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Alterations Among Few of Varhadi Flora and Fauna Against Ever-Changing, Unpredicted Regional Climate

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ABSTRACT

Alterations in the rainfall pattern, temperature and other weather conditions etc; are witnessed in the *Varhad* region, that has been accelerated during last 2-3 decades resulting into a dramatic paradigm shift in its climate. This has affected the cropping pattern and its adaptability, resulted into extinction of the few animal species, weather vulnerability and reform in microbial communities. As its consequence, there have been several losses in the few of local crop varieties, fauna and flora. The possible reasons for such unawareness about the climatic change in this particular region have been suggested. Overall, in this free lance commentary, few visual experiences and recordable observations of *Varhadi* flora and fauna against changing regional climate have been discussed.

Key words: Climate change, *Varhad*, weather vulnerability

THE ARTICLE

North-eastern region of the Maharashtra state and central parts of India i.e. *Vidarbha* and *Khandesh* majorly covers the areas of *Wardha*, *Kanhan*, *Wainganga* and *Tapi-Purna* river basins, respectively and forest covers with the soils of alluvial to black cotton type that have poor to appropriate fertilization capacity (Phirke *et al*., 2010). The *Vidarbha* further constitutes of the area of *Varhad* and *Zadipatti*. The *Varhad* region also has the Sant Gadge Baba Amravati University's (SGBAU) jurisdiction prevailing over the parts of this region constituting five districts including *Amravati* (a revenue divisional government head quarter), *Akola*, *Buldhana*, *Washim* and *Yavatmal*.

This region is traversed at the middle by the National Highway No. 6 (NH-6) starting from *Dhule* up to *Gondia* and offers the shelter, food, protection and geography to the human inhabitants that belongs to various ethnicities, races, communities, faiths and tribes and use and exploit the available natural resources for their livelihood. Among the non-human inhabitants, it includes several plant species including naturally grown vegetation, agriculture and forests; animal species including domestic livestock, wild and native genera and microbial communities that have made these eco-systems sustainable through their contribution in biogeo-chemical cycling of all required vital elements.

This has resulted in the multifaceted ecological interactions of all these inhabitants with the biotic and abiotic factors of the regional environment. This region has participated successfully in national population increase as well as green and white revolutions and also, enjoyed its socio-economic benefits. Increase in human population per unit area per unit time has reduced the equal and justified use of natural resources specifically air, water and land for generating food and space for activities. This has forced several people to seek professional alternatives. Many have tried to increase the availability of land by successive deforestation and removing the cover of vegetation for cultivation, construction and industry.

The greed towards the continuous power generation and consumption for increase in the overall standard of living and transportation; lead to the pollution through fuel consumption. Therefore, human activity was among the major biotic factor that makes the impact on the ever changing environment of the region that is contributed to the national and global levels. Among the notable feature of pollution is the steady rise in the gaseous inorganic carbon emission (CO_2) with the least ways for its recycling back into organic biomass (Aggarwal, 2008).

On this background, this region is witnessing the change in its climate especially intolerable temperature rise since last two decades during different seasons like monsoon,

winter and summer. This change is further affecting the environmental conditions like relative humidity, water availability, drought and heavy rains etc. causing alterations in the hydrological cycles, making the region's agro-based economy unequal, bias and unsustainable for all levels.

Cumulatively, this led to depletion of overall pleasant climate for maintaining the sustainable standards of inhabitation for the people of the region. Therefore, the study and execution of this project would have been limited to the area under north-eastern Maharashtra.

The following is the brief background of the topic and a review of exhaustive literature for the study. Only selected information that was easily grasped and comprehended by the investigator and considered needful to emphasise the significance of this topic has been included herewith. Thus, it is merely representative and not the complete. Hence, simple and easily comprehensible issues are discussed herewith.

The author approaching his forties is native to the north-east Maharashtra region and has traveled vigorously to know the climate and geography of this region called *Varhad* (under *Wardha*, *Kanhan* and *Wainganga* river basins), *Khandesh* (under *Tapi-Purna* river basins) and *Marathwada* (under *Godavari* basin). Since his childhood, he has observed the drastic and dramatic changes in the paradigm of the surrounding climate and the environment of these regions. The major are from the agriculture, forestry, wildlife, livestock and sociology. Also, he has read from the history of the region and recorded few of the folklores and stories from aged, learned, respected leaders of the various societies about the past climate, environment and sociology of the region.

The brain-storming discussions with the farmers, peasants, multidisciplinary faculty members and scientists, traders, entrepreneurs, wildlife workers, NGOs, GOs, politicians and policy makers about the several observations he/they had in the habitats while deriving their livelihood, residing in the region and working in the surrounding environment revealed the following few of the eye-opening examples particularly from these regions.

1. *Past memories of then developing farmers*: The oldest people almost disappeared from the life, told about cultivation of the sugarcane as a major cash crop upto 1920 in whole *Varhad* or *Vidarbha* that has been almost abandoned later on largely due to gradual changes in climatic conditions. Other crops such as brinjals (*Solanum melongena*), chillies (*Capsicum annuum*), tomato (*Solanum lycopersium*), onion (*Allium sepa*), garlic (*Zingiber officinale*) and other vegetable and fruit crops like berries (*Zyziphus jojoba*), bananas (*Musa paradisiaca*), oranges (*Citrus sinesis*), sweet lime (*Citrus aurantifolia*), lemons (*Citrus limon*), papaya (*Carica papaya*) etc. also suffered losses. The yield losses are huge for this region where temperatures are already high for last 3-4 decades (Phirke *et al*., 2003 and 2010).

