INTERNATIONAL COURT OF JUSTICE

OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE

(REQUEST FOR ADVISORY OPINION)

Written Statement of the Democratic Socialist Republic of Sri Lanka

March 2024

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Annexes

I. INTRODUCTION

1. The Democratic Socialist Republic of Sri Lanka (Sri Lanka) tenders this written statement in response to the Order of the President of the International Court of Justice (ICJ) issued on 20 April 2023 in respect of the request for an advisory opinion contained in United Nations General Assembly (UNGA) Resolution 77/276, adopted by consensus on 29 March 2023. The advisory opinion that is sought is on the following legal questions:

> *Having particular regard to the Charter of the United Nations, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the United Nations Framework Convention on Climate Change, the Paris Agreement, the United Nations Convention on the Law of the Sea, the duty of due diligence, the rights recognized in the Universal Declaration of Human Rights, the principle of prevention of significant harm to the environment and the duty to protect and preserve the marine environment,*
>
> > *a) What are the obligations of States under international law to ensure the protection of the climate system and other parts of the environment from anthropogenic emissions of greenhouse gases for States and for present and future generations;*
> >
> > *b) What are the legal consequences under these obligations for States where they, by their acts and omissions, have caused significant harm to the climate system and other parts of the environment, with respect to:*
> >
> > i. *States, including, in particular, small island developing States, which due to their geographical circumstances and level of development, are injured or specially affected by or are particularly vulnerable to the adverse effects of climate change?*
> > ii. *Peoples and individuals of the present and future generations affected by the adverse effects of climate change?*

2. This written statement is structured as follows: I. Introduction, II. Jurisdiction of court and the admissibility of the request for an advisory opinion, III. Climate change and its impacts. IV. Merits of the legal questions, and V. Conclusions.

3. Sri Lanka, having ratified the United Nations Framework Convention on Climate Change (UNFCC), the Kyoto Protocol and the Paris Agreement, as well as being an island state that is increasingly suffering the harmful impacts of climate change and, therefore, a member country of the Climate Vulnerable Forum, is pleased to be associated with the instant proceedings before the ICJ.

4. Under the leadership of His Excellency Ranil Wickremasinghe, the President of Sri Lanka, the cause of climate justice has become a top priority. Within the past year alone, Sri Lanka took bold initiatives on the subject, including the launch of the Climate Justice Forum for vulnerable and developing countries at the 28th meeting of the Conference of the Parties (COP 28) held in Dubai, hosting the 5th Forum of Ministers and Environment Authorities of Asia Pacific in Colombo in collaboration with the United Nations Environment Programme (UNEP) and launching the International Climate Change University, having already identified land to set up campus. Sri Lanka also updated its National Policy on Climate Change in November 2023, envisioning a "climate-resilient low-carbon prosperous Sri Lanka". These strident steps demonstrate Sri Lanka's genuine and active commitment to implement climate action for a low-carbon future with smart adaptive measures to minimise the negative impacts of climate change in an effort to ensuring sustainable development of the country, whilst at the same time contributing to global efforts to reduce greenhouse gas emissions.

5. In such a backdrop, Sri Lanka would strongly welcome from the ICJ an advisory opinion on the two questions posed to it by the UNGA Resolution, with the aim of clarifying the scope and extent of State Responsibility for Climate Change and State Liability arising therefrom. Sri Lanka is firmly of the view that whereas jurisprudence on accountability for climate change is emerging from domestic and regional courts, a pronouncement from an apex judicial body such as the ICJ has the potential to settle the law with greater persuasive value. It is hoped that the opinion of the ICJ emphasises that all States have legal obligations under international law to ensure the protection of the climate system and other parts of the environment, as well as legal consequences where such States have breached those obligations.

6. At the very outset of these submissions, it is with a sense of national pride that Sri Lanka echoes the words of Judge C.G. Weeramantry, an eminent jurist and a former Justice and Vice President of the ICJ. Delivering a Separate Opinion in the *Case Concerning the Gabcikovo-Nagymaros Project, Hungary versus Slovakia*, Weeramantry epitomised the far-sighted and broad-minded wisdom of the ICJ by an inter-disciplinary and insightful discourse on international law obligations to protect the environment. Although the topic of climate change was not in the spotlight at the time, Judge Weeramantry's words underscore the fundamental object of the UNGA resolution 77/276, i.e. environmental justice in the form of climate justice:

> *"The protection of the environment is likewise a vital part of contemporary human rights doctrine, for it is a sine qua non for numerous human rights such as the right to health and the right to life itself. It is scarcely necessary to elaborate on this, as damage to the environment can impair and undermine all the human rights spoken of in the Universal Declaration and other human rights instruments.*
>
> *While, therefore, all peoples have the right to initiate development projects and enjoy their benefits, there is likewise a duty to ensure that those projects do not significantly damage the environment.*
>
> *After the early formulations of the concept of development, it has been recognized that development cannot be pursued to such a point as to result in substantial damage to the environment within which it is to occur. Therefore development can only be prosecuted in harmony with the reasonable demands of environmental protection. Whether development is sustainable by reason of its impact on the environment will, of course, be a question to be answered in the context of the particular situation involved.*
>
> *It is thus the correct formulation of the right to development that that right does not exist in the absolute sense, but is relative always to its tolerance by the environment…"*[1]

[1] *I.C.J. Reports*, 1997, pp. 91–92

II. JURISDICTION AND ADMISSIBILITY

A. The court has jurisdiction to render the requested advisory opinion

7. The jurisdiction of the ICJ to give advisory opinions is found in the UN Charter and Chapter IV of the Statute of the ICJ. Whilst Article 96(1) of the UN Charter states that '*The General Assembly may request the International Court of Justice to give an advisory opinion on **any legal question***', Article 65(1) of the Statute of the ICJ states that '*The Court may give an advisory opinion on **any legal question** at the request of whatever body may be authorised by or in accordance with the Charter of the United Nations to make such a request*.'

8. The nature of that "legal question" envisaged by the UN Charter and the Statute of the ICJ has also been interpreted by the ICJ itself, in the case concerning the Legality of the Threat or Use of Nuclear Weapons, where it was decided that "the Court may give an advisory opinion on any legal question, **abstract or otherwise**."[2]

9. Insofar as the subject matter of the instant application is concerned, the two legal questions posed to the ICJ are certainly not abstract. It is respectfully submitted that the UNGA has been addressing with growing force the issue of climate change, including in its annual resolution on the "Protection of the global climate for present and future generations". Therefore, the questions involve two fundamental legal issues which have naturally arisen in the course of the UNGA's mandate on protecting the climate, i.e. the "obligations of States under international law" and "legal consequences under these obligations", both of which fall well within the meaning of "any legal question", as contemplated under Article 96(1) of the UN Charter and Article 65(1) of the Statute of the ICJ.

10. Since the UNGA Resolution 77/276 which forms the basis for seeking an advisory opinion was co-sponsored by a record number of 132 States, including Sri Lanka, and thereafter adopted by consensus, the said two legal questions do not carry any political flavour. The process reflects that all Member States were of one mind that the UNGA was acting well within its powers when it adopted the resolution, as well as that the

[2] I.C.J. Reports 1996 (1), p. 236, para. 15

questions are ones which can, and indeed should, be addressed by the ICJ under its advisory jurisdiction.

B. There are no compelling reasons to exercise discretion not to render the requested advisory opinion

11. Because Article 65(1) of the Statute of the ICJ states that the court "*may give*" an advisory opinion, this phrase has been consistently interpreted as giving discretion as to whether or not an opinion requested should be given.[3] However, there is precedent that an opinion "*represents its participation in the activities of the UN and, in principle, should not be refused*".[4] As a result, only "*compelling reasons would justify refusal of such a request*".[5]

12. The ICJ has defined those 'compelling reasons' to be the motives of the States sponsoring or supporting the request for an advisory opinion[6]; the origins, political history or distribution of votes underlying a request[7]; the lack of 'clean hands' of the sponsoring State[8]; the lack of any indication by the requesting organ of the purpose for which the opinion is sought or its usefulness[9]; the fact that a question is abstract or does not relate

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3 See *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion*, I.C.J. Reports 2004, p. 136, para. 44; *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion*, I.C.J. Reports 2010, p. 403, para. 29; *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, Advisory Opinion of 25 February 2019, General List No. 169, para. 63.

4 See *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion*, I.C.J. Reports 2004, p. 136, para. 44; *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, Advisory Opinion of 25 February 2019, General List No. 169, para. 65.

5 See *Western Sahara, Advisory Opinion*, I.C.J. Reports 1975, p. 12, para 23; *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, p. 226, para 14; *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion*, I.C.J. Reports 2004, p. 136, para. 44; *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion*, I.C.J. Reports 2010, p. 403, para. 30; *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, Advisory Opinion of 25 February 2019, General List No. 169, para. 65.

6 *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion*, I.C.J. Reports 2010, p. 403, para. 33.

7 *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, p. 226, para. 16.

8 *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion*, I.C.J. Reports 2004, p. 136, paras. 63–64.

9 *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion*, I.C.J. Reports 2010, p. 403, para. 34; *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, p. 226, para. 16.

to a concrete dispute[10]; the fact that the opinion may possibly have adverse effects on a political process[11]; e.g. in a peace negotiation[12]; the fact that the UN Security Council has already taken action on the issue or that answering the question requires interpreting acts of the UN Security Council[13]. It is respectfully submitted that none of these reasons exist in the present case.

13. Similarly, the lack of sufficient information and evidence to form an opinion could be relevant in appreciating propriety as noted by the ICJ in the *Western Sahara* Advisory Opinion citing the *Eastern Carelia* case.[14] However, the subject of climate change is well-researched and there is enough and more reliable information for the ICJ to render its opinion on the attendant legal obligations and legal consequences. Secondly, there is scientific consensus on climate change reflected in the reports of the Intergovernmental Panel on Climate Change (IPCC), particularly in the Summaries for Policymakers, which have been approved by consensus by all 195 member States.[15] In such a context, it cannot be contended that there is any dearth of factual material.

14. Further, the mere fact that pending requests before the International Tribunal for the Law of the Sea (ITLOS)[16] and the Inter-American Court of Human Rights (IACtHR)[17] may traverse the subject of climate change is not a ground to decline the rendering of an

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10 *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, p. 226, para. 15.

11 *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, p. 226, para. 17.

12 *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion*, I.C.J. Reports 2004, p. 136, paras. 51–54.

13 *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion*, I.C.J. Reports 2010, p. 403, paras. 36–47.

14 *Western Sahara, Advisory Opinion*, I.C.J. Reports 1975, p. 12, para. 46, citing *Status of Eastern Carelia, Advisory Opinion* (1923) PCIJ Series B no 5, p. 29; *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, Advisory Opinion of 25 February 2019, General List No. 169, para. 71.

15 Principles Governing IPCC Work, Appendix A: Procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC Reports, section 4.4, available at: https://www.ipcc.ch/site/assets/uploads/2018/09/ipcc-principles-appendix-a-final.pdf

16 *Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law (Request for Advisory Opinion submitted to the Tribunal)*, pending, available at: https://www.itlos.org/en/main/cases/list-of-cases/request-for-an-advisory-opinion-submitted-by-the-commission-of-small-island-states-on-climate-change-and-international-law-request-for-advisory-opinion-submitted-to-the-tribunal/

17 *Solicitud de Opinión Consultiva presentada por Colombia y Chile ante la Corte Interamericana de Derechos Humanos*, 9 de enero de 2023, pending, available at: https://www.corteidh.or.cr/observaciones_oc_new.cfm?nId_oc=2634

opinion by the ICJ, for several reasons: (i) the UNGA is a distinct body from the entities seeking the other advisory opinions (the Commission of Small Island States on Climate Change and International Law (COSIS) for the ITLOS request and Chile and Colombia for the ICtHR request), (ii) the subject-matter and questions asked in those cases are much narrower and specific, (iii) the entities seeking the instant advisory opinion consider that there is a clear distinction between the processes (as made clear by the fact that COSIS has requested and been authorised by the Court to take part in the ICJ proceedings, and that both Chile and Colombia co-sponsored the UNGA Resolution requesting the advisory opinion of the ICJ), and (iv) only the ICJ has the general competence to provide the type of advice needed by the UNGA, considering the scope of the question, which goes far beyond the interpretation of any single treaty.

