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CLIMATE CHANGE: GRASSROOTS INITIATIVES FOR GLOBAL SOLUTIONS

Abstract: The science of climate change has now found widespread understanding and grassroots level awareness, which was clearly a major driver of the Paris Agreement on Climate Change. However, this agreement does not in itself give us commitments which would bring about limiting temperature increase to 2°C by the end of this century.

Meanwhile, as the presentation would show the impacts of climate change are becoming progressively serious. Hence, it is essential to ensure that the level of ambition of national governments is raised to a level where they enhance their commitments to reduce emissions of greenhouse gases as part of collective responsibility. Climate Change is a classic example of a serious global challenge, which has risks for every society on earth, and therefore, needs action at the international, national, sub national and local levels. A change in values, priorities and lifestyles has to be at the heart of grassroots initiatives, which require leadership by the youth of the world.

The time frame within which adequate action should be taken is very limited, and therefore the academic community and those involved in policy making need to work with a sense of purpose and urgency to meet the problem which has been referred to as the defining challenge of our time. This presentation would provide the scientific reasons for such a coordinated approach and coordinated action within the academic and scientific community.

Key words: *SDG, climate change*

CLIMATE CHANGE

The global goals for sustainable development approved by the UN General Assembly, commonly referred to as the SDGs have an important thread running through them, which clearly focuses on the elimination of poverty and economic disparities and most importantly the protection of the global commons. While each SDG focuses on an extremely important goal and related activities, there is, as one would expect, a substantial amount of overlap between each one of them and close linkages across them. It is obvious that human society has been pursuing a path of development which is clearly unsustainable.

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The evidence of this unfortunate reality is growing all across the globe in a variety of ways. Traditionally, neoclassical economics has always taken the view that the objectives of any business or industry are to only maximize profits and to increase value for the shareholders. Negative externalities imposed by economic activities and the difference between private and social costs and private and social gains respectively, were expected to be addressed, according to the neoclassical view through the market system and appropriate pricing. It was assumed that the invisible hand would take care of anomalies in costs and benefits and bridge the gap between private costs and benefits on the one hand and social costs and benefits on the other. In actual fact the world has witnessed an increasing schism between private and social values and a glaring weakness of public policy in bridging this increasing gap.

One major flaw in the strict neoclassical approach lies in ignorance of the fact that the economic system is a closed system, and any negative externality or waste that is produced remains as a part of the system. Visionary economists like Kenneth Boulding and Nicholas Georgescu-Roegen were bold enough to challenge the neoclassical view and highlight the reality of a closed economic system that we are a part of. Kenneth Boulding was certainly right when he talked about the economy as spaceship earth. According to this view any waste that is produced within the spaceship remains a part of it, and if it creates negative impacts, these cannot be wished away and have to be accepted as part of the system. If this view is upheld, as it should be, then business organisations should also be aware of the fact that negative externalities also affect business opportunities and achievements.

It was a brilliant biologist, Garrett Hardin, who articulated the concept of the tragedy of the commons. Essentially the commons provide service to one and all, and there has historically been no price for use of the commons. As a result, therefore, with expansion of the world's population and growing demand for goods and services consequent on higher incomes, humanity has overexploited the global commons, leading to its degradation and decline and the value of the services it provides. Climate change is a good example of this reality, wherein the increase in the concentration of greenhouse gases in the atmosphere, which is treated as a dumping ground, has brought about climate change with very harmful impacts. The work of the Intergovernmental Panel on Climate Change (IPCC) has clearly given us irrefutable evidence that human influence on the climate change is clear. By assessing and projecting future impacts it has also shown us that if we continue to disrupt our climate we would be risking severe, pervasive and irreversible impacts. Fortunately, today we have the means for limiting climate change, and through timely and adequate measures build a more prosperous and sustainable future.

Figure 1 shows changes in average temperature on land and ocean surface, from which it is evident that the increase after the middle of the last century has been very rapid. With melting of snow and ice across the globe and thermal expansion of the oceans, the sea level has been increasing as a result of climate change, with a much faster increase in recent years, which has serious implications for low lying coastal areas and small island states. Since the beginning of the last century and up to 2010 sea level rise has been an average of 19 cms as shown in figure 2.