2. *Visual observations among oilseeds*: The North-eastern Maharashtrian farmers adopted the cultivation and oil extraction of sunflower (*Helianthus spp.)* during nineties that has been completely abandoned now due to reduced yield of the crop for weather reasons. The *Varhad* cultivated safflower on large scale for oil extraction, which is fighting for maintaining its threshold limits for the possible extinction from the region. The groundnut which was a major oil seed crop in the stated region, finds no place now a days. Last two decades have completely covered the whole arid districts of north eastern Maharashtra by soybean as a major short term *rabbi* oil seed crop as this region favored the maximal productivity of soybean, possibly due to the reason that soybean production reciprocates with the rise in the surrounding concentration of assimilable CO_2 (Lal *et al*., 1999 and Mall *et al*., 2004).

3. *Experiences in cereals*: The local varieties called *gavran* (literally meaning country) of sorghum (*Sorghum bicolor*) like *Savner* (Brown colored grains); *Amner* or *Amalner* (yellow colored grains) and that with white grains are totally extinct now. Those are replaced completely by the introduced hybrid varieties of jowar. The grain yield of sorghum lowers during winter than in monsoon in this sorghum producing regions. The sweet sorghum variety *wani*, which offered best quality *hurda* (sweet grains those can be roasted to enjoy as party snacks) and sweet stubble juice; struggles hard to maintain its existence in the regional ecosystem (Srivastava *et al*., 2010). *Varhadi* and *Khandeshi*

farmers have observed and experienced that an increase of winter temperature from normal decreased wheat grain yield. Wheat (*Tritium aestivum*) is a major preferred *kharip* cereal in north eastern Maharashtra, requiring severe colds during its early growth stages for targeted productivity, is genuinely affected by intra-seasonal temperature variation. If any winter does not (i) begin on time, (ii) drop temperatures considerably down and (iii) elongate to the regular periods adequately; the growth of wheat crop is adversely affected lowering the potential yield that was hoped for. This observation of the regional peasants matches with that of simulation study made by Prabhjyot-Kaur *et al.*, 2007.

4. *The extinction of friendly,* *aesthetic and wild animals*: The zoological fauna of vultures (*Gyps indicus*) [natural scavengers], centipedes (*Scutigera coleoptrata*), black and yellow scorpions (*Pandius imperater*), house sparrows (*Passer domesticus*), parakeets (*Psittacula kvameri*), crows (*Coruus corone*) all these regular visitors to domestic, rural and urban premises have vanished in the last thirty years (Houghton *at al*., 1996; IPCC, 2007a, b). The new species of birds that weren't witnessed before 10 years started regularly visiting domestic premises, now.

5. *The influence on our routine microbiological laboratory work*: The scientifically planned biological experiments are failing to provide the logically anticipated observations for the psychrophillic and mesophillic organisms due to considerable increase in ambient temperature, dryness and wind velocities, making results more ambiguous and R & D efforts futile. Contamination of thermophiles in mesophillic and mesophiles in psychrophillic microbial experiments is common now-a-days in our microbiological laboratories. To remove such suspects from research, the use of tailored skill, power and cost-intensive sophisticated instrumentation become unavoidable to conduct accurate experimentation under temperature and humidity controlled dust-proof laboratory conditions.

6. *The weather vulnerability*: Citizens are experiencing extremes of temperature. After the mid of February, people can not move outside due to intolerable heat affecting the trade, work during summer and farmers has to wait till July and August for the emergence of Monsoon. The vulnerability is increasing day-wise due to sudden, speedy and abrupt climatic changes compounded with various socio-economic troubles including poverty, ignorance and heterogeneity in society. A rise in the temperature also has a significant effect on the quality of cotton, fruits, vegetables, aromatic and medicinal plants. The nutritional quality of cereals and pulses are moderately affected which subsequently will have consequences for nutritional security of our developing country where cereals are the primary diet. Economically and socially disadvantaged sections of the society are the prime preys for such kind of damages as those don't have quality food, clothes and shelter to manage with changes in the habitats.

While watching this paradigm shift, the scientific temperament bestowed upon investigator through ongoing continuous education and research always created several questions in his mind about the various reasons that might be prevailing behind the climate change especially change in rainfall pattern, temperature, air and water pollution, compounded with enormous deforestation, over exploitation of natural resources including the deterioration of soil fertility.

The lack of knowledge, unawareness towards the climatic and interdisciplinary approach, lukewarm attitude of the teaching and research faculties from state and regional universities and institutes towards introducing the concepts of green house effect, global warming and newer research methodologies related to green house gaseous analysis and microbial production of atmospheric trace gases apart from other anthopogenically induced green house gas emission etc. are among the fewer, but significant reasons for the fact, why this area of the study is not strengthened especially in Maharashtra and this region.

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