



## Health of People and Planet: Our Responsibility



Over the last three years, the Pontifical Academy of Sciences (PAS) and the Pontifical Academy of Social Sciences (PASS) have held a series of meetings related to the degradation of the environment, climate change, extinction and sustainable development and have briefed the Holy Father Pope Francis about the outcome of some of these meetings. The meetings typically include scientists, policy makers, philosophers and theologians and at times, world leaders. At one such meeting held in 2015, the attendees arrived at the following conclusion:

"This century is on course to witness unprecedented environmental changes. In particular, the projected climate changes or, more appropriately, climate disruptions, when coupled with ongoing massive species extinctions and the destruction of ecosystems, will doubtless leave their indelible marks on both humanity and nature. As early as 2100, there will be a non-negligible probability of irreversible and catastrophic climate impacts that may last over thousands of years, raising the existential question of whether civilization as we know it can be extended beyond this century. Only a radical change in our attitude towards Creation and towards our fellow humans, complemented by transformative technological innovations, could reverse the dangerous trends that have already been set into motion inadvertently."

Dasgupta, Ramanathan, Raven, Sánchez Sorondo, Arber, et al., 29 April 2015

Comprehensive as these meetings were, they did not fully factor in the adverse public health effects of air pollution and climate change. Reliance on fossil fuels and burning of solid biomass are the major, if not the dominant, sources of air pollution and climate change. Scientific studies related to health effects of air pollution date back to at least the 1950s and there is now an

immense body of evidence on how air pollution harms health. However, the health consequences of climate change, both direct and indirect, have not received much attention until recently. Thanks to two recent international efforts, one by the World Health Organization and another from the LANCET commission, climate effects are beginning to receive the sort of attention they deserve, particularly since, both studies concluded:

*Climate change is the biggest global health threat of the 21st century*

Margaret Chan, Secretary General WHO; Editorial in LANCET, 2015

It is now time for a more holistic meeting at the Vatican that documents the interconnections between fossil fuel use, the pollution of the atmosphere and the oceans, climate change, public health, the health of ecosystems and sustainability. The central focus will be on the health of the people and the health of the ecosystems and their interdependence between ecosystems and people. It is likely such a focus on people's health may very well bring people and political leaders to push for more drastic actions to limit air pollution and climate change below dangerous levels now being reached and to implement policies to protect Earth's essential life support systems.

Scope of the proposed meeting:

Burning of coal, oil, gas and solid biomass for energy access has become a major threat to the health of humanity. It also poses a major threat to the natural systems which sustain all life. Unsustainable demands for energy and wasteful utilization of natural resources affect health in a myriad of ways:

Air pollution from burning fossil and solid biomass contributes to around 7 million premature deaths a year, mostly from ischemic heart disease, stroke, lung cancer and chronic obstructive airways disease in adults and acute lower respiratory illness in children. Globally, 88% of the world's population breathes air that does not meet WHO's air quality guidelines. Air pollution also destroys over 100 million tons of crops each year. Damages to human health and to the environment by air pollution are already valued at trillions of dollars (USD) per year.

Climate change caused by fossil fuel burning leads to increased risks of extreme events such as heat waves, droughts, fires, severe storms, floods which in turn have major health effects. For example: a single heat wave event, which occurred in Europe in 2003, claimed 70000 lives; 250,000 excess deaths were attributed to droughts and famines during 2011-2012 in the horn of Africa. Tropical storm Haiyan claimed more than 7800 lives in the Philippines; heat waves in Pakistan and India lost at least 4000 people to the 2015 heat wave. While we cannot claim these extreme events were caused by anthropogenic climate changes, we know that the probability of exposure to extreme events is increasing significantly due to climate change. These extreme events affect the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter. Climate change also affects the spread of disease vectors, food

insecurity, under-nutrition, mental health, displacement and migration. By end of century projections suggest that as a result of climate change together with population growth and demographic change there could be (Lancet Commission, 2015): 3 billion additional annual heat exposure events for elderly people; 1.4 billion additional annual person drought exposure events; 2 billion additional annual extreme rainfall exposure events.

Climate change is occurring against a background of other far reaching environmental changes including freshwater depletion, land use change and soil degradation. We depend entirely on the living world (biodiversity) for our survival: they collectively make up the ecosystems into which we evolved and which make our life possible. We obtain all of our food from plants, yet only about 100 of the estimated 460,000 species supply 90% of what we eat, directly or indirectly. Two-thirds of the people in the world depend on plants for their medicine, and, for the rest of us, about a quarter of our medicines come from or came from plants. About one fifth of all species of organisms are estimated to be in danger of extinction now, but with current trends, half of all species could become extinct during the remainder of this century, 83 years. It is estimated that 12 million species of organisms exist, except for bacteria, but we have found and named only a out two million of them, and know next to nothing about the vast majority of even those we have named.

Ocean acidification and deoxygenation resulting from fossil fuel combustion and resulting climate change have major consequences to coral reefs, fisheries and aquaculture, which provide nutrients to about 4 billion people. The acidity of the ocean has already increased by 30% due to increase in atmospheric CO<sub>2</sub>; with unchecked emissions of CO<sub>2</sub>, it can increase by 100% by 2100. Oxygen loss in the open and coastal oceans, called as de-oxygenation, is being observed and is largely due to ocean warming.

All of these environmental effects will contribute to global inequality since the poorest three billion are still depending on 18th century technologies for meeting basic needs such as cooking; and as a result are the most exposed to pollution. They will also be particularly vulnerable to climate change since they lack adequate coping systems such as health care, insurance or savings to deal with catastrophic events such as loss of home due to floods, loss of livelihood due to droughts, sea level rise and fires etc. Their ability to undertake physical labor will be reduced by increasing heat stress. Women and children are the worst affected. Climate change is projected to be responsible for additional 20 to 25 million under nourished children. UNICEF warned that climate change poses the greatest threat to children and their children. The meeting must discuss social justice and ethical issues as urged by Pope Francis in the encyclical *Laudato si'*:

"We have to realize that a true ecological approach always becomes a social approach; it must integrate questions of justice in debates on the environment, so as to hear both the cry of the earth and the cry of the poor".

We are assembling a meeting of global thought leaders in all these areas, with emphasis on

human health to consider the latest evidence and make recommendations to be submitted directly to Pope Francis and other world leaders for further actions. Experts spanning medicine, public health, air pollution, marine pollution, climate change, food and water security, ecology, species extinction, renewable energy, and policy should be included. The first two days will be devoted to a detailed assessment of the health of people and the ecosystem. We will document and diagnose the health impacts of fossil fuel combustion and the resulting climate change. The final day of the meeting will be devoted to seeking solutions and will end with a call for actions by policy makers and political leaders.