FOOD AND AGRICULTURAL ETHICS: THE SCIENCE OF HUMAN SURVIVAL

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19th century German philosopher, Ludwig Feuerbach (1804-1872), made an emphatic statement that "Man is what He eats" (*Der Mensch ist, was er iβt'*)[1]. His statement aptly captures the decisive role of food in determining the quality of human life; because it has been proved that a person who takes nutritious food makes a fulfilling life in terms of longevity and productivity. Food being the primary source of energy and building material for the human body since its conception, what goes into a person turns into the person. How an embryo enhances into the size and structure of an adult with bones, different organs, and skin is designed by the proteins, carbs and fats supplied from the food it consumed during its growth period from prenatal to adulthood.

Apart from growth, food also determines the functioning of the human body, indicating that the quality, capacity and efficiency of human activities depend very much on the quantity and quality of the food consumed. Such a description of the human life span with the role of food in it, substantiates the pronouncement by the German Philosopher which echoes across centuries. The present health scenario of the people, especially of the youth who is to lead the 21st country, evinces the relevance of what Ludwig had viewed long back. It is to be noted that even among young generation, the Non Communicable Diseases (NCD)/Lifestyle diseases and Cancer

[1] FABRIZIO TUROLDO et al, *Man is what he eats: The Philosophy and Ethics of eating, Etica & Politica /Ethics & Politics*, xxiii, 2021, 2, pp. 762, See http://www2. units.it/etica/ 2021_2/ TUROLDO_ET_AL.pdf.

are growing at an alarming rate in India. Because of the predominant role of food in determining the overall health of a human person, food and agriculture sector has become a epicenter of ethical concerns of the contemporary society. The purpose of this article is to analyze the contemporary relevance of food and agricultural ethics and to explore its various implications in the quality of life.

1.LIFE-STYLE DISEASES/ NON-COMMUNICABLE DISEASES(NCD)

The World Health Organization (WHO) estimates that 16 million people worldwide succumb to lifestyle diseases/non-communicable diseases prematurely every year, putting the entire world on the verge of a public health disaster.[2] The main reason for this rapid rise in lifestyle diseases like cancer, heart disease, diabetes, hypertension, stroke, and obesity is the consumption of unhealthy food.

Global status report on non-communicable diseases 2010 affirms: “The World Cancer Research Fund has estimated that 27–39% of the main cancers can be prevented by improving diet, physical activity and body composition. Approximately 16 million (1.0%) DALYs and 1.7 million (2.8%) of deaths worldwide are attributable to low fruit and vegetable consumption. Adequate consumption of fruit and vegetables reduces the risk for cardiovascular diseases, stomach cancer and colorectal cancer. There is convincing evidence that the consumption of high levels of high-energy foods, such as processed foods that are high in fats and sugars, promotes obesity compared to low-energy foods such as

[2]https://www.medindia.net/patients/lifestyleandwellness/common-lifestyle-habits-that-cause-diseases.htm.;https://www.who.int/health-topics/noncommunicable-diseases#tab=tab_1.

fruits and vegetables. The amount of dietary salt consumed is an important determinant of blood pressure levels and overall cardiovascular risk"[3]. We can prevent many lifestyle diseases through a well-balanced diet rich in nutrients, making lifestyle modifications and engaging in more physical activities. We can prevent it "by replacing saturated and trans fats with unsaturated fats, including sources of omega-3 fatty acids, ensuring generous consumption of fruits and vegetables and adequate folic acid intake, consuming cereal products in their whole-grain, high-fiber form, limiting consumption of sugar and sugar-based beverages, limiting excessive caloric intake from any source and limiting sodium intake"[4]. All these facts unequivocally demonstrate the vital role that healthy diet plays in preventing the proliferation of the lifestyle diseases.

In India, Non-Communicable Diseases (NCD) are growing at an alarming rate. According to the report of the Associated Chambers of Commerce of India, "more than two-thirds of individuals suffering from NCDs are in the most productive life age group - between 26 and 59 years. This is an alarming trend and points to the grim reality that the burden of NCDs on India is long-lasting, given that 65 per cent of the country's population is below 35 years of age".[5] According to World Health Organization (WHO), 53 percent of the deaths in 2008 in India, were due to

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[3] Global status report on non-communicable diseases 2010, p.20; https://www. who.int/nmh/ publications/ ncd_report_full_en.pdf; KRISELA STEYN & ALBERTINO DAMASCENO, *Disease and Mortality in Sub-Saharan Africa*. 2nd edition, see https://www.ncbi.nlm.nih. gov/ books/NBK2290/#A1613.

[4] WALTER C. WILLETT, et al, Chapter 44, Prevention of Chronic Disease by Means of Diet and Lifestyle Changes Disease, in *Control Priorities in Developing Countries*. 2nd edition., see also https://www.ncbi.nlm.nih.gov/books/NBK11795/.

[5]https://www.newindianexpress.com/nation/2021/jul/24/lifestyle-disorders-growing-in-india-prevalent-among-35-age-group.

Non-Communicable Diseases(NCD)[6]. Report of the Indian Council for Medical Research on the 'Burden of cancers in India', observed that "the number of Indians suffering from cancer is projected to increase to 29.8 million in 2025 from 26.7 million in 2021. This increase is due to the increasing consumption of packaged food with harmful preservatives, increased use of junk foods, use of vegetables grown in toxic water like rivers near industries, adulteration in food, artificial colouring of food and vegetables"[7] .

Kerala occupies the first place in India in the lifestyle diseases' outbreak. *The Economic Times* reported that "Kerala has long been known for spectacular feats in the field of health and boasting of social development indicators comparable to developed countries. However, an alarming increase in cases of killer ailments cancer, kidney and liver diseases is threatening to put its reputation in jeopardy"[8]. In Kerala about 2,50,000 people undergo cancer treatment with the addition of at least 60,000 new cancer patients every year[9]. Kerala is currently witnessing an increasing number of liver and kidney transplant surgeries in super specialty hospitals.

Increased wealth, lifestyle changes, increased consumption of junk food, pesticide residues and chemicals in food products,

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[6] World Health Organization, Non-communicable Diseases Country Profile 2011, see- JOY CHAKMA, Lifestyle and Non-Communicable Diseases: A double edged sword for future India, December 2014, in *Indian Journal of Community Health* 26(4):325-332, see also https://www.researchgate.net/profile/Joy-Chakma.

[7] https://www.livemint.com/ science/health/indias-cancer-burden-to-rise-to-29-8-million-in-2025-icmr-report11652382169284.html);https://www.Manoramaonline.com/health/health-news/2022/ 05/ 28/ cancer-patients-india.html

[8] *The Economic Times- e-paper*(April,23, 2016), see https://economictimes.indiatimes.com/ industry/healthcare/biotech/healthcare/health-crisis-in-kerala-the-increase-in-cancer-kidney-and-liver-diseases/articleshow/51950836.cms.;https://englisharchives.mathrubhumi.com/health/ health- news/keralites-consumed-rs-8000-cr-worth-allopathic-medicine-in-2018-1.3566503

[9] *Malayala Manorama News*, (February 4, 2021).

increase in diabetes etc. have accelerated this health crisis in Kerala[10]. It is quite alarming that allopathic medicines worth Rs 8000 crore were sold in Kerala during the period 2017-2018[11]. We can never consider the increased use of allopathic medicines in Kerala as compared to other States in India, cannot be attributed to Kerala's economic stability or its overall development in the public health care sector.

The establishment of new oncology hospitals or new specialty/super-specialty hospitals for lifestyle-related diseases alone will not provide a permanent solution to this health crisis. They are indispensable but along with them, we have to start Community Dietary Education/Food Literacy programmes, Food Therapy Clinics/Nutritional Counselling Centers etc. in order to thwart the proliferation of life style diseases. Furthermore, we must promote the production of organic food and encourage the organic food consumption culture in our society. A new perspective in preventive medicine, which focuses on diet as a means to health, especially in preventing lifestyle diseases is also the demand of the time. Investing in preventive health care can reduce the enormous cost of treating lifestyle-related diseases, which is a small amount of money as compared to the money spent on remedial measures.

We could impede effectively the alarming growth of lifestyle diseases' outbreak, If we wisely combine the wisdom of *Ayurveda* with the knowledge of modern Nutritional Science. In addition, a

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[10] *The Economics Times, India* (April 23, 2016), see https://economictimes.indiatimes.com/ industry/ healthcare/biotech/healthcare/health-crisis-in-kerala-the-increase-in-cancer-kidney-and*liver-diseases/ articleshow/51950836.cms.*

[11]*Mathrubhumi News,Kerala,India (Feb 13,2019),see https://englisharchives.mathrubhumi. Com/health/ health-news/keralites-consumed-rs-8000-cr-worth-allopathic-medicine-in-1.3566503.*

new approach is needed- the wisdom to divert a portion of public funds to set aside for the above-mentioned programmes in public health care sector. The development of a *National Lifestyle Disease Outbreak Surveillance System* is urgently needed for the early detection, control and effective prevention of lifestyle diseases' outbreak. The economic growth of the Nation as well as the health of the population are both seriously threatened by the rising incidence of non-communicable diseases/lifestyle diseases.

2. FOOD AND MENTAL HEALTH

The food that we consume affect significantly not only our physical health but also our mental health. Diet can affect cognitive ability and behavior of a person. Healthy diet improves and preserves the brain function. Nutritious food is not only good for our brain health but also help to optimize our cognitive function.[12] Significant negative alterations in the systems of food production patterns and its consumption over the past few years, have significantly increased mental health problems, issues, and crises among citizens.

