm land	11.11%	22.22%	66.66%

Adaptation in farming Sankuli, Datia

Indicator	Yes	No	Don't know
Early showing of crop	33.33%	0%	66.66%
Late showing of crop	33.33%	0%	66.66%
Showing according to Hindu calendar	33.33%	0%	66.66%
Kisan credit card	0%	33.33%	66.66%
Crop insurance	0%	33.33%	66.66%
Agro forestry practices	0%	33.33%	66.66%
Ignore Open bounding in farm land	11.11%	22.22%	66.66%
Kapil Dhara Yojana benefited	0%	0%	100%
Rotational farming practice	11.11%	22.22%	66.66%
Mix cropping on farm land	11.11%	22.22%	66.66%

More than 65% respondents in the Sankuli village are landless. So adaptation in agriculture is very less. Most of the respondents' answer "don't know" in the overall adaptation by the community of Datia district in agriculture is very less (21%). Most of respondents says that they are doing self-adaptation due to climate change. They change his crop cycle or showing dates. Government adaptation is very less on this area only. 10% respondent have Kisan credit card, no one have crop insurance and less than 20% respondent have water harvesting in farm land or Kapil Dhara scheme well or Babdi. Less than 10% respondent is doing agro forestry or less than 20% doing mix cropping or rotational farming to analyses the adaptation we take ten indicator and the average of all indicators is 21%. We consider that average of those indicators is more than 21%. We consider that indicators help the community

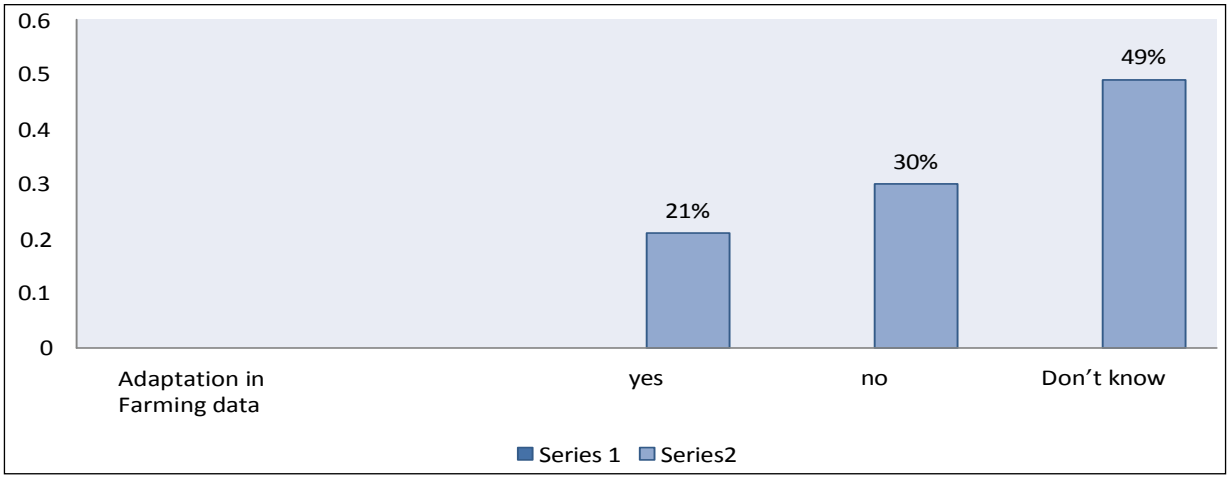

Fig. 1

adaptation about climate change on agriculture these are given below:

1. Early showing of crop
2. Late showing of crop
3. Showing according to Hindu calendar

Adaptation in Farming by Community of Dehri Village, Alirajpur

Indicator	Yes	No	Don't know
Early showing of crop	37.5%	37.5%	25%
Late showing of crop	37.5%	37.5%	25%
Showing according to Hindu calendar	56.25%	18.75%	25%
Kisan credit card	18.75%	56.25%	25%
Crop insurance	0%	75%	25%
Agro forestry practices	25%	50%	25%
Kapil Dhara Yojna benefited	18.75%	6.25%	75%
Rotational farming practice	50%	25%	25%
Mix cropping or climate resilience crop	56.25%	18.75%	25%

