Mitigating Environmental Degradation: The Strategic Roles of Muslims for Human Well-Being and Planetary Stability

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Abstract

As environmental crises escalate, with rising global warming, ice melting, species extinction, and pollution, urgent action is required to safeguard humanity and the planet. This article reviews the literature on environmental risks in Muslim countries, particularly poorer ones. The environmental impact equation (I = f [T, P, A]) underscores the key drivers—technology, population, and affluence, with affluence identified as the primary driver of climate change resulting from excessive carbon emissions. The wealthiest one percent produce approximately 70 times more carbon than the poorest 50%, yet it is poorer communities that disproportionately suffer the consequences. This paper examines how Muslims can contribute to sustainability and mitigate environmental damage by addressing ecological "overshoots," promoting "degrowth" and "steady-state" economies, and fostering *qanā'ah* (contentment) as a personal lifestyle practice. The emphasis is placed on affluence, rather than population, as the critical factor in combating climate change.

Keywords
Climate change, *qanā'ah*, degrowth economy, environmental degradation, mitigation, steady-state economy.

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Introduction

This article explores the strategic roles that Muslims can adopt to address and reduce environmental degradation, especially in the form of climate change, as well as their role in promoting a more sustainable future. The word "mitigation" refers to measures taken to avoid, minimise, or compensate for the harmful effects of environmental impacts resulting from human activities. This article intends to answer the question: How can Muslims strategically contribute to mitigating environmental degradation for the dual purposes of enhancing human well-being and promoting planetary stability? The conceptual framework of this article's investigation covers various fields, which are: (1) the intersectionality between environmental stewardship and human well-being; (2) Islamic values and ethics; (3) global and local perspectives; (4) policy and advocacy; (5) community-based solutions; and (6) longitudinal (time-series) analysis. Due to the large scope of the investigation, this article employs the method of literature review and case studies.

First and foremost, it is essential that we consider "planetary boundaries." These refer to the processes of Earth systems and associated thresholds that, if crossed, could lead to irreversible or catastrophic environmental changes. The concept of "planetary boundaries" was first introduced in 2009 by a group of scientists—Johan Rockstrom, Will Steffen, and others—who subsequently mapped nine of them.[1] Six of these boundaries have now been crossed, which are: (1) climate change; (2) biosphere integrity; (3) land-system change; (4) freshwater change; (5) biochemical flows; (6) and novel entities (which include all chemical compounds created by humans, such as microplastics).[2] Earth is suffering from environmental degradation, which is massively reducing its ecological sustainability. We now face three major environmental crises: (1) climate change, (2) the loss of biodiversity, and (3) pollution, all of which are driven by human activities and unsustainable consumption patterns. Developing nations are being hit the hardest but, unfortunately, have the least capacity to adapt. The United Nations Environmental Program found that seven million people die annually resulting from air pollution and another 30 million people are forced to leave their homes because of climate disruptions.[3] Rising sea-levels, for example, will especially impact island nations and coastal countries. The 2015 Paris Agreement promoted efforts to ensure global average temperatures

1. Johan Rockstrom et al., "A safe operating space for humanity," *Nature* 461 (2009): 472–475.
2. K. Richardson et. al., "Earth beyond six of nine planetary boundaries," *Science Advances* 9, no. 37 (2023).
3. Hariati Azizan, "Young Malaysians jump on the green bandwagon," *Sunday Star*, 5th June 2022, https://www.thestar.com.my/news/focus/2022/06/05/world-environment-day-young-malaysians-jump--on-the-green-bandwagon (Accessed 26 January 2024); UN Environmental Programme, *Pollution Action Note—Data you need to know*, 6th September 2023 https://www.unep.org/interactives/air-pollution-note/ (Accessed 26th January 2024).

remained below a level of 1.5°C above pre-industrial levels. Environmental crises, however, are here and now: "the past few weeks, climate records were shattered globally… Average sea surface temperatures have been the highest ever recorded and Antarctica sea ice extent the lowest on record."[4] The months from June to August 2023 were the warmest months in human history.[5]

A simple formula describes the scale of Environmental Impact (I) as a function of population size (P), technology efficiency (T), and affluence or consumption per person (A): I = *f* (P, A, T), or I = P x A x T. From this formula, it can be observed that direct relationships exist between population growth and increased CO2 emissions. Population growth, however, is slowing, and the efficacy of "green" technologies is simultaneously increasing. While governments are addressing "T," this paper intends to discuss more on "P" and "A." Table 1 shows the change in CO2 emissions per capita of key countries between 2005 and 2020, as well as their ecological footprints between 2012 and 2022. "Eco-footprint" is the impact of human activities measured in terms of the area(s) of biologically productive land and water required to produce the goods consumed and assimilate the wastes generated from it. Meanwhile, "biocapacity" is the capacity of a biologically productive area to generate renewable resources and absorb wastes. In 2022, Earth's biocapacity was 1.5 global hectares per capita, while the average citizen's eco-footprint was 2.6 hectares per capita (Figure 1). In other words, humans are consuming Earth's natural resources 1.7 times faster than its biocapacity, which is an alarmingly unsustainable deficit.[6] This is what is known as "overshoot," which results in the degradation of the world's ecosystems. Certain affluent countries—such as the United States and Australia—consume more excessively than others. If everyone consumes similarly, it will require five earths to sustain them. Clearly, to live sustainably is a must now.

4. Kimberley Reid, "Why are so many climate records breaking all at once," *The Conversation*, 6th July 2023, https://theconversation.com/why-are-so-many-climate-records-breaking-all-at-once-209214 (Accessed 27th August 2023).
5. "2023 is already on track to be the hottest year ever recorded," *The Star*, Malaysia, 17th July 2023, https://www.thestar.com.my/aseanplus/aseanplus-news/2023/07/17/2023-is-already-on-track-to-be-the-hottest-year-ever-recorded (Accessed 8th September 2023).
6. Global Footprint Network, "Estimating the Date of Earth Overshoot Day, 2023," https://www.overshootday.org/content/uploads/2023/06/Earth-Overshoot-Day-2023-Nowcast-Report.pdf (Accessed 15th November 2023).

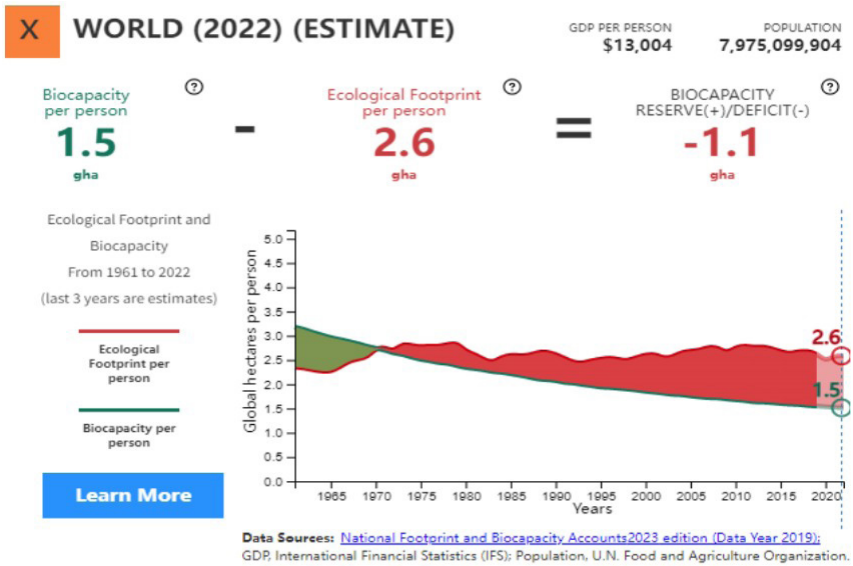
Table 1 Carbon emissions and environmental footprints of the citizens in selected countries.