Modern medical science considers mother's diet as one of the prime causes for the epigenetic changes in the fetus. According to Yuanyuan Li et al, "Maternal diets or nutritional compositions contribute to the establishment of the epigenetic profiles in the fetus that have a profound impact on individual susceptibility to certain diseases or disorders in the offspring later in life"[13]. According to

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[12] FRANCE BELLISLE, *British Journal of Nutrition*, Volume 92, Issue S2, (October 2004), pp. S227-S232, see https://www.cambridge.org/core/services/aop-cambridge-core/content/view/54F8DA9C708A34A737D663BBEABED1D0/S000711450400234Xa.pdf/effects-of-diet-on-behaviour-and-cognition-in-children.pdf.

[13] YUANYUAN LI et al, Epigenetic Mechanisms Link Maternal Diets and Gut Microbiome to Obesity in the Offspring, Genet., 27 August 2018,Sec.Epigenomics and Epigenetics,

Sara. J. Spencer et al(2017), “Poor diet in utero and during early postnatal life can cause lasting changes in many aspects of metabolic and central functions, including impairments in cognition and accelerated brain aging”[14]. Severe maternal diet deficiencies during pregnancy may eventually lead to behavioral disorders in children.

A research led by scientists from King’s College London and the University of Bristol has found that “a diet high in fat and sugar during pregnancy may interact with a gene that controls early brain development in the fetus, potentially increasing the risk for attention deficit hyperactive disorder (ADHD) in some individuals”[15]. The results of a study led by a team from the Barcelona Institute for Global Health (ISGlobal), a centre supported by "la Caixa," suggest that “the risk of a child developing symptoms of attention deficit hyperactivity disorder (ADHD) may be modulated by the mother's diet during pregnancy”[16]. The diet of the mother during pregnancy and the diet of the child from the age of 1-5 years will have a significant influence in the development of their positive mental health.

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https://doi.org/10.3389/fgene.2018.00342,see https://www.frontiersin. org/articles/ 10.3389/ fgene.2018.00342/full .

[14] SARA. J. SPENCER et al, Food for thought: how nutrition impacts cognition and emotion**,** in *npj Science of Food,* volume 1, Article number: 7 (2017), see https:// www.nature.com/articles/ s41538-017-0008-y.

[15]JOLIEN RIJLAARSDAM et al, Prenatal unhealthy diet, insulin-like growth factor 2 gene (*IGF2*) methylation, and attention deficit hyperactivity disorder symptoms in youth with early-onset conduct problems, In Journal of Child Psychol Psychiatry. 2017 Jan; 58(1): 19–27, see also https://www. ncbi.nlm. nih.gov/pmc/ articles/PMC5161647/;https://www.kcl.ac.uk /archive/news/ ioppn/ records/ 2016/ august/ unhealthy-diet-during-pregnancy-could-be-linked-to-adhd; https://www. nichd. nih.gov/ newsroom/ releases/091516_adhd; https://www.toplinemd.com/miami-obgyn/news/adhd-associated-unhealthy-diet-pregnancy2).

[16] MÓNICA LÓPEZ-VICENTE et al, Prenatal Omega-6:Omega-3 Ratio and Attention Deficit and Hyperactivity Disorder Symptoms. *The Journal of Pediatrics,* 2019; DOI: 10.1016/j. jpeds. 2019.02.022; see also in https://www. sciencedaily. com/releases/ 2019/03/ 190328080410.htm

Modern food production patterns also have a prime role in causing hyperactivity in children. According to the medical research, Hyperactivity is an adverse reaction of children to Food Additives, Artificial Sweeteners, Artificial colours, and Chemicals added to preserve food, which is present in many industrial food and beverages[17]. Unhealthy diet makes significant negative alterations in the cognitive ability and behavior in children. It is discovered that a balanced diet can bring a great improvement even in the intelligence score of children[18]. Moreover, the food that we consume have a vital role in increasing anti-social violence and criminal behavior. Psycho-social research revealed that increased consumption of junk food has a significant role in the growth of behavioral disorders and antisocial violence among the adolescents and youth[19] .

[17] Z. ROUIM et al (2020), Jim Stevenson, in *Journal of Children's Services* (2009); MARVIN BORIS et al, Annals of Allergy (1994); ANDREW KEMP, *British Medical Journal* (2008), DONNA MCCANN et al, in *Lancet* (2007), FEINGOLD FB, in *Delaware Medical Journal* (1977), FEINGOLD BF, Adverse reactions to food additives. Presented at: *The American Medical Association Annual Meeting*; June 24–28, (Chicago,1973); TUULA E. TUORMAA, The Adverse Effects of Food Additives on Health: A Review of the Literature with Special Emphasis on Childhood Hyperactivity, in *Journal of Orthomolecular Medicine*, Vol. 9, No. 4, (1994), pages.225-243;https://www. southampton.ac.uk/news/2007/09/hyperactivity-in-children-and-food-additives.page.

[18] HASANAIN FAISAL GHAZI et al, *Annals of Nutritional Disorders and Therapy* (2014), ARUN OOMMEN, *Journal of Neurology and Stroke* (2014). FRANCE BELLISLE, Effects of diet on behaviour and cognition in children, in *British Journal of Nutrition* (2004 Oct;92) Supplement, 2: S227-32.

[19] DAVID BENTON, *Neuroscience and Biobehavioral Reviews*, 2007, C. BERNARD GESCH et al, in *British Journal of Psychiatry*, (2002); HOURA MOHSENI et al, The relationship between history of dietary nutrients intakes and incidence of aggressive behavior in adolescent girls: A case–control study, in *Clinical Nutrition* ESPEN**,** Volume 43, (June 2021), Pages 200-205/; HANIEH MALMIR et al, *Junk food consumption and psychological distress in children and adolescents: a systematic review and meta-analysis*, https://doi.org/ 10.1080/ 1028415 X . 2022. 2094856, see also https:// www. tandfonline. com/doi/abs/ 10.1080/1028415 X. 2022. 2094856? journalCode=ynns20.

The food we consume is inextricably linked with the emergence of several mental health problems and diseases such as Autism, (that impairs the ability to study, interact and communicate), Attention Deficit Hyper Activity Disorder (ADHD), Schizophrenia, (that affects a person's ability to think, feel and behave clearly), Dementia and Depression[20] . It is noted that regular consumption of fish, fresh and pure vegetables, nuts, fruits, whole grains, leafy greens and other food and beverages can reduce the severity of depression and anxiety[21]. It is worth mentioning that in Western countries where depression is very common, people consume a lot of foods high in fats and artificial sweeteners [22] . Qingyi Huang et al(2019) observes that 'there is a growing body of health epidemiological evidence supporting that a dietary pattern which has a higher intake of fruits, vegetables, olive oil, nuts, fish, and whole grain; and a lesser intake of meat, meat products, commercial bakery, trans fat, and sugary

[20] Report of an inquiry held by the Associate Parliamentary Food and Health Forum, *The Links Between Diet and Behaviour: The influence of nutrition on mental health,* (January 2008), see in https://www. fabresearch.org/uploads/itemUploads/7302/The%20Links% 20Between% 20 Diet% 20and%20Behaviour%20-%20FHF%20inquiry %20 report% 20January%202008%20(2).pdf; HEATHER M. FRANCIS et al, A brief diet intervention can reduce symptoms of depression in young adults–A randomised controlled trial, PLOS ONE|https://doi.org/10.1371/ journal.pone. 0222768 October 9, 2019 , see in https://journals.plos. org/plosone/ article/file?type =printable &id=10.1371/journal.pone.0222768.

[21] A. SANCHEZ VILLAGAS et al, Preventing the recurrence of depression with a Mediterranean diet supplemented with extra-virgin olive oil. The PREDI-DEP trial: study protocol, in *BMC Psychiatry* (volume 19, Article number: 63 (2019)Pages. 2-7; YE LI et al, Dietary patterns and depression risk: A meta-analysis, in *Psychiatry Res.* 2017 Jul;253:373-382.doi:10.1016/j.psychres.2017.04.020; QINGYI HUANG at al, Linking What We Eat to Our Mood: A Review of Diet, Dietary Antioxidants, and Depression, in *Antioxidants* (Basel).2019 Sep 5;8(9):376.doi:10.3390/antiox8090376, seehttps://pubmed.ncbi.nlm.nih.gov/31491962/**;** DOMINIKA GŁĄBSKA et al, Fruit and Vegetable Intake and Mental Health in Adults: A Systematic Review, in *Nutrient*s.(2020) Jan; 12(1): 115; ARENI ALTUN et al, The Mediterranean dietary pattern and depression risk: A systematic review, in *Neurology, Psychiatry and Brain, Research*, Volume 33, September 2019, Pages 1-10.

[22] QINGYI HUANG et al, Linking What We Eat to Our Mood: A Review of Diet, Dietary Antioxidants, and Depression, Antioxidants (Basel),2019 Sep 5;8(9):376, see https://pubmed.ncbi. nlm.nih.gov/ 31491962; WALID EL ANSARI et al, Food and mental health: relationship between food and perceived stress and depressive symptoms among university students in the United Kingdom, Full text links in *Cent Eur J Public Health* (2014) Jun;22(2):90- 97.

dessert/drinks may reduce the risk of depression"[23]. The therapeutic value of dietary intervention for psychological disorders is unquestionably supported by contemporary medical research. The need of time is a new mental health care culture that incorporates food therapy (balanced nutritious diet) with existing mental health intervention programs..

3.ADULTERATION OF FOOD AND BEVERAGES

Rampant adulteration of food and beverages is the most serious threat that public health faces today in India. Many things that we use in our daily life are gravely adulterated. The fact that in India even infant milk products are seriously adulterated highlights the severity of the problem that we face in this sphere. This is a clear indication of the numbness of our social conscience. Consumption of such contaminated food and beverages often leads to cancer, liver and kidney disease, which in turn pose a serious threat to human life itself.

