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CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT MODELS, AND RENEWABLE ENERGIES

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I. CLIMATE CHANGE

1. The global climate is probably changing faster nowadays than in any other period in the history of humankind. Even worse is the fact that these changes are taking place in an overpopulated world, subject to a constant process of adaptation to abrupt climate alterations.

2. Large regions of the planet may become drier, while others may be seriously affected by extensive floods. The average temperature of seas and oceans may increase, causing waters to rise steadily. This process will entail grave consequences for coastal populations, especially those living on islands and regions located below sea-level. The ensuing risks are the disappearance of many cities, the extinction of species, the spread of diseases, and a significant impact on food production.

3. The likelihood that such disquieting scenarios may become a dramatic reality has for some time already been the subject of studies by scientists the world over. Even though climate has undergone natural changes throughout the centuries, scientists believe that greenhouse gas (GHG) emissions may trigger a permanent, irreversible change in climate.

4. Gas emissions lead the earth to behave like a greenhouse, retaining solar heat close to the earth's surface. Such an effect is not necessarily adverse, since the planet would be extremely hot during the day and freezing cold during the night in the absence of this effect. Under such conditions – similar to those prevailing on the moon, for example – life as we know it would not be viable.

5. However, the greenhouse effect in a very dense atmosphere may cause a sharp rise in the planet's average temperatures – replicating what happens on Venus, for example. This phenomenon is expected to take place because approximately 35 per cent of the radiation received by the planet is reflected back into space, while the other 65 per cent remain on earth. Part of the light radiation coming from the sun is then absorbed and transformed into infrared waves, that is, heat.

6. Therefore, the greenhouse effect is basically the action of GHGs, among which carbon dioxide (CO₂) and methane (CH₄) are noteworthy. Since pre-historical times, CO₂ has played a fundamental role in regulating the overall temperature of the planet.

7. Over the past years, the concentrations of these two gases in the atmosphere have been rising fast. The figures for CO₂ and CH₄ are now the highest for the past 800,000 years, according to a report issued in May 2008 by France's National Centre for Scientific Research (CNRS). CNRS scientists examined centuries-old ice samples containing small portions of air. It was thus possible to correlate the evolution of our planet's temperature to the carbon cycle.

8. This rise in gas concentration levels derives mainly from the use of fossil fuels. It is estimated that emissions of CO₂ into the atmosphere due to anthropogenic activity now reach 9 billion tonnes per year. Over the same period, the oceans can absorb 2 billion tonnes of CO₂. Since the earth's ecosystems can also absorb 2 billion tonnes of CO₂ per year, 5 billion tonnes of CO₂ still remains which are added to the atmosphere each year. The risks stemming from this situation must not be ignored.

9. Taking into account the Fourth Report of the Intergovernmental Panel on Climate Change (IPCC), one should therefore expect that an accentuated greenhouse effect, as a result of human actions, will intensify the present abnormal climate events. The current panorama therefore constitutes a significant warning about the need for nations to seek mechanisms to adapt to the scenarios described by the IPCC.

10. Such adaptation must take into consideration the fact that it is very hard to reabsorb CO₂ already emitted into space, because of the chemical stability which affords it a long life in the atmosphere. To illustrate what this stability amounts to, it would take about 120 years for nature to reduce by half a certain quantity of CO₂ molecules in the air. Therefore, in ideal conditions of zero CO₂ emission into the atmosphere, the effects of this reduction will only be felt several decades later.

11. Therefore, it is necessary to point out the historical responsibility of the countries with massive fossil fuel consumption, ever since the start of the Industrial Revolution. This responsibility is different for rich and developing countries. In June 1992, the United Nations Conference on Environment and Development (Rio Summit), established this distinction, in an unmistakable way.

12. The parties that signed the United Nations Framework Convention on Climate Change (FCCC) acknowledge that changes in the earth's climate and their negative effects are common issues to humanity. In acknowledging that human activity significantly increase GHG concentration levels in the atmosphere, the parties consider that the largest contribution of historical and current global emissions derive from the developed world. They also acknowledge that the per capita emissions of developing countries are still relatively low and these countries must be allowed more emissions in order to grow and meet their social and development needs.

13. Evidently, as acknowledged by the FCCC, the forecasts relative to climate change are characterized by uncertainties, especially when regarding its evolution over time, its magnitude, and the differences in regional patterns. However, the global nature of climate change calls for the broadest cooperation possible from all countries in order for the international response to be effective and adequate.

14. In this way, national parliaments must take on this commitment to prepare an efficient environmental legislation, through which environmental rules, administrative goals and priorities mirror the environmental and development context.

15. It must be noted that the environmental rules enforced by a group of countries are not necessarily suitable for others and can result in heavy social and economic costs, particularly for developing countries. It must also be highlighted that the broadness of requisite measures that lead to awareness of and a solution to the climate change issue must necessarily acknowledge the various dimensions of the environmental issue.

16. The FCCC reckons that these measures will be more effective in the environmental, social, and economic areas if they are based on relevant scientific, technical, and economic findings and are continuously put to test considering the innovations in each area.

17. The efforts to address climate change must be coordinated in such a way as to avoid negative impacts on the least favoured nations, which could prevent these countries from achieving sustainable economic growth. These efforts should be undertaken, as a matter of necessity, in a democratic context.

18. One should not perceive democracy as a flawless concept. Sir Winston Churchill once said that democracy is the worst form of government except for all those other forms that have been tried from time to time. In this sense, a free arena that allows competition of political systems generates conflicts; paradoxically, in turn, these conflicts legitimize and perpetuate democracy.

19. Political competition will only be accepted in systems bound by written and unwritten rules. At the global level, the quest for an environmentally sustainable economy involves the interest of a host of nations that have yet to promote mature social and economic development, hence the need for international negotiations to bring together science and politics. Together, the two subjects can enhance application of the knowledge gathered by humanity throughout the centuries.

20. The enormous climate change challenges have taken on a global dimension and therefore must be dealt with from an interdependent perspective. Unfortunately, the current global trend is to recognize the interdependence factor only when it is more inconvenient to ignore it. Still, the negotiations structures likely to acknowledge even limited interdependence tend to be effective and permanent.

21. Sustainable development is frequently seen, by the poorest countries, as standing in the way of the need for progress and poverty eradication. For these poorest countries, the pressure exerted by external dependency and internal economic instability in the wake of an expanding globalization process leaves barely any room for consideration of long-term environmental goals.

22. Compelling scientific evidence suggests that the future of the planet may be jeopardized if we try to maintain some aspects of the current way of life adopted by the developed world. In this context, it has become essential to consider a well-balanced mix of politics and science.

23. For this objective to be achieved, national parliaments must focus on issues related to heavy global dependence on fossil fuels. The sustainability of global development depends mostly on the energy consumption of individual countries. This is the biggest obstacle for a sustainable future.

II. RENEWABLE ENERGY

24. The increasing scarcity of oil reserves makes it even more urgent to find alternative sources of energy. Significant research in areas that still receive little funding must be undertaken in order to improve the effectiveness of sustainable energy on a scale that will yield significant results in a reasonable period of time.

25. The present technologies allow the establishment of realistic targets for the reduction of GHG emissions. However, the least developed countries are not adequately aided in their requests for the necessary funds to develop clean technologies for energy generation.

26. The United Nations Environment Programme (UNEP), in a report published in August 2008, estimates that an annual reduction of 6 per cent in GHG emissions could be obtained if the global energy subsidies representing 0.7 per cent of the world GDP were eliminated.

27. According to the UNEP report, US\$ 300 billion are spent every year in order to maintain low fossil fuel prices and subsidize producers. These subsidies not only deprive the poor of benefits, but also increase the consumption of energy from non-renewable sources. In this context, the waste of finite resources is favoured over the inclusion of more sustainable sources of energy.

28. Fossil fuel subsidies are created for political reasons. The majority of these resources are used to guarantee low prices for fossil fuels such as oil, coal, and gas, and for energy generated by fossil fuels.

29. However, renewable sources of energy have been gaining ground in the international arena due to continuous and consistent improvements in the development of new technologies and in the expansion of production. Renewable energy considerably decreases the dependence of nations on fossil fuel imports.

30. Among the main renewable sources of energy, biofuels are in the spotlight due to the fact that they are the main energy alternatives available in a short period of time and due to their capacity to ensure energy security, associated with other positive results such as: energy diversification, agribusiness development, job and income generation, reclamation of degraded areas, reduction of CO₂ emissions and reduction of their impact on climate change.

31. It is important to emphasize that the annual growth foreseen for the world energy consumption is 2.1 per cent, while the annual growth foreseen for world oil and gas consumption is 1.9 per cent. Therefore, there is a deficit scenario between energy supply and demand for growth. Decreasing fossil fuel reserves, lack of guaranteed supply, and increasing environmental pressure further worsen this scenario.

32. Ethanol produced from sugarcane is sustainable because it consumes, during its production, fewer quantities of fossil fuels than ethanol produced from corn. In addition, corn ethanol production promotes a direct competition between the utilization of corn for food and its utilization for fuel. It is a negative effect that raises the price of corn and corn products in countries where this grain is a staple.

33. The production chain of ethanol from sugarcane does not contribute significantly to an accentuation of the greenhouse effect. The potential sugarcane production in the world is:

Description	Area (millions of hectares)
Area suitable for cultivation	351.9
Protected areas and forest-covered areas	153.7
Area currently in use	20.4
Available area	177.8

34. The area used for the production of biofuels throughout the world covers about 10 million hectares, while the overall area occupied by agriculture covers 1.2 billion hectares.

35. In Brazil, there is no significant competition for land use between food production and fuel production. Sugarcane occupies approximately 10 per cent of total cultivated lands, corresponding to only 1 per cent of lands available for agriculture in the country. The total area occupied by sugarcane to produce sugar and ethanol equals 5.6 million hectares.

36. According to Professor José Goldemberg, of the University of São Paulo, the Brazilian model of ethanol production from sugarcane can be replicated in other countries without significant impacts on the environment. The expansion of production following the model of the Brazilian ethanol programme, thus adding 30 million hectares of land in Brazil and other countries, would allow ethanol to replace 10 per cent of the gasoline used in the world. Such an area corresponds to a small fraction of the 2 billion hectares of cultivated lands in the entire world.

37. A report released by World Wildlife Fund (WWF)-Brazil in May 2008 points out the benefits of ethanol on the environment. The report claims that the production of ethanol from sugarcane has a positive impact on the environment, does not invade forest areas in the Amazon region, and does not bring about significant competition with food production.

38. The WWF report endorses the stance taken by the government of Brazil concerning the demonstrated environmental benefits of ethanol production from sugarcane and the use of ethanol as a substitute for gasoline.

39. Brazilian ethanol has a more positive energy balance than ethanol produced from corn. The WWF report analysed some of the myths surrounding ethanol production in Brazil and found that there is no real, immediate risk that sugarcane production will expand into the Amazon.

40. Another conclusion is related to hypothetical competition between sugarcane and other food crops, especially in the current world food production crisis situation. According to this report, the risk of competition is minor. Sugarcane does little competing with other food crops, basically because it occupies a small area.

41. The annual G8 summit held in June in Japan reinforced the conservative stance of the rich countries concerning GHG emissions reduction. At the meeting, World Bank President, Robert Zoellick, attributed to biofuels a share of the responsibility for the rise in food prices. UN Secretary-General, Ban Ki-moon, adopted the same logic. However, both presentations were careful to make the distinction between the biofuels produced from sugarcane and those produced from grains such as corn.

42. Unlike what happens in Brazil, ethanol production in the United States has caused three quarters of corn production to be diverted into alcohol production in recent years. According to the World Bank, grain prices have doubled in the past three years. So far, grain prices have risen by 60 per cent in 2008 alone. Reports from the World Bank reveal that Brazilian ethanol production has not significantly influenced the price of sugar.

43. The cost of ethanol produced from sugarcane is 28 cents a litre. Corn ethanol costs 45 cents a litre. Moreover, processed sugarcane delivers three times more alcohol per cultivated area than corn. Sugarcane ethanol reduces GHG emissions by a third, in comparison with fossil fuels, while corn ethanol reduces emissions by only 12 per cent.