OPINION EDITORIAL

Got Beef? The Role of Traditional Ecological Knowledge and One Health in Managing the True Cost of Meat Consumption

Ankita Datar, McMaster University

INTRODUCTION

The rise in consumption patterns within every industry, from food to automobile, is evident through globalization [1]. Under the guise of development, achieving western standards of living are considered as the "progress of the nation". To achieve this quality of life, developing countries attempt to attract foreign investments through extensive economic restructuring and exporting of resources to the developed world. These products are not produced according to the same labour, environmental or safety standards as developed countries, which enables its consumers to enjoy having access to cheap goods without worrying about the ecological cost of consumption [1].

Connecting Meat with Consumption

One of the ways of determining the ecological cost of meat is through evaluating its carbon footprint. Meat products are particularly carbon-intensive, with emissions generated from both on-farm and off-farm sources, including cattle feed production, fermentation of manure and processing of beef products [2]. Intensive livestock production requires large quantities of water and large areas of land for animal grazing. According to global statistical data, approximately 30% of land and 8% of safe drinking water available in the world is invested in livestock production [2]. Transnational food corporations have utilized technology to increase the availability of meat products worldwide, as global citizens have seen sharp declines in meat prices [3]. The sharp decline in costs is not only associated with technological advancements in meat processing, but also from the deflection of true costs onto developing regions.

As demand for meat increases from North America, tropical deforestation in countries such as Brazil occurs to allow for greater grazing land for cattle [4]. In turn, deforestation has significant impacts on the carbon cycle and regulation of the regional climate [5]. When deforestation is combined with poor pasture and manure management, the Greenhouse Gas Emissions (GHG) associated with cattle production are significantly greater per unit of product [4].

The industrialization of agriculture means that every stage of the food production cycle must occur on a large-scale. Similar to most business models, cattle production only accounts for short-term costs within agricultural business plans. Reviewing the example of deforestation, the ecological impacts are widespread and long term. Loss of wildlife habitat and the destruction of indigenous homelands are relatively immediate effects seen within the Amazon [6]. The degradation of pastures decreases cattle-ranching productivity, and in a positive-feedback loop, farmers engage in further deforestation, extensive grazing and land degradation, which further damages the local ecosystem. The long-term effects of these factors have transnational implications, such as ineffective regulation of the water cycle, rising surface temperatures and greater risks of regional flooding.

Ineffective water regulation over time results in reduced soil fertility and land productivity, thereby threatening food security within the region [6].

Although the effects of agricultural intensification are seen globally, the majority of climate change research within the food industry attempts to improve efficiency of production and processing to reduce emissions, while simultaneously increasing yields. The underlying issues of consumption ingrained within every stage of the food cycle largely remain unaddressed. Without tackling consumption, eco-technologies will not make a dent on the commitments that countries have made to UN sustainable development goals, nor will they protect vulnerable workers within our food systems that are already facing climate calamities.

Traditional Ecological Knowledge (TEK) and One-Health

TEK is a rich source of reference when it comes to agricultural production, ecosystem conservation and climate-centered policymaking. In Peru, TEK inclusion in agroecological systems has been useful for water management across several farming communities [7]. For example, TEK has been used to implement and manage man-made wetlands, known as bofedales, which can produce high-quality, low-carbon animal fodder to feed the livestock, even during dry seasons [7]. Communal efforts to maintain healthy and biodiverse wetland systems ensures the health of animals while improving the energy efficiency of livestock production. This example highlights one way through which TEK increases livestock producers' climate resilience to dry spells through efficient natural resource management [7].

Pastoralists that account for TEK when making herding decisions are shown to engage in sustainable land-planning and are less likely to over-extract natural resources [8]. In West Africa, TEK on livestock focuses on the use of natural land cover for grazing compared to cropland. The pastoralists in this region have a detailed soil classification system through which they determine appropriate grazing landscapes for their livestock for different climate conditions. This maintains the fertility of soil to produce enough forage for animals without grassland degradation [8]. TEK on livestock provides holistic solutions by accounting for all relationships the livestock have with the surrounding ecosystem, including soil quality, water quality and vegetation biodiversity [8]. In more industrialized production facilities, only the relationship between livestock and their forage is accounted for.

The interconnected nature of human, animal and ecological health are described by the concept of one-health. When policymakers consider and account for the intricate relationships between these variables, the impact of programming grows. The above applications of TEK show the practical socioeconomic, and in-turn health benefits of this transformative approach. Rising consumption of meat products is directly correlated to the rise in zoonotic disease, while biodiversity loss increases the prevalence of epidemics [9]. Reducing the complexity of food production chains, promoting community self-sufficiency, reducing the distance between animal farms and end-consumers, and most importantly, reducing meat consumption through stronger regulations, all apply the one-health lens to animal farming. This should have both direct and indirect positive effects on human health by reducing the risks of infectious disease and agro-pollution, while promoting food and water security, and natural resource conservation [9].