Adaptation in farming community of Poya village, Alirajpur

Indicator	Yes	No	Don't know
Mix cropping in farm land	38.46%	30.7%	30.46%
Early showing of crop	30.7%	38.46%	30.46%
Late showing of crop	30.7%	38.46%	38.46%
Showing according to Hindu calendar	30.7%	38.46%	38.46%
Kisan credit card	15.3%	53.8%	38.46%
Crop insurance	0%	69.4%	38.46%
Agro forestry practices	38.46%	30.7%	38.46%
Kapil Dhara Yojana benefited	15.3%	53.8%	30.7%

Twenty percent of the respondents in Dehri village or more than 30% respondent in Poya village is landless. They are either agriculture labor or doing other labor work, so they are silent on adaptation process in farming the adaptation in farming by community of Alirajpur is 29% more than sager and Datia district self-adaptation by community is high. To analyze the adaptation in farming in Alirajpur, we put nine indicators and take response of community. Community responding that out of nine indicator five indicator, which they are effectively, adapt these indicators 'individual average is more than the total average of all indicator these are given below:

1. Mix cropping or climate resilience crop
2. Early showing of crop
3. Late showing of crop
4. Showing according to Hindu calendar
5. Agro forestry practices

Climate Change Adaptation by Community in Soil and Water Sector Karta Village, Sagar

Indicator	Yes	No	Don't know
Zero tillage on farm land	0%	7.40%	92.59%
Meadbandi in farm land	55.55%	40.7%	14.8%
Well or Babdi on farm land	25.9%	62.9%	11.11%
Pond or canal benefited for soil	51.85%	22.22%	25.9%
Pre showing seed treatment	3.7%	88.88%	7.4%
Farm pond on farm land	3.7%	51.85%	44.4%
Organic fertilizer or pesticide use	7.40%	85.18%	7.40%
Showing tradinal seed verities with mix farming	33.33%	14.8%	55.55%

More than 60% respondents of the village Majera village is landless. So they did not make any response about adaptation process, either self adaptation or government intervention. Both are not so effective in Sagar district. Most of the farmer is doing mono-cropping and inorganic fertilizer and pesticide. Less than 10% respondents doing organic farming, marker dependency for seed, pesticides or urea is very high. So investment in farming is very high and less than 10% farmer has kisan credit cards or crop insurance. Less than 10% farmer has soil health card or regular testing of soil. Less than 20% farmer have farm pond or well on farm and less than 35% farmer doing Medbandi on farm land. For analyses of adaptation in soil and water sector we put nine indicators and take response of community. The average of response about adaptation of all nine indicators is 17%. we take effective indicator which community adapt either self or government is more than the average of total indicator. These are given below:

1. Meadbandi on farm land
2. Pond or canal benefited in farming

3. Showing tradinal seed verities
4. Well or Babdi on farm land

Less than 15% are doing mix cropping. Less than 30% doing Medbandi on farm land we put ten indicators for taking responses of community adaptation on soil and water sector. The average of all indicator is only 10% that is very least and 59% not aware of adaptation either they are landless or not know about impact of climate change or cause of these change. The average of four indicators is more than the total average of all indicators. These areas are as follows:

1. Organic fertilizer and pesticides use
2. Well or Babdi on farm land by government scheme
3. Farm pond or canal, river benefited on soil
4. Mix cropping for soil health

To analyses the adaptation in livelihood by the community due to climate change the migration of community towards the metro city or they adapt non-Bioresource based livelihood where climatic factor work very less in the district of Alirajpur migration. Rate is high due to climate change with respect to Sagar and Datia, government policy for livelihood is very less. Most of community to adapt migration today as adaptation in Alirajpur we put seven indicator. Out of these, three is effectively adapt by community these are given below:

1. Shifting livelihood due to climate change
2. Adapt alternative livelihood or new livelihood
3. Migration for livelihood other area more than 4 months

RESULTS AND ANALYSIS

Climate Change Community Perception

The impact of climate change varies from district to district. Our study in different agro-climatic zone shows that the impact of climate change is most in Alirajpur district, because average of all indicators is very high in Alirajpur. It is approximately 48%. Sagar have moderate and Datia have least impact. In all three different agro climatic zones community are commonly agree on some indicators, which we put for take precipitation. These are that temperature is increasing and number of rainy days is decreasing. Dry spell is going long, late onset of monsoon, uneven distribution of rain and drought frequency is increase. Due to impact on these indicator Bio-resources are affected or impacted and Bio-resource is the source of life and livelihood of community.

Impact of Climate Change in Forest and it's Produced

As we see that due to climate change cause of temperature increase and change in rainfall pattern and its frequency so that will be also impact on forest and its produced. Different climatic zone forest type may be change and forest cover is different. However, impact of climate change seen in all type of forest in study area. The flowering and fruiting of some species is changed due to high heat and rainfall pattern changed. Early flowering and fruiting is common according to traditional calendars of India by community observation. Impact seen on forest alien species is gradually increased due to dryness increase. Germination percentage of alien species gradually increases due to high heat wave make favorable climate for them. Germination of native species is decreased because of high heat wave new plant have not favorable environment for germination. Because of new climatic condition is favorable for some specific plant species. The climate change is make favorable condition for forest fire because high dryness is favorable condition or cause of forest fire. And quantity of mushroom and other forest produced are impacted because these all are directly linked with climatic factors. The more impact of climatic factor on forest of Sager district due to high dryness and less dry decades forest with less canopy the average of all indicator is high in Sagar. So forest fire is common in summers this reason. And least impact on Alirajpur because this area is rich in natural resource and average of all indicators is less.

Impact of Climate Change on Farming

Madhya Pradesh have different agro-climatic zone high crop diversity. But due to climate change and high heat wave and new rainfall pattern or other effective indicator make favorable condition for some specific crop. Because they need high heat for ripen and fruiting like Arhar, urad or mung sustain in less water or new climatic condition is favorable for Jwar, Bajra like climate resilient crops.

Otherwise, some crop is vulnerable due to climate change because of unpredictable rainfall, change in soil organic contains, and soil fertility .some crop verities are vulnerable like soyabeen. Most of agrarian community in all climate zone respondents didn't have crop insurance and kisan credit card and connectivity with market and *Mandi*. So they sell his crop in very lower rate. Some community people are landless so they have no response the impact of climate change on agriculture. The most of the agrarian community respond that due to climate change crop yield decreases. Most impact of climate change seen in Alirajpur because average of all indicator is highland moderate in Sagar district and least in Datia.

Climate Change Impact on Water Resource

Climatic factor directly impacted the water resource. Most of community of all three agro-climatic zone response that due to climate change water level is well impacted and pond is dry up early in the summers. The impact is seen on the ground water recharge and ground water level the clearest impact is seen on the water body of Sagar they are impacted heavily. And Alirajpur and Datia also have clear respond that due to climate change water scarcity increase in summers and water-body is going dry up early in summer with respect to past. The impact of climate changes on water resource same in Alirajpur and Sagar because average of all indicators is same in both district and least in Datia district.

Climate change impact on biodiversity

Climate indicator is directly linked with bio-resource and its diversity. Therefore, they are sensitive towards this change. Most of respondent of all district agree that agro-biodiversity of different agro-climatic zone are different. But due to new climate condition, high- heat is favorable for some specific crop so farmer going towards the mono cropping. Climate change has also impact on migration of pollinator and impacted the diversity of pollinator. Most of the respondents on all three districts agree that due to change invensive alien species increase and soil microbial contain decrease because of new rainfall pattern. The impact of climate change on biodiversity is high in Alirajpur average of all indicator is high in Alirajpur district and least in Datia because average in Datia least.