	CO2 emissions (tonnes per capita)		Ecological Footprint (global hectares per capita)		Earths required 2022
Country	2005[1]	2020[2]	2012[3]	2022[4]	
Australia	18.96	14.8	9.31	7.27	4.5
Indonesia	1.59	2.1	1.58	1.66	1.1
Malaysia	6.9	7.4	3.71	3.91	2.6
Nigeria	0.72	0.5	1.16	1.02	0.7
UAE	26.72	20.3	4.94	8.95	6.0
UK	9.23	4.6	7.93	4.20	2.8
USA	19.95	13.0	8.4	8.04	5.4

Sources: See footnote.[7]

7. "List of countries by carbon dioxide emissions per capita," *Wikipedia*, https://en.wikipedia.org/wiki/List_of_countries_by_carbon_dioxide_emissions_per_capita (Accessed 13th November 2023); World Bank, "CO2 emissions (metric tons per capita)," https://data.worldbank.org/indicator/EN.ATM.CO2E.PC (Accessed 13th November 2023); "List of countries by ecological footprint (2012)," *Wikipedia*, https://en.wikipedia.org/wiki/List_of_countries_by_ecological_footprint (Accessed 13th November 2023); and "Ecological footprint by countries 2023," *Global Footprint Network*, https://worldpopulationreview.com/country-rankings/ecological-footprint-by-country (Accessed 15th November 2023).

Figure 1 Humanity's ecological footprints and the planet's biocapacity in global hectares per person from 1961 to 2022 (2023 edition).



Source: overshootday.org[8]

Many regions where Muslims live are particularly at risk of climate harm. For instance, in the Middle East and North Africa (MENA), parts of the region are warming at a level twice the global average temperature and many cities may gradually become uninhabitable.[9] It is the world's most water-scarce region, now exacerbated by climate change. The MENA region also has the world's largest refugee population and the highest rate of population growth, which further strain its already depleted natural resources. In another region, Malaysia also faces long-term climate risks. From 2001 to 2021, Malaysia lost 29% of its tree cover.[10] The environmental impacts there were caused primarily by climate change and deforestation, which then not only impacted its biodiversity but also caused air and water pollutions which impacted human health. Global warming causes heat waves and more frequent and denser rainfalls, which then cause extreme flood events and landslides. Sea-levels have also risen significantly.[11]

8. Global Footprint Network, "Estimating the Date of Earth Overshoot Day 2023," https://www.overshootday.org/content/uploads/2023/06/Earth-Overshoot-Day-2023-Nowcast-Report.pdf (Accessed 13th November 2023).
9. Jos Lelieveld, "Hot Air in the Orient," *Max Planck Institute* 4, no. 16: 62–66.
10. Milton Lum, "The effects of climate change in Malaysia," *The Star*, 5th July 2022.
11. Ibid.

The Secretary-General of the United Nations, Antonio Guterres, described the latest report of the Intergovernmental Panel on Climate Change (IPCC)[12] as "a litany of broken promises" and reminded the world it is "on a fast track to climate disaster." In 2019, the IPCC indicated that to curb global warming, CO2 emissions should be cut 43% by 2030 compared to 2010 levels; current plans show a 10.6% increase.[13] A new UN report finds that even if nations meet their current climate goals, the planet will still heat at a catastrophic rate, 2.5–2.9°C above the pre-industrial levels![14] For reference, global sea-levels 7,000–5,000 years ago were two to four metres higher than the present levels,[15] while the average temperatures then were around 0.5°C higher than modern temperatures.[16] With a 2.5°C rise in temperature over the pre-industrial levels "locked-in," the present writer believes that a sizeable, impactful rises of global sea-levels—about three metres and above—are to be expected by the early 2100s.

Islamic Teachings on Environmental Stewardship, Sustainability, and Adaptation

Islam arguably contains more teachings related to environmental guidance than other religions. As for many other aspects of this religion, the foundation of Islamic environmental ethics is *tawḥīd*:

> It emphasises the interconnectivity of the cosmos, the intrinsic value of every part of creation, and the significance of maintaining equilibrium and harmony in everyday life. These principles, which support responsible sustainable use of natural resources, and preservation of biodiversity and the environment, form the basis of Muslim environmental ethics.[17]

12. Which is the United Nations body responsible for advancing scientific knowledge about climate change caused by human activities.
13. "Low emissions transition splutters as energy crisis bites," *Weekend Australian*, 30th October 2022.
14. "UN warns world 'out of road' for limiting warming to 1.5 °C ahead of COP28 meeting in Dubai," *Al-Jazeera*, 21st November 2023.
15. Keith Richard, "10,000 to 5,000 Years Ago, Global Sea Levels were 3 Meters Higher, Temperatures 4–6°C Warmer," *No Tricks Zone*, 21st August, 2017, https://notrickszone.com/2017/08/21/10000-to-5000-years-ago-global-sea-levels-were-3-meters-higher-temperatures-4-6-c-warmer/ (Accessed 24th November 2023).
16. D. Kaufman et al., "A global database of Holocene paleotemperatures records," *Sci Data* 7, no. 115 (2020).
17. Imran Hayat et al.,"The Role of Islamic Environmental Ethics in the Alleviation of Climate Challenges and the Preservation of Ecosystem," *Russian Law Journal XI*, no. 11s (2023): 398.

Based on the Qur'ān and *ḥadīth*, Islam outlines an environmental ethics that follows the concepts of *khilāfah* (stewardship), *āyāt* (seeing God's signs everywhere), *amānah* (divine trust), *mīzān* (balance), *ʿadl* (justice),[18] *fiṭrah* (natural human state of goodness and purity), *arḥām* (family-community values),[19] and *maṣlaḥah* (public interest), while also preventing or limiting corruption and pollution (*fasād*), which are deviations from the state of *fiṭrah*. In al-Jayyousi's model, these values form the framework for achieving *ḥayātun ṭayyibah* (good God-directed life), which together with making the universe prosperous (*ʿimārat al-kawn*), are considered to be the goals of Islamic sustainable development.[20] A valuable Islamic practice in natural resource management is *ḥimā*, which is the allocation of protected areas with restrictions on extraction, grazing, and hunting so as to promote ecological sustainability.[21]

Koehrsen has insightfully highlighted that "Muslim environmentalism has strong potential to advance ethical questions about climate change adaptation."[22] Indeed, Muslims are better equipped than many, through Islamic teachings, for the role humanity needs in displaying resilience in adapting to anticipated new conditions expected from severe climate change. Such empowering Islamic values include *ṣabr* (patience/perseverance), *qanāʿah* (contentment), *taʿāwun* (co-operation), and *ṣadaqah* (charity), all of which are needed for mutual support in facing crises.

Comparative Severity between Overpopulation and Excessive Consumption

We now address the two factors most relevant to us—population and affluence—as to which is more responsible for larger carbon emissions causing the greater impact to humanity. As observed in Table 1, wealthy countries have a greater eco-footprint and generate much higher carbon emissions than poorer countries. The research conducted by this current article demonstrates that although high population growth in developing countries is responsible for significant impacts on biodiversity and water resources, it has nevertheless only a minor contribution to climate change.[23]

18. With *tawḥīd*, these are the six principles of a "Green Deen," as discussed by Ibrahim Abdul-Matin, *Green Deen*: *What Islam Teaches About Protecting the Planet* (San Francisco: Berret-Koehler, 2010).
19. Odeh Rashed al-Jayyousi, *Islam and Sustainable Development: New Worldviews* (Farnham, UK: Gower, 2012), 48–49.
20. Ibid.
21. Ibid., 90.
22. Jens Koehrsen, "Muslims and climate change: How Islam, Muslim organizations, and religious leaders influence climate change perceptions and mitigation activities," *WIREs Climate Change* 12, no. e702 (2021): 14.
23. Daud Batchelor, "First national conference on environmental crisis: Faith perspectives," *Australian Muslim Times*, 10th March 2020, https://www.amust.com.au/2020/03/first-national-conference-on-environmental-crisis-faith-perspectives/ (Accessed 6th June 2023).

The two billion global Muslim population is increasing twice as fast as the global population growth due to a higher total fertility rate (TFR) of Muslim women compared to non-Muslim women.[24] Nigeria, for example, has Africa's highest population with a TFR of 4.6 children.[25] The average number of children per woman in Nigeria is 2.6 times higher than that of women in Australia (1.7) and the US (1.8). Yet, Australians and Americans generate more excessive annual CO2 emissions per head—14.8 tonnes and 13.0 tonnes respectively—that is, six to 30 times than that of Indonesia and Nigeria, which are only 2.1 tonnes and 0.5 tonnes respectively. Critically, Murtagh and Schlax estimated lifetime CO2 emissions added by having a single child range from 56 tonnes (Bangladesh) to 9441 tonnes in the US.[26] Lifetime emissions of having one extra child in the US is 86 times greater than in Nigeria (110 tonnes), and a huge 169 times more than that of having a child in Bangladesh.

To summarise, while the population growth rates in developing countries with high total fertility rate are two to three times higher than in Western countries, consumeristic patterns in the Western countries result in extremely greater carbon emissions, by factors of up to 169 times. Excessive individual consumptions as a part of material consumerism in wealthy countries is clearly the main culprit of climate change, rather than the population growth rates in developing countries.

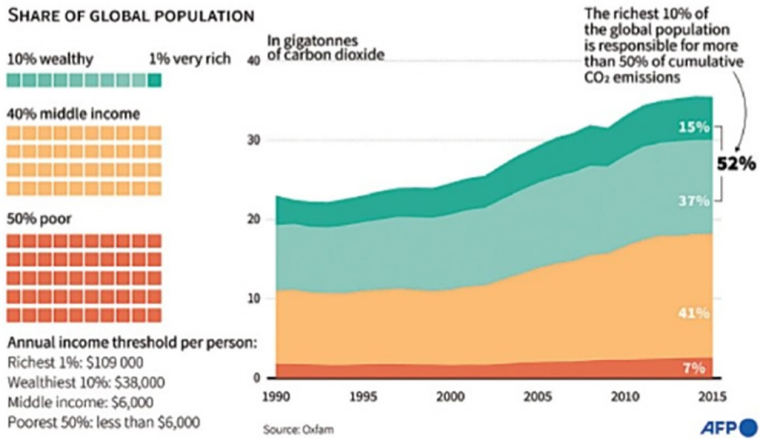
Inequality and Excessive Consumerism by the Wealthy Elites

Figure 2 shows the different emissions resulting from severe disparities in global incomes, which illustrates the overwhelming influence of wealthy countries.[27] The inequality between rich and poor people's emissions within countries now overwhelms the country-to-country disparities.[28] It shows that "between 1990 and 2015, the richest one percent of people drove 15% of climate-changing emissions—more than twice the seven percent emitted by the poorest half."[29]

24. Michael Lipka and Conrad Hackett, "Why Muslims are the fastest growing religious group?" *Pew Research Center*, 6th April 2017, https://www.pewresearch.org/short-reads/2017/04/06/why-muslims-are-the-worlds-fastest-growing-religious-group/ (Accessed 5th July 2023).
25. CIA World Factbook, "Total Fertility Rate: Country Comparisons 2023," https://www.cia.gov/the-world-factbook/field/total-fertility-rate/country-comparison (Accessed 16th July 2023).
26. Paul A. Murtagh and Michael G. Schlax, "Reproduction and the carbon legacy of individuals," *Global Environmental Change*, no. 19 (2009): 18.
27. 70% of emissions derive from North America, Western Europe, and Australasia/Japan.
28. Eric Roston, Leslie Kaufman, and Hayley Warren, "How the World's Richest People Area Driving Global Warming," *Bloomberg Asia Edition*, 24th March 2022, https://www.bloomberg.com/graphics/2022-wealth-carbon-emissions-inequality-powers-world-climate/#:~:text=It's%20the%20bedrock%20idea%20underpinning,to%20help%20poor%20nations%20adapt. (Accessed 16th July 2023).
29. Reuters, "Emissions by richest one per cent twice that of poorest 50 pc," *Dawn*, 22nd September 2020, https://www.dawn.com/news/1580976 (Accessed 15th November 2023).

Oxfam and Stockholm Environment Institute further indicates that the richest one percent produced as much human-generated carbon emissions as the five billion poorest two-thirds.[30]

Figure 2 Inequality and CO2 emissions: Share of cumulative CO2 emissions for different income brackets from 1990 to 2015



Source: Stockholm Environment Institute research, cited in Dawn.[31]

In another research by World Inequality Lab (WIL), they found:

> with more riches come higher emissions, as wealth drives changes in travel, diets, cars, and lifestyle choices…the richest 10%—those earning more than 109,000 USD a year…emit about 70 times as much carbon as the bottom 50%.[32]

Extremely rich people, who are responsible for exorbitant carbon emissions typically consume a high meat-based diet, and are frequent flyers who often fly with private aircrafts, and sometimes superyachts, which are the single most polluting asset. We can call these people the "pollution elites."[33] Emily Ghosh

30. Jonathan Watts, "The great carbon divide," *The Guardian Weekly*, 24th November 2023, 11–12, https://www.theguardian.com/environment/ng-interactive/2023/nov/20/the-great-carbon-divide-climate-chasm-rich-poor.
31. Reuters, "Emissions by richest one per cent twice that of poorest 50 pc."
32. Rose Mary Petrass, "How the World's Richest People Are Driving Global Warming," *The Fifth Estate*, 26th April 2022, https://thefifthestate.com.au/arts-and-letters/what-were-reading-how-the-worlds-richest-people-are-driving-global-warming/ (Accessed 16th July 2023).
33. Danny Halpin, "The overconsumption of the elites," *The Ecologist*, 11th April 2023, https://theecologist.org/2023/apr/11/overconsumption-elites (Accessed 16th July 2023).

says: "With the climate problem we can't ignore what people in the top 1% and 10% are doing… There needs to be a strong shift in power."[34] The solution is politicians taking back control of the climate issue with strong legislation and policy. They should support initiatives of leading NGOs, for example:

> Oxfam is calling for hefty wealth taxes on the super-rich and windfall taxes on fossil fuel companies to support the worst affected, reduce inequality and fund a transition to renewable energy.[35]

Jason Hickel, from the London School of Economics, highlights: "We need a political discourse that…recognises that the rich and capitalism are the major drivers of the climate crisis."[36]

Islamic Teachings on Social Justice

Hayat and others note that…

> Islamic jurists have applied the *'adl* principle that emphasises fairness and justice in the use of environmental goods and distribution of natural resources. In situations where marginalised communities are disproportionately impacted by environmental degradation, they advocated for an equitable distribution of resources.[37]

They further note that

> …ecosystems and natural resources have been exploited for the benefit of wealthy elites and multinational corporations, frequently at the expense of local communities… Therefore, addressing issues related to the environment in the world necessitates addressing poverty and inequality…[38]

34. Emily Ghosh et. al, *The Carbon Inequality Era: An assessment of the global distribution of consumption emissions among individuals from 1990 to 2015 and beyond* (Stockholm: Oxfam and Stockholm Environment Institute, 2020).
35. Jonathan Watts, "Richest 1% account for more carbon emissions than poorest 66%, report says," *The Guardian*, 20th November 2023, https://www.theguardian.com/environment/2023/nov/20/richest-1-account-for-more-carbon-emissions-than-poorest-66-report-says#:~:text=10%20months%20old-,Richest%201%25%20account%20for%20more%20carbon,than%20poorest%2066%25%2C%20report%20says&text=The%20richest%201%25%20of%20humanity,climate%20emergency%2C%20a%20report%20says. (Accessed 4th October 2024).
36. Watts, "The great carbon divide," 12.
37. Hayat et al., "The Role of Islamic Environmental Ethics," 400.
38. Ibid.

Odeh al-Jayyousi compares capitalism and the Islamic alternative: "The underlying principles and drive of capitalism are based on the notion of profit-seeking, regardless of social consequences…and [it] lacks the inner impulse for social justice."[39] However, in the case of Islam, he says, "To address disparities between the rich and the poor, Islam institutionalised social security…Within the Islamic framework the right of property ownership must be conceived as a trust to be… subjected to moral responsibility towards society as a whole."[40]

The Needed Reform for Capitalism and An Adoption of a Steady-State Economy

Yuval Noah Harari commented shockingly:

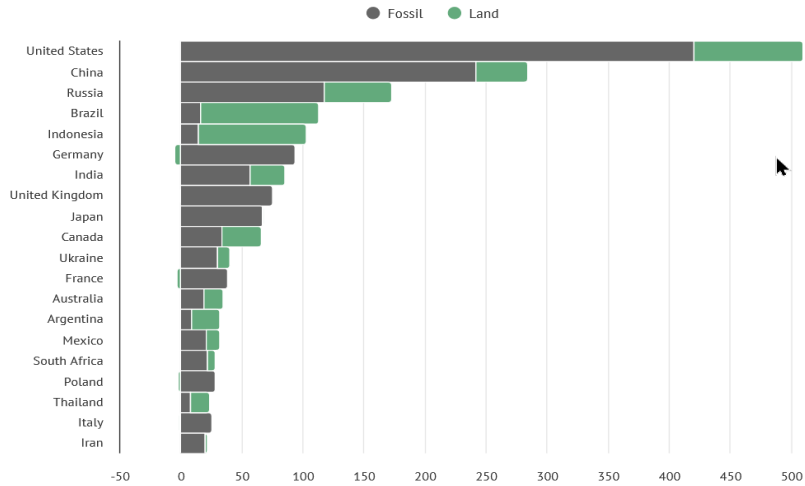
> If all new industries pollute the atmosphere and oceans, causing global warming and mass extinctions, then we should build for ourselves virtual worlds and hi-tech sanctuaries that will provide us with all the good things in life even if the planet becomes as hot, dreary, and polluted as hell.[41]

He further highlights that "in practice, humankind is unwilling to make the serious economic, social or political sacrifices necessary to stop this catastrophe…"[42] This situation is now changing as community leaders speak out in addressing the crises. Wealthy countries need to take the lead and make greater efforts than countries with lower emissions. This is because: firstly, they got rich by emitting far greater historical carbon emissions (Figure 3);[43] secondly, their current emissions support an unsustainable lifestyle on a finite planet that must be curtailed; thirdly, they have much greater economic and institutional capacity to assist others who still face development challenges.[44] Civil Society Review warned:

> Any approach that does not require the wealthy to contribute to an extremely rapid climate transition, supporting…poor countries as they seek to develop along low-carbon paths while at the same time adapting to worsening impacts of climate change, is doomed to fail.[45]

39. Al-Jayyousi, *Islam and Sustainable Development*, 74.
40. Ibid., 75.
41. Yuval Noah Harari, *Homo Deus: A Brief History of Tomorrow* (New York: Harper Collins, 2017), 214.
42. Ibid., 215–216.
43. Roston, Kaufman, and Warren, "How the World's Richest People Area Driving Global Warming."
44. Civil Society Review, "Equity After Paris," *A Civil Society Equity Review*, 12th November 2018, 5, https://unfccc.int/sites/default/files/resource/387_Civil%20Society%20Equity%20Review%20-%20TD%20Submission.pdf (Accessed 14th July 2023).
45. Ibid., 5.

Figure 3 Historical cumulative CO2 emissions by country (1850–2021).



Note: Subtotals are displayed for fossil fuels and cement (grey); land use and forestry (green).
Source: Simon Evans, "Which countries are historically responsible for climate change."[46]

Further, in an article written by Rostom, Kaufman, and Warren, it shows that globally, while the middle classes achieved commendable reductions in per capita emissions since 1960, the top elite showed a shocking 107% increase in their emissions in the same period.[47] Emissions reduction focusing on individuals is just as important as government, corporate, institutional, or technological reductions. An article titled "Scientists Warning on Affluence" concluded that

> …people, not institutions, need to solve the problems. Organisations engaged in climate debates—governments, companies, NGOs—are ultimately legal or social structures made up by people. And if people do not change, the institutions will not either.[48]

46. Simon Evans, "Which countries are historically responsible for climate change," *Carbon Brief*, 5th October 2021, https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change/ (Accessed 15th November 2023).
47. Roston, Kaufman, and Warren, "How the World's Richest People Area Driving Global Warming."
48. T. Wiedman, "Scientists warning on affluence," *Nat. Commun* 11, no. 3107 (2020), https://www.nature.com/articles/s41467-020-16941-y (Accessed 20th November 2023).

As an example of the challenges faced, the average persons in the United Kingdom emit 8.5 tonnes of carbon annually (including imported goods emissions). To stay within the 1.5°C warming limit, individuals need to reduce this figure dramatically to 0.7 tonnes.[49] As time is necessary to change personal consumeristic behaviours, Kenner, believes: "The issue is about speed, and for that government action is necessary."[50] Another instance of the challenges can be observed in Samuel Alexander's perceptive observation in 2014, that we consume resources of

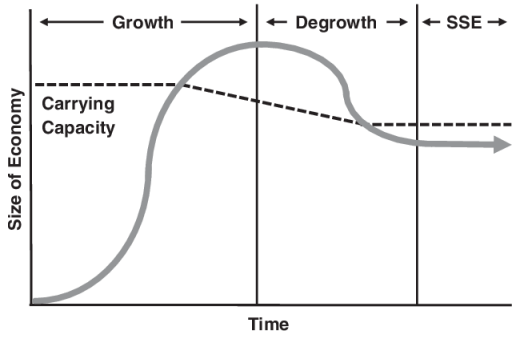
> …one-and-a-half earths [1.7 earths now] to sustain the existing global economy. Every year that this "ecological overshoot" continues, the foundations of our existence are undermined… Our growth-oriented civilisation is deluded that there are no environmental limits to growth…This is the defining critical flaw in growth economics...[51]

He further says, "There is absolutely no way today's 7.2 billion people could live the Western way of life, let alone the 11 billion expected in the future… We need an alternative."[52]

"Greening capitalism" is not enough. The necessary transition requires rich nations to downscale radically their resource and energy demands. This realisation calls for economic "degrowth," meaning a phase of planned and equitable contractions, eventually reaching a steady-state economy (SSE) that operates within Earth's biophysical limits (Figure 4). Getting the wealthy to reduce their emissions may be difficult given that, firstly, many have strong political influence to thwart change, and secondly, many are materialists attracted to accumulating goods and image-focused; behavioural traits then are difficult to curtail.

49. Laura Paddison, "How the rich are driving change," *BBC Carbon Cost*, 29th November 2021, https://www.bbc.com/future/article/20211025-climate-how-to-make-the-rich-pay-for-their-carbon-emissions (Accessed 16th July 2023).
50. Dario Kenner, *Carbon Inequality: The Role of the Richest in Climate Change* (Milton Park, UK: Routledge, 2021).
51. Samuel Alexander, "Life in a 'degrowth' economy, and why you might actually enjoy it," *The Conversation*, 2nd October 2014, https://theconversation.com/life-in-a-degrowth-economy-and-why-you-might-actually-enjoy-it-32224 (Accessed 16th July 2023).
52. Ibid.

Figure 4 The "degrowth" transition to a "steady-state-economy" (SSE).



Source: Daniel O'Neill, "Measuring progress in the degrowth transition to a steady state economy."[53]

Strategic Roles of Muslims

Jens Koehrsen notes:

> Massive oil production in the Middle East and deforestation in Indonesia, Mali, and Nigeria, as well as carbon-intensive consumption habits (e.g., car use, air conditioning), indicate strong mitigation potentials in Muslim-majority countries... In response…, governments of Muslim-majority countries have signed international agreements, and some started implementing green economy strategies.[54]

Consequently, strategic roles for Muslims and Muslim countries to address environmental degradation can cover a number of fields.

Education and Awareness

Muslims need to play an active role in raising awareness and propagating Islam's valuable teachings on environmental protection within their own communities and the world at large. As *KhalīfatuLlāh fī al-arḍ* (God's stewards on earth), every person has a religious duty to protect the environment. In The First Australian National Conference on the Environmental Crisis and Our Obligations to Act, the current writer stated that Muslims generally give environmental action a lower priority compared to issues related to the "war on terror," migrant crises,

53. Daniel O'Neill, "Measuring progress in the degrowth transition to a steady state economy," *Ecological Economics* 84 (2012): 221–231.

54. Koehrsen, "Muslims and climate change," 7.

and economic betterment.[55] Today, however, Muslims are becoming more involved. Survey data indicate that the majority of Muslims regard climate change as "an important societal challenge."[56] In this regard, Koehrsen discusses the strong potential of Muslim communities to address environmental crises:

> Religious leaders and organisations often enjoy high credibility. They have an important voice in public debates and can influence political decision-making… Some religious institutions have massive financial and organisational resources (e.g., media networks, local schools) that they can mobilise to promote transformations toward more environmentally sustainable societies… Religious communities have started to undertake environmental activities, such as public statements, consultations with national and regional governments, recycling or tree-planting projects, and environmental education.[57]

> Scholars stress the potentials of Muslim organisations and leaders to promote environmental concerns. This includes their ability to reach broad populations in Muslim majority countries through public messages, Friday prayers, and ethical teachings... Given their high legitimacy, local religious leaders may even become gatekeepers who influence what information the given local community regards as credible. In addition, Muslim organisations can use their infrastructures and financial resources to undertake practical environmental projects (e.g., recycling) that become experimentation sites for local communities…[58]

For example, in 2015, the late respected American activist Ibrahim Abdul Matin promoted the community role of Green Mosques initiative.[59] Another example is where leading Muslim environmentalists convened in Istanbul in 2015 to promulgate the "Islamic Declaration on Global Climate Change," seeking to create greater awareness on climate change and called on Muslim decision-makers to take urgent actions in response.[60] As a summary outline, Koehrsen highlighted the following climate change mitigation activities that religious organisations can undertake: (1) "campaigning publicly to raise greater concern about climate change and lobbying… (e.g., through public statements,

55. Batchelor, "First Australian National Conference on the Environmental Crisis."
56. Koehrsen, "Muslims and climate change," 5.
57. Ibid., 2.
58. Z.F. Mohamad, N. Idris, and Z. Mamat, "Role of religious communities in enhancing transition experiments: A localised strategy for sustainable solid waste management in Malaysia," *Sustainability Science* 7, no. 2 (2012): 237–251; and Koehrsen, "Muslims and climate change," 7.
59. Abdul-Matin, *Green Deen*, 57–71.
60. Daud Batchelor, "The Islamic Declaration on Climate Change," *Islam and Civilisation Renewal* 6, no. 4 (2015): 584–585.

media campaigns, advocacy work)"; (2) materialising change by undertaking socio-technological measures to reduce carbon emissions (e.g., switching energy consumption of religious buildings to renewables); and (3) disseminating pro-environmental values and worldviews to religious constituencies.[61] To put it differently, environmentalism is most powerful when working across religious, ethnic, and racial fronts. It is an antidote to selfishness and materialism; acknowledging that everyone can be affected by environmental degradation.

Examples from Some Countries

In Indonesia, Muslim environmentalists engage with powerful Muslim organisations such as Majelis Ulama Indonesia (MUI), the Muhammadiyah organisation, and Nahdatul Ulama and their extensive networks to undertake mitigation activities: "About 90% of Indonesia's 270 million people are Muslims, while the nation has 800,000 mosques, 37,000 [Islamic] boarding schools, and more than 170 Islam-led universities,"[62] offering a huge platform for environmental education. These bear "the potential of undertaking a comprehensive low-carbon transformation… Although the context facilitates a top-down approach, local student grassroots initiatives emerge."[63] Therefore, Muslim scholars should be encouraged to study the environmental sciences.

In Malaysia, Muslims engage with strategies for the conversation of biodiversity. In 2012, Mohd Azlan Abdul Gulam Azad wrote an article titled *Biodiversity Conservation Strategy in Malaysia: A Review from an Islamic Perspective*. His paper is perhaps a pioneer attempt to identify the core Islamic principles related to the conservation of biodiversity in Southeast Asia and how they could be applied in mitigating impacts. He wrote:

> Recent studies show that the use of religious weekly sermons in mosques has increased awareness and can elevate public concern on conservation issues... This illustrates that the majority of Malaysian Muslims will be able to adopt and accept new concepts and ideas if presented from a religious point of view… The education system should encourage younger generations to seek…knowledge of the environment and its principles... Additionally, to increase public awareness and positive perceptions these teachings should be synergised at various educational stages, including tertiary education.[64]

61. Koehrsen, "Muslims and climate change," 6.
62. Michael Taylor, "Can Indonesia's Muslim leaders boost public climate action?" *Thomas Reuters Foundation*, 17th August 2022, https://www.context.news/nature/can-indonesias-muslim-leaders-boost-public-climate-change-action (Accessed 16th July 2023).
63. Koehrsen, "Muslims and climate change," 13.
64. Mohd Azlan Abdul Gulam Azad, "Biodiversity Conservation Strategy in Malaysia: A Review from an Islamic Perspective," *Jurnal Hadhari* 4, no. 1 (2012): 134.

Sustainable Lifestyles

Islam offers great insightful teachings which should ensure that Muslims do not blindly follow a materialistic culture, but rather heed the Islamic call to purify the soul (*tazkiyyat al-nafs*), not to be extravagant and wasteful, to be kind to animals, and plant trees. Muslims themselves can lead by good example (*uswah hasanah*) by embracing sustainable lifestyles. In fact, many Muslims initiatives have sought to encourage lifestyle changes among their community members by drawing on educational programmes, workshops, and information guides—for example, the "Green Hajj Guide," which promotes greater environmental awareness amongst pilgrims.[65] A global Muslim Leaders Survey showed that more than 80% of the respondents believed that "they should promote that individuals should consume less and switch to environmentally-friendly consumption patterns."[66]

The Concepts of "Degrowth" and "Steady-State Economy"

We now address the necessity of achieving a sustainable "steady-state" or "degrowth" economies, as discussed earlier. Alexander describes "degrowth" as the following: "given the extent of ecological overshoot…; the transition will require the richest nations to downscale radically their resource and energy demands."[67] He further states:

> Degrowth would liberate us from the burden of pursuing material excess. We simply do not need so much stuff—certainly not if it comes at the cost of planetary health, social justice, and personal well-being. Consumerism is a gross failure…, a debilitating addiction that degrades nature… Degrowth, by contrast, involves embracing the "simpler way."[68]

Here, Alexander is describing a future where we purchase fewer new clothes, but mend, or buy second-hands instead.[69] In this respect, the current author highlighted elsewhere that Islam provides a holistic approach to the connection between human's bodily and spiritual needs, and shows how to achieve essential change in reducing individual material consumption by developing a state of

65. Koehrsen, "Muslims and climate change," 8.
66. V. Skirbekk and K. Pędziwiatr, "Sustainability and Climate Change in Major Religions with a Focus on Islam," *Humanitarian Academy for World Development, Birmingham, Research Paper* (2018), ix. https://www.researchgate.net/publication/329656310 (Accessed 20th November 2023).
67. Alexander, "Life in a 'degrowth' economy."
68. Ibid.
69. Ibid.

mind—a blessed state of well-being and contentment (*qanāʿah*).[70] Al-Jāḥiẓ (d. 869 CE) defined *qanāʿah* as "a satisfaction with the things that make livelihood easy; to abandon the greed for acquiring material goods;…and abandoning the inclination toward material goods, and the compulsion to amass them."[71]

Let us now consider aspects under the fields of human lives, what strategies can be employed to mitigate environmental degradation. In the aspect of shelter, sustainable living requires reducing the living area per person of homes and improving energy efficiency and insulation. In the aspect of food and waste, patterns of food consumption will need a significant change to become sustainable. This involves, firstly, reducing food wastage. This is because a third of food produced globally regularly goes to waste.[72] Secondly, there is a need to reduce the consumption of red meat and increase the consumption of chicken and vegetable protein as alternatives. Thirdly, people should buy more locally produced food. Switching to plant-based diets is a lifestyle change with the greatest potential to reduce carbon emissions.[73] The philosopher Peter Singer highlights: "plant foods typically have far lower greenhouse emissions than animal foods,... Beef, for example, emits 192 times as much CO2 equivalent per gram of protein as nuts."[74] Muslims could adopt a diet that is closer to that of a vegetarian, which is closer to the lifestyle of the Prophet, who ate meat only on rare occasions.[75]

We should also be aware of modern marketing. Advertisements are often attempts to convince people to buy things they do not actually need: "Ads work primarily through seductive imagery implying: 'If you buy this, you will be happy, successful, and cool."[76] One must break free from these insinuations. We need to avoid wasteful consumption, by considering the following strategies: (1) being moderate in all things (the golden mean or *wasaṭiyyah*); (2) not purchasing what is unneeded, bearing in mind whether or not one will really utilise the said purchase; (3) and purchase or place on one's plate only enough food one can eat comfortably.[77]

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70. Daud Batchelor, "Reducing Wasteful Consumption Toward Sustainability by Waste Avoidance Using Self-improvement (*Tazkiyyah*) and Contentment (*Qanāʿah*) Approaches," in *Islamic Perspectives on Science and Technology: Selected Conference Papers* (Singapore: Springer, 2016), 204.
71. Farid Ali, "Contentment (*Qanāʿah*) and its role in curbing social and environmental problems," *Islam and Civilisational Renewal* 5, no. 3 (2014): 430–446.
72. Meghan Lehmann, "High Stakes," *Weekend Australian Magazine*, 3rd–4th June 2023, 18.
73. Felix Creutzig et al., "Demand, Services and Social Aspects of Mitigation," in *Climate Change 2022: Mitigation of Climate Change* (Cambridge: Cambridge University Press, 2022), 505.
74. Peter Singer, "We are gambling with the future of our planet for the sake of hamburgers," *The Conversation*, 15th June 2023.
75. Daud Batchelor, "Islamic Perspectives on Reducing Meat Consumption to Promote Earth's Sustainability," *Islam and Civilisational Renewal* 10, no. 2 (2019): 170.
76. Mark Delaney and Tom Delaney, *Low Carbon and Loving It: Adventures in Sustainable Living—from the Streets of India to Middle Class Australia* (Australia: Mark Delaney, 2018), 85.
77. Batchelor, "Reducing Wasteful Consumption Toward Sustainability," 201.

In the aspect of transport, Vaughan provides the following scenarios for a sustainable transport culture, where "…with most cars and vans running on electricity or another 'energy carrier' such as hydrogen;... there should be fewer cars… Cars will be charged when there is the least pressure on electricity grids, such as overnight."[78] Cars are the biggest source of per capita emissions in the US.[79] In countries such as Malaysia and Brunei that have the highest number of car ownership per capita in Southeast Asia, there is good potential for greater uptake of public transport. This could be encouraged by prioritising the development of a highly efficient public transport and policies that increase the costs of car travel.[80] According to one Intergovernmental Panel on Climate Change (IPCC) Working Group, "the greatest 'avoid' potential comes from reducing long-haul aviation and providing short-distance low-carbon urban infrastructures," for instance, interconnecting fast trains. They further identified that "individual mobility choices have the largest potential to reduce carbon footprints. Prioritising car-free mobility by walking and cycling could save two tonnes of CO2 equivalent (2TCO2-eq) per head annually.[81]

In the aspect of work, Alexander suggested that with dramatic decarbonisation, "we would tend to reduce our working hours in the formal economy in exchange for more home-production and leisure."[82] Meanwhile, in terms of land use, globally, more tree cover will be needed. Vaughan rightly states:

> To remove and store CO2, peatland and forests need to be restored. The [UK] Climate Change Committee envisages shifts towards plant-based diets freeing up around a fifth of farmland for other uses, such as tree-planting… There is a consensus…there will be a big increase in electricity generation...[83]

This would involve more transmission infrastructure. Vaughan further notes: "In cities, green roofs and more green space will both be far more common, partly to lock up CO2 but critically to offset the urban heat island effect."[84] Finally, in individual lifestyle actions, it is people who are the key drivers for the mitigation towards reducing their carbon footprint by curbing personal consumptions. Table 2 helps an aspirant to focus on "hotspots" where lifestyle changes can be made to significantly reduce one's footprint.

78. Adam Vaughan, "What Does a World Look Like Where We've Taken the Steps Needed to Limit Global Warming?" *New Scientist*, 4th September 2021, 38.
79. Roston et al., "How the World's Richest People Area Driving Global Warming."
80. Ibid.
81. Creutzig et al., "Demand, Services and Social Aspects of Mitigation," 505.
82. Alexander, "Life in a 'degrowth' economy."
83. Vaughan, "What Does a World Look Like…," 37–38.
84. Ibid., 38.

Table 2 Carbon footprint "hotspot" identifier.

Life Areas	High-carbon Hotspot	Low-carbon Alternative	Most Sustainable Alternative
Buying goods	Regular new purchases	Some new goods	Mostly second-hand
Diet	Highly meat and dairy-based	Less beef and dairy products	Vegetarian or Vegan
Local travel	Drive most days	Drive occasionally	No car
Long-distance travel	International flights	Mainly Domestic flights	All trains and buses
Domestic electricity/gas	No solar and lots of air-conditioning	Some solar and air-conditioning	Full solar and no air-conditioning
Housing	>90 m^2 per person	45–90m^2 per person	<45 m^2 per person

Source: Delaney and Delaney, Table 7, p.172.

An IPCC Working Group identified that "wealthy individuals contribute disproportionately to higher emissions and have a high potential for emissions reductions." They are especially capable of reducing their carbon emissions by becoming role models of low carbon lifestyles.[85]

Conservation and Reforestation

The Muslim majority countries are found in Africa, Europe, and Asia, covering diverse environments from deserts to tropical forests. In the Middle East, deforestation, desertification, and biodiversity decline are huge environmental issues.[86] The IPCC 2022 Report estimates that the potential loss of natural capital, which amounts to an economic value of 44 trillion USD, is currently at risk.[87] Exclusively due to human activities, "the planet is entering its sixth mass extinction event, and new evidence suggests the crisis is twice as bad as scientists previously thought."[88] Deforestation is occurring globally, predominantly in the tropical regions—the Congo and South America have overtaken Southeast Asia

85. Creutzig et al., "Demand, Services and Social Aspects of Mitigation," 506.
86. Hayat et al., "The Role of Islamic Environmental Ethics in the Alleviation of Climate Challenges," 401.
87. IPCC, "IPCC Sixth Assessment Report. Climate Change 2022: Impacts, Adaptation and Vulnerability," https://www.ipcc.ch/report/ar6/wg2/ (Accessed 16th July 2023)
88. Sarah Bekessy et al., "The historic COP15 outcome is an imperfect game-changer for saving nature. Here's why Australia did us proud," *The Conversation*, 20th December 2022, https://theconversation.com/the-historic-cop15-outcome-is-an-imperfect-game-changer-for-saving-nature-heres-why-australia-did-us-proud-196731 (Accessed 16th July 2023).

in the degree of this devastation.[89] These regions face a high risk of biodiversity loss and wildlife extinctions. Malhi et al. highlight that we need to understand the ecological dynamics of climate impacts to identify hotspots of vulnerability and resilience, and to identify management interventions that may assist biosphere resilience against climate change. At the same time, ecosystems can also assist in the mitigation of and adaptation to climate change.[90]

Specific Actions

Specific actions that can be taken towards conservation and deforestation include the following. Firstly, Hayat and others believe that

> Poverty can be reduced, and environmental outcomes enhanced by adopting sustainable development practices that give priority to the requirements of underserved communities and encourage economic and social justice.[91]

Furthermore, Malhi and others stress that we should protect, restore, and use ecosystems as tools to tackle climate change using the framework of "natural climate solutions."[92] In this line, "The national potential for natural climate solutions in tropical countries, where the carbon sink provided by forests is significant and there is the greatest potential to mitigate carbon change through natural climate solutions,…" is evaluated by Griscom and others.[93]

Besides that, nature-based strategies should also be employed to mitigate climate change in cityscapes, which include enhanced vegetation covers and green spaces.[94] Cityscapes are particularly vulnerable to climate change hazards, due to the low vegetated covers, high impervious covers, generation of pollutants, heat island effects, high demand for freshwater resources, and concentration of population and infrastructures in vulnerable areas.

Another strategy is the 2022 Kunming-Montreal Global Biodiversity Framework. It is where 196 delegations committed to 23 targets to stem the tide of extinction. Greenfield states:

89. Mikaela Weisse and Liz Goldman, "Forest Loss Remained Stubbornly High in 2021," *Global Forest Watch* https://www.globalforestwatch.org/blog/data-and-research/global-tree-cover-loss-data-2021/ (Accessed 11th November 2023).
90. Y. Malhi et al., "Climate change and ecosystems: threats, opportunities and solutions," *Philosophical Transactions of the Royal Society B: Biological Sciences*, 375, no. 1794 (2020): 1.
91. Hayat et al., "The Role of Islamic Environmental Ethics," 401.
92. Malhi et al., "Climate change and ecosystems," 4.
93. B.V. Griscom et al., "National mitigation potential from natural climate solutions in the tropics," *Philosophical Transactions of the Royal Society B: Biological Sciences* 375, no. 1794 (2020).
94. Ticky Fullerton, "Nature Positive a brave new world," *Weekend Australian,* 31st December 2022–1st January 2023.

> Among the targets and goals agreed by all governments, except the Vatican and the US, were to protect 30% of the planet for nature by the end of the decade, reform 500 billion USD of environmentally damaging subsidies, and restore 30% of the planet's degraded terrestrial, inland water, coastal, and marine ecosystems.[95]

And finally, the "Just Energy Partnership" strategy. At the 2022 G20 summit in Indonesia, rich nations led by the US and Japan pledged to give Indonesia a 20 billion USD package to help the coal-dependent country shift to renewable energy and reach carbon neutrality by 2050. Jamasmie states that "Indonesia is committed to cap power-sector emissions at 290 megatons CO2 annually by 2030 and generate a third of its power from renewable sources by 2030."[96]

Ethical Investments

Al-Roubaie and Sarea highlight "Green investment" as a vehicle that strengthens sustainable development. Islamically, investments must comply with the principles of Sharīʿah "to administer justice with all stakeholders, protect the environment and sustain the development process. [Notably,] it is prohibited to invest in unlawful products."[97] To promote green finance, "banks can provide preferential green credit with favourable terms to finance environment-friendly projects... Governments should incentivise banks to develop green structures to make green finance available and attractive."[98] Public financial institutions and private banks, including Islamic banks, also issue green bonds (*sukūk*) to support green project investments. The World Bank projected that in 2017 the green bond market will increase to 1 trillion USD by 2020.[99] The Australian Religious Response for Climate Change (ARRCC) encourages individuals to switch money away from funds and banks invested in fossil-fuel assets to support those invested in renewable energy instead. They reported that, currently, "55% of the world's superannuation is invested in high-carbon assets with less than 2% invested in clean energy."[100]

95. Patrick Greenfield, "Nature at risk of breakdown if COP15 pledges not met, world leaders warned," *The Guardian*, 20th June 2023, https://www.theguardian.com/environment/2023/jun/20/nature-at-risk-of-breakdown-if-cop15-pledges-not-met-world-leaders-warned (Accessed 14th July 2023).
96. Cecilia Jamasmie, "Wealthiest nations offer Indonesia $20 billion to wean off coal," 15th November 2022, https://www.mining.com/wealthiest-nations-offer-indonesia-20-billion-to-wean-it-off-coal/ (Accessed 16th July 2023).
97. Amer al-Roubaie and Adel M. Sarea, "Green investment and sustainable development: The case of Islamic finance," *Journal of Islamic Business and Management* 9, no. 1 (2019): 22.
98. Ibid., 20.
99. Ibid., 21.
100. Australian Religious Response to Climate Change, "Individual Action," https://www.arrcc.org.au/go_fossil_free_individual (Accessed 16th July 2023).

Advocacy, Policy Engagement, and Global Policymaking

Muslims are encouraged to become active at local, national, and international levels in advocacy and policymaking towards mitigating environmental harm and promoting human well-being. They can join or ally with environmental groups, NGOs, institutions, and governments, to advocate for actions, policies, and legislations to address environmental degradation, climate change, and promote sustainable development. Some examples of the leading Muslim environmental NGOs include WALHI (Indonesia), Kader Hijau Muhammadiyah (Indonesia), Ummah for Earth (UK), and GRASS (Malaysia). Meanwhile, interfaith organisations involving Muslims in activism include Green Faith International and ARRCC.

In the case of Climate Change, efforts are focused on annual meetings of the Conference of the Parties (COP), the supreme decision-making body of the UN Framework Convention on Climate Change (UNFCCC). In each meeting, based on updated emission inventories, the COP assesses the progress made in achieving the Convention's objectives. Discussion is provided below on key issues in policy debates held within this framework. Issues at the forefront in the COP27 held in Egypt in 2022, were the following.

Firstly, loss and damage. Developed countries have caused over half of the cumulative historical carbon emissions; for instance, the US and Germany are among the top emitters today.[101] At the same time, developing countries are the most vulnerable to climate impacts. Annual economic costs among developing countries for these losses and damages are expected to reach 200–580 billion USD by 2030.[102] Reasonably, "developed countries must take responsibility for the climate crisis they initiated by paying reparations for developing countries," but many seek to weaken their obligations and "shift focus of UNFCCC processes to each country's own domestic mitigation"[103] Also, the COP27 climate summit approved a special fund to cover losses suffered by vulnerable nations hit by global warming. It covers a broad sweep of climate impacts, from bridges and homes washed away in flash flooding, to the threatened disappearance of cultures and whole islands to rising sea-levels.[104]

The second key issue pertains to "Greenwashing." The UN pledged to clamp down and hold companies and governments accountable for their promises, including reducing fossil fuel production.[105] The third key issue regards

101. Tapi Sen, "A disappearing nation," *Pearls and Irritations*, 5th July 2023, https://johnmenadue.com/a-disappearing-nation/ (Accessed 14th July 2023).

102. Ibid.

103. Civil Society Review, "Equity After Paris," 5.

104. "Rich to pay for 'loss & damage' of pollution," *Courier Mail*, 21st November 2022.

105. Graham Lloyd, "Bowen's speech zeroes in on climate hypocrisy," *Weekend Australian*, 19th–20th November 2022.

the need for more ambitious national pledges. The Civil Society Review assessed that "no country's pledge [at the 2015 Paris Agreement] even remotely reflects a future consistent with a 1.5°C pathway."[106] Governments of Egypt and Britain commissioned a report released at COP27, which stated that:

> …annual investments in emerging market and developing countries other than China to cut emissions, to boost resilience and deal with loss and damage caused by climate change impacts, as well as restoring nature and land, should exceed 2 trillion USD by 2030. Total annual investment needs were estimated to be 1 trillion USD in 2025... Half should come from wealthy governments and half from internal sources.[107]

Lloyd notes, "A 2021 report by Carbon Brief [Figure 3] says the cumulative amount of CO2 emitted since the start of the industrial revolution is closely tied to the 1.2°C of warming that already occurred."[108] Evans added that, "in total, humans have pumped around 2500 billion tonnes of CO2 (GtCO2) into the atmosphere since 1850, leaving <500GtCO2 of remaining carbon budget to stay below 1.5°C of warming." The report says:

> In first place,…the US has released more than 509Gt CO2 since 1850... China is second with 11%, followed by Russia (7%), Brazil (5%), and Indonesia (4%). The latter pair are among the largest historical emitters due to CO2 from their land."[109]

The Carbon Brief ranking is crudely adopted as a measure of responsibility to pay reparations.[110] Lloyd further reported: "The G77, a group of more than 130 developing nations plus China, argued…for a new fund…, in a similar way to the Green Climate Fund and the UN Global Environmental Facility." The position favoured by a recent meeting of G7 leaders was that the task should be given to the World Bank and other global financial institutions, but developing countries are not particularly interested in becoming burdened with more loans.[111]

106. Civil Society Review, "Equity After Paris," 5.
107. Vera Songwe et al., "Finance for climate action: scaling up investment for climate and development," https://www.lse.ac.uk/granthaminstitute/publication/finance-for-climate-action-scaling-up-investment-for-climate-and-development/ (Accessed 14th July 2023).
108. Graham Lloyd, "Reparations on the agenda at world's biggest trade fair," *Weekend Australian*, 12th–13th November, 2022.
109. Evans, "Analysis: Which countries are historically responsible for climate change?"
110. Lloyd, "Reparations on the agenda at world's biggest trade fair."
111. Idem, "Bowen's speech zeroes on climate hypocrisy."

The fourth key issue is the exorbitant emissions driven by excessive consumption, especially by global elites. In this regard, Paddison suggested certain policies to be considered: firstly, targeted taxes should be imposed on unsustainable behaviours such as frequent flying and overconsumptions of meat; secondly, "a personal carbon allowance where individuals are allocated an equal, tradable carbon allowance. If people want to emit more, they must buy unwanted allowances of others," where versions of it have been explored in Ireland, France, and California; and, thirdly, "*choice editing*, where governments restrict carbon-intensive products—like private jets or mega yachts—from coming to market."[112] Governments also need to provide citizens sustainable options such as "creating fast, extensive and affordable public transport networks; decarbonising electricity; building denser, well-insulated housing; banning the use of gas-powered cars; and considering…a four-day working week." What is more sustainable environmentally is also often "better for our own well-being and social cohesion, that is, a four-day working week could allow for a better work-life balance, more family time and fewer child-care costs."[113]

The fifth key issue pertains to tax on carbon emissions. Countries that have established national carbon pricing include Argentina, Canada, China, Colombia, Denmark, Kazakhstan, Mexico, Singapore, South Africa, and South Korea.[114] In the 2022 COP15 Montreal summit, one of the additional issues considered is the aim of the Kunming-Montreal Global Biodiversity Framework, which is to "pave the way for humanity and nature to live in harmony by 2050… The agreement was for 30 billion USD per year to flow from wealthy to poorer countries by 2030."[115]

Subsequently, COP28 was hosted by the UAE in November to December 2023, and climate justice was high on its agenda. It needed to recognise that "fossil fuel expansion is a death trap; and unprecedented interventions to mitigate 1.5 °C climate overshoot" are essential.[116] Firstly, there was an agreement that the transition from fossil fuels needed to occur quickly.[117] Secondly, the Loss and Damage fund was operationalised. However, only 725 million USD was

112. Laura Paddison, "How the rich are driving climate change," *BBC Climate Cost*, 28th October 2021, https://www.bbc.com/future/article/20211025-climate-how-to-make-the-rich-pay-for-their-carbon-emissions (Accessed 14th July 2023).

113. Ibid.

114. Chu Bee Kim, "Price on Carbon emissions," *New Straits Times*, 15th June 2022.

115. Bekessy et al., "The historic COP15 outcome is an imperfect game-changer for saving nature."

116. David Spratt and Ian Dunlop, "COP-out: Why the petrostate-hosted climate talkfest will fail," *Pearls and Irritations*, 23rd November 2023, https://johnmenadue.com/cop-out-why-the-petrostate-hosted-climate-talkfest-will-fail/ (Accessed 26th November 2023).

117. Matt McDonald, "Hard-fought COP28 agreement suggests the days of fossil fuels are numbered—but climate catastrophe is not yet averted," *The Conversation*, 13th December 2023, https://theconversation.com/hard-fought-cop28-agreement-suggests-the-days-of-fossil-fuels-are-numbered-but-climate-catastrophe-is-not-yet-averted-219597 (Accessed 2nd February 2024).

committed initially. Having the fund administered initially by the World Bank raises concern due to its questionable environmental credentials. The fund's board could, however, choose the World Bank or another country to host the fund permanently. Wealthy nations want higher income developing countries such as the Persian Gulf nations, to also contribute, even though contributions are voluntary. Developed countries want to reserve the funds for poor countries on the front lines of climate change, not wealthier countries such as China.[118] The conference also delivered important commitments to tripling renewable energy and a new pledge to cut emissions from cooling technologies such as air conditioning, which is increasingly important as the world heats up. Major players in the oil and gas sector committed to decarbonising their direct emissions and reducing methane emissions. Furthermore, a 30 billion USD climate investment fund, Altérra, aims to support further mobilisation of up to 250 billion USD in investment by 2030. Other emerging-market funds include the Arab Coordination Group that plans to direct 10 billion USD until 2030 towards energy transition projects in developing countries.[119] In 2024, COP29 in Azerbaijan will focus on the question of getting the financial strength needed for the transition from fossil fuels, which needs to scale up from billions to trillions of dollars.

Muslim Country Examples

Notably, "Muslim organisations and leaders undertook public campaigning activities, launching public statements and advocating for climate policy among governments."[120] Unfortunately, many developing countries lack effective governance structures and institutions. Consequently, "Although environmental policies and regulations are written down, corruption, a lack of resources,… frequently hamper their implementation."[121]

Pertaining to the MENA regions, a Washington DC think tank, New Lines Institute, believes that MENA governments "should develop a cooperation mechanism, the MENA Environmental Agency, with the twin goals of meeting the criteria set by the 2015 Paris Climate Agreement and developing strategies to respond to population displacements [climate refugees] as they occur."[122]

118. Matthew Dalton, "Deal reached on climate damage fund," *The Weekend Australian*, 2nd–3rd December 2023.

119. McKinsey Sustainability, "COP28: Inclusivity," 8th December 2023, https://www.mckinsey.com/capabilities/sustainability/our-insights/sustainability-blog/cop28-inclusivity (Accessed 2nd February 2024)

120. Koehrsen, "Muslims and climate change," 7.

121. Hayat et al., "The Role of Islamic Environmental Ethics," 402.

122. Fanning and Mekelberg, "The Coming Climate Migration Crisis in the Middle East and North Africa," *New Lines Institute for Strategy and Policy*, 7th December 2022.

Meanwhile, in Indonesia, President Joko Widodo highlighted Indonesia's forest preservation achievements at the COP26 summit, including the lowest level of deforestation in 20 years, and an 82% reduction in forest fires from clearing forests and peatlands. Indonesia aims to transform its forest and land-use sector into a Net Carbon Sink by 2030.[123] In neighbouring Malaysia, the Ministry of Natural Resources, Environment, and Climate Change is developing the Climate Change Bill to focus on carbon emissions and pricing, together with the establishment of an authoritative enforcement body, which is envisaged to be ready for consideration in Parliament in three years.[124] Malaysia aims to reduce greenhouse gases emission intensity by 45% in 2030.

Conclusions

As we see old records being smashed with the heightened climate change and anticipated increased rates of the rising of sea level, mitigation actions are urgently required to reduce harms to the environment and, consequently, to humans. Harrison stressed, "The majority of the Islamic world occupies areas known to be at particular risk of climate harm, so one would assume the imperative to tackle the issue should be foremost in the economic planning" of these countries.[125]

In assessing whether it is high population growth in developing countries or excessive consumption, particularly in wealthy countries, as the main culprit of excessive carbon emissions, clearly the latter is primarily responsible. However, within countries themselves, regardless of whether developed or developing, it is mainly the wealthy elites who are responsible for the astronomical levels of carbon emissions from their extravagant consumeristic lifestyles. Therefore, due to "overshoots" in the consumption of natural resources that exceed Earth's biocapacity, and the urgency to address the bourgeoning environmental crises, Muslim governments should consider macro-mitigating actions, entailing transitions to a "degrowth" economy for wealthy Gulf Arab oil sheikdoms, or to "steady-state economy" for economically advanced countries like Malaysia, while economic growth is only encouraged for developing countries to provide their populations with the basic necessities.

For individuals, Islamic teachings that promote a simple lifestyle without extravagance and waste and the encouragement to seek *qanā'ah* are necessary solutions to addressing the crises. God warns mankind not to become overly

123. Amanda Hodge, "Jakarta back peddling throws forest pact into doubt," *Weekend Australian*, 6th–7th November 2021.

124. Soo Wern Jun, "Three years to develop Malaysia's climate change Bill, says Nik Nazmi," *Malay Mail*, 23rd February 2023.

125. Simon Harrison, "Climate change policy: politics or a matter of faith," *Australasian Muslim Times*, 22nd September 2017.

attached to the worldly life (*ḥayāt al-dunyā*), which is advantageous in seeking to "tread lightly" on Earth. People who seek to emulate the excessive consumeristic lifestyles of the West are referred to the Qurʾānic verse: "See you one who takes for his god his own passion?"[126] Let us return to the blessed natural state of *fiṭrah* and mitigate the environmental destructions. Let us be in this world as "a traveller"[127] where we "rest in the shade of a tree, and then pass on leaving the tree behind."[128] Let us plant more trees to provide more shade from global warming we are now experiencing in increasing intensity.

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126. *Sūrat al-Furqān* (25):43; in his commentary on this verse, Yusuf Ali states: "The man who worships his own passions or impulses or desires is most hopeless to teach or guide." See Abdullah Yusuf Ali, *The Meaning of The Holy Qur'an: Text, Translation and Commentary* (Kuala Lumpur: Islamic Book Trust, 2009).
127. *Ṣaḥīḥ al-Bukhārī*, no. 6416. The *ḥadīth* reads: "'AbduLlāh bin 'Umar said, 'Allah's Messenger (peace be upon him) took hold of my shoulder and said, "Be in this world as if you were a stranger or a traveller." The sub-narrator added: Ibn 'Umar used to say, "If you survive till the evening, do not expect to be alive in the morning, and if you survive till the morning, do not expect to be alive in the evening, and take from your health for your sickness, and (take) from your life for your death."'"
128. *Sunan al-Tirmidhī*, no. 2377. The *ḥadīth* reads: "The Messenger of Allah (peace be upon him) was sleeping upon a mat, then he stood, and the mat had left marks on his side. We said: 'O Messenger of Allah! We could get a bed for you.' He said: 'What do I have to do with the world! I am not in the world but as a rider seeking shade under a tree, then he catches his breath and leaves it.'"

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