15. Accordingly, it is respectfully submitted that in the instant application, any reasons or situations that would compel the ICJ to refuse rendering an opinion on the two questions at hand do not exist and that, therefore, the court may exercise its jurisdiction to deliver the opinion.

C. There is no need to reformulate the questions

16. In the instant case, the ICJ is expressly asked by the UNGA to answer two questions, having particular regard to certain treaties and rules of international law which are recalled in the chapeau of the question.

17. Question (a) of the UNGA Resolution 77/276 asks the ICJ to identify and clarify the "obligations of States under international law to ensure the protection of the climate system and other parts of the environment from anthropogenic emissions of greenhouse gases". The obligations to be identified and clarified are those governing a specific conduct, namely "anthropogenic emissions of greenhouse gases", a term which is understood, scientifically, as:

> "Gaseous constituents of the *atmosphere*, both natural and *anthropogenic*, that absorb and emit radiation at specific wavelengths within the spectrum of radiation emitted by the Earth's surface, by the atmosphere itself, and by clouds. This property causes the *greenhouse effect*. Water vapour (H_2O), *carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4)* and *ozone (O_3)* are the primary GHGs in the Earth's atmosphere. Human-made GHGs include *sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs), chlorofluorocarbons (CFCs)* and

> *perfluorocarbons (PFCs)*; several of these are also O_3-depleting (and are regulated under the *Montreal Protocol*)".

18. Emissions of greenhouse gases are "anthropogenic" when they are caused by "human activities". According to the Glossary of the IPCC:

> "Emissions of greenhouse gases (GHGs), precursors of GHGs and aerosols caused by human activities. These activities include the burning of fossil fuels, deforestation, land use and land use changes (LULUC), livestock production, fertilisation, waste management, and industrial processes."

19. Question (b) is a necessary follow-up question because legal duties or, in this case, legal obligations, have no meaning unless there is a mechanism to enforce them by imposing liability for breach. Hence, if Question (a) is answered by a clarification of the legal obligations that States have in respect of protecting the climate system and other parts of the environment under international law, then Question (b) should be framed exactly as it already is, asking the "legal consequences" which follow if a State fails to fulfill its legal obligations under Question (a).

20. Sri Lanka respectfully submits that these questions are specific, clear and unambiguous, and that there is no necessity, therefore, to reformulate them. Further, the UNGA Resolution 77/276 was adopted by consensus of all members without any challenge at the time with regard to the clarity of the questions. It reinforces the fact that the two legal questions were fully understood by member States.

21. Further, there are only very limited circumstances in which a question posed to the ICJ may be reformulated, and these were carved out in the Advisory Opinion of the ICJ on the *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 196*: *"The Court recalls that it may depart from the language of the question put to it where the question is not adequately formulated (Interpretation of the Greco-Turkish Agreement of 1 December 1926 (Final Protocol, Article IV), Advisory Opinion, 1928, P.C.I.J., Series B, No. 16) or does not reflect the "legal questions really in issue" (Interpretation of the Agreement of 25 March 1951 between the WHO and Egypt, Advisory Opinion, I.C.J. Reports 1980, p. 89, para. 35). Similarly, where the question asked is ambiguous or vague, the Court may clarify it before giving its opinion (Application for Review of Judgement No. 273 of the United Nations Administrative Tribunal, Advisory Opinion, I.C.J. Reports 1982, p. 348, para. 46). Although, in*

exceptional circumstances, the Court may reformulate the questions referred to it for an advisory opinion, it only does so to ensure that it gives a reply "based on law" (Western Sahara, Advisory Opinion, I.C.J. Reports 1975, p. 18, para. 15). However, none of the grounds that have previously led the ICJ to reformulate questions tendered for its advisory opinion are applicable in this case.

22. In any event, a question formulated in general terms cannot provide the grounds for reformulation. In its Advisory Opinion on the Wall in Occupied Palestinian Territory, the ICJ expressly noted that *"lack of clarity in the drafting of a question does not deprive the Court of jurisdiction. Rather, such uncertainty will require clarification in interpretation, and such necessary clarifications of interpretation have frequently been given by the Court."*

23. Moreover, in its Advisory Opinion on the Legality of Nuclear Weapons, the ICJ made clear that it can answer abstract questions: *"it is the clear position of the Court that to contend that it should not deal with a question couched in abstract terms is 'a mere affirmation devoid of any justification', and that 'the Court may give an advisory opinion on any legal question, abstract or otherwise" (Conditions of Admission of a State to Membership in the United Nations (Article 4 of Charter), Advisory Opinion, 1948, I.C.J. Reports 1947-1948, p. 61; see also Effect of Awards of Compensation Made by the United Nations Administrative Tribunal, Advisory Opinion, I. C.J. Reports 1954, p. 51 ; and Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276 (1970), Advisory Opinion, I. C.J. Reports 1971, p. 27, para. 40)"*

24. Further, the questions are not formulated in a way that prejudges any disputes between States. While Question (a) focuses on **legal obligations** of States, Question (b) hones in on **legal consequences** of breach of the obligations identified in response to Question (a). No specific dispute is referred to in the formulation of the questions. Moreover, at the time of its adoption by consensus, no party raised any objection that the questions prejudge any dispute.

25. More fundamentally, it cannot be argued in good faith that the specific formulation of a resolution which was co-sponsored by no less than 132 States when tabled, and which

was then adopted by consensus by the States of the UNGA does not reflect exactly what it needed the ICJ to clarify.

III. CLIMATE CHANGE AND ITS IMPACTS

A. Scientific consensus on causes and impacts of climate change

26. As per preambular paragraph 9 of UNGA Resolution 77/276, scientific consensus on the cause and impacts of climate change is identifiable in respect of four areas. First is the fact that there is consensus that it is anthropogenic GHG emissions which cause climate change. Similar consensus is found on the fact that the conduct causing climate change has had devastating impacts, including more frequent and intense extreme events. Thirdly, it is clear that these components of the scientific consensus are not the only ones which the UNGA is concerned about. Fourthly, the first two components of the scientific consensus rely on statements in the Summaries for Policymakers of IPCC reports. These statements strongly confirm the link between human conduct and climate change.

> *"Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850–1900 in 2011–2020. Global greenhouse gas emissions have continued to increase, with unequal historical and ongoing contributions arising from unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries, and among individuals*"[18]

> *"Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (high confidence). Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected (high confidence)*"[19]

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18 IPCC, *Synthesis Report of the IPCC Sixth Assessment Report (AR6)*, Summary for Policymakers, statement A.1, available at: https://www.ipcc.ch/report/sixth-assessment-report-cycle/

19 IPCC, *Synthesis Report of the IPCC Sixth Assessment Report (AR6)*, Summary for Policymakers, statement A.2, available at: https://www.ipcc.ch/report/sixth-assessment-report-cycle/

27. These Summaries for Policymakers have been approved by all 195 member States of the IPCC,[20] thus elevating them from the status of scientific consensus to State consensus. Therefore, the issue is well-settled and the two legal questions before the ICJ do not call upon court to take any stance on a scientific matter.

28. It is respectfully submitted that there is sufficient and sound scientific data connecting the source of climate change to the impacts of climate change, particularly through the field of attribution science. Thus, event attribution can ultimately provide the lead to source attribution, making it possible to conclude that a particular phenomenon of extreme weather was caused by a particular source, an anthropogenic source. The strongest evidence comes from phenomena such as extreme heat, extreme rainfall, extreme precipitation, hightide flooding and parched earth.

29. There are many other components of the scientific consensus that are of utmost concern, including the fact that global warming has already exceeded 1°C and the resulting scale of changes in the climate system are unprecedented over many centuries to many thousands of years, global sea level has risen faster since 1900 than over any preceding century in at least the last 3000 years, driven by human influence, and it will continue to rise over the 21st century. [21]

B. Country-specific evidence: Climate change impacts on Sri Lanka

This part of the statement focuses on evidence gathered from Sri Lanka's experience of climate change gathered from a comprehensive expert report[22] compiled on the strength of

[20] Principles Governing IPCC Work, Appendix A: Procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC Reports, section 4.4, available at: https://www.ipcc.ch/site/assets/uploads/2018/09/ipcc-principles-appendix-a-final.pdf

[21] IPCC, *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Summary for Policymakers, statement A.1.7, available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

[22] Buddhi Marambe, Senior Professor, Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka; Member, National Experts Committee on Climate Change Adaptation (NECCCA), Ministry of Environment, Sri Lanka. The report is an expanded version of a report submitted to the Global Water Partnership (GWP) by the author, Thusitha Sugathapala, Pradeep Silva and Samantha Dissanayake.

thorough research.[23] Such scientific evidence can also be found in Annexes 1 to X of this written statement.

[23] ADB (2017). Climate Change Profile of Pakistan. Asian Development Bank. URL:
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30. Sri Lanka is recognized as vulnerable to climate change impacts, ranked 103 out of 181 countries in the ND-GAIN Index (University of Notre Dame 2020). With a steady increase of both the maximum and minimum temperature in Sri Lanka, the multi model ensemble predictions (Jayawardena et al. 2024; Figures 1 and 2) have revealed that the minimum and maximum temperature of Representative Concentration Pathway (RCP) 4.5 scenario (IPCC 2023) is expected to be increased by 0.7-1.2 °C during 2020-2040, and 1.5-2.3 °C during 2070-2090. The annual increment of ambient temperature at 0.01–0.03 °C since 1960 (Jayawardena et al. 2017) has affected all economic sectors of Sri Lanka. For example, climate predictions have shown that wet seasons in Sri Lanka are becoming wetter while dry seasons are becoming drier, directly affecting agriculture and food security of the country (Marambe et al. 2013; Marambe et al., 2015). The daily minimum temperature (night-time) has shown a rapid increase to that of the daily maximum temperature (daytime) affecting the farming community in the cooler climates at higher elevations (Bandara et al., 2021). Sri Lanka has a moderate level of vulnerability to slow onset sea-level rise impacts, assuming a modest sea-level rise of 10 cm by 2030 and 21 cm by 2060. However, a combined impacts of storm surge and sea-level rise would increase the vulnerability of Sri Lanka (WB and ADB 2021).

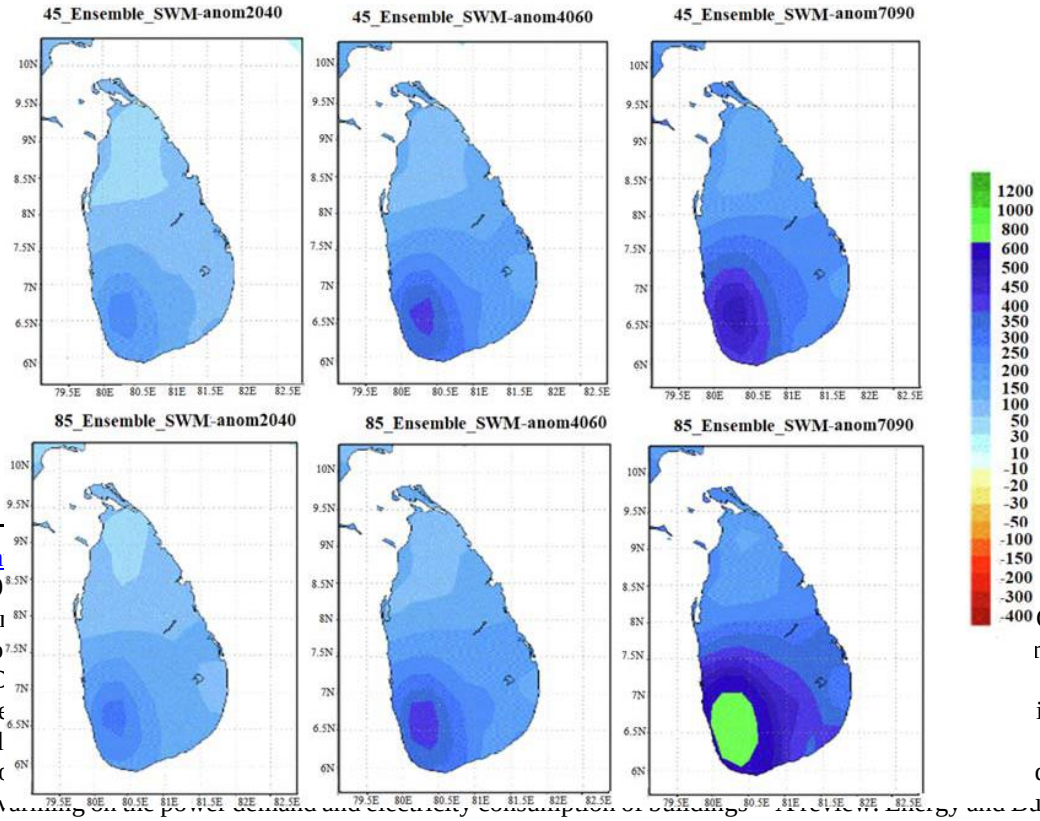

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Figure 1. Multimodel ensemble of change in Southwest Monsoon (SWM) rainfall, relative to 1975e2005 for moderate emission scenario (representative concentration pathways [RCP] 4.5) (upper) and high emission scenario (RCP 8.5) for time periods (2020e2040) (left), (2040e2060) (middle), and (2070e2090) (right). Source: Jayawardena et al., 2024)