Climate change impact on livelihood

Climate change is cause of high migration. Because of this impact on Bioresource based livelihood so impact on high on those agro-climatic zone where Bioresource is low. The migration rate in Sagar and Alirajpur is high because either people are involving Bioresource based livelihood or low adaptive capacity. The impact is directly seen on rural economy, which is directly impacted due to climate change. Most of community of all three agro climate zone respond that they try to shift him non Bio resource based livelihood. The clear of impact highest in Datia district because average of all indicator is high in Datia and least in Sagar because average in Sagar is least.

Vulnerability Due to Climate Change

Vulnerability due to climate change is different in different agro-climatic zone. Area of Bundelkhand like Sagar where Bioresource is very less and per capita resource distribution is very less so it is higher vulnerable. More than 45% community respond in Sagar that due to climate change every sector of life and livelihood is vulnerable. Alirajpur is moderate vulnerable due to climate change because Alirajpur have high resource and high impact. Datia is the least vulnerable because high adoptive capacity land holding and adoptive capacity play a burst roll in this area to reduce the vulnerability. Because more than 60% community are agrarian due to climate change migration and shifting of livelihood towards non-Bioresource based livelihood is common in all agro climatic zone.

Adaptation in Different Sector Due to Climate Change

Adaptation in farming due to climate change: Farming is the major livelihood of the community of study area. Most of the farmer take one crop and migrate other livelihood either city or doing work as agriculture labor. Adaptation in farming is showing climate resilience crop or new seed verities which less time taking or mono-cropping or crop which favorable new whether condition in all district but these type of respondent is very few. Most of the farming community takes his own adaptation most of Farming community change his sawing dates and doing mix cropping in farm land.

Some community person takes diction of farming according to Hindu Nakshatra Vigyan which is more help people in farming. But due to climate change somehow it change. Adaptation in farming is high by community of Alirajpur because average of all indicators is high in Alirajpur moderate in Sagar and least in the Datia district.

Adaptation in livelihood sector: Due to climate change community adapt own or government intervention help in adaptation process for livelihood. Most of community adapts and they shift him as non Bioresource based livelihood to adapt alternative livelihood. Adaptation in livelihood is higher in Alirajpur because average of all indicator high in Alirajpur moderate in Sagar than least in Datia district.

Adaptation in soil water sector: Due to impact of climate change on water sector is most vulnerable. Community is responding in all three agro-climatic zone the scarcity of water is increasing with respect to past. Government policy play a burst roll on this adaptation practice and the adaptation is seen well by the help of government policy in Sagar district. Like farm pond, Kapil Dhara scheme and other watershed development program help to increase community adoptive capacity and reduce vulnerability. But beneficiary of this program is very less. So people are doing self-adaptation common pond is seen well in Sagar but Alirajpur and Datia have scarcity of water seen in summer. Most the farmer are doing inorganic cultivation and doing over use of pesticide, which harm the soil quality and cause of climate change. Adaptation in Sagar is high because average of all indicators is high in Sagar modrate in alirajpur and least in Datia.

CONCLUSION

Climate change is the global phenomena. That cause of increasing temperature, decreasing number of rainy days, long dry spell and high heat wave, uneven distribution of rain, late onset of monsoon and incident of drought increase, which affected life and livelihood of community. In addition, impact of climate change is observed in soil health and farming & forestry, and water resource.

Madhya Pradesh is India's second largest state by area, with undulating topography and diverse physiography State is drained by rain-fed rivers and receives 1160 mm average rainfall annually and the state is rich with bio-diversity, vast forest cover and plenty of mineral wealth. Seventy percent of the rural population of state is engaged in agriculture and allied activities covering agriculture with predominantly agrarian economy.

In this study the impact factors have been analyzed on the basis of the following objectives:

1. To study community's perceptions in the climate change

Based on the community's perception, the impact of climate change is well observed in erratic rainfall, temperature increase, frequency of rainy days and long dry spell, late onset of monsoon, hot winter. They also revealed their perception in connection in the other indicators as Incidents of forest fire increase, natural regeneration in the forest, quantity of mushroom, quantity of NTFP, new or alien species in the forest, and early flowering and fruiting. Germination percentage of alien species gradually increases due to high heat wave make favorable climate for them. Germination of native species is decreased because of high heat wave new plant have not favorable environment for germination.

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