One's first wealth is his health. No matter how much wealth one owes, if he lacks his health, it is of no use for him. According to Winston Churchill, the famous British Prime Minister, "***healthy citizens are the greatest asset of any nation[24].*** The economic well-being of a Nation primarily depends upon the richness of the health of its citizens. An analyze of COVID-19 period will definitively substantiate this truth. To invest in the health of its citizens is the biggest financial investment that a country could ever make. Availability of healthy and nutritious

[23] QINGYI HUANG et al, Linking What We Eat to Our Mood: A Review of Diet, Dietary Antioxidants, and Depression, Antioxidants (Basel),2019 Sep 5;8(9):376, see https:// pubmed.ncbi.nlm.nih.gov/ 31491962.

[24] https://www.northlandbioscience.com/medications.

food to all its citizens is a clear sign of the economic stability and wellbeing of a country.

According to Ann Wigmore, renowned Lithuanian-American holistic health practitioner, "*the food you eat can be either the safest and most powerful form of medicine or the slowest form of poison*"[25]. The deadly toxins that contained in the adulterated food and beverages may slowly kill the persons who consume it. Then it is reasonable to conclude that increase in cancer, kidney and liver diseases over the last few decades in our country are primarily due to the widespread adulteration of food.

In reality, Food adulteration is a crime against humanity. Because it poses a grave threat to the very existence and wellbeing of the human race. We must consider the production and distribution of safe, clean, healthy and nutritious food to our fellow citizens as an integral part of patriotism. Patriotism is not simply the love for ones' own homeland, but also the good will to contribute something for the well-being of its citizens. Adulteration of food and beverages leads to a tremendous increase in the lifestyle diseases and other diet related diseases. As a result, a huge amount of money from public budget has to be allocated to the public health care sector. Such a situation jeopardizes the economic stability and further future development of the country. In this perspective, food security becomes ultimately a question of national security. In order to take serious legal steps against food adulteration practices prevalent in the country, the current food safety laws should be renewed and modified.

[25] PE THET KHIN, Safer Food for a Safer World**,** *in Japan Med Association Journal*., (2015) Dec; 58(4): 129–143, see https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4829759/.

The sheer silence and indifference expressed by the Indian politicians, intellectuals, socio-cultural activists and environmentalists in counteracting the rampant food adulteration practices in India is literally embarrassing. All the political parties should dare to include in their political manifesto that they would provide clean and safe nutritious food free from toxins and chemicals to the people. Political parties have to demonstrate their social commitment by warding off food adulteration practices in the country and organize strategies, policies and action plans to fight against this social evil. The need of the time is a new political culture with a sense of social commitment that strives tirelessly for public health and food literacy.

Kerala ranks first among other states of India with regard to the literacy rate. The people who belong to this State often boast about it. But the high percentage of food adulteration practices prevalent in the State shows the pathetic situation of its food literacy rate. “Food literacy is the process of acquiring the knowledge, skills and attitudes necessary to choose, grow, prepare and enjoy healthy food to support one’s health, community and the environment. It is also a process of understanding the impact of our food choices on our health, the environment and our economy”[26]. The fact that there is plenty of traders, markets and consumers for any adulterated food in the State is a clear proof of its low food literacy rate. This calls for an urgent enormous social advancement in the field of food literacy.

In order to combat with the dangerous anti-national and anti-social tendency of food adulteration, we have to develop a new

[26]https://www.fraserhealth.ca/health-topics-a-to-z/children-and-youth/healthy-eating-for-children/food-literacy.

administrative pattern of involving the public in the formulation and implementation of food safety policies and laws. We should take initiative to form '*Food and Agricultural Ethics Councils'* at Central and State Government levels. People's representatives, food safety officials, agriculture-food scientists, people from food industry, socio-economic-cultural experts etc should be included in this committee. To form *Food Ethics Vigilance Cells* at the *Panchayat level* is also highly advisable in this regard. The formulation and effective functioning of such committees will be a great help to thwart the anti-national and anti-social tendency of food adulteration.

Constituting a Food Security Police Department at the Central and State levels will be a significant step to circumvent the social evil of food adulteration. Establishment of *Special Food Security Courts* in order to ensure and facilitate the fast track trial and punishment of food adulterers should be also given prime importance. No elected democratic government can divaricate from this sphere because it is a matter of public health, patriotism and national security. Food safety is a significant public health priority. That means "Governments should make food safety a public health priority, as they play a pivotal role. By developing policies and regulatory frameworks, and by establishing and implementing effective food safety systems, Governments must ensure food producers and suppliers along the whole food chain operate responsibly and supply safe food to consumers"[27]. A radical change in the education and social conscience of the citizens plays an important role in combating with the social evil of food adulteration. The study and research of Food and Agriculture Ethics will guide us in this social transformation.

[27] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4829759/ .

4). FOOD AND IMMUNITY

The outbreak of the COVID-19 pandemic has brought a renewed public interest with regard to human immune system. Our immunity is the most crucial factor in blocking the spread of various pandemics. A well-functioning immune system is indispensable for our survival in the face of pandemics. The food that we consume is very decisive in creating in us a healthy immune system.

A research conducted by the University of Bonn (Germany) has revealed that, regular consumption of Junk Food can undermine even our immune system. This research discovered that "the immune system reacts similarly to a high fat and high calorie diet as to a bacterial infection. Unhealthy food seems to make the body's defenses more aggressive in the long term. Even long after switching to a healthy diet, inflammation towards innate immune stimulation is more pronounced. These changes may be involved in the development of arteriosclerosis and diabetes"[28]. This research indicates the danger of the unhealthy nutritional behaviors.

According to the researchers, "wrong nutrition can have dramatic consequences. In recent centuries, average life expectancy has steadily increased in Western countries. This trend is currently being broken for the first time: Individuals born today will live on average shorter lives than their parents. Unhealthy diets and too little exercise likely play a decisive role in this"[29]. According to Dr. Samer Blackmon, "if you eat a lot of foods and

[28] https://www.sciencedaily.com/releases/2018/01/180111141637.htm);https://www.uni-bonn.de/de/universitaet/presse-kommunikation/presseservice/archivpressemitteilungen/2018/ 010 -2018

[29] https://www.sciencedaily.com/releases/2018/01/180111141637.htm).

beverages high in sugar or refined carbohydrates, which the body processes as sugar, you may be reducing your body's ability to ward off disease. Eating a well-rounded diet high in pretty, colorful veggies and fruits will give your body the vitamins and minerals it needs to fight off illness. "Believe it or not, what you put in your mouth serves as one building block to a strong immune system"[30].

The food we consume acts as various building materials required to build a strong immune system in us. It means that the nutritious food has a decisive role in forming a healthy immune system. A diet lacking in one or more nutrients can severely undermine the production and function of immune cells and antibodies[31]. Since the food that we consume have a very crucial role in the protection of our health, wise choices in this regard should be our priority during and after COVID-19. The most cost-effective way to combat infectious diseases now and in the future is to acquire adequate immunity through the consumption of healthy food.

5). FOOD AS MEDICINE

The Greek physician Hippocrates affirmed: *Let Food Be Thy Medicine and Thy Medicine Food* [32]. It does not mean to discard the modern allopathic medicines but rather to indicate that a healthy diet plays a decisive role in preventing and curing diseases. The primary medicine of any human being is in fact the healthy food. The famous *Ayurvedic* saying, "***When the diet is wrong, medicine is of no use***"

[30]https://www.piedmont.org/living-better/foods-and-drinks-that-compromise-your-immune-system;https://www.cnbc.com/2022/01/15/this-is-the-worst-ingredient-for-your-immune-system-says-immunologist-and-health-expert.html;https://www.medicalnewstoday.com/articles/326386;https://www.medicalnewstoday.com/articles/how-and-why-does-diet-influence-immune-function#Can-diet-influence-the-immune-system?.

[31]https://www.hsph.harvard.edu/nutritionsource/nutrition-and-immunity/;https://www.scielo .br/j/jvatitd/a/ QF8cJsh7MjgRNx9qd8Svqyp/?lang=en-

[32] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC318470.

and "***When the diet is correct, medicine is of no need***"[33] sheds light on the above mentioned truth. The true medicine should start from our dining table. In order to start medicine from the dining table, first it should start from the agricultural sector and food industry sector. This, in turn, ultimately leads us to an organic and biodiversity farming culture.

6). ENVIRONMENTAL-BIODIVERSITY CONSERVATION

The Industrial Revolution has brought new inventions and advanced technologies to the humanity. The world faces many crucial environmental problems since these scientific and technological advancements are not synchronized with the rhythms of the nature. The protection of the environment and the conservation of biodiversity are the basic prerequisites for the overall development of any country in the world[34]. Existence and survival of human race is unimaginable without a proper protection of them. The way in which we safeguard biodiversity and the environment has a clear impact up on our health and well-being. Air and water pollution, the greenhouse effect, global warming, acid rain, smoke, deforestation, ozone layer depletion, ocean acidification, loss of biodiversity, loss of soil fertility, increased carbon emissions and wildfires are some of the major environmental hazards that the world faces today.[35] It is our

[33] https://www.healthline.com/health/food-nutrition/i-tried-the-ayurvedic-diet

[34]https://international-partnerships.ec.europa.eu/policies/climate-environment-and-energy/biodiversity- and-ecosystems_en; William E. Rees,Economic Development And Environmental Protection: An Ecological Economics Perspective ,in Environmental Monitoring and Assessment volume 86, pages 29–45 (2003) see https://link.springer.com/article/10.1023/A: 1024098417023.

[35]https://www.conserve-energy-future.com/15-current-environmental-problems.php; https://link.springer.com/article/10.1007/s43538-022-00073-6;https://education.National geographic.org/resource/greenhouse-effect;https://www.thelancet.com/pdfs/journals/lancet/PIIS0140- 6736(15) 60901-1.pdf.

responsibility to do everything within our power to make our planet Earth a beautiful habitat for the survival of humankind.

Due to environmental problems, numerous viruses and bacteria that have not yet been able to infect humans have started attacking humans, causing a number of infectious diseases. It poses a serious threat to the health and survival of human race. Extreme droughts, climate change and floods cause many infectious diseases, especially malaria and dengue[36]. Improving air and water quality, focusing on proper sanitation and conserving biodiversity are the important ways to ward off many of these infectious diseases. Hence, the environmental protection becomes an integral part of the promotion of the public health. In reality, what the environmental protection ultimately guarantees is nothing but health and survival of human persons.

Maintaining the quality of the environment is essential to slow down the global warming. Forests have a decisive role in preventing climatic changes. According to Andrea Borgarello: "Forests are vital storehouses of carbon on our planet. However, when forests are cleared to make way for agriculture and other activities, they emit large quantities of carbon dioxide and other greenhouse gases into the atmosphere. This contributes to climate change"[37]. Research shows that the deforestation causes the increase of global warming up to

[36] https://www.ncbi.nlm.nih.gov/books/NBK20370/; Ichiro Kurane et al, The Effect of Global Warming on Infectious Diseases Osong Public Health Res Perspect. 2010 Dec; 1(1): 4–9; Jan.C.Semenza et al, Climate Change and Cascading Risks from Infectious Disease, *Infectious Diseases and Therapy* (2022) Published: 19 May 2022.; Lena C.Grobusch et al, A hot topic at the environment–health nexus: investigating the impact of climate change on infectious diseases, International Journal of Infectious Diseases,Volume 116, March 2022, Pages 7-9; https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg2-chapter8-1.pdf.

[37] https://www.worldbank.org/en/topic/forests/brief/forests-combat-climate-change

10%[38].Therefore, the protection of forests is an integral part of environmental protection.

Earth is a beautiful paradise of a wide variety of plants, animals and other creatures. The Creator has a specific purpose and reason for creating this biodiversity on earth. It must be protected at any cost. The very existence, future and survival of the human race depends on the biodiversity[39]. Plants and animals are vital for satisfying our nutritional needs. Consequently, the scarcity of various plant and animal species will ultimately lead to poverty itself. This truth sheds light on our moral duty to preserve biodiversity.

The major causes of biodiversity loss are changes in land and water use and management, followed by pollution, overexploitation and overharvesting, climate change, and population growth and urbanization[40].According to environmental statistics, "India is one of the richest countries in the world in terms of biodiversity. India has a unique position in the world in so far as it accounts for 7-8 per cent of the earth's total biodiversity. India is also one of the 18 mega diverse countries, which together possess 60-70 percent of the world's biodiversity"[41]. According to

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38https://www.ucsusa.org/resources/tropical-deforestation-and-global-warming; https://www.lse.ac.uk/granthaminstitute/explainers/whats-redd-and-will-it-help-tackle-climate-change/

39https://www.theguardian.com/news/2018/mar/12/what-is-biodiversity-and-why-does-it-matter-to-us;https://www.genevaenvironmentnetwork.org/resources/updates/international-day-for-biological-diversity/

40 OLIVIA LAI ,What are the Biggest Causes of Biodiversity Loss?, see https://earth.org/causes-of-biodiversity-loss/; Vijeta Singh et al, The principal factors responsible for biodiversity loss , Open Journal of Plant Science, see https://www.peertechzpublications.com/articles/OJPS-6-126.php;https://royalsociety.org/topics-policy/projects/biodiversity/human-impact-on-biodiversity /; https://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_c risis/. https://education.nationalgeographic.org/resource/endangered-species.

41https://pib.gov.in/newsite/erelcontent.aspx?relid=4475;https://pib.gov.in/PressReleasePage.aspx ?PRID=155777;. https://unesdoc.unesco.org/ark:/48223/pf0000260780.locale=en.

Scientists “our planet now faces a global extinction crisis never witnessed by humankind. They predict that more than 1 million species are on the verge of extinction in the coming decades”[42].

A healthy ecosystem is indispensable to create a conducive environment for the growth of biodiversity. It is to be noted that “healthy ecosystems clean our water, purify our air, maintain our soil, regulate the climate, recycle nutrients and provide us with food. They provide raw materials and resources for medicines and other purposes. They are at the foundation of all civilization and sustain our economies. It's that simple: we could not live without these “ecosystem services”. They are what we call our natural capital”[43].. Ultimately, biodiversity conservation and environmental protection ensure prosperity and a better quality of life for people. Without biodiversity, it is very difficult to guarantee a sustainable future for the people and the planet. The prophetic words of Saint Pope John Paul II that “the Earth will not continue to offer its harvest, except with faithful stewardship. We cannot say we love the land and then take steps to destroy it for use by future generations”[44] will be the antidote to prevent the destruction of biodiversity.

7). FOOD AND AGRICULTURE ETHICS

Due to the modern scientific and technological advancements in the field of agriculture and food production techniques, we can observe radical changes in the field of food production, its

[42]https://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction crisis/;https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/.

[43] https://ec.europa.eu/environment/nature/biodiversity/intro/index_en.htm

[44] https://www.clossolene.com/j ournal/the-earth-will-not-continue-to-offer-its-harvest-except-with-faithful-stewardship-we-cannot-say-we-love-the-land-and-then-take-steps-to-destroy-it-for-use-by-future-generations/;https://www.passiton.com/inspirational-quotes/7273-the-earth-will-not-continue-to-offer-its

distribution, preparation and consumption. Contemporary innovations in the public health, food production and food consumption patterns, globalization and urbanization trends, new political, socio-economic, and cultural developments in trade have accelerated radical changes in the patterns of food and beverage consumption[45]. These radical changes contributed to the upsurge of many ethical problems in the field of food and agriculture sectors. Hence, a meticulous and serious study and research on ethical issues derived from food and agriculture sector becomes a matter of paramount importance.

Food and Agricultural Ethics is a systematic interdisciplinary study of human conduct in the field of food and agricultural sciences and industry, that is, the human conduct in the field of cultivation, production, marketing, distribution, preparation and consumption of food is examined in the light of Ethical or Moral values and principles.

It is a bridge towards the bright and sustainable future of human race and a science of human survival. Without this science, a healthy future, survival and sustenance of humanity is almost impossible. The ultimate goal of Food Agricultural Ethics is to employ and utilize the modern technological innovations and scientific advancements occurring in the field of food and agriculture sectors in favor of the better environment and successful survival of life on earth.

[45]Cfr.https://www.researchgate.net/publication/313070027_Globalization_urbanization_and_nutritional_change_in_the_developing_world;https://royalsocietypublishing.org/doi/10.1098/rstb.20 10.0136;https://link.springer.com/chapter/10.1007/978-3-030-13958-21; https://www.fao.org/ 3/ y5736e/y5736e.pdf.

8). INSTITUTE OF FOOD AND AGRICULTURAL ETHICS (IFAE)

Institute of Food and Agricultural Ethics (IFAE) is a venture to promote the study and research in the field of Food and Agricultural Ethics. It is an institute, owned and managed by the Diocese of Thamarassery. Since ethical issues related to food and agriculture affect everyone equally, we work irrespective of caste, colour and creed. We are first of its kind in India which is exclusively dedicated for the study and research in the field of food and agricultural ethics.

We are trailblazers to bring ethics as an integral part of food and agricultural sciences. We work to encourage Federal/State Governments and Civil society to provide utmost priority to ethical principles and values in all transactions of food and agricultural policies and thus to bring about the overall health and well-being of the citizens.

OUR ETHICAL VISION

'Do good and do no harm', virtue of Justice, Human dignity and Solidarity, Principle of Universal Destination of Goods, Fundamental human rights and the principle of moral obligation towards the future generation.

OUR VISION

Our vision is to create a 'new culture' in the world, where all citizens are provided with sufficient healthy and nutritious food; where the rights of the farmers are ensured with utmost respect; where animal and plant species are preserved for a healthy planet and where the ecological balance of the biosphere is safeguarded.

OUR MISSION

Our mission is to provide healthy and nutritious food free from toxins and chemicals to all citizens and thus to form a healthy generation. We actualize this mission through the following programmes.1). Foodborne/dietary Disease Prevention and Food Therapy Clinics. 2). Food Education and Nutritional/dietary Counselling in Schools and Colleges 3). Anti-food Adulteration Campaigns 4). Agri-Eco Industrial Information and Training Park AEIITP) 5). Academic Courses/Training programmes related to food and agricultural ethics 6). Community based Zero Waste initiative 7). Community Herbal Medicine Movement 8). IFAE accredited supermarkets and restaurants. 9). Awareness Programmes for environmental protection and conservation of biodiversity.10). Toll free helpline for farmers.

The aim of the Food and Agricultural Ethics is to constitute a new scientific culture of ethically balancing the technological innovations and scientific advancements occurring in food and agricultural sectors with ever increasing insurgencies for protecting biodiversity and environment.

The Institute is committed to realizing these noble dreams of humanity in a scientific and scholarly manner. To accomplish it, Institute makes every effort to assist and encourage the students and researchers to conduct scientific study and research in the field of Food and Agricultural Ethics.

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