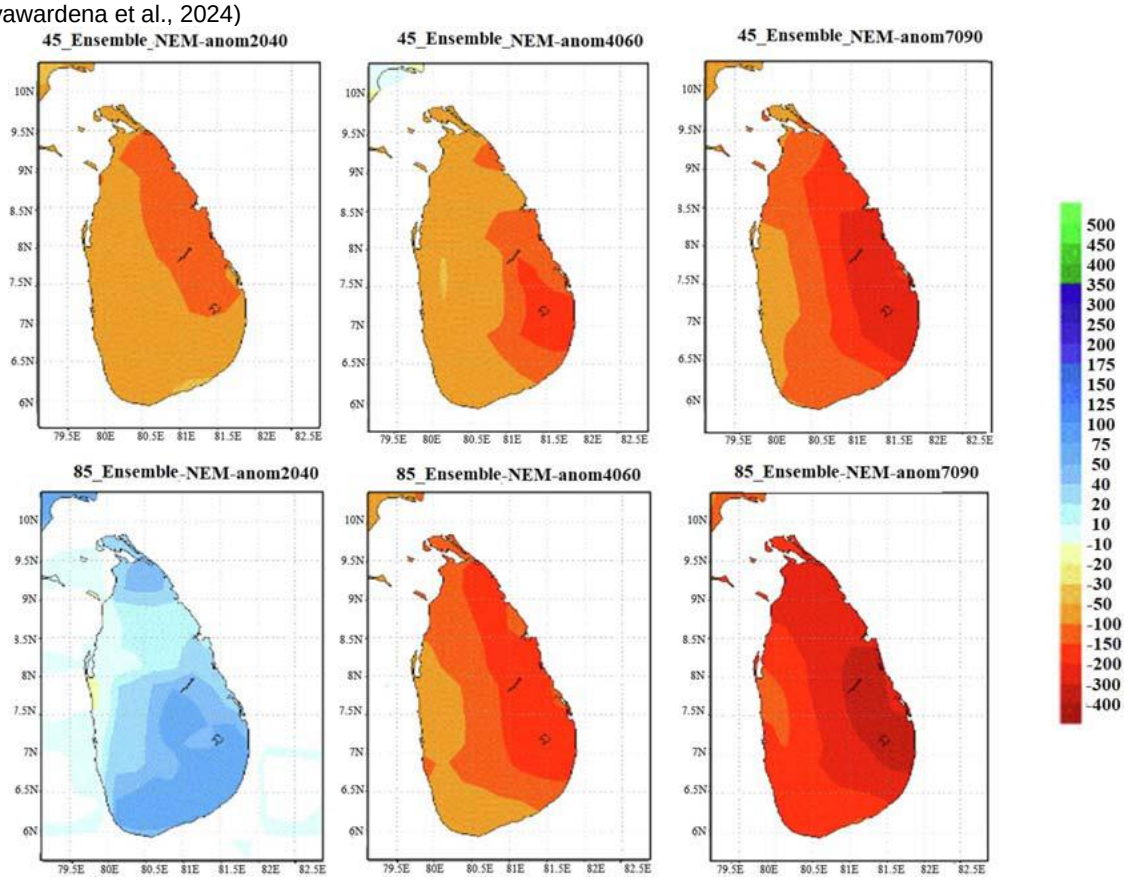

Figure 2. Multimodel ensemble of change in NEM rainfall, relative to 1975e2005 for moderate emission scenario (representative concentration pathways [RCP] 4.5) (upper) and high emission scenario (RCP 8.5) for time periods (2020e2040) (left), (2040e2060) (middle), and (2070e2090) (right). Source: Jayawardena et al., 2024)

Overall Economic Impact of Climate Change

31. Sri Lanka has frequently faced repetitive climate-induced disasters with multiple impacts on economic development. Sri Lanka has been identified as one of the most vulnerable countries with an absolute annual loss estimated at US$ 3,626 million attributed to climate change (Eckstein et al. 2020). Climate-induced hazards in Sri Lanka has increased by 22-

fold during the last decade compared to 1973-1983 (UNDRR 2019) causing damages of nearly US$ 7 billion between 1990 and 2018. However, the total extent of damages in reality is undeniably greater due to costs arising from unrecorded local events and smaller scale events such as regional flooding.

32. The impacts of chain of recurring disasters have affected the country's development as much as the rare events of catastrophic proportions. e.g. flooding between 1990 and 2018 has caused over US$ 2 billion dollars in damages (UNDRR 2019). The estimated damages and losses in Sri Lanka from the floods and landslides was more than US$ 473 million in May 2016 and US$ 368 million in May 2017 (MNPEA 2017). The contingent liability of the government of Sri Lanka in 2017 was US$ 149 million (approx. 1% of total government expenditure; WB 2018). The loss and damage (L&D) due to climate change describe the harms inflicted by climate change that go beyond the limits of adaptation, and highlights the need to address L&D due to climate-induced disasters in Sri Lanka across all sectors at all levels.

33. The World Bank estimates that 7.7 % (USD 50 billion) of country's GDP would need to be allocated to face climate disasters by 2050 (WB and EU 2017).Climate-induced disasters have threatened Sri Lanka's economic growth while the vulnerable communities in the country are suffering from deteriorating conditions resulting in climate change (ReliefWeb 2022). With an increasing occurrences of catastrophic extreme climate events and slow-onset events, the Government of Sri Lanka has recognized the need to implement climate actions while focusing on sustainable development. Sri Lanka needs to avoid climate-induced trade-offs in maintaining a high growth rate. Moreover, climate-related opportunities are enormous, such as improving resource efficiencies and cost savings, adopting low-emission energy sources, developing new products and services, accessing new markets, and building resilience along the supply chain.

Sectoral Impacts – Adaptation Sectors in NDCs

34. Sri Lanka is a low carbon emitting country with per capita emissions of around 1.02 tonnes/per person (NDC 2021), and its development pathway has remained low-carbon-intensive. Despite having a relatively low carbon footprint, Sri Lanka is committed to reduce greenhouse gas (GHG) emissions by 14.5% with respect to BAU scenario from 2021 to 2030 in the Power (electricity generation), Transport, Industry, Waste, Forestry,

and Agriculture sectors. The Updated Nationally Determined Contributions (NDC 2021) and the NDC Implementation Plan from 2021 to 2030 (NDCIP 2023) highlighted the approach that the country will embark on to minimize the impact of climate change and efforts to reduce GHG emissions further. Hence, sub-sections below comprise extracts of the information presented in the published literature with respect to climate change impacts on the adaptation and mitigation sectors identified in updated NDC (NDC 2021) and NDC implementation plan (NDCIP 2023).

Impact on Agriculture

i. Agriculture sector – Crops

35. Sri Lanka is predominantly rural and agriculture-based country. It boasts a world renowned hydraulic civilization spanning over two millennia. Approximately 2.6 million ha, equivalent to 42% of the country's total terrain, is in crop production. Much of this land is owned by 1,650,000 smallholder farmers. Agriculture in Sri Lanka is considered to be the sector that is the most vulnerable to the adverse impacts of climate change. Moreover, Sri Lanka have experienced a severe food insecurity situation with a number of associated issues mainly owing to climate change (Marambe et al. 2015).

36. At present, climate change impacts are threatening the entire life cycle of food production and food security in Sri Lanka. The major climatic parameters such as temperature and precipitation are the most influencing factors for crop growth (Jayatillake and Droogers 2004) and the farming districts of Nuwara Eliya, Badulla, Moneragala, Ratnapura, and Anuradhapura are more sensitive to climate change (Eriyagama et al. 2010).

37. Moreover, Sri Lankan farming communities have faced frequent and severe droughts since 1974 having a negative impact on agriculture (Berundharshani and Munasinghe 2015) and livelihoods and the socio-economic condition of farmers. Increased temperatures and decreased daytime and night time temperature differences have negatively affected high value crops, especially vegetable and potato cultivation (De Zoysa and Inoue 2014; Marambe et al., 2015). The sections below covers the climate impacts on selected segments of crop-agriculture in Sri Lanka.

a) Paddy and other cereals

38. Rice is the staple food in Sri Lanka and is mainly cultivated as a wetland crop. The country has two predominant cultivation seasons linked with the bi-modal monsoon patterns. The primary cropping season for paddy is the Maha season with cultivation of about 850,000 ha. Around 450,000 ha are cultivated in the Yala season. Nearly one million farmer families are engaged in paddy cultivation providing livelihoods for up to 32% of the population. Rice cultivation is highly vulnerable to climate shocks such as droughts, dry spells, floods and sea-level rise. Rainfed paddy farmers are highly exposed and sensitive to drought. Crop failures due to climate change impacts have resulted in loss of resilience among farmers. The government has mobilized about LKR 9.1 billion as crop insurance to compensate the crop losses from 2014 to 2018 in both Yala and Maha seasons (AAIB 2019).

39. Temperature rise in the country is expected to surpass tolerable limits for cereal crops such as rice and maize (Malaviarachchi et al. 2014). Experiments done under controlled environment have concluded that an increase in temperature from 0.1 °C to 0.5 °C could reduce rice yield by approximately 1-5% (Vidanage and Abeygunawardane 1994). Further, the ambient temperature exceeding 35 °C even for just 60–90 min at the flowering stage of paddy could result in sterile grains, especially in the Yala season in the dry and intermediate zones in Sri Lanka.

b) Horticultural crops

40. Fruits and vegetables are of high economic value compared to ornamental plants in Sri Lanka. Most of the horticultural crops are highly perishable due to their physiological state. An increase in temperature results in an increased respiration rate of fruits and vegetables (Kandegama et al. 2022); e.g., climacteric fruits ripen quickly after harvesting and their shelf-life would gradually reduce resulting in a low retention time of the desired physiological maturity state. Further, Rains at the onset of flowering result in flowers drop-offs and reduce fruiting in mango (Kandegama et al., 2022). There are serious effects on underutilized fruits grown in intermediate and dry zones from climatic variations (Ratnayake et al. 2019). Further, Rajapakse et al. (2019) reported that the absence of climate-smart vegetable varieties has significantly affected the vegetable production of the country.

c) Tea Cultivation

41. Tea is grown as a rain fed crop in Sri Lanka, and is one of the main sources of foreign exchange earnings for the country contributing to about 1.2% of the GDP. The total cultivated extent is about 202,000 ha producing about 300 million kg of made (manufactured) tea. The majority of tea plantations in Sri Lanka, except those at high elevations (>1200m), are likely to be adversely affected by high temperatures and dry weather conditions. The reduction of monthly rainfall by 100 mm, would reduce the productivity by 30-80 kg of 'made' tea per hectare. However, the increase in ambient CO2 concentration from around 370 ppm to 600 ppm would increase tea yield by about 33-37% (Wijeratne et al. 2007).

d) Coconut cultivation

42. The coconut sector of Sri Lanka accounts for about 0.7% of the GDP with significant foreign exchange earnings. The total land area under cultivation covers more than 440,000 ha, annually producing about 2.5-3.0 billion nuts. Coconut palms that are frequently exposed to warm/drought seasons would fail in fruit formation as reproductive organs of a mature coconut palm (from flowers to mature nut) are more sensitive to water stress and high temperature than the vegetative organs (Ranasinghe et al., 2015). Pollen formation followed by button nut formation are sensitive to changes in the climatic conditions. Continuous exposure to heat or water stress can prevent accumulation of starch and sucrose in the developing anthers, which are the main sources of energy for pollen germination, resulting in poor pollen quality. Further, high temperatures, low relative humidity and a high vapor pressure deficit at the stage of pollination may result in pollen drying leading to reduced nut formation.

43. In Sri Lanka, floods and landslides are the other conditions that damage coconut farming. Over 5,600 ha of coconut lands are highly vulnerable while another 19,600 ha are moderately vulnerable to flood exposure (MOE 2011). Occasional flooding does not harm coconut palms, but poorly-drained soils persisting for an extended period may eventually damage the palms.

e) Rubber cultivation

44. Rubber is a plantation crop that is totally dependent on rainfall. The crop requires a warm climate with around 2,000 mm rainfall evenly spread across the entire year. Rubber

plantations tolerates drought conditions more than any other plantation crop grown in Sri Lanka. Similarly, they are flood-tolerant for several days. Although commonly grown in rainy districts such as Kalutara and Ratnapura (wet zone), the best weather for rubber is in the intermediate zone (Yogaratnam, 2011).

45. Recurrent rainfall and floods lead to lower yields due to frequent interruptions in rubber tapping which impose additional costs on large-scale planters and smallholders. A short dry spell is advantageous for rubber to avoid leaf diseases caused by fungi during the period of new flush formation (mid-Feb to mid-March). However, rainfall and drought would affect the number of tapping days and disrupt harvesting. Furthermore, temperatures above 30 °C for a prolonged period affects physiological processes of the rubber tree (Yogaratnam, 2001). Despite such sensitivities, rubber is a crop that has its own adaptive capacity to withstand adverse environmental conditions (Wijesuriya and Seneviratne, 2019).

f) Minor export crops

46. In Sri Lanka, approximately 25% of the gross export earnings are derived from the minor export crops such as clove, cinnamon, cardamom, nutmeg, mace, pepper, etc.. Sri Lanka is the world's largest producer and exporter of cinnamon which accounts for approximately 77% of the world exports. The country produces 2% of the world supply of pepper with an export value per year of over US$ 7 billion (Sachitra and Chong (2015).

47. Impact of climate change on spice crops mainly links with frequent dry spells and intense rainfall (Subasinghe and Ariyathilaka, 2019). The cinnamon crop can withstand high temperatures up to 32 °C if rainfall is over 1,750 mm per annum, and tolerate high humidity. Pepper is a rainfed crop that requires over 2,000 mm of annual rainfall and temperatures higher than 12 °C up to a maximum of 35 °C. Areas with prolonged drought or dry periods should be avoided for pepper cultivation unless there is supplementary irrigation. A clear dry spell and sufficient rainfall is vital for flower induction and pollination while strong winds are harmful (TNC 2021).

g) Sugarcane Cultivation

48. Sugarcane is a semi-perennial, commercial crop grown in the intermediate and dry zones of Sri Lanka. There is a potential of producing an average yield of 56-112 MT/ha from local sugarcane plantations. Scarcity of water and prolonged drought periods severely

affect the sugarcane crop, while unseasonal rainfall and shifts in monsoonal weather patterns are considered more critical climatic factors.

49. As the scarcity of water and prolong drought periods severely affect the sugarcane crop, the rainfall and the shifts in monsoonal weather are considered as more critical climate factors for sugarcane (Kumarasinghe and Wijayawardhana 2011). Weakened plants due to water scarcity are more vulnerable to pest and disease attacks in addition to the retarded growth and the yield (De Silva et al., 2019).

ii. Agriculture Sector – Livestock and poultry

50. The livestock and poultry sector grew by 4% in 2019 (DAPH 2015) but growth was affected thereafter due to the COVID-19 pandemic and inadequate availability of animal feed. Climate change poses formidable challenges to the livestock sector and its future development. Climate change has a negative effect on livestock industry in the country (Weerasinghe, 2019). The predicted temperature increased from 2.3 °C to 4.8 °C in 2050 and increased precipitation will aggravate the stress on dairy animals by adversely affecting productivity and reproductive capacity on high yielding dairy cattle. The impact of such events on the livestock sector will result in a loss of income and livelihood for rural households and will indirectly affect livestock production by aggravating feed, fodder and water shortages. The drought experienced during 2016-2017 provided clear evidences for such impacts on the livestock sector.

a) Dairy farming

51. The Thermal Comfort Zone (TCZ) for temperate dairy breeds is in the range of 5 °C – 25 °C. Hence, intensification of dairy systems in the dry regions using temperate breeds could lead to greater vulnerability of the animals to increase in temperature and humidity. A temperature Humidity Index (THI; Figure 3) of higher than 72 units generates heat stress for dairy cattle. Temperature anomalies predicted for 2030 and 2050 indicate that part of the intermediate and dry zones are at high risk of increasing temperature. According to the THI maps, the upcountry wet zone is the most suitable area for exotic breeds due to the favourable climate prevailing in those regions throughout the year. A considerable drop of milk yield is to be expected when animals with different coping levels were reared in thermal environments beyond their comfortable ranges (Silva et al., 2021). However,

further expansion of the dairy industry in this area is hindered due to restriction of resources such as land and fodder. The THI values in the intermediate and dry zones vary with the day and night temperature changes. The majority of dairy animals are distributed in the intermediate and dry zones (88%) where land is available (DAPH 2015), however, these zones will face greater challenges from increase in temperature, and frequent droughts and disease incidences. The cattle industry was significantly affected by drought especially during 2006 and 2007 (Marambe et al., 2015).

b) Poultry farming

52. Most of the large poultry farms with over 100,000 animals are managed under closed house systems where climate within-house environment is completely controlled. These farms are not affected by the outside environment or temperature and such farms account for around 22% of the total poultry population.

53. The small and medium scale farmers mostly manage their poultry in open-house systems and they are the most vulnerable to the adverse impacts of climate change. Such farms are not economically sound as they are highly vulnerable to climate change such as extreme rainfall, high temperature and humidity. For example, poultry industry was highly affected by flood incidences during 2005–2008 and drought during 2005–2010 when compared to the rest of the animal production sector (Marambe et al., 2015). Changing climatic conditions directly affect feed intake and productivity of poultry. Further, extreme heat and humidity may lead to high mortality.

c) Swine farming

54. Swine industry is popular in the coastal belt from Kalutara to Negambo and has spread to the interior where urban markets are being established. About 60% of swine farms are small scale, while 25% are medium-sized and the remaining 15% are large scale. Medium and large scale farms are intensively managed in housing and the animals are fed with concentrates throughout their production period. Swine in small farms are managed using extensive or semi-intensive systems. The swine industry is mainly dependent on exotic breeds such as Landrace and Large White which are highly vulnerable to stress conditions caused by high temperature and humidity. Further, a substantial number of farmers in coastal areas are rearing indigenous pigs that have valuable traits such as adaptability to

poor feed quality, resistance to diseases and the ability to survive under a wide range of environments (Silva et al. 2016).

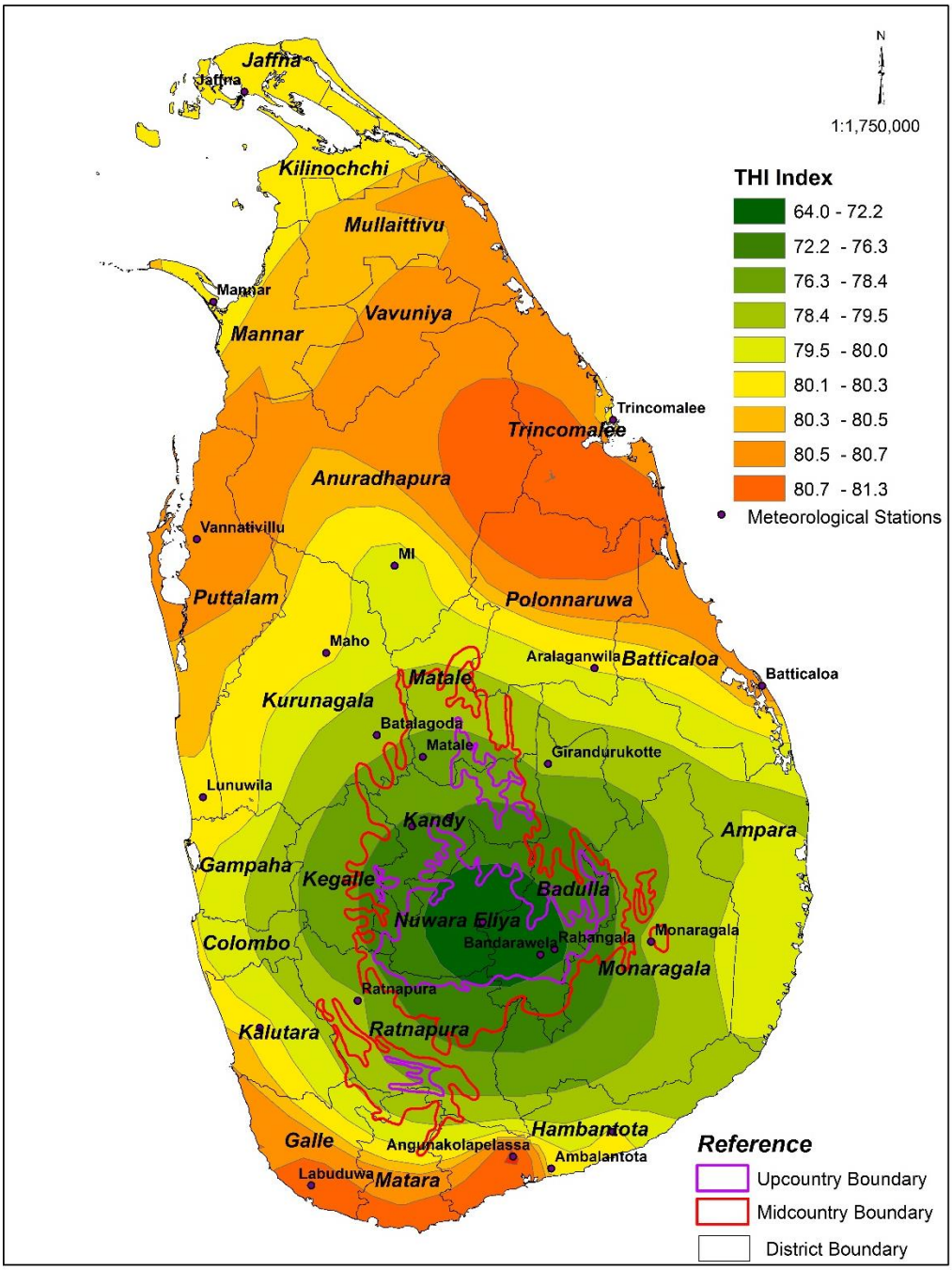

Figure 3. Temperature Humidity Index (THI) map of Sri Lanka with respect to g 10 different dairy cattle breeds and their crosses. (Source: Silva et al., 2021)

iii. Agriculture sector – Aquaculture and fisheries sectors

55. The fisheries sector of Sri Lanka consists of three main sub sectors namely; offshore, deep sea, and inland and aquaculture. These sub sectors employ around 250,000 active fishers and another 100,000 in support services, where 560,000 people have found direct and indirect employment. The fishery sector constitutes the major economic activity in the coastal region which is home to 25% of the population in the country. The sector provides about 70% of the animal protein requirement in the country and contributed 1.3% to the GDP.

56. Climate change issues for the fisheries sector have received relatively little attention. However, the sea level rise at the rate of 1.5 mm/year to 3 mm/year over the past 100 years (Arulananthan 2016) and warming of the sea has recently been identified as the most two crucial factors in the fisheries sector. The effects of climate change on aquatic ecosystems can be seen through the sea surface temperature (SST) rise and associated changes in the phenology of the organisms, or indirect through ocean acidification. The increasing frequency and intensity of storms could also increase the sector's vulnerability to climate change.

57. Aquaculture and mariculture are rapidly growing fisheries sectors in Sri Lanka that have already been affected by the climate change (Arulananthan 2019). Due to climate change, fisheries sector has experienced differences in species distribution. Changes in freshwater levels in estuaries would alter the composition of brackish water species. A changing climate would impact seagrass bed ecosystems which in turn, would affect marine production and income of fishery based livelihoods. The property and physical infrastructure of small scale fishers and their communities would also be threatened with rising sea levels. Changes of the SST according to climate change impacts on the distribution, growth and reproduction of fish stocks will lead to significant shifting of potential fishing grounds, causing impact on offshore deep sea fisheries.

58. Sea level rise will result in loss or change of coastal habitats and species distribution with profound impacts on fisheries. Landward migration of coastal wetlands would result in the loss of established freshwater and brackish water habitats (such as mangroves, salt mashers, coral reefs and seagrass) that are important breeding grounds for coastal and marine fisheries. Loss of wetlands in coastal areas and changes in salinity of lagoons and estuaries

affect fish and shellfish. Increasing storm surges and disaster events will damage reefs, leading to reduction in fish breeding and feeding grounds. Also, damage to coral reefs will increase coastal erosion and salinity of inland soil and freshwater sources. Ocean acidification would make it more difficult for shellfish, crabs, lobsters and corals to build calcium carbonate shells, causing stocks to diminish.

59. Threats to aquaculture due to climate change are more manageable. However, shrimp farming in the north-western coast found to be particularly vulnerable to climate change. There is insufficient scientific information available on the climate change impacts of inland fisheries. The freshwater ecosystems are threatened by changes in temperature, drought, precipitation, run off and floods. These impacts create a high risk environment for fish stocks. Recent studies illustrate that inland fisheries in northern, north-western, north-central and eastern provinces are subject to high risks from climate change impacts. In marine fisheries sector, Kalpitiya in Puttlam district emerges as highly vulnerable to sea level rise. Kalpitiya area has 43 fishery landing sites providing livelihoods to approximately 6,000 people and they are highly vulnerable due to sea level rise. The inland and brackish water fisheries in the dry and intermediate zones have been identified to be vulnerable to droughts (MERE 2011).

Impact on Human Health and Nutrition

60. Studies around the world have suggested the possibility of increased health hazards with changing climate patterns. Life cycles of biological agents associated with diseases are highly sensitive to weather and climate related parameters. Though Sri Lanka has reported relatively high achievements in the health sector compared with other developing nations, the country has experienced outbreak of diseases that are closely connected with environment and weather patterns (NAP 2016). Seasonal outbreaks of dengue are a prime example of this.

61. Spread of vector borne diseases into new areas with changing patterns of local climate is a potential health hazard that needs close attention. Sri Lanka has a history of such epidemics in the past such as periodic outbreaks of malaria (Mahendran et al., 2020). In addition, extreme weather conditions can lead to disasters causing injuries and fatalities. Besides, living and health comfort can directly be affected by gradual rise in temperature and sudden, uncharacteristic and extreme changes in weather parameters. Demographic

information suggests that Sri Lanka has an ageing population which would particularly be vulnerable to climate related health hazards. Hence, serious effort towards adaptation against potential health hazards associated with climate change is a priority. Alahakoon et al. (2022) reported that heat stress can reach dangerous levels in Sri Lanka due to climate change.

62. Climate variability has multiple influences on human health with direct impacts which include the effects of rising temperatures and more intense heat waves and floods. Increasing temperatures could encourage spread of vector borne diseases such as dengue. Sri Lanka has recently experienced outbreaks of diseases those are closely connected with extreme weather events.

63. Polluted surface water, secondary to floods increases the risk of vector borne, rodent borne and water borne diseases. Extreme weather conditions which are aggravated due to impacts of climate change could further lead to disasters which cause injuries and fatalities (MOE 2010). Changes in rainfall patterns, intensities, increasing temperatures and prolonged droughts could impact on food security, affecting nutritional status and lead for psychiatric illnesses, predominantly among the rural poor (WHO 2015). In identifying vulnerability of health sector, this section focuses on vector borne diseases (dengue, malaria, filariasis, leishmaniasis), zoonotic diseases (leptospirosis), nutritional status, food and water borne diseases, extreme climate related health concerns, heat-induced health issues and diseases associated with air pollution.

64. Nutrition is an essential factor in the human health and it depends on the availability of food and access to sufficient nutritional food. Under-nutrition (severe, moderate and mild), micronutrient malnutrition (anaemia, iron deficiency, vitamin A deficiency and Iodine deficiency), overweight and obesity are the major nutritional associated issues in Sri Lanka. All these complications may directly or indirectly associate with climate change and will obstruct the overall development in the country (MRI 2009). Climate change will affect food production, especially cereal crops due to changes in temperature, rainfall patterns, soil moisture and fertility. Food insecurity resulting from climate change would lead to widespread malnutrition and hunger affecting mainly children and pregnant mothers.

Impact on Water – Drinking and Irrigation

65. Sri Lanka, in comparison to many other countries, possesses abundant water resources in terms of total aggregate water availability. However, spatial and temporal fluctuations in rainfall lead to variations in both surface and ground water availability (Chandrasekara et al. 2021). Historically, the monsoon rainfall patterns created a need for planned water conservation and good water governance practices. The overall impacts of climate change on the water sector are likely to have adverse effects for agricultural water supply, energy generation, human health, and human settlements (TNC 2021). As of 2019, a major hindrance to effective water governance and planning was the level of uncertainty, and lack of spatial specificity associated with all water-related projections. In what is a highly spatially variable climate, and with noteworthy social vulnerabilities, further research is urgently required to improve understanding of potential future issues.

66. Availability, supply, distribution, use and conservation of water resources are directly dependent on climate conditions. The water resources sector in Sri Lanka has to cater to the needs of the domestic use, agricultural and industrial sectors, and ecosystems (NAP 2016). Relationship between water and ecosystems is a complex one. Hence, in addition to fulfilling human needs, managers of water resources have to be mindful about ecosystems also. Only a limited segment of households in the country have access to safe drinking water. Sri Lanka has invested heavily on agricultural water supply and a significant share of the country's power generation capacity also is dependent on water resources. A growing number of industrial facilities also create demand for water resources and this has led to high level of extraction of groundwater as well as increased pollution of water resources. Overall, water is an important sector that has implications for all major economic sectors and human activities that need special attention in adaptation climate change.

i. Drinking water

67. More frequent extreme weather events are causing profound and long term Impacts on the spatial and temporal water availability. With temperature and rainfall anomalies projected for 2030 and 2050 as per the RCP 8.5 scenario, the situation would be further aggravated in the dry and intermediate zones due to high rates of evapotranspiration (TNC 2021). Colombo and Gampaha districts (in the Kelani river basin), Matara (in Nilwala river basin) and Hambanthota district have a high degree of flood-associated risks for drinking water

quality (turbidity, micro-organisms and colour). The risk will be greater when rainfall anomaly projections for 2030 and 2050 as per the RCP 8.5 scenario, especially in the wet zone.

ii. Irrigation Water

68. Sri Lanka has a historical irrigation-based cultivation system dates back over two millennia and inherited an advanced hydraulic infrastructure and knowhow. Sharp variations of water availability for agriculture over space and time led to the development of an intricate irrigation and water supply system giving rise to one of the world most advanced hydraulic engineering accomplishments. Crops such as paddy that requires a large quantity of irrigation water, and the smallholder farmers who are dependent on rain for their irrigation needs become most vulnerable to variability and reduction of precipitation (Esham and Garforth, 2013).

Impact on Coastal Resources

69. Sri Lanka is richly endowed with varied coastal and marine ecosystems that include estuaries and lagoons (214,522 ha), mangroves (11,656 ha), seagrass beds (37,137 ha) salt marshes (27,520 ha), coral reefs and large extents of beaches including barrier beaches, spits (5,731 ha), sand dunes, mangroves and associate water bodies (10,363 ha). Each of these coastal habitats possess a significant amount of species and provides an array of ecosystem services vital to human, and support livelihoods of the coastal communities in significant manner to enhance their economic status and maintain social integrity.

70. The likely impacts of climate change on coastal areas include sea level rise and associated saline water intrusion further inland. Over the last century, mean sea level has risen by 15 cm. This results in increased salinity making the existing primary production activities untenable. A study conducted by Nianthi and Shaw (2015) reported that seal level rise will inundate the low lying coastal areas in particular causing significant economic impacts on land resources (an estimated amount of LKR 1,242 million), tourism sectors (affected cost: LKR 201 million rupees and replacement cost LKR 1,174 million), industries (impact on small industries LKR 152 million) and rice and coconut production (LKR 64.5 million and 83 million, respectively).

Impact on Biodiversity and Ecosystems

71. Sri Lanka (along with India's Western Ghats) is one of the world's 36 biodiversity hotspots of the world. Irrespective of its relatively small size, Sri Lanka has a diverse array of ecosystems with a very rich species composition of fauna and flora. The diversity of ecosystem distribution in Sri Lanka is based on spatial variation of rainfall, temperature, topography and soil.

72. According to UNESCO's Man and the Biosphere Programme, the country has four biosphere reserves: Hurulu, Sinharaja, Kanneliya-Dediyagala-Nakiyadeniya and Bundala. The coastal landform in Sri Lanka is approximately 1,700 km in length and is comprised of estuaries, lagoons, beaches, rocky shores, sand dunes, salt marshes and mangroves. The Gulf of Mannar has the most extensive shallow coral reefs and seagrass beds in Sri Lanka while fringing coral reefs are common in the northern, eastern and southern coastal waters. Deforestation and forest fragmentation are the predominant threat to Sri Lanka's biodiversity, while invasive alien species are increasingly dominating the landscape aided by climate changes.

73. Few studies have been conducted on the impacts of changing rainfall patterns and temperature increases on forest species and ecosystems. Habitat sensitive species such as freshwater fish, pteridophytes (ferns), orchids and other aquatic plants are sensitive to water availability. In 2010, severe bleaching of the coral reefs in the Pigeon Island National Park and Dutch Bay in Trincomalee damaged the coral ecosystems (Rajasuriya 2010). Similar coral bleaching has been recently observed in 2019, especially for reefs in the east and north coasts. Sea level rise by 1 m in the Batticaloa region of Sri Lanka would cause landward communities to be inundated with brackish water at various depths and the present permanent coastal vegetation-front would shift landward by 30–45 m (Mathiventhan et al., 2022).

Impact on Human Settlements and Infrastructure

74. Human settlements in Sri Lanka comprise of urban, rural and estate sectors. The rural population is 77.4% of the total population, while urban and estate populations constitute 18.2% and 4.4%. The Urban Development Authority forecasts that 70% of Sri Lanka's population would reside in urban settlements by 2030 (NCAS 2010). Human settlements are highly vulnerable to the adverse impacts of climate change including higher temperatures, longer periods of drought and disasters caused by erratic rainfall patterns,

floods, landslides and sea level rise. Urban and rural settlements are susceptible to flood risk while settlements in slopes over 450 area are highly threatened to landslides.

75. High humidity compounds the effects of the temperatures being felt by human beings. Extreme heat can lead to dangerous, even deadly, consequences, including heat stress and heatstroke. While the effects of heat may be exacerbated in cities like Colombo, due to the urban heat island (UHI) effect, the livelihoods, and social well-being can also be severely disrupted during and after periods of unusually hot weather (Nanayakkara et al., 2023).

76. The effects of temperature rise and heat stress in urban areas are increasingly compounded by the phenomenon of the UHI effect. Dark surfaces, residential and industrial sources of heat, an absence of vegetation, and air pollution can push temperatures higher than those of the rural surroundings, commonly anywhere in the range of 0.1 °C – 3 °C in global mega-cities. Urban surfaces such as roads and roofs absorb, hold, and re-radiate heat, raising the temperature in our urban areas (Jayawardena et al. 2024).

77. The development activities that have replaced green spaces with more hard surfaces that absorb heat, and human activities such as traffic, industry, and electricity usage generate heat that adds to the UHI effect. The UHI effect in Colombo, Sri Lanka may have driven around a 1.6°C increase in land surface temperatures (WB and ADB 2021). As well as impacting on human health the temperature peaks that will result from combined UHI and climate change, as well as future urban expansion, are likely to damage the productivity of the service sector economy, both through direct impacts on labor productivity, but also through the additional costs of adaptation.

78. A study has explored the risks and trade-offs that will be faced over the 21st century as communities and infrastructure are forced to retreat from the present-day coast as sea level rises and storm surge risk increases. An optimal retreat distance of between 37 and 262 m along Sri Lanka's east coast is proposed, a move which will be associated with significant economic costs (Dastgheib et al. 2018). Declines in living standards in Sri Lanka due to temperature increases are expected to be some of the most marked in South Asia (Mani et al. 2018). Under higher emissions pathways, northern and western regions of Sri Lanka, such as Jaffna district, are projected to see income declines of up to 10% by the 2050s. In these regions, climate changes could be compounding high levels of existing deprivation.

Impact on Tourism

79. Sri Lanka is a popular tourist destination and has been described as one of the best island countries to visit for its contrasting geophysical and climatic zones that can be accessed within hours of each other. Tourism Development Plan of 2011-2016 and 2017-2020 have embedded strategies to enhance the tourism industry and boost arrivals. The tourism sector contributes around 10-12% to GDP of the country, making it the third highest earner of foreign exchange for the national economy (CBSL 2018). The current strategy sought earnings of US$ 10 $ billion by 2025. The sector employs more than 360,000 people directly and indirectly (SLTDA 2017).

80. The tourism sector is highly vulnerable to the adverse effects of climate change such as temperature rise, heat waves, sea level rise and extreme weather events (storm surges, prolong drought, flash flood and landslides). The majority of tourism facilities are located in the coastal areas (60%) where elevation is less than 2 m which further exposes the sector to risks from sea level rise and storm surges (Nayanananda 2007). Further, climate change would exacerbate loss of beaches and marine biodiversity (e.g. coral bleaching), spread of infectious diseases, warmer temperatures and heat stress for tourists and lack of water in certain areas. Moreover, prolonged droughts could undermine sightseeing in wildlife parks and reserves, mainly located in the dry zone.

Sectoral Impacts – Mitigation Sectors in NDCs

81. The Mitigation sectors in the NDCs are the key to reducing greenhouse gas emissions as pledged by Sri Lanka. Among the six sectors, Forestry and Agriculture (including livestock) sectors were explained previously under adaptation as well (Section 3). Though agriculture sector is one of the most vulnerable to climate change, the sector also contributes significantly to climate change and hence, considered under NDC Mitigation sectors. Forestry sector, that house a significant proportion of the native biological diversity of Sri Lanka, helps capturing CO2 from the environment, supporting removing GHGs, is categorized under the mitigation NDCs. The section below covers the four remain rest of the NDC mitigation sectors identified by Sri Lanka and highlights the impact of climate change on those sectors.

Industry, Electricity (Power), Transportation and Waste Sectors

82. Energy, industry and transportation are generally considered as sectors that are relevant in the case of mitigation rather than adaptation to climate change. However, consultations carried out with stakeholders and experts suggested that these sectors also need the support of certain adaptation measures to cope with the projected climate impacts. Hence, these sectors are considered here not for their contribution to mitigation of climate change but for identifying and implementing essential adaptation measures to enhance the climate resilience of them. Sri Lanka's power generation is still dependent on hydro power facilities to a significant extent and changing patterns of rainfall have would have an impact on them. Rainfall patterns are crucial for supply of raw materials for agro-based industries. Besides, rising scarcity of water and high extraction of groundwater would likely to create difficulties in industrial water supply in the future. Extreme events have the potential to affect transportation. Hence, despite usual affiliation of these sectors with mitigation efforts, they need the support of appropriately designed adaptation measures, too.

83. The industrial sector is shown to suffer a significant negative impact due to strong winds and landslide events. The textiles and garment sub-sectors are negatively impacted while the machinery sub sector shows a positive impact. This indicates the effect of higher demand for new machinery and equipment employed in disaster reconstruction efforts (Weerasekara et al. 2021).

84. Research suggests that on average, a one degree increase in ambient temperature can result in a 0.5%–8.5% increase in electricity demand (Santamouris et al. 2015), supporting the increased demand for business and residential air-cooling systems. The increase in demand associated with rising temperatures under climate change can be captured in the indicator "Cooling Degree Days", which represents the total burden of cooling required to maintain temperatures at the optimum level for human comfort. In Sri Lanka the projected increase in cooling requirement is significant, rising at least 10% by the 2040s under all emissions pathways. This increase in demand places strain on energy generation systems which are compounded by the heat stress on the energy generation system itself, commonly due to its own cooling requirements, which can reduce its efficiency (ADB 2017).

85. The main transport infrastructure in Sri Lanka consisting of roads, railways, airports and sea ports are vulnerable to some impact of climate change, especially as most have not been

designed to accommodate the consequences. There is a high probability that the island's coastal zone will be affected by sea level rise and will have to face associated inundation of land, saltwater intrusion, and increased frequency of storm surges. The coastal region (i.e. DSDs with a coastal boundary) contains nearly 20% of the island's Class A and B roads, and 33.3% of its railroads (MOE 2011). This infrastructure is particularly vulnerable to sea level rise. Already, the railway lines from Colombo to the South have been affected by coastal erosion at some places. Sea level rise and more frequent and intense storm surges may also impact harbours and ports, and consequently on the service facilities they offer.

86. The main roads in the country are generally surfaced with pre-mix bitumen or asphalt. Increased ambient temperatures could cause surface flow of asphalt, distortion of road markings, and bleeding of bitumen making old road surfaces brittle (RDA 2016). This may necessitate heavy investment on repair and maintenance. Similarly, increased rainfall intensity as a result of climate change could exacerbate flooding of roadways, particularly as many canals and drainage outfalls are already in disrepair or have been planned for lower rates of flow. Increased levels of damage to land-transportation infrastructure will cause direct costs for repair and rehabilitation, and also result in substantial losses across many other sectors that are dependent on the road and rail network.

87. Waste management is one of the key services every city administration government provide, and climate change can impact waste facilities both directly and indirectly. The present haphazard waste disposal practices in Sri Lanka have created many environmental problems and numerous nuisances on the public. At the same time, improper waste management - e.g. waste blocking drainage, exacerbates flooding during rainfall events (MCUDP 2024) can reduce the ability of a city to cope with extreme climate events. All new and existing waste management systems therefore need to be designed to be resilient to climate change. Extreme climate events will impact waste management systems such as collection, transportation, dumping, etc, thus contributing inconvenience, disturbance, health-related issues and overall environmental pollution.

IV. MERITS OF THE LEGAL QUESTIONS

88. It is respectfully stated that there are numerous sources of international law, as well as domestic jurisprudence, which articulate legal obligations on the issue of protection of the

environment in general. These can be easily extended to support the claim that States have obligations under international law to protect, in particular, the climate system and other parts of the environment, from anthropogenic emissions of greenhouse gases for States and for present and future generation.

89. Equally, there are several authorities from both international and domestic law on legal consequences flowing from the breach of State obligations under international law, which can then be applied to breaches within the international environment law sphere and particularly in relation to climate change.

A. Applicable law

90. In the instant case, some of the sources and principles of international law upon which the ICJ is expected to form its opinion are already contained in the chapeaux to the two legal questions, i.e. the Charter of the United Nations, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the United Nations Framework Convention on Climate Change, the Paris Agreement, the United Nations Convention on the Law of the Sea, the duty of due diligence, the rights recognized in the Universal Declaration of Human Rights, the principle of prevention of significant harm to the environment and the duty to protect and preserve the marine environment.

91. However, by no means should the ICJ restrict itself only to those sources and principles of international law and, in this regard, Sri Lanka respectfully urges the court to identify the relevant State obligations from amongst the entire corpus of international law and which go beyond the discourse of purely environmental rights/duties, but other obligations which are indirectly, but significantly breached due to climate change, and assess the legal consequences which follow under international law.

92. The wide lens from which the ICJ is urged to approach the two legal questions is further confirmed by some of the preambular paragraphs of the UNGA Resolution 77/276 which recall its own previous resolutions on environment-related issues, resolutions of the Human Rights Council and a host of other sources of international law relating to both human rights and environmental rights in particular.

B. Obligations of States under international law in relation to climate change

93. In order to identify the obligations of States, it is important to first recall the basic sources of public international law, as set out under Article 38 of the Statute of the ICJ. They are, a) international conventions, whether general or particular, establishing rules expressly recognized by the contesting states; b) international customs, as evidence of a general practice accepted as law (customary international law); general principles of law recognized by civilised nations, and d) judicial decisions and the teachings of the most highly qualified publicists of the various nations.

94. It is respectfully submitted that the obligations of the State to protect the environment and, consequently, the obligations to ensure that the climate system of the environment is not changed in a manner that causes adverse impacts, are found in each one of the above sources. They may be couched in the form of rights which then necessarily and implicitly invoke corresponding obligations, they may not always expressly make reference to the "environment" or any part thereof, but be rights/obligations which can only exist in the context of a healthy or unharmed environment, and they may not carry equal weight of persuasiveness. Yet, they are human rights such as the right to life, right to a healthy environment, right to self-determination, right to development, right to culture, right to health, rights of children, rights of women, rights of persons with disabilities, rights of indigenous peoples, and rights of future generations, all of which are in some way negatively impacted when obligations to protect the environment, including the climate system, are breached. These rights are scattered across the landscape of international law sources. Some are listed below, but the list is not exhaustive by any means:

a) International conventions

- Charter of the United Nations
- International Covenant on Civil and Political Rights
- International Covenant on Economic, Social and Cultural Rights
- Convention on the Rights of the Child
- United Nations Convention on the Law of the Sea
- Vienna Convention for the Protection of the Ozone Layer
- Montreal Protocol on Substances that Deplete the Ozone Layer

- Convention on Biological Diversity
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
- United Nations Framework Convention on Climate Change
- Kyoto Protocol
- Paris Agreement

b) Customary international law

- Universal Declaration of Human Rights
- Declaration of the United Nations Conference on the Human Environment
- Stockholm Declaration
- Rio Declaration on Environment and Development
- UNGA Resolution 76/300 of 28 July 2022 and Resolution 48/13 of 8 October 2021 of the Human Rights Council on the right to a clean, healthy and sustainable environment
- UNGA resolution 77/165 of 14 December 2022 on the protection of the global climate for present and future generations of humankind
- UNGA resolution 70/1 of 25 September 2015 entitled "Transforming our world: the 2030 Agenda for Sustainable Development"
- Human Rights Council resolution 50/9 of 7 July 2022 on human rights and climate change

c) General principles of international law

- Sovereignty of States over natural resources and the responsibility not to cause transboundary environmental damage
- Principle of preventive action
- Principles of good neighbourliness and co-operation
- Principle of sustainable development
- Precautionary principle

- Polluter pays principle
- Principle of common but differentiated responsibility (CBDR)
- Duty of due diligence
- Duty to compensate for harm
- Duty to protect and preserve the marine environment

d) Judicial decisions and writings of jurists

- Trail Smelter Case, United States of America versus Canada (1938 and 1941)
- Affaire du Lac Lanoux, Espagne versus France, (1957)
- Nuclear Test Cases, Australia versus France and New Zealand versus France, (1974)
- Fisheries Jurisdiction Cases, United Kingdom of Great Britain and Northern Ireland versus Iceland and Federal Republic of Germany versus Iceland (1974)
- Case Concerning the Gabcikovo-Nagymaros Project (1997)
- Stichting Greenpeace Council v Commission of European Communities (1998)

95. From among all of the above, perhaps the most important principle of international law that addresses climate change is the principle of prevention of transboundary harm.[24] It is eminent among "the most directly relevant applicable law governing the question"[25] of which the court has been seized in these advisory proceedings. The ICJ has expressed the principle thus:

> *"in general international law it is 'every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States' (Corfu Channel (United Kingdom v. Albania), Merits, Judgment, I.C.J. Reports 1949, p. 22). 'A State is thus obliged to use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State' in a transboundary context…".*[26]

[24] See e.g. General Assembly Resolution A/RES/61/36, 18 December 2006.
[25] *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996*, p. 243, para. 34
[26] *Dispute over the Status and Use of the Waters of the Silala (Chile* v. *Bolivia), I.C.J. Reports* 2022, p. 648, para. 99, citing *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay), I.C.J. Reports 2010*, p. 56, para. 101; *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996*, p. 242, para. 29

96. The principle imposes an obligation of "due diligence". In *Pulp Mills* the Court explained that "the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory. It is 'every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States'".[27]

97. Given that this fundamental principle concerns the rights of other States — it concerns "every State's obligation not to allow knowingly its territory to be used for acts *contrary to the rights of other States*"[28] — it is necessary for to determine what are the most directly relevant rights of other States in this regard. Sri Lanka submits that those rights are: first, the right of all States to territorial integrity; and, secondly, the right of every people not to be deprived of its own means of subsistence.

