



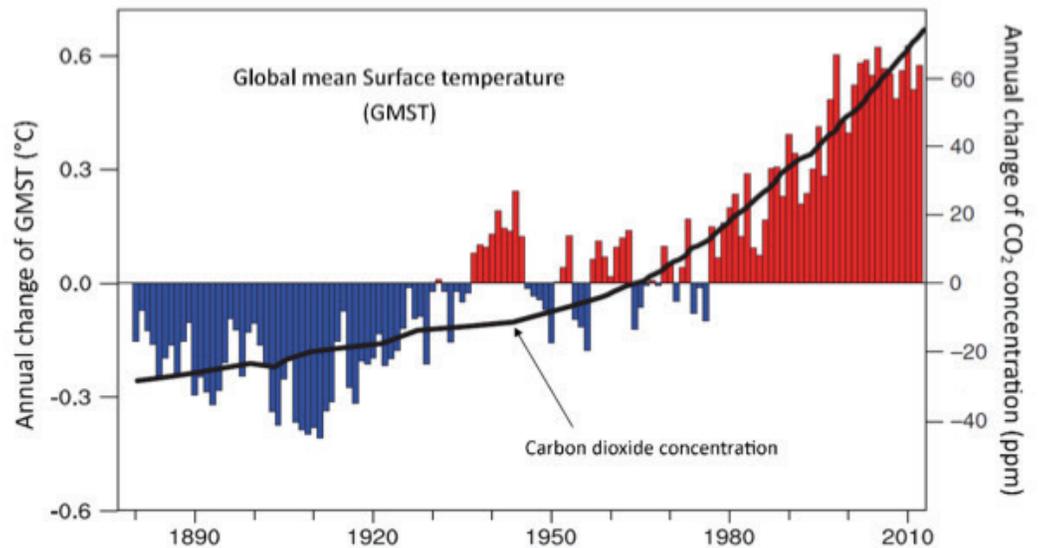
carmelngo

BULLETIN OF THE CARMELITE NGO

2016 - VOL 9 NUMBER 1

"We Christians, together with the other monotheistic religions, believe that the universe is the fruit of a loving decision by the Creator, who permits man respectfully to use creation for the good of his fellow men and for the glory of the Creator; he is not authorized to abuse it, much less to destroy it. In all religions, the environment is a fundamental good or the good of our common poverty so that human dignity flourishes.

—Pope Francis
Address to the United Nations
September 25, 2015



Global Warming: Why Still Care About It?

Eduardo Agosta Scarel

In the last sixteen years, many skeptics of climate change were very happy to argue against the science of climate, since the global warming detected by the globally averaged surface temperature showed a deceleration from 1999 onwards (Fig. 1, vertical color bars). They would argue that the warming had stopped, or even that it was never related with human activities, that was part of natural variations of climate. Others dared to speak about global “cooling”.

Looking at Figure 1, it is apparent that the annual change of the mean global surface temperature (GMST), which showed a constant positive change (warming) since at least 1950s, has decelerated, meaning a slowdown in the rate of change in the period 1999-2013. That is, there is an “hiatus” in the pace of global warming at the beginning of the 21st century. In spite of this fact, the honest scientists of climate have still been convinced of the evidence for an unabated surplus of energy in the climate system due to year-to-year increase in the concentration of carbon dioxide (among other Greenhouse Gases, GHGs), being emitted by the burning of fossil fuels. The relentless increase in CO₂ concentration is eloquent (solid line in Fig. 1) Instead of brushing the evidence down the carpet, the correct question to address is: where has the surplus of energy gone to, out of the air parcels near surface? In addressing the question, new insights of interactions within the complex climate system have been conquered in the last five years. Let’s explain by pieces.

