ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

ENVIRONMENTAL TRANSFORMATION AND POLICIES AROUND THE WORLD – ANANALYSIS

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ABSTRACT

In contemporary times, the environmental crisis has become an area of great concern around theworld.Environmentaldeteriorationposesathreattohumanhealth,theecosystem,naturalresources, and the overall planetary wellbeing. This article aims to shed light on the manner inwhich the global food system plays a serious and consequential role in degrading the environment.An in-depth factual analysis has beendoneto understand the effectsandcarbon footprintofdifferent dietary patterns on the environment. In addition to that, the important focus has been onstudyingandunderstandingtheroleofgovernments,internationalbodiesandseveralotherindependent organizations incurating policies, programs and other similar strategies to addressthe problem and use the very challenge as a potential strategy to protect the ecosystem. The studyreveals that a plant-based diet stands sustainable in the long term and can help in mitigating thecarbon footprint of the food system. The research concludes by an observationthat countriesaround the world have begun focusing on inculcating sustainable food policies as an importantmeasure to combat global warming. The policies have proved to be effective and successful inachievingthedesired goals.

KeyWords:Governance,Agriculture,Footprint,Sustainable,Food,Diet,Ecology.

I. Introduction

The pattern in which the world is consuming food today is changing rapidly. Western dietpattern is becoming more and more popular amongst the growing population especially indeveloping countries, with international famous fast-food giants setting up franchises all aroundthe world and the import and export of foreign food products bringing global cuisines under theroof of a single supermarket or a high-end restaurant, similar demands are being made from thefood sector accordingly. This,in turn, has also affected the way policies are designed keepinginmindthechangingfoodconsumptionpatternandthemodus operandiofits production.

Food production, like any other activity, requires various kinds of resources like land, water,fossil energy, different kinds of production methods that affect the environment. Gradual andregular improvements in technologies have also led to a dramatic increase in the output ofmodern agriculture and thus the environmental impact of the production and consumption ofdifferent varieties of food has also increased. However, it is imperative to note that not all kindsof food products use the resources equally or affect the environment in the same manner. Itsignificantly varies from diet to diet. Some food items may have nearly negligible impact andsome mayaffect the environment tothe extent that it begins destroying the eco-system. Withthe human population expected to grow up to almost 30% by 2050 i.e. from 7 billion to 9.8billion as estimated by the United Nations Department of Economic and Social Affairs, humanswill have more stomachs to feed and needs to cater to. This implies an increase in demand formore food products, especially of animal products, including animal flesh and milk, and cropsthat will have to be fulfilled by the suppliers.The relation of climate change and greenhousegas emissions (GHGEs) with food production has already begun to become a point of interestwith the growing awareness. Present-day system of food production, especially the agriculturesector,hasanimmenselyunsustainableeffectontheenvironment.Theuseofdifferentnatural

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resources especially to raise livestock and to grow their feed crops is increasing the degradationoftheenvironmenton daily basis.

For this reason, it is crucial to find ways through which humans can feed the current as well asfuturegenerationinasustainablemannerbymitigatingtheadverseeffectsoftheenvironmentalfootprintofthecurrentglobalfoodsystem.Itisbecomingtheneedofthehourto move towards an environment friendly food system and adopt sustainable dietary patterns.Sustainable diets are those diets with low environmental impacts which contribute to food andnutrition security and to healthy life for present and future generations. Sustainable diets areprotective andrespectful of biodiversity andecosystems, culturallyacceptable,accessible,economically fair and affordable; nutritionally adequate, safe and healthy; while optimizingnaturaland human resources(FAO, 2010).

Hence the major perspective is to understand the role played by the agriculture and livestocksectorinescalatingtheglobalwarmingandtheroleplayedbygovernmentsallovertheworldin addressingtheissueandcontainingthesamethroughrequisitepolicies andregulations.

II. ResearchMethodology,DataCollectionandReviewofLiterature

Lappé (2010) has talked about the linkage of animal agriculture with climate change andhighlightsthefactsaboutthewayfoodsystemturnsouttobeasignificantcauseofenvironmental degradation which have been left unnoticed and most of the times ignored. Thisis mostly due to the lack of awareness and the dominant mainstream rhetoric about fossil fuels,transportation, and urbanization in relation to environmental pollution. She also talks about therelevance of the global food system that can prove to be a helpful tool in containing the effectsofanimalagricultureontheplanetanditsresourcesthroughadequatepolicies.

Ladner (2015) was of the opinion that dependency upon the industrialized agriculture hascaused an imbalance in food supply with exorbitant environmental and economic cost. Hedescribes the way the problems can be mitigated through the sustainable food policy and cityplanning.Hehasprovidedwiththesolutionstoattaintheobjectiveofsustainablefoodproduction and distribution which will naturally make the cities safer and more beautiful alongwitheconomicbenefits.

Foer (2009)lays emphasis on the new generation that is becoming a part of industrializedworld and why consuming animals would be a significant and different issue for them now ascompared to what it meant for the generations years back. He has thrown light on the lack oftransparency on the part of meat industries in the modern world and the reasons for the cons ofeating animals outweighing the pros of the same. He concludes by saying that consuminganimals that are industrially and factory farmed is bad for the environment as well as humansandnon-humansalike.

Carolan (2013) throws light on way the production of seemingly cheap food such as fast foodin reality proves to be a huge burden and costs a lot to the environment with special emphasisonthemeatproductionandconsumption,astheyprovetobeanineefficientuseofenvironmentalresourcesandasignificantcauseofclimatechange.

By analyzing the above reviews of literature, it can be inferred that although the awarenesspertaining to the role of global food system and food production in accelerating squandering

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ofthenaturalresourcesandthewarmingupoftheplanetemergesasanewconceptandunderstanding for the majority population, it has not gone completely unnoticed. Scientists,researchers,sociologists,ecologistsandpeople fromsimilarbackgroundshave,time andagain,examinedtheevolutionoffoodconsumption,globalizationoffoodcultureandmostimporta ntly, contribution of food production system to ecological imbalance. They have alsotriedtoprovidesolutions tomitigatethecarbonfootprintoffoodproductionandconsumption.

Thispaper ismainly factual,analytical and descriptive in nature. Through thispaper,anattempthasbeenmadetounderstandtherelationshipbetweenenvironmentandfoodprodu ctionandthewayinwhichfoodsectorcanbeutilizedasascopeformitigatingenvironmental challenges. The data used in this paper is from secondary sources as per therequirements of thestudy.

a) DietaryLifestylesandtheEnvironment:AnAnalysis

Theanalysisoftheimpactofdifferentdietarylifestyleswillbedonebysystematicevaluation of the environmental footprint of non-vegetarian diet, lacto-ovo-vegetarian dietandvegan dietoneby one.

b) EnvironmentalImpactofaNon-Vegetarian Diet

In relation to the carbon footprint, the production of red meat roughly generates 23% ofagriculture-relatedgreenhousegasemissions(Moreira,2018).Globally,ithasbeenestimated that livestock is responsible for generating dangerously high amounts of methaneemissions, a gas which is more toxic and deleterious to the environment than carbondioxide. This output is especially dominated by beef production. According to one study, itwas estimated that meat and dairy production processes account for 80% of all GHGEsfrom the food sector and 24% of total GHGEs (Bradbury, 2014). A study from Indiaindicates that production of mutton and animal milk contribute up to 23% and 35% of totallocal agricultural greenhouse gas emissions, while all other food production combinedcontribute 16% of it (Joy, 2018). Globally, animal agriculture (production of all animal-derivedproducts)is responsiblefor18%oftotalgreenhousegas emissions(FAO,2006).

AnimalAgricultureisalsoresponsibleforcausingwaterdepletionandwatershortage.27%ofthe world'sfreshwaterisusedfor the productionofanimal products(MekonnenandHoekstra,2011).Morewaterisusedformeat(animalprotein)productionth anitisneededforplantproteinproduction.Onekilogramofplant-basedproteinrequiresroughly100times lesswaterthan onekilogramofanimal-basedprotein (Cleveland,2017).

Taking into consideration the Amazon Rainforest Fires in Brazil (2019), it was observedthat the fires were deliberately started to clear land and to make room for cattle ranchingandproductionoffeedcrops.Examplelikethisthrowlightontheseverityoftheenvironme ntaldestruction causedby theproductionof meat.

c) EnvironmentalImpactofaLacto-Ovo-VegetarianDiet

Whencomparedtoanon-vegetariandiet,lacto-ovo-vegetariandiethascomparativelysmaller carbon footprint. However, the production of dairy and eggs, globally, pose aserious threat to methane emissions, water consumption and land required. Globally dairyoperations are most likely to consume a large quantity of water throughout the severalactivities involved in the production of dairy milk and other dairy products. They are alsoresponsible forpolluting water resourcesdue to manure, fertilizer and fecesrunofffromthe dairy farms. The Food and Agriculture Organization (FAO) of the United Nationspredicts that, in India,

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"increase in demand for dairy products will put increasing pressureon dairy production systems; traditional breeds and feeding practices are likely to give waytohigher-yieldingbreeds,associatedintensificationofproductionsystems,increaseddiseaserisks,pollution andanimalhealthissues,andagreaterrelianceon(feed)concentrates."

