EcoTrack - Sustainable Living and Personal Wellness Hub: A Survey

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Abstract **– EcoTrack: Sustainable Living and Personal Wellness Hub serves as a foundation for understanding the interconnected challenges of environmental sustainability and human health. This survey examines how carbon emissions—particularly from the food and agriculture sectors—intersect with the health risks posed by processed and packaged food consumption. It explores established and emerging methods of calculating carbon footprints, while also evaluating dietary patterns contributing to lifestyle-related diseases. By linking ecological impact with nutritional outcomes, the paper emphasizes the need for integrated, evidence-based strategies at both personal and policy levels. Through the use of contemporary tools, real-world applications, and cross-disciplinary insights, this work aims to support researchers, advocates, and individuals striving for sustainable living.**

Index Terms **- Agricultural sustainability, Carbon emissions, Carbon footprint, Dietary health, Environmental impact, Food systems, Nutrition policy, Packaged food, public health, Sustainable living**

I. INTRODUCTION

The urgency of addressing climate change and lifestyle-related illnesses has never been greater. Carbon emissions from human activities—transportation, electricity use, and food production—are key contributors to global warming. Simultaneously, dietary shifts towards ultra-processed and packaged foods have led to an epidemic of non-communicable diseases.

These two domains intersect in multiple ways, particularly through food choices. Animal agriculture, for instance, generates significant greenhouse gas emissions, while over-processed foods often lack nutritional value and contain harmful additives. This survey investigates how modifying food consumption habits can yield benefits for both environmental sustainability and human health.

II. LITERATURE SURVEY

The intersection of food systems and environmental impact has been extensively researched by global organizations, independent think tanks, and academia. This section highlights key works and their implications:

A. *GHG Protocol (2020)* – The Greenhouse Gas Protocol provides a standardized method for measuring greenhouse gas emissions, widely adopted by both corporate and governmental stakeholders. It divides emissions into three main categories—direct, energy-related, and value-chain emissions—making it suitable for evaluating food and agricultural sectors [1].

B. *IPCC Special Reports (2021)* – Reports from the Intergovernmental Panel on Climate Change estimate that agriculture and land-use practices are responsible for up to one-third of human-induced GHG emissions. The IPCC emphasizes how restructured food systems and sustainable agricultural methods can play a vital role in meeting international climate goals [2].

C. *Springmann et al. (2018), Nature* – This pivotal research modeled the environmental and health implications of dietary transitions. The authors projected that shifting to plant-forward diets could lower emissions significantly and reduce premature mortality, underscoring the alignment between human health and planetary boundaries [3].

D. *WHO Global Nutrition Report (2022)* – The World Health Organization's comprehensive report highlights the growing impact of diet-related diseases, pointing to a surge in processed food consumption. It advocates for increased intake of whole and nutrient-rich foods to combat rising non-communicable diseases [4].

E. *FAO and UNEP (2020)* – Findings from the FAO and UNEP indicate that animal agriculture is a leading driver of methane release and land-use change. The report stresses the environmental toll of livestock farming and encourages strategies such as feed optimization and

diversified diets to reduce environmental strain [5].

F. *Lancet Commission on Healthy Diets (2019)* – This comprehensive report advocates a 'planetary health diet' emphasizing plant-based foods, legumes, nuts, and sustainable seafood. It outlines dietary patterns that could sustainably feed 10 billion people by 2050 while staying within planetary boundaries. The paper emphasizes systems-level changes, including food subsidies and agricultural reform [6].
G. *Environmental Working Group (EWG)* – EWG's research ranks over 1,000 food items based on their carbon footprint, pesticide residue, and water usage. Their 'Meat Eater's Guide to Climate Change + Health' provides an accessible tool for consumers to understand the impact of food choices [7].
H. *Poore & Nemecek (2018), Science* – A meta-analysis of over 38,000 farms and 1,600 processors showed that environmental impact varies drastically by production method. For instance, emissions from beef can vary 50-fold depending on the farm. This paper argues for product-level carbon labeling to empower sustainable consumer behavior [8].
I. *Global Panel on Agriculture and Food Systems for Nutrition (2021)* – This policy-focused report addresses the double burden of malnutrition and climate change. It proposes integrated governance approaches, including food taxation, labeling, and investment in local food systems [9].
J. *HLPE (High Level Panel of Experts, 2020)* – The UN's HLPE recommends sustainable food systems as a core strategy to address climate risks. It calls for increased support for agroecology, nutrition-sensitive agriculture, and public procurement reforms [10].
K. *Clark et al. (2019), Nature Sustainability* – This study conducted a cross-analysis of several food categories to evaluate their impact on both the environment and public health. The findings demonstrated that many plant-based foods not only have lower emissions and land use but are also associated with improved dietary outcomes, supporting the alignment between sustainable and healthy diets [11].
L. *Tilman & Clark (2014), Nature* – The research highlighted global dietary patterns and their implications for environmental stress and health. It projected that reducing the intake of high-impact foods, particularly red meat, could substantially decrease mortality and environmental burdens simultaneously [12].
M. *Searchinger et al. (2018), World Resources Institute* – This report outlines strategic approaches to creating a food system capable of sustainably feeding the global population by 2050. The authors propose solutions such as enhancing crop yields, promoting dietary shifts, and minimizing food loss as essential steps toward achieving long-term sustainability [13].
N. *Rockström, J., et al. (2009). Planetary Boundaries* - Exploring the Safe Operating Space for Humanity. Ecology and Society - Introduces the concept of planetary boundaries, including nitrogen cycles and biodiversity loss, which food systems directly affect. This paper lays the environmental foundation for discussing sustainable diets [14]
O. Barrett, C. B., et al. (2020). Measuring Food Insecurity and Hunger. IFPRI Discussion Paper - Though focused on food access, this paper is useful for linking food system sustainability with equity and nutrition outcomes, especially in lower-income populations where health-environment trade-offs are more pronounced [15].

These literature contributions establish the foundational need for a dual-focus strategy that addresses the environmental and health implications of food consumption. They also highlight gaps in current practices, especially in integrated policy implementation and consumer engagement tools.

III. CHALLENGES

A. *Data Silos* - Emissions and health data are rarely integrated, making systemic assessment difficult.
B. *Cultural Barriers* - Traditional dietary habits and socio-economic conditions hinder behavior change.
C. *Greenwashing and Mislabeling* - Misleading claims on packaging prevent informed consumer choices.
D. *Accessibility* - Healthy, low-emission foods often remain unaffordable or unavailable in many regions.
E. *Infrastructure Gaps* - Rural and low-income areas lack access to digital tracking tools.
F. *Lack of Policy Support* - Governments often subsidize high-emission food sectors rather than healthier alternatives.

G. *Underdeveloped Tech Ecosystem* - Limited innovation in food-emission tracking compared to energy or mobility sectors.

IV. COMPARATIVE STUDY

Feature	High-Emission/Processed Food	Low-Emission/Whole Food
Carbon Footprint	High (e.g., beef, cheese, frozen meals)	Low (e.g., grains, legumes, fresh produce)
Health Impact	Linked to chronic illness	Supports immune function and longevity
Land Use	Requires extensive land for feed crops	Efficient land use in plant-based farming
Water Footprint	High (e.g., dairy, nuts)	Moderate to low (e.g., pulses, tubers)
Packaging Waste	Non-recyclable plastics common	Often package-free or biodegradable
Shelf Life	Long with additives and preservatives	Short but nutritionally dense
Economic Cost	Externalized health and environmental costs	Potential long-term savings for healthcare systems

V. CONCLUSION

Achieving sustainability in our daily lives, particularly through food choices, plays a pivotal role in shaping a healthier planet and population. By addressing both environmental footprints and nutritional impacts simultaneously, individuals and policymakers can target two major global challenges—climate change and health deterioration. Reducing reliance on heavily processed foods and transitioning toward more plant-based, low-impact diets can significantly cut emissions while enhancing overall well-being. Moving forward, a multi-pronged approach involving technological innovations, supportive policy frameworks, and consumer education is essential to drive meaningful change toward a sustainable future.

REFERENCES

[1] Greenhouse Gas Protocol. (2020). *GHG Protocol Agriculture, Forestry and Other Land Use (AFOLU) Guidance.* World Resources Institute. https://ghgprotocol.org/AFOLU

[2] Intergovernmental Panel on Climate Change. (2021). *Climate Change and Land*: An IPCC Special Report. https://www.ipcc.ch/srccl/

[3] Springmann, M., Clark, M., Mason-D'Croz, D., Wiebe, K., et al. (2018). *Options for keeping the food system within environmental limits*. Nature, 562(7728), 519–525. https://doi.org/10.1038/s41586-018-0594-0

[4] World Health Organization. (2022). *Global Nutrition Report 2022*. https://globalnutritionreport.org/reports/2022-global-nutrition-report/

[5] Food and Agriculture Organization & United Nations Environment Programme. (2020*). The State of the World's Forests 2020*: Forests, Biodiversity and People. https://www.fao.org/documents/card/en/c/ca8642en

[6] Willett, W., Rockström, J., Loken, B., et al. (2019). *Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems*. The Lancet, 393(10170), 447–492. https://doi.org/10.1016/S0140-6736(18)31788-4

[7] Environmental Working Group. (2011*). Meat Eater's Guide to Climate Change + Health*. https://www.ewg.org/meateatersguide/

[8] Poore, J., & Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers. Science,* 360(6392), 987–992. https://doi.org/10.1126/science.aaq0216

[9] Global Panel on Agriculture and Food Systems for Nutrition. (2021). *Future Food Systems: For people, our planet and prosperity*. https://www.glopan.org/foresight2/

[10] High Level Panel of Experts on Food Security and Nutrition. (2020). *Food security and nutrition: building a global narrative towards 2030*. https://www.fao.org/3/ca9731en/ca9731en.pdf

[11] Clark, M. A., Springmann, M., Hill, J., & Tilman, D. (2019). *Multiple health and environmental impacts of foods.* Nature Sustainability, 2(8), 664–672. https://doi.org/10.1038/s41893-019-0331-8

[12] Tilman, D., & Clark, M. (2014*). Global diets link environmental sustainability and human health*. Nature, 515(7528), 518–522. https://doi.org/10.1038/nature13959

[13] Searchinger, T., Waite, R., Hanson, C., & Ranganathan, J. (2018). *Creating a Sustainable Food Future: A Menu of Solutions to Feed*

Nearly 10 Billion People by 2050. World Resources Institute. https://www.wri.org/research/creating-sustainable-food-future

[14] Rockström, J., Steffen, W., Noone, K., et al. (2009). *A safe operating space for humanity*. *Nature*, 461(7263), 472–475. https://doi.org/10.1038/461472a

[15] Barrett, C. B. (2020). *Measuring food insecurity*. *Science*, 368(6488), 404–405. https://doi.org/10.1126/science.aba4442