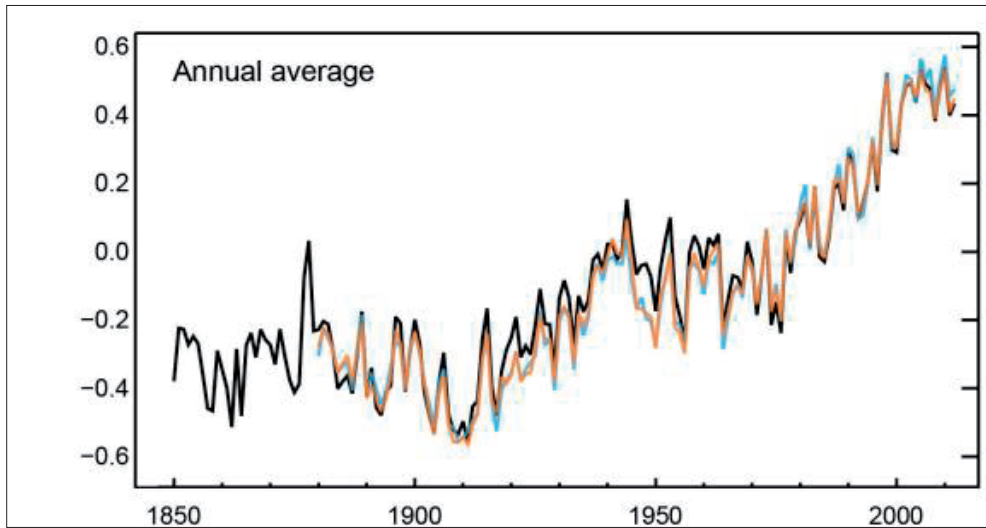


Fig. 1. Globally averaged combined land and ocean surface temperatures. (IPCC AR 5 WGI SPM)

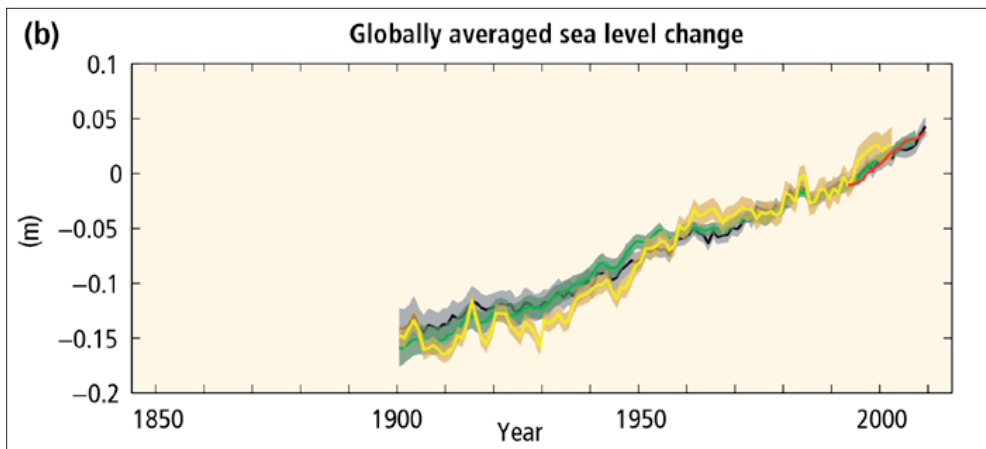


Fig. 2. Sea level change (IPCC AR 5 SYR SPM)

Figure 3 and 4 show the historic increase in concentration of greenhouse gases and the increase of CO₂ emissions respectively.

Climate change is not merely a warming of temperatures but a major disruption of several natural phenomenon, which have serious implications for human life and the survival of other species on this planet. Some of these projected changes in climate and their impacts are shown in figures 5 and 6 respectively.

One of the important findings of the IPCC relates to the increase in frequency and intensity of extreme events, particularly as they apply to heat waves, extreme precipitation events and extreme sea level rise related occurrences. In 2017

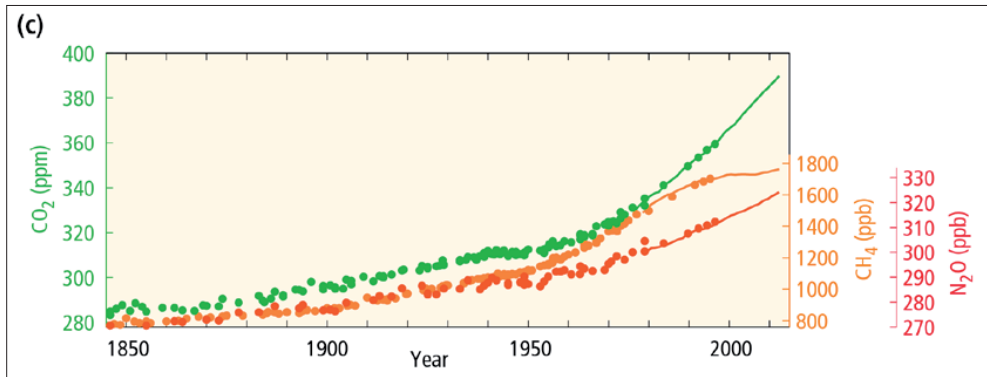


Fig. 3. Globally averaged greenhouse gas concentrations (IPCC AR 5 SYR SPM)