Egg production, on the other hand, affects water and land toxicity. It is mainly associatedwithemissionofgreenhousegasesandcontaminationofsoilandwater.Themanufacturingofthematerialusedinthepackagingofeggsmightalsoharmtheenvironment.

d) EnvironmentalImpactofaVegan Diet

A vegan diet is the one which is 100% plant based – does not even include animal milk - which forms a major part of a vegetarian diet which is, more often than not, confused asbeing similar to a vegan diet. A vegan diet contains no product that is derived from ananimal.

When compared to any type of non-vegan dietary lifestyle, a vegan diet proved to be themost environmentally sound, sustainable and friendly. This is because far less amount ofland, water, energy and other resources are required to produce vegetables, fruits, nuts,seeds, and other grainsand crops when they are directly being consumed by humansinstead of being fed to animals who are then slaughtered for human consumption, hencecausing a highly inefficient way of the transfer of energy. Eating plant-based food directlyconverts solar energy to food energy.

University of Oxford study (Poore, 2018) found thatnot eating meat and dairy productscan cut back a person's carbon footprint by up to 73%. According to the United NationsEnvironment Program report, "Assessing the Environmental Impacts of Consumption andProduction", a global shift towards a plant-based diet is imperative in mitigating the worsteffects of climatechangeon theplanet.

III. Objectiveofthestudy

- Whichtypeofdietprovestobethemostenvironment-friendlyandsustainableamongstall?
- Tostudytheroleofglobalfoodsysteminthecurrentenvironmentalcrisis.
- Tounderstandtheproductionsystemandcarbonfootprintofdifferentdietpatterns.
- Toexaminethepositionandworksofgovernmentsandinternationalorganizationspertainingto therelationship betweenenvironmentand dietarypatterns.
- To analyze the policies and regulations formed and adopted by governments, independentbodies, NGOs, and different other institutions to address the problem and to bring about asustainablechange.
- What steps have been taken by the governments, international organizations and/or NGOsand other independent bodies in tackling with the growing concern about the unsustainableglobalfood system?

IV. Hypothesis:

- A vegan diet that is free from any animal-derived product and is 100% plant-based has theleast amount of carbon footprint, minimal resource utilization and is the most sustainabledietamongstall.
- TheNGOsaswellasInternationalOrganizationshaveplayedasignificanceroleinsustaining,global food system.
- Many steps have been taken by the national and international organizations to ensuresustainabilityof environmentalfriendlydietary system.

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

V. DiscussionandAnalysis:

PoliciesrelatedtoDietandEnvironmentandevidencesaroundtheworld

Inregardtotheregulationsandpoliciesaddressingdiet andenvironmentthat have beenformulated and implemented, NGOs, independent bodies and institutions come to the forefrontthat act as a catalyst of change and influence the governments to take necessary actions. Therole of NGOs and institutions is an indispensible one in not only persuading the governments toformpoliciesbutalso independently curatingpoliciesto drivethechange.

The policies associated with Diet and Environment focus on bringing in and implementing"SustainableFoodPolicyandFoodSystem"toreduceone'scarbonfootprintontheenvironment through mindful selection and consumption of food resources. The type of foodconsumed plays a major role in determining one's impact on the environment. Steps are takenbyeducationalinstitutionsandwork-placesinmitigatingtheircarbon-footprintthroughsustainable food policies. Sustainable Food Policies aim to reduce the environmental impact ofvarious institutions by studying the carbon footprint of different food products consumed bythem and replacing the ones with higher footprint by those products that are comparativelyenvironment-friendly,sustainableandhavealowercarbonfootprint.Theadoptionofsustainable food policies has shown positive results way more effectively and quicklythanother types of policies that are also implemented for the purpose of reducing environmentalfootprint.Growingawarenessregardingthecontributionofanimalagriculturetoglobal warming and resource depletion has led to different institutions adopt these policies in order tomove towards an environment-friendly lifestyle. Discussed below are some of the examplesfromallover theworld forthesame.

In 2016, **Cambridge University,**as part of its Sustainable Food Policy, successfully reducedits food-related carbon emissions by cutting out beef and lamb from its menus. It also promoteda reduction in the consumption of dairy products. In place of animal products, they introducedvegan and vegetarian options which would not only appeal the university community but willalso help in the reduction of their environmental footprint.The university was able to cut itscarbon emissions by 10.5% (University of Cambridge, 2016) because of the switch. The switchwas made as a part of their Sustainable Food Policy according to the recommendations ofAndrew Balmford,who is theprofessor ofConservationScienceattheuniversity.

HarvardUniversitysignedtheCoolFoodPledgedesignedbyWorldResourceInstitute(WRI)andUNEnvironmenttoachievethegoalofbecomingfuelneutralby2016andfossilfuelfreeby2050.AsapartofitsSavethePlanetprograms,Harvardisstrivingtobringaboutachangeindietandmovetowardsamoreplant-basedwayofconsumption.Harvard'sSustainableandHealthfulFoodStandardsfocusesonmakingtheuniversitycommunitymoreawareandinformedabouttheconsequencesoftheir food choices.

Similarschemeshave beenimplemented incitieslike Lille (France)and Veracruz (Mexico)throughwhich, children areserved meat-freemeals atleastoneday every week.

One of the largest private universities in India, **Lovely Professional University**, worked withVeganOutreachIndia,anNGO,tobringinSustainableFoodpolicythroughtheGreenTuesday Campaign which is curated by the NGO to help various institutions in India reducetheir environmental footprint by adopting a more plant-based diet. The university has strived toreduceits milkconsumptionby14.3%andintroducetwonon-dairybeverages.

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

TwoVeganSchoolMealProjects,onenamed**AktionPflanen-Power**,meaningPlant-Powered Pupils, an initiative was taken by German Health Insurance Company BKK ProVitaand an NGO, named ProVeg is a student-focused project which aims to educate students on thebenefits of a plant-based vegan diet and second, **KEEKS, - Climate and Energy-efficientKitcheninSchools–**alsoheadedbyProVeg,isaninitiativewhichaimstomaketheschool

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

kitchens and mess more efficient and environment-friendly through managing the food theyserve.Boththeprojectswereimplementedin Germanschools.**Theprojectswerealsoawardedb ytheUnitedNationsandwonthe2018ClimateActionAwardfortheirmomentous steptowardsmitigatingtheircarbonfootprint**.

In 2019**,** the **Food Safety and Standards Authority of India (FSSAI)** through their initiativenamed **Eat Right India** encouraged people to adopt a sustainable dietary lifestyle includingPlant-BasedFoodsasameasuretofightagainstclimatechange.Intheirview,it'snecessaryandessentialthatth epeopleconsumehealthyfoods thatareenvironmentallysustainable.

Theaboveexaminedevidencesandpoliciesfromdifferentpartsoftheworldthoroughlyanalyzeandconf irmthatashifttowardsamoreplant-basedvegandietarylifestyleisessentialincuttinguponourcarbonemissionsandtoembraceanenvironm entfriendlylifestyle.It'sequally important tonotethattheseveralprojects,initiatives,stepstakenbyinstitutionsworldwideare designedandimplementedtakingintoconsiderationtheindispensableresearchdoneandkeyfindingsrel easedbytwoofthemajorinternationalbodies– first,TheFoodandAgricultureOrganizationoftheUnitedNations(FAO,2006)explicatedthatAnimal Agriculture isresponsible for18%ofanthropogenicgreenhouse gasemissionsandsecond,TheWorld-WatchInstitute,which,initspublication"LivestockandClimateChange"(Goodland,2009), expounded that Animal Agriculture and contribution of Livestock account for 51% of allclimate-noxiousgases(CO_2equivalent),describingthatFAOunderestimatedandoverlookedsomedirectandin directlivestockemissions.Additionally,aspertherecommendationsofthemostcomprehensivestudyd onetodateontheimpactoffarmingontheplanet,"avoidingmeatanddairyproducts isthesinglebiggestwaytoreduceone's environmentalimpactontheplanet"(Poore, 2018).

Therefore, taking note of the developments in the studies and recommendations of internationalenvironment organizations and research bodies, the environmental policies related to diet arebecoming a crucial part and focus of the decisions taken by governments and NGOs worldwideincontaining theenvironmentcrisis.