98. With regard to the right of a State to territorial integrity, the ICJ has observed, "the principle of territorial integrity is an important part of the international legal order and is enshrined in the Charter of the United Nations".[29] The right of one State to sovereignty necessarily "has as a corollary a duty: the obligation to protect within the territory the rights of other States, in particular their right to integrity".[30] Judge Weeramantry accordingly observed in his separate opinion in *Gabčikovo-Nagymaros*, "territorial sovereignty" is among the well-established areas of international law that forms the basis for the most fundamental principles of international environmental law. [31]

99. Secondly, every people has the right not to be deprived of its own means of subsistence.[32] This fundamental human rights principle is "a legal principle of general application".[33] It is a right that "entails corresponding duties for all States and the international community".[34] The principle that in no case may a people be deprived of its own means of subsistence has played an important role in the Court's own case-law. In the Fisheries case

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[27] *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay), I.C.J. Reports 2010*, pp. 55–56, para. 101, citing *Corfu Channel (United Kingdom* v. *Albania), Merits, I.C.J. Reports 1949*, p. 22.
[28] Ibid, pp. 55–56, para. 101; *Corfu Channel (United Kingdom* v. *Albania), Merits, I.C.J. Reports 1949*, p. 22 (emphasis added).
[29] *Accordance with International Law of the Unilateral Declaration of Independence in Respect of Kosovo, Advisory Opinion, I.C.J. Reports 2010*, p. 437, para. 80.
[30] *Island of Palmas (Netherlands, United States of America)* (1928), vol. II, R.I.A.A., p. 839
[31] *Gabčikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports*, p. 95.
[32] See Common Article 1, paragraph 1, International Covenant on Civil and Political Rights, 16 December 1966, 999 *U.N.T.S.* 171, and International Covenant on Economic and Social Rights, 16 December, 999 *U.N.T.S.* 3.
[33] ILC Yearbook 2001, II, Part 2, 66, para. 8(a), A/CN./SER.A/1996/Add.1 (Part 2).
[34] CCPR General Comment No 12, 13 March 1984, para. 5.

the Court emphasized the importance of "the vital needs of the population" of the coastal State.[35] In Gulf of Maine the Chamber of the Court laid emphasis on the need to avoid an outcome that would have "catastrophic repercussions for the livelihood and economic well-being of the population of the countries concerned".[36] Judge Weeramantry accordingly emphasized the importance of the welfare of the people in question in his separate opinion in Gabčikovo-Nagymaros.[37]

100. As evident from the impacts of climate change, the breach of obligations to protect the climate system and other parts of the environment, almost always result in the breach of obligations pertaining to the right to the highest attainable standard of health, to clean water and adequate sanitation, to livelihood, to child development, to maternal health, etc and, ultimately, the right to life itself. It is for that reason that the above list of international law sources spanning an array of diverse areas of human rights and principles of law are relevant to the first question before the ICJ. For, if the court were to accept the argument that climate change has resulted in deprivation of the right to a clean and healthy environment, all of those other rights may very well be equally affected in the case of the man who is unable to earn his living from cultivation due to frequent flooding, the woman whose maternal health suffers as a result of excessive heat, the child who is unable to play outdoors and the yet unborn generations of humankind whose right to life would have diminished in a world which, by the time of their birth, has become uninhabitable.

101. This is the very reason that the environment, including the climate system, should be treated not as the private playground of any powerful actor, but a communal resource held in trust by the State for its peoples and animals. In the *Gabčikovo-Nagymaros Project Case*, at pp.101-102, Judge Weeramantry draws from Sri Lanka's history to illustrate the point:

> *The ancient chronicles record that when the King (Devanampiya Tissa, 247-207 BC) was on a hunting trip (around 223 BC), the Arahat Mahinda, son of the Emperor Asoka of India, preached to him a sermon on Buddhism which converted the king. Here are excerpts from that:*

[35] *Fisheries Case, Judgment of December 18th, 1951, I.C.J. Reports 1951*, p. 142.
[36] *Delimitation of the Maritime Boundary in the Gulf of Maine Area, I.C.J. Reports 1984*, p. 342, para. 237; see also *Maritime Delimitation in the Black Sea (Romania* v. *Ukraine), I.C.J. Reports 2009*, p. 126, para. 198; *Territorial and Maritime Dispute (Nicaragua* v. *Columbia), I.C.J. Reports 2012*, p. 706, para. 223.
[37] *Gabčikovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports*, pp. 89–90.

"O great King, the birds of the air and the beasts have as equal a right to live and move about in any part of the land as thou. The land belongs to the people and all living beings; thou art only the guardian of it."

This sermon, which indeed contained the first principle of modern environmental law - the principle of trusteeship of earth resources - caused the king to start sanctuaries for wild animals - a concept which continued to be respected for over twenty centuries. The traditional legal system's protection of Sauna and flora, based on this Buddhist teaching, extended well into the eighteenth century. The sermon also pointed out that even birds and beasts have a right to freedom from fear. The notion of not causing harm to others and hence sic utere tuo ut alienum non luedus was a central notion of Buddhism. It translated well into environmental attitudes. "Alienurn "in this context would be extended by Buddhism to future generations as well, and to other component elements of the natural order beyond man himself, for the Buddhist concept of duty had an enormously long reach."

Legal consequences where States have breached their obligations

102. The second question before the ICJ is a natural corollary to the first question in that, having identified the obligations of States, the obvious next step is to remedy a breach of that obligation. In doing so, it is necessary to examine the lawfulness of the conduct which has caused climate change and its impacts and, in the case of a breach, the legal consequences arise automatically as a matter of law. This question is also framed in a way that the court would be able to opine whether the nature of the consequences would be different, depending on whether it is "a State" of the various types described in the first limb or "Peoples and individuals" captured under the second limb.

103. At the outset, it is respectfully recalled that the ICJ has not shied away from giving advisory opinions on **legal consequences** relating to specific incidents which have occurred in the international sphere. Cases in point are those the words are found in the titles themselves, i.e. "Legal Consequences of the Chagos Archipelago from Mauritius in 1965" (2017), "Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory" (2003) and "Legal Consequences for States of the Continued Presence of South

Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276" (1970)" Pending along with the instant request is also the case titled "Legal Consequences arising from the Policies and Practices of Israel in the Occupied Palestinian Territory, including East Jerusalem" (2023).

104. For purposes of supporting the second legal question, Sri Lanka relies primarily on the International Law Commission (ILC) Articles on State Responsibility, particularly Article 30 (Cessation and non-repetition), Article 31 (Reparation), Article 33 (Scope of the international obligations set out in this part), 34 (Forms of reparation), 35 (Restitution) and 36 (Compensation). In fact, the UNGA Resolution 77/276 references most of these forms as potential legal consequences against States who are in breach of their obligations, i.e. reparation for the consequences of extreme and slow onset events (preambular paragraphs 8 and 10), finance, capacity-building and technology transfer for adaptation and loss and damage (preambular paragraph 11), and developed countries' commitment of USD 100 billion per year by 2020 for mitigation action (preambular paragraph 12),.

105. However, given the provisions of Article 55 which recognize the residual nature of these legal consequences, they will apply only when treaties are silent on the specific consequences resulting from a breach of obligations. Sri Lanka is also mindful that the causal nexus between the breach of a State obligation by act or omission to protect the climate system and any loss due to climate change may vary depending on the primary rule violated and the nature and extent of the injury.

106. Further, just as much as the type of obligations of States with regard to climate change could be a wide array due to the reach of climate change over so many sectors, so too the legal consequences. For instance, it is reported that loss and damage caused by floods in May 2016 in Sri Lanka was US$ 660 million, and that in May 2017 was estimated to be US$ 478 million. Moreover, the extreme rainfall event in May 2017, Sri Lanka lost 212 human lives and 78 recorded missing, where the losses cannot be valued in currency. Whilst monetary compensation may seem to be the obvious remedy in these cases, it is not so straightforward in others. For, in addition to these direct climate change impacts, Sri Lanka's food systems are faced with indirect or compounding risks, such as supply chain risks and unavailability of inputs, fuel, and implements; market demand and price volatility leading to reduced wholesale or retail prices and profit margins; lack of reliable real-time market information; rising costs of living, inflation, currency devaluation, loan-related

risks, and debt traps; post-harvest losses and food waste; human-wildlife conflict; and human mobility, including internal migration.

107. Therefore, it is respectfully submitted that the scientific evidence put forward by Sri Lanka as to the impacts of climate change in its own territory, as well as global scientific evidence on the issue, creates at least a prima facie case that States who are in breach of their obligations to protect the climate system of the environment should bear liability for and suffer the legal consequences of their acts/omissions. In this regard, Sri Lanka draws from the provisions of its Constitution and judicial decisions from its own Supreme Court, to demonstrate the legal consequences which follow when environmental rights are violated.

108. Article 27(1) of the Constitution of Sri Lanka states that the Directive Principles of State Policy shall guide Parliament, the President and the Cabinet of Ministers in the enactment of laws and the governance of Sri Lanka for the establishment of a just and free society, and among these Directive Principles is the pledge that the State shall protect, preserve and improve the environment for the benefit of the community (Article 27(14)). Further, Article 28 of the Constitution states that the exercise and enjoyment of rights and freedoms are inseparable from the performance of duties and obligations and, accordingly, one such duty is the duty of every person in Sri Lanka to protect nature and conserve its riches. While neither the right to a healthy environment, nor even the right to life is expressly recognized as a justiciable Fundamental Right in Sri Lanka's Constitution, it is by an invocation of these Directive Principles, as well as the right to equality before the law and equal protection of the law enshrined in Article 12(1) that environmental rights have been embraced by domestic law. Therefore, wherever environmental rights have been found to have been infringed, court has not been hesitant to ensure that legal consequences follow and grant remedies to the Petitioners.

109. The Supreme Court of Sri Lanka has repeatedly recognized environmental rights in a series of judgments over the years. In ***Bulankulama and others v. Secretary, Ministry of Industrial Development and others (Eppawela case)***,[38] the subject matter was a mineral investment agreement entered into between the State and a private company, allowing the latter to extract phosphate, without first having conducted an environmental impact

[38] [2000] 3 Sri.L.R. 243. EPPAWALA PHOSPHATE EXTRACTION CASE – Environment Foundation (Guarantee) Limited. (efl.lk)

assessment. The Petitioners claimed that their livelihoods were affected. The court observed as follows:

> *"International standard setting instruments have clearly recognized the principle of inter-generational equity. It has been stated that humankind bears a solemn responsibility to protect and improve the environment for present and future generations. (Principle 1, Stockholm Declaration). The natural resources of the earth including the air, water, land flora and fauna must be safeguarded for the benefit of present and future generations. (Principle 2, Stockholm Declaration). The non-renewable resources of the earth must be employed in such a way as to guard against their future exhaustion and to ensure that benefits from such employment are shared by all humankind. (Principle 5, Stockholm Declaration). The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations. (Principle 3, Rio De Janeiro Declaration). The inter-generational principle in my view, should be regarded as axiomatic in the decision making process in relation to matters concerning the natural resources and the environment of Sri Lanka in general, and particularly in the case before us. It is not something new to us, although memories may need to be, jogged."*[39]

110. In ***Watte Gedera Wijebanda v. Conservator-General of Forests***,[40] the Petitioner had applied for a license to mine a quarry for silica quartz and his application had been rejected. The Supreme Court of Sri Lanka cited several principles of international environmental law and upheld the rejection:

> *"The right of all persons to the useful and proper use of the environment and the conservation thereof has been recognized universally and also under the national laws of Sri Lanka. While environmental rights are not specifically alluded to under the fundamental rights chapter of the Constitution, the right to a clean environment and the principle of inter-generational equity with respect to the protection and preservation of the environment are inherent in a meaningful reading of Article 12(1) of the Constitution.*
>
> *The constitution in Article 27(4) of the directive principles of state policy enjoins the state to protect, preserve and improve the environment. Article 28 refers to the fundamental duty upon every person in Sri Lanka to protect nature and conserve its riches.*
>
> *Further, although the Directive Principles of State Policy are not specifically enforceable against the state, they provide important guidance and direction to the various organs of state in the enactment of laws and in carrying out the functions of good governance. An important parallel can be drawn with the Indian experience, and the significance granted to Directive Principles within that countries' legal scheme governing environmental protection.*
>
> *…*

[39] Ibid at pp,277-278

[40] (2009) 1 Sri.L.R 337 Watte Ged.era Wijebanda v. Conservator General Of Forests And Others - SLR - 337, Vol 1 of 2009 [2007] LKSC 15; (2009) 1 Sri LR 337 (5 April 2007) (commonlii.org)

Correspondingly, courts in Sri Lanka, have long since recognized that the organs of State are guardians to whom the people have committed the care and preservation of the resources of the people. This recognition of the doctrine of 'public trust', accords a great responsibility upon the government to preserve and protect the environment and its resources.

The doctrine of public trust was initially developed in ancient Roman jurisprudence and was founded on the principle that certain common property resources such as rivers, forests and air were held by the government in trusteeship for the free and unimpeded use of the general public. This doctrine emphasizes the obligation of the government to protect and conserve these resources for public use and protect it from exploitation by private individuals for short term monetary or commercial gains. Such resources being an endowment of nature should be available freely to the general public, irrespective of the individual's status or income level in life. This doctrine is an "affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands surrendering the right of protection only in the rarest of cases, when the abandonment of that trust is consistent with fundamental and larger interest of the purposes of hat trust. Contemporary concerns with the state and its role in the protection of the environment have close links with this doctrine of public trust. As part of this responsibility governments make policy decisions related to the environment and its useful utilization, conservation and protection and should always be only in the interest of the general public with a long term view of such being conserved for intergenerational use. For this doctrine is closely linked with the principle of intergenerational equity. Human kind of one generation holds the guardianship and conservation of the natural resources in trust for future generations, a sacred duty to be carried out with the highest level of accountability.

Under the public trust doctrine as adopted in Sri Lanka, the State is enjoined to consider contemporaneously, the demands of sustainable development through the efficient management of resources for the benefit of all and the protection and regeneration of our environment and its resources. Principle 21 of the Stockholm declaration, 1972 and Principle 2 of the Rio De Janeiro Declaration, 1992 recognize the right of each state to exploit its own resources, pursuant, however to its own environmental and development policies. The principle of sustainable development prioritizes human needs and concerns for a healthy and productive life in harmony with nature. Therefore environmental protection as envisaged under the Constitution forms an integral part of such development."

Where government officers act in the manner set out in the facts of the instant case, they act in grave breach of the public trust reposed upon them.

Although the international instruments and constitutional provisions cited above are not legally binding upon governments, they constitute an important part of our environmental protection regime. As evidenced by the decision of this court in Bulankulama v. Secretary, Ministry of Industrial Development, (6) they constitute a form of soft law, the importance and relevance of which must be recognized when reviewing executive action vis-a.-vis the environment, In this case the Supreme Court adverted to principle 1 of the Rio declaration that "Human beings are the center of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature"

The phrase 'sustainable development' encapsulates the meaning that natural resources must be utilized in a sustainable manner, in keeping with the principle of intergenerational equity. This requires that the State as the guardian of our natural

resource base does not compromise the needs of future generations whilst attempting to meet and fulfill the present need for development and commercial prosperity or short term gain."[41]

111. In ***Kariyawasam v. Central Environmental Authority and others***,[42] the issue was alleged water contamination in an area surrounding a thermal power plant in respect of which no environmental impact assessment had been done. The Supreme Court of Sri Lanka extensively relied on the principles contained in the Rio Declaration and ultimately held that there was a breach of the fundamental rights of the Petitioners, including their right to clean water, and that the company operating the power plant was subject to the polluter pay principle:

> *"Finally, to consider the question of whether the scope of Article 12 (1) of the Constitution extends to environmental rights in appropriate circumstances, the Supreme Court of India has firmly declared that the people of that country have a fundamental right to a clean environment as part of the right to life guaranteed by Article 21 of the Constitution of India. Thus, in ND JAYAL vs. UNION OF INDA [at para. 22], the Supreme Court of India stated "In a catena of cases we have reiterated that right to clean environment is a guaranteed fundamental right.".*
>
> *...I wish to add that, in my view, when Article 12 (1) of the Constitution is read in the light of Article 27 (14) of the Constitution, it vests in the citizens of Sri Lanka a fundamental right to be free from unlawful, arbitrary or unreasonable executive or administrative acts or omissions which cause or permit the causing of pollution or degradation of the environment. In this connection, I note that in ASHIK vs. BANDULA, O-I-C WELIGAMA [2007 1 SLR 191 at p.193], Silva CJ mentioned that the Court was acting in the public interest "to make a determination as to the effective guarantee of the fundamental right enshrined in Article 12 (1) of the Constitution for the equal protection of the law in safeguarding the People from harmful effects of noise pollution.".*
>
> *Further, with regard to the case before us, it seems to me that when Article 12 (1) guarantees that "All persons are equal before the law and are entitled to the equal protection of the law", it vests in the residents of the Chunnakam area a constitutionally guaranteed right to be protected by the provisions of the National Environmental Act to the same extent that residents elsewhere in the country would be protected by the same Act. This, in turn, grants the residents of the Chunnakam area the right to legitimately expect that the CEA and BOI will fulfil their duties under the Act and the applicable Regulations in relation to the 8th respondent"s thermal power station and not act in breach of these duties, just as these statutory authorities are required to do and have done in relation to comparable projects anywhere else in the country. Therefore, an arbitrary or unreasonable failure on the part of the CEA and the BOI to perform their duties under the National Environmental Act and the regulations made thereunder which causes loss, damage and inconvenience to the*

[41] Ibid, pp.356-359
[42] Supreme Court Fundamental Rights Application No.141/2015, SC Minutes of 04 April 2019 sc_fr_141_2015.pdf (supremecourt.lk)

residents of the Chunnakam area, will entail a violation of their rights guaranteed by Article 12 (1).

I might add that, access to clean water is a necessity of life and is inherent in Article 27 (2) (c) of the Constitution which declares that the State must ensure "the realization by all citizens of an adequate standard of living for themselves and their families, including adequate food, clothing and housing, the continuous improvement of living conditions and the full enjoyment of leisure and social and cultural opportunities.". It is public knowledge that the majority of the people of our country have ready access to clean water which is provided by the apparatus of the State. It is also undisputed that prior to the pollution of groundwater in the Chunnakam area referred to earlier, the residents of that area had clean water. Thus, the pollution referred to earlier has deprived the residents of the Chunnakam area of access to clean water. They have, thereby, been placed at a significant disadvantage when compared to residents elsewhere in the country.

...

"It is an oft-cited and applied principle of environmental law that the "Polluter Pays". This is reflected in Principle 16 of the Rio Declaration, which states "National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.".

In VELLORE CITIZENS WELFARE FORUM vs. UNION OF INDIA [at para. 12], the Supreme Court of India observed "The `Polluter Pays" principle has been held to be a sound principle by this Court" and went on to state "The `Polluter Pays" principle as interpreted by this Court means that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environmental degradation.". When granting relief [at para. 36], the Supreme Court ordered, inter alia, "An industry may have set up the necessary pollution control device at present but it shall be liable to pay for the past pollution generated by the said industry which has resulted in the environmental degradation and suffering to the residents of the area.". The Supreme Court of India applied the `Polluter Pays" Principle directed the polluter to pay compensation in several later cases such as S. JAGANATH vs. UNION OF INDIA [AIR 1997 SC 811], M.C. MEHTA vs. KAMALNATH [1997 1 SCC 388] and RAMJI PATEL vs. ANGRIK UPBHOKTA MARG DHARSHAK MANCH [2000 3 SCC 29].

In Sri Lanka, in WIJEBANDA vs. CONSERVATOR GENERAL OF FORESTS [at p.362], Tilakawardane J stated "While the polluter pays principle internalizes the costs of pollution to corporate or individual polluters, the principle of public accountability extends this liability towards corrupt or incompetent regulators for the most egregious instances of mis-regulation.". In BULANKULAMA vs. MINISTRY OF INDUSTRIAL DEVELOPMENT [p. 305] Amerasinghe J stated, "The costs of environmental damage should, in my view, be borne by the party that causes such harm, rather than being allowed to fall on the general community to be paid through reduced environmental quality or increased taxation in order to mitigate the environmentally degrading effects of the project"."[43]

[43] Ibid, , pp.52-53; 63-64.

112. Yet, despite the provisions of Sri Lanka's Constitution, as well as the dicta of its domestic courts recognizing the obligation of the State to protect the environment, the State can do little when other States pollute the environment by anthropogenic acts resulting in climate change across borders. It is for this reason that it is imperative for international law to clarify not only the obligations of States to protect the climate system and other parts of the environment, but the legal consequences which follow when other States, peoples and individuals are affected by the breach of those obligations.

113. On the basis of the foregoing considerations, Sri Lanka respectfully urges the ICJ to fully answer both legal questions so that there will finally be clarity on the subject of climate justice.

V. CONCLUSIONS

114. On the basis of the foregoing considerations, Sri Lanka respectfully urges the ICJ to fully answer both legal questions so that there will finally be clarity on the subject of climate justice.

115. It is particularly hoped that the ICJ will consider the principle of Intergenerational Equity and the value attached to the concept of the Highest Possible Climate Ambition. Therefore, it is respectfully reiterated that if the court accepts the fundamental obligation of States to prevent and redress the impact of environmental degradation and climate change on future generations and act responsibly as guardians/trustees of the Earth's resources, court should also translate that obligation into the kind of action that is expected, i.e. that States should comply with the 1.5°C target set out in the Paris Agreement and fulfill their Nationally Determined Contributions. However, the 'highest possible climate ambition' of States must be interpreted alongside the principle of 'common but differentiated responsibilities' (CBDR), which cannot, nevertheless, justify regressions or lack of action.

116. Another State obligation which court should consider is limiting regressions in environmental protection and climate ambition. For, any regression in environmental protection, particularly in climate change mitigation and adaptation measures, must be carefully limited. States should only adopt such measures after a thorough proportionality

analysis that weighs the potential future impacts on human rights in accordance with principles of equality, intergenerational equity, and non-discrimination.

117. Since the introduction of this written statement commenced with a recollection of the wise words of Judge Weeramantry in the *Gabcikovo-Nagymaros case*, it is apt to conclude by returning to that watershed moment in the history of the ICJ when the concept of sustainable development emerged through the advancement of international environment law in his Separate Opinion. Its closing paragraphs read thus:

> *"We have entered an era of international law in which international law subserves not only the interests of individual States, but looks beyond them and their parochial concerns to the greater interests of humanity and planetary welfare. In addressing such problems, which transcend the individual rights and obligations of the litigating States, international law will need to look beyond procedural rules fashioned for purely inter partes litigation.*
>
> *When we enter the arena of obligations which operate erga omnes rather than inter partes, rules based on individual fairness and procedural compliance may be inadequate. The great ecological questions now surfacing will call for thought upon this matter. International environmental law will need to proceed beyond weighing the rights and obligations of parties within a closed compartment of individual State self-interest, unrelated to the global concerns of humanity as a whole.*
>
> *The present case offers an opportunity for such reflection.*
>
> *Environmental law is one of the most rapidly developing areas of international law and 1 have thought it fit to make these observations on a few aspects which have presented themselves for consideration in this case. As this vital branch of law proceeds to develop, it will need all the insights available from the human experience, crossing cultural and disciplinary boundaries which have traditionally hemmed in the discipline of international law."* (pp.118-119)

118. When Judge Weeramantry made these observations in 1997 and despite the *erga omnes* approach that he took in that case, it was essentially an *inter partes* dispute between Hungary and Slovakia which was before the ICJ. However, over a quarter century later

in 2024, the two legal questions that UNGA Resolution 77/276 has placed at the doorstep of the ICJ do not involve an *inter partes* dispute, but are fairly and squarely about legal obligations and legal consequences under international law concerning the interests of all of humanity, including its present and future generations. Therefore, now is that moment of time where in the trajectory of the development of environmental law, the ICJ has been provided a fresh opportunity to make use of international law, look beyond interests of individual States to the greater interests of humanity and planetary welfare, as well as draw from all the insights available from the human experience, crossing cultural and disciplinary boundaries, as urged by Judge Weeramantry, in order to make a pronouncement on the latest and most pressing environmental phenomenon of our times, climate change. Given that the world we live in may even be past the stage of climate change and has reached the state of a climate crisis, the urgency to receive an advisory opinion on the subject from the ICJ is all the more, and Sri Lanka fervently hopes that the court will engage with the questions fairly and fully, robustly and responsibly and, above all, with climate justice in mind.

22nd March 2024

[Signature]

ARUNI RANARAJA

AMBASSADOR OF THE DEMOCRATIC SOCIALIST REPUBLIC

OF SRI LANKA

TO THE KINGDOM OF THE NETHERLANDS

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