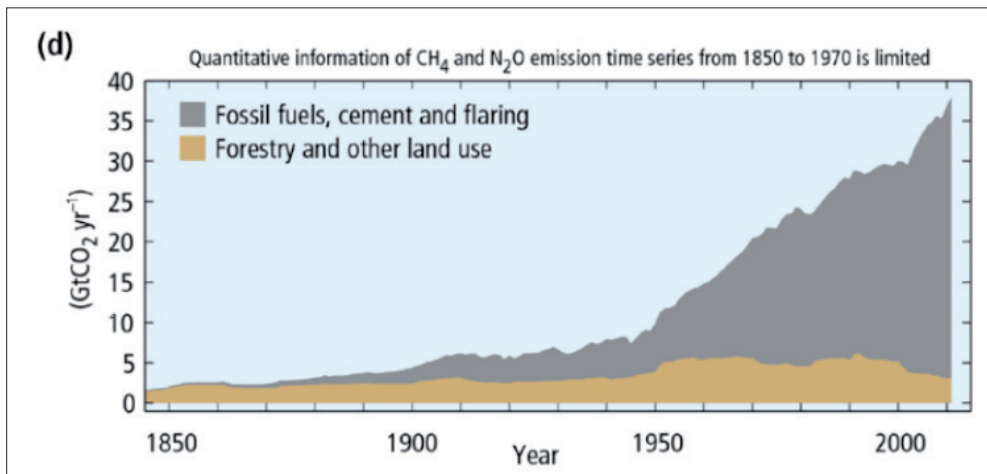


Fig. 4. Global anthropogenic CO₂ emissions (IPCC AR 5 SYR SPM)

a number of hurricanes and extreme precipitation events devastated North America and the Caribbean region. Insurance companies are very well equipped to assess the business implications of impacts such as sea level rise, coastal flooding and other extreme events, and have clearly integrated some of these impacts of climate change in their own assumption of probabilities and insurance costs. Other economic impacts include the constraints on a plane taking off in high temperatures because the air becomes rarer.

Some of the impacts of climate change would be inevitable in the future because of inertia in the system and the past concentration of greenhouse gases (GHGs). Hence, an important preparatory response to projections of climate change would be to put in place adaptation measures to deal with these individual impacts. Relevant adaptation measures would include better management of water, changes in agricultural practices and cropping patterns, revised zoning restrictions for

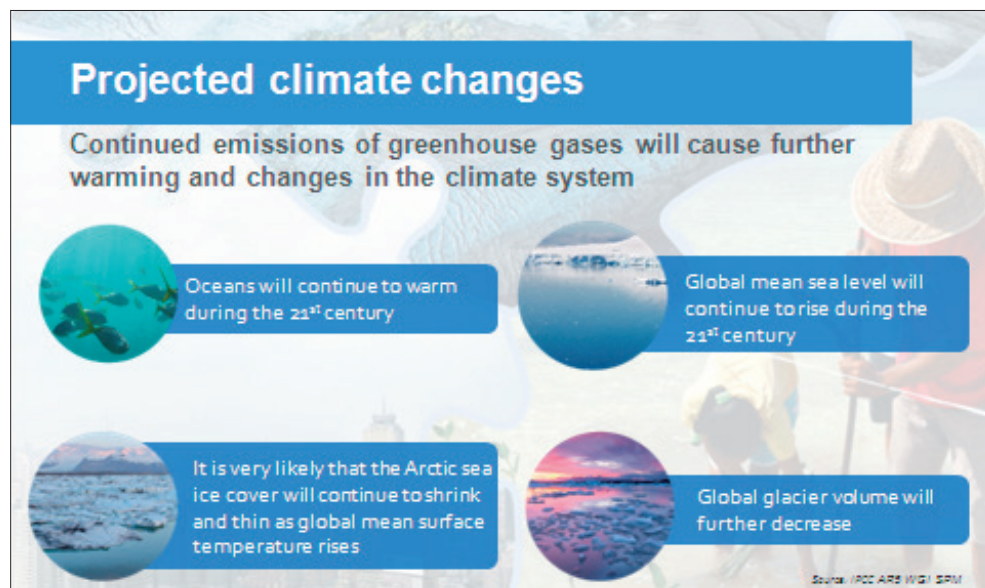


Fig. 5. Impacts of Climate change

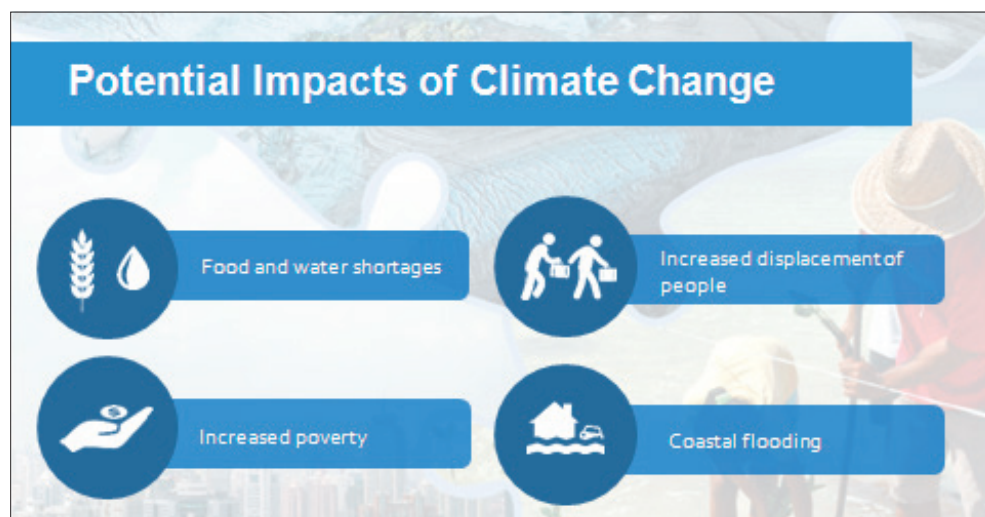


Fig. 6. Impacts of Climate Change

buildings in coastal areas etc. Adaptation capabilities and practices would be based on local resources and priorities, because impacts would vary from place to place, requiring specifically designed measures in response to local impacts. However, if we allow an increase in emissions at the same rate as we have seen in recent decades then the extent of climate change would reach levels that would be totally beyond our ability to adapt. Consequently an integrated climate change response strategy would require a combination of adaptation and mitigation measures.

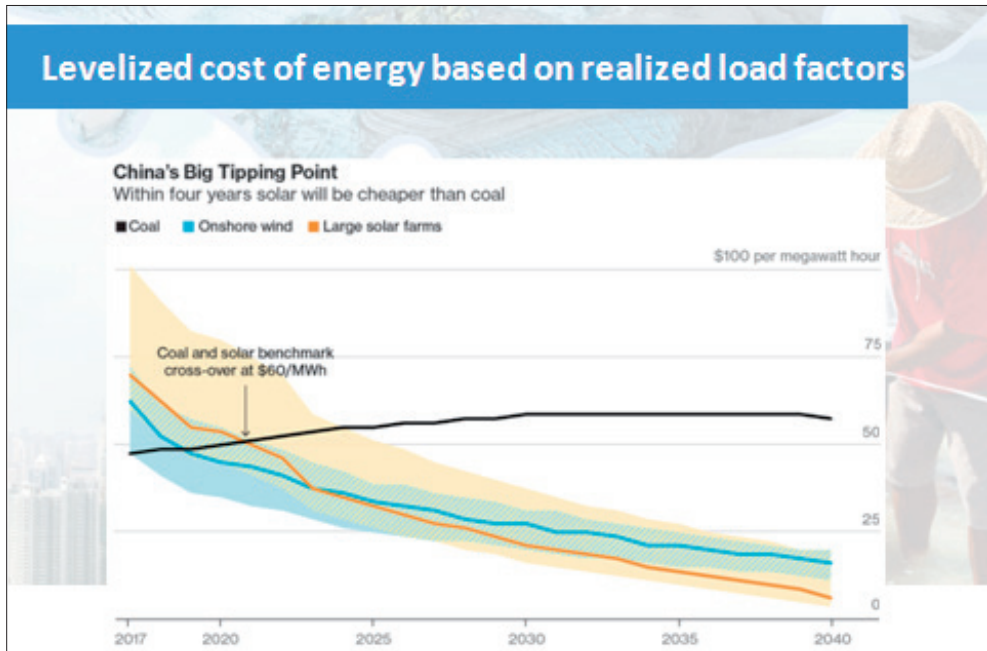


Fig. 7. Cost of RES to coal based power

Fortunately, we already have the means and the technologies by which we could mitigate the emission of GHGs at a satisfactory level. Essentially to limit temperature increase to 2°C by the end of this century we would need to use energy more efficiently and move to greater use of no carbon and zero carbon energy and improve carbon sinks. This means deforestation would have to be eliminated completely and forest area increased as well as new carbon capture and storage technology developed and used on a wide scale. For limiting temperature increase to 2 °C by the year 2100, we would need a 40 to 70 % reduction of GHG emissions by 2050 compared to levels in 2010, and negative or zero emissions by 2100. Lifestyle and behavioral changes would be an important part of mitigation strategies.

Fortunately there are growing examples of mitigation strategies being implemented. A region in China, for instance, was running on renewable energy for an entire week in 2017. The town of Palo Alto in California runs entirely on no carbon energy. The relative cost of renewable energy to coal based power generation is shown in figure 7, which clearly establishes the economic merits of moving to renewable energy technologies and the benefits of moving away from fossil fuels. Some oil companies are now taking a lead in moving to renewables. Figure 8 shows the limited time available to us if we were to limit temperature increase to 2 °C or lower by 2100. At the beginning of industrialization we had a budget of 2900 Giga tonnes of CO₂ that could have been emitted for the 2°C limit to hold by the year 2100. But by 2011 we had already used 1900 Giga tonnes. Hence, we have a very limited budget left for further emissions of CO₂ to keep within the 2°C limit and change is, therefore, urgent and essential.

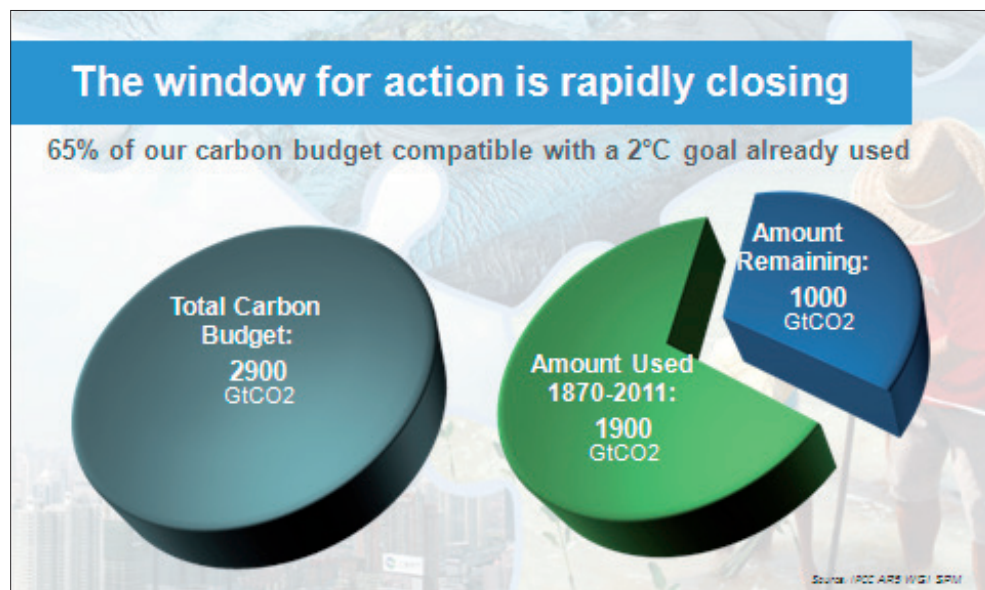


Fig. 8. Carbon budget

CONCLUSIONS

It is obvious that governments alone will not be able to solve the problem and the growing challenge of climate change. There are also powerful lobbies that use their power & money to stall action. Often they succeed in questioning the science, sowing doubts in the minds of the public, and attacking individuals who tell the truth about climate change. Government policies and actions need to be built on grassroots actions. There are 1.8 billion youth today between the ages of 10 and 24 and it is their future which is endangered by the projected impacts of climate change. It is also a reality that youth generally have an open mind which is receptive to the need for change and value systems which can be modified to pursue common interest and benefit. It is for this reason that the POP (Protect our Planet) Movement has been launched to inform, educate, empower and motivate the youth of the world to take the lead and deal with the challenge of climate change. They would have to begin with their own educational institutions and convert them to models of climate responsive entities, which would have a major influence on the actions and attitudes of the youth of today as well as impact on communities around these institutions. The teachers and students of each institution may feel that they are a very small part of the capacity that is required to deal with this major global problem. Against this background it would be useful to remember what Mahatma Gandhi had said:

“A small body of determined spirits fired by an unquenchable faith in their mission can alter the course of history”.