CONCLUSION

The individualization of responsibility in climate action is a common practice in modern-day environmentalism. The ability to make individual decisions and the freedom to have a variety of choices is celebrated, regardless of the possibilities of cost displacement, overconsumption and often, wasteful consumption [10]. People who care (or can afford to care) about what conditions their food is produced under, can purchase products that are certified through climate labelling. Although rising demand for meat is linked to being a key driver for pandemics, consumption is largely overlooked or challenged in policy recommendations that assume this is a fixed certainty [9]. Instead, "eco-solutions" for intensive livestock production focus on increasing production efficiency through technologies and promoting eco-markets in which consumers can choose as the 'markets decide'. The impact of green technologies at production facilities has shown to further stimulate unsustainable consumption as producers ultimately reinvest the savings from efficient resource-use into even greater production, land clearance and further exploitation of resources. However, these solutions are marketed as victories that should be celebrated as wins against climate change. Governance approaches therefore need to move past market-mechanisms and soft regulations within the food industry.

The sharp declines in the cost of meat combined with policies that fail to confront the relationship producers have with the surrounding ecosystem shows the limits of the green economy and eco-capitalism to bring forth large-scale change. This is evident within the meat industry, which has seen exponential growth within consumption, despite technological advancements in meat production and processing. The paradox of 'sustainable consumption' remains a challenge in modern-day environmental movements, which refuse to move past the question 'how can we maintain the status-quo without sacrificing much else?'.

REFERENCES

1. Dauvergne P. The Shadows of Consumption: Consequences for the Global Environment. Cambridge: MIT Press; 2010.

2. Chen Z, An C, Fang H, Zhang Y, Zhou Z, Zhou Y, et al. Assessment of regional greenhouse gas emission from beef cattle production: A case study of Saskatchewan in Canada. J. Environ. Manage. [Internet]. 2020 Jun [cited 2022 Feb 10];264(1):1-12. Available from: www.sciencedirect.com/science/article/pii/S0301479720303777?via%3Dihub DOI: https://doi.org/10.1016/j.jenvman.2020.110443

3. Kearney J. Food consumption trends and drivers. Philos. Trans. R. Soc. Lond. [Internet]. 2010 Sept [cited 2022 Feb 10];365(1554):2793–2807. Available from: https://royalsocietypublishing.org/doi/10.1098/rstb.2010.0149 DOI: https://doi.org/10.1098/rstb.2010.0149

4. Caviglia-Harris J. Agricultural innovation and climate change policy in the Brazilian Amazon: Intensification practices and the derived demand for pasture. JEEM [Internet]. 2018 Jul [cited 2022 Feb 10];90(1):232-248. Available from: www.sciencedirect.com/science/article/abs/pii/S0095069616301358?via%3Dihub DOI: https://doi.org/10.1016/j.jeem.2018.06.006

5. Durango S, Gaviria X, Gonzalez R, Sotelo M, Gutierrez J, Chirinda N, et al. Info Note: Climate change mitigation initiatives in beef production systems in tropical countries [Internet]. Columbia: CCAFS; 2017 May [cited 2022 Feb 10]. Available from: https://cgspace.cgiar.org/handle/10568/81302

6. Pachamama Alliance. Environmental Effects of Deforestation [Internet]. California: Panchamama.org; 2021 [cited 2022 Feb 10]. Available from: www.pachamama.org/effects-of-deforestation

7. Saylor CR, Alsharif KA, Torres H. The importance of traditional ecological knowledge in agroecological systems in Peru. Int J Biodivers Sci Ecosyst Serv Manag [Internet]. 2017 Jan [cited 2022 Feb 10];13(1):150-161. Available from: https://www.tandfonline.com/doi/full/10.1080/21513732.2017.1285814 DOI: https://doi.org/10.1080/21513732.2017.1285814

8. Tamou C, Boer I, Ripoll-Bosch R, Oosting S. Traditional ecological knowledge underlying herding decisions of pastoralists. Animal [Internet]. 2018 Apr [cited 2022 Feb 10];12(4):831-843. Available from: https://pubmed.ncbi.nlm.nih.gov/28849752/ DOI:10.1017/S1751731117002130

9. Espinosa R, Tago D, Treich N. Infectious Diseases and Meat Production. Environ Resour Econ. [Internet]. 2020 Aug [cited 2022 Feb 10];76(1):1019-1044. Available from: https://link.springer.com/article/10.1007/s10640-020-00484-3#Sec2

10. Xavier M. Subjectivity under consumerism: The totalization of the subject of commodity. Psicol. Soc. [Internet]. 2016 May [cited 2022 Feb 10];28(2):207-216. Available from: https://www.scielo.br/j/psoc/a/KTbLKqyznQq9vLsHZ5n8ThF/?lang=en DOI: http://dx.doi.org/10.1590/1807-03102016v28n2p207