VI. RevaluationofDiscussion

Theattemptedresearchputsanewperspectiveintoplace,i.e.understandingtheroleoflivestock and agriculture in augmenting global warming and global greenhouse emissions. Themainstreamdiscussionsmainlyhavebeenrevolvingaroundtheimpactofclimatechangeonthepla ntandlivestockagricultureandstrivetofindsolutionsforthesame.Thus,itisimperativethatproduction ofvariousfoodproductsisalsoacknowledgedasaresource-intensiveactivityandaccordingly,peoplearemadeawareandareeducatedaboutlessercarbon-footprint food products so that they can make an informed decision about choosing anenvironment-friendlydietary lifestyle.

Simultaneously, it is crucial that the governments take the responsibility to make sustainablefood productsmore accessible to people and subsidize them so that they are easily availableand affordable. Locally produced food products should be promoted in place of purchasing andconsumptionofimportedfoodproducts.Thisisbecause eventhoughthe findingsoftheresearch show that a plant-based vegan diet is the most sustainable and environment-friendly,inculcating large amounts of vegan products that are majorly imported from foreign countriescanactas ahindranceinachieving

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 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

thecompleteenvironmentalbenefitofaplant-based diet.

It is also important to note that, realization and acknowledgement of the fact that the foodchoicesof the people have consequential impact on the environmentand itsresources, maytaketimeduetoseveralfactors;thusthisisthereasonforthesignificantroleofgovernment,

NGOs, policy makers, administrators and people working at grass-root levels. The work doneby government personnel in making regulations, policies, strategies and laws accelerate theneededchangeandrequiredimprovementwithefficiencyandwithinthedesiredperiodoftime.

VII. Result

- A diet based on animal products requires an unsustainable amount of resources and causesthe most environmental damage having a larger environmental footprint as compared to aplant-baseddiet.
- A plant-based diet proved to be the most sustainable in the long term with an importantrequisitei.e. itshould compriseof mostlylocallyproduced items.
- The role played by NGOs and independent bodies has been crucial in addressing the issue ofdiet and environment and helping various institutions in adopting measures to reduce theircarbonfootprint.
- The governments of different countries, althoughthey havetakentime in bringing outrequired policies pertaining to food consumption, have started working on educating thecitizens in making an informed choice which helps not only the environment but also theirhealth.

VIII. Recommendations

- Organizations, from around the world have already begun working on this issue and thegovernments must take up the responsibility in empowering people to make better andinformeddecisionsregarding their foodchoices.
- Theconsumptionoffoodresourcesshouldbedoneinasustainableandenvironment-friendlymanner.
- Themediashouldplayanimportantroleindisseminatingawarenessregardingtheimportanceofaplantbased diet.
- Collegesandschoolsshouldorganizeprogramsandcampaignstoencouragetheneedforsustainablefoodconsumption.
- Thegovernmentsshoulddevisesuchpoliciesthatregulatetheharmfulimpactontheenvironmentby encouraging thepromotionofavegan diet.
- Moreplantbasedfooditemsshouldbe madecheaper.
- Taxonmeatcanalsohelpinregulatingthehighamountsofmeatproductsbeingconsumedbythemajority population.

IX. Conclusion

Altogether, it has been observed that while the current global food system poses a big threat tothe ecological system of the planet, it can equally provide great potential and act as a tool toscalebackandmollifyglobalwarming,deforestation,waterdepletion,greenhousegasemission and, several other environmental challenges. The hypothesis of the study proves to betrue on the basis of secondary study. This is often due to the minimal environmental impact of avegan diet. A vegan diet is plant-based approach to live a healthy and sustainable life. AnimalAgriculture acquires one of the top positions in polluting the environment. A diet comprising ofanimal-based products will always have a larger carbon footprint than a plant-based diet due toinefficiency in transfer and also a waste of energy in the chain and process of meat, dairy andegg production. It isalso vitalto understand that,in spite of the observationsdone on theimpact of agriculture and livestock farming on the planet, the awareness concerning the

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 UGC CARE Listed (Group -I) Journal Volume 9, Iss 3, May 2020

foodhabits of individualsforming a significant part of their environmental footprint emerges as anewconceptandknowledgetomany;thereforekeepingthisinmind,theroleofpolicyperspectiveandpolicyapproachbecomeimportantinordertobringaboutasignificantchangeat a systematic level which provides with faster and far-reaching results accompanied withchange at an individual level. Food consumption is one such quotidian human activity which isvitalforsurvivalasitistheprimarysourceofenergytocarryoutseveralotherhumanactivities,

thus it is imperative to adopt a sustainable diet which does not threaten and hamperthe futureof our planet and equally, the future of the coming generation. With this understanding in theregard, a plant-based diet that excludes all animal-derived products proves to be the leastenvironmentally impactingandalso standssustainablein thelongrun.

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