Figure 1: Annual changes of the global mean surface temperature (GMST, in °C. Vertical bars) and of the carbon dioxide (CO₂) concentration (in ppm. Black solid line), in the period 1881-2013. The “hiatus” is a deceleration in the rate of warming observed after 1999. The annual changes are relative to the means in the 20th century. Temperature data from the Global Historical Climatology Network-Monthly (GHCN-M) version 3, retrieved at <ftp://ftp.ncdc.noaa.gov/pub/data/ghcn/v3/>. Carbon dioxide data retrieve at Ed Dlugokencky and Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccg/trends/)

Note that the Earth's climate is a complex system: Not only is it compounded by the air parcels of the Atmosphere, but also by the oceans, the sea ice in the poles, glaciers and ice caps in the continents, lakes and rivers, the large ecosystems as biome like the Amazonia interacting with the Atmosphere, and also the coasts, mountains and plains. All of them in mutual interactions set up the Earth's climate at diverse time scales. Traditionally, we have measured the surplus of energy within the climate system through the GMST (that is why we speak of a "warming", since we feel the temperature near the surface warmer). We did so because we have rather long records and quite widespread measurements of air temperature near surface recorded by simple instruments such as Mercury thermometers. However, the heat is free to flow through the components of the climate system.

All the energy entering the Earth system comes from the Sun in the form of solar radiation (the energy from interior of planet Earth, mainly liquid in the outer core, is inconsequential: it represents less than 0.02% of the total energy transfer within the Earth's climate system). Thanks to this Sun's fuel, the Earth's climate works. Like some fuel service station, the Sun is a 24-hour open shop providing non-stopping solar energy. The Atmosphere is transparent to the Sun's direct energy. In other words, the Sun cannot heat the air directly. The surface of the Earth, instead, absorbs most of the Sun's energy. Then the Earth's surface releases this energy outback into the free space in the form of Earth's radiation. In this way, the Earth system reaches an energy equilibrium between incoming solar radiation and outgoing terrestrial radiation. This is known as the radiative energy budget. It is the Earth's outgoing radiation the one responsible to heat the air parcels of the Atmosphere from the bottom. The warming is stronger close to the Earth's surface since the surface is the "heat source" of the lower levels of the Atmosphere.

It is quite evident that the main external forcing of climate is consequently the Sun. Any factor changing the energy flux (radiation) from the Sun to the Earth will change climate. For instance, in the past two millennia, Sun's internal dynamical variations, as revealed by the sunspot number changes, influenced climate. At the scale of dozens of millennia, changes in the position of the Earth relative to the Sun (factors called, "orbital parameters") have also driven the glacial and interglacial ages, because of strong variations and differential distribution of the incoming energy from the Sun in the form of radiation.

Having said that, there are other internal factors forcing the Earth's climate. Internal factors because they are related with the way in which the incoming solar energy is transferred within the different components of the climate system. There are two most important internal factors: one is the coupled atmosphere-ocean interaction in the central Pacific, known as the El Niño phenomenon, globally impacting climate in remote regions; and the other is the natural GHGs effect.

To understand how they work in the redistribution of energy within the climate system, let's start to think about natural GHGs as blankets. We human beings use blankets to keep our body warm when sleeping in a winter night. Blankets do not heat out body, but they prevent the heat emitted by our body to be lost in the empty room. Similarly, natural GHGs keep the heat emitted by the Earth surface (the body) within the lower levels of the Atmosphere (called troposphere) otherwise it will be lost outback in the empty space (room). Thus, owing to the existence of natural GHG effect, the equilibrium temperature obtained for radiative energy budget is quite warmer than the one corresponding to the distance between the Earth and the Sun. The latter makes life possible, since the mean global temperature at surface was about 15° C at least until fifty years ago. If natural GHG effect did not exist, the equilibrium temperature

CarmeNGO is published four times each year and is distributed to those interested in the mission of the NGO. For more information or to add your name and address to our mailing list, please visit our website (carmelitengo.org) or write to us by email (jremson@carmelitengo.org) or by regular post at 1725 General Taylor Street; New Orleans, LA 70115; USA)

Related Websites This Issue:

Laudato Si: Pope Francis' Encyclical on the Environment and Climate Change
laudatosi.com

Top Ten Takeaways from *Laudato Si*
[americamagazine.org/top-ten-take-aways-laudato-si](http://americamagazine.org/top-ten-takeaways-laudato-si)

Basics: Climate Change | EPA
www3.epa.gov

ECO Watch: Climate Change Archives
ecowatch.com

Earthen Spirituality
earthenspirituality.com

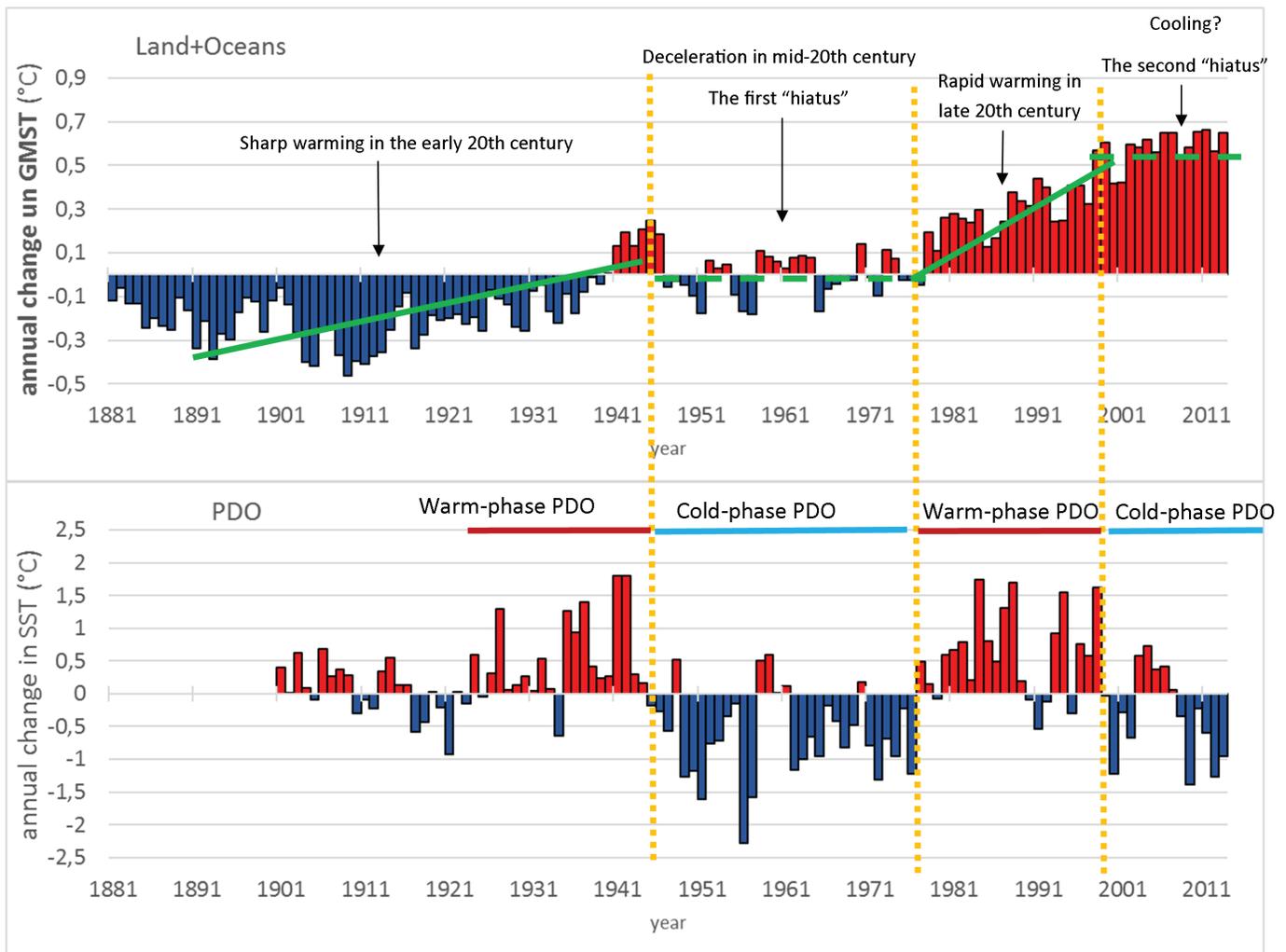


Figure 2: Climate scientists have investigated why global temperatures have not risen much since 1999, many have focused on an ocean cycle known as the Pacific Decadal Oscillation (PDO). During periods when the PDO index is positive and the eastern Pacific is warm, global temperatures have risen quickly. During spells when the PDO index is negative, the warming has decayed. Data corresponds to annual averages of changes relative to the means in the 20th century for both the GMST and the PDO index. GMST data is the as in Fig. 1. PDO index is obtained from historical sea surface temperature (SST), available at the url: <http://research.jisao.washington.edu/pdo/PDO.latest>

would be like in the moon: about -18°C !

Nonetheless, human activities related with burning fossil fuels (oil, natural gas and carbon) have been adding more blankets (GHGs) into the Atmosphere making it warmer each time, especially during the last five decades (see solid black line in Fig. 1, second half of the 20th century). In other words, less energy is emitted outback into the free space. Then, from the outer space it is seen as an imbalance between the incoming solar radiation and the outgoing terrestrial radiation. From 2000, satellite measurements of radiation from space can track changes over time. The radiative budget gets a positive surplus towards the Earth. Such positive surplus of energy is observed to be about 0.5-1 watts per m^2 along the period of deceleration of warming in the global mean surface temperature (2003-2009). Then question arises again: where such an extra energy has gone to if not heating the air parcels?

There is an univocal claim that the Pacific Ocean plays a great role in modulating global climate. At the scale of few years, the El Niño event is key. During el Niño, ocean heat that was previously built up in the tropical western Pacific (during a La Niña event), spread across the Pacific and into the atmosphere, stimulating storms and warming the surface. Typically, an El Niño event is followed by peaks (warming) of the global mean surface temperature (GMST) and La Niña event is followed by nadirs (cooling) of the GMST. We can think of La Niña events as period of storing energy into the ocean, and El Niño event as period of restoring this energy back into the surface warming the atmosphere.

Additionally, at scales of a few decades, scientists have found that there is a slow oceanic process in the Pacific that mimic the El Niño/la Niña phenomena. It is called the Pacific Decadal Oscillation (PDO). Thus, during a cold phase of PDO,

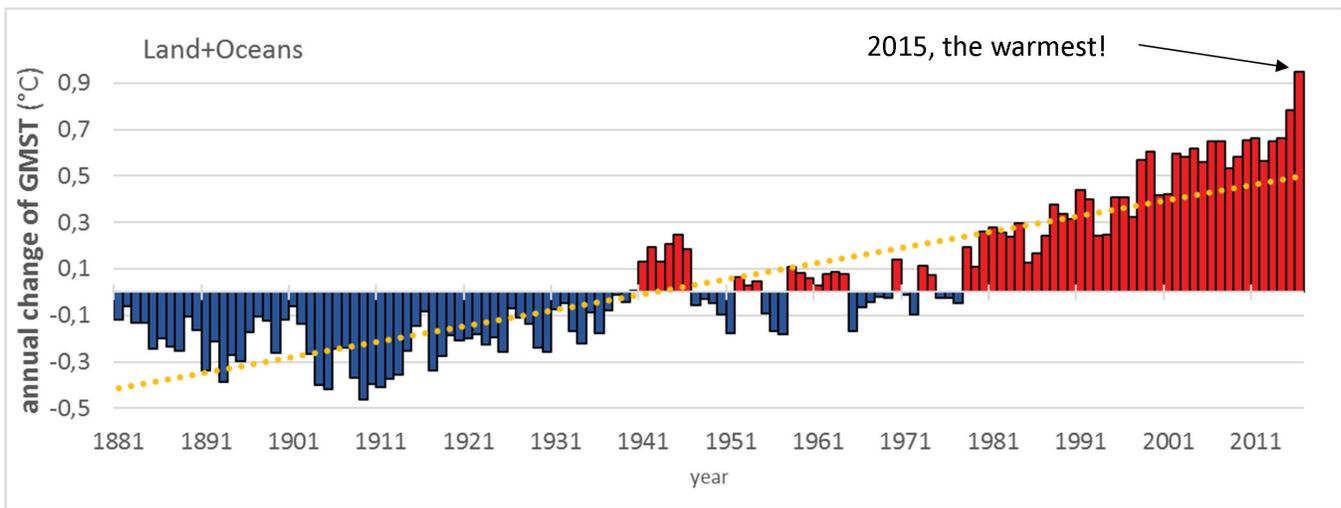


Figure 3: Annual change of the GMST in the period 1881-2015, relative to the mean of the 20th century (1901-2000). Temperature data source as in Fig. 1.

there are 20-30 years of mean conditions in the Earth Climate that are similar to La Niña conditions. This means, long-term conditions of storing heat deep into the ocean. During a warm phase of PDO, instead, there are 20-30 years with similar conditions to those of El Niño, thus, restoring back the heat into the atmosphere. More recently, it has been shown that warm phases of PDO are related with the increasing year-to-year warming of the GMST and cold phase of PDO is related to the two last “hiatus.” Figure 2 shows the PDO index, where positive values are related with the warm phase of PDO and negative values are related with the cold phase of PDO. The figure clearly shows the strong correspondence between a warm-phase PDO and global warming and between a cold-phase PDO and a “hiatus” in the global warming. The evidence is pretty clear in Fig. 2. The relative global cooling in the early 2000s is about having had a decade of cooler temperatures in the eastern equatorial Pacific (a cold phase of the PDO).

After many years of monitoring the climate systems, it’s clear now that the GMST can vary from year to year, even decade to decade. These differences are largely a result of internal natural variations such as el Niño events or the PDO, respectively. The PDO results in more sequestration of heat in the deep ocean during the cold phase of the PDO. Because of that, GMST tends to stagnate during this cold PDO phase, but increases during the warm phase. Observations and models show that the PDO is a key player in the two recent hiatus periods. Some other examples of causes behind natural variation include volcanic activity, and decreased water vapor in the stratosphere.

Recalling that a cold phase of PDO, like La Niña, results in piling up warm water in the western Pacific, the process will inevitably reverse. At some point, the water will get so high that it just sloshes back. When that happens, the missing heat will reappear and temperatures will spike once again. The mystery of the hidden energy during the last hiatus will be unraveled. When will that happen? In fact, this just happened during the last El Niño event in 2015.

A relevant fraction of the sequestered heat stored along sixteen years was poured out into the atmosphere in what it has been called the “super” El Niño. The upward trend in GMST resumed in 2014, and the 2015 has been so far the hottest (see Figure 3). The warming associated with el super El Niño 2015 is expected to extend well beyond the boreal summer 2016. There is speculation whether the latest El Niño event and the strong switch in the sign of the PDO since 2014 mean that the GMST is stepping up again. However, as GHGs continue to rise further, a negative decadal trend in GMST becomes less likely.

According to most of the Meteorological Offices in the world, such as the British Met Office, it is highly likely that the 2016 will be as warm as 2015. Based on the linear trend (orange dotted line in Fig. 3), the change of temperature in 2015 is slightly above +1.0°C compared to pre-industrial era (before 1850). In some way we are already half way of the target of 2°C, placed during the Paris’ climate agreement in December 2015. As of 2014, about 2,000 gigatons of CO₂ had already been emitted, meaning our world has already used about two thirds of the 2 °C budget. This gives an indication that we are already committed to some level of further warming.

What have we learnt so far? We have learnt that although Earth’s climate is undoubtedly warming, natural variations are strong enough to mask steady background warming at any point in time. However, as investigations are being developed and climate change models tested, it’s important to expect these variations and plan for them in a context of human influence driving our modern climate into uncharted territory.



Our Mother [Earth] is in labor and she is being raped ...” Thomas Berry, Dreamer of the Earth: The Spiritual Ecology. If we are serious about climate change we must stop thinking of the Earth as an object, its resources to be used and discarded. We need to treat the Earth as the subject of our actions towards it. We must think of the Earth not only in terms of carbon emissions or unlimited resources, but as a precious gift from God. A gift that has been entrusted to us to treasure and care for – we must come to appreciate our spiritual relationship with the Earth. As Thomas Berry wrote; “The subject with which we are concerned is the spirituality of the Earth. By this I do not mean a spirituality that is directed toward an appreciation of the Earth. I speak of the Earth as subject, not as object. I am concerned with the maternal principle out of which we were born and whence we derive all that we are and all that we have. In our totality we are born of the Earth. We are earthlings. The Earth is our origin, our nourishment, our support, our guide. Our spirituality itself is earth-derived. If there is no spirituality in the Earth, then there is no spirituality in ourselves. The human and the Earth are totally implicated each in the other.” Pope Francis, as the teacher and protector of the Faith, provides a way to integrate the natural world and a spiritual dimension of the Earth with his encyclical Laudato Si.

Our Responsibility for the Earth

We live in the natural world and we need to find reasonable ways to protect the Earth from being degraded and destroyed. In my view, this requires an approach that is both spiritual and natural. We need to find a way that honors the Earth that is rooted in a spiritual dimension, and also practical in a natural dimension.

The natural dimension is taking shape today when world leaders came together in Paris in 2015 for the Earth Summit. No single nation can change the direction of climate change by itself. Such an enormous undertaking requires the cooperation and partnership among all nations.

The agreements reached in Paris provide the path to merge the natural world with deep-rooted earth spirituality. The Paris agreements can help us to think of the Earth as subject and not the object of our consideration.

“We need to find a way that honors the Earth that is rooted in a spiritual dimension, and also practical in a natural dimension.”

“The Paris Outcome is the turning point for action to limit climate change below dangerous levels. It signaled the end of business as usual for the energy industries. Future investment will need to be compatible with a zero carbon world.”

The Paris Agreement established an enduring, binding and transparent legal regime where all countries make commitments to reduce greenhouse gas emissions and manage the impacts of climate change.

The strong interventions from key global leaders were responsible for delivering a high ambition result. Leaders ensured climate action was initiated in other international processes, including the G20 and the Sustainable Development Goals.

By integrating action by regions, cities, investors and companies into the COP process, world leaders have created immediate momentum behind the implementation of the Paris Agreement in the real economy.

Paris marked a turning point in building the low carbon economy. Implementation of means that renewables will make up 78% of new power generation investment to 2030 in major economies. Delivering this will require major reforms to electricity markets, business and financing models. The continu-

continued on page 6

The Sin of Slavery In Today's World

There are an estimated 20.9 Million people trapped in some form of slavery today. It's sometimes called “Modern-Day Slavery” and sometimes “Human Trafficking.” At all times it is slavery at its core.



Domestic Servitude

Employees working in private homes are forced or coerced into serving and/or fraudulently convinced that they have no option to leave.



Forced Labor

Human beings are forced to work under the threat of violence and for no pay. These slaves are treated as property and exploited to create a product for commercial sale.



Child Labor

Any enslavement — whether forced labor, domestic servitude, bonded labor or sex trafficking — of a child.



Sex Trafficking

Women, men or children that are forced into the commercial sex industry and held against their will by force, fraud or coercion.



Bonded Labor

Individuals that are compelled to work in order to repay a debt and unable to leave until the debt is repaid. It is the most common form of enslavement in the world.



Forced Marriage

Women and children who are forced to marry another without their consent or against their will.

continued from page 5 ation of climate financing in the Paris Agreement beyond \$100bn promised up to 2020 will provide support to emerging and developing countries to deliver these necessary economic and governance reforms.

The Paris Agreement commits to a process of increasing emission cuts every 5 years to meet that goal. The long-term goal of greenhouse gas neutrality in the second half of the century will require a rapid phase out of fossil fuels.

Paris was a significant achievement for multilateral diplomacy. In an increasingly multi-polar world strong cooperative agreements have become far harder to deliver. The Paris Agreement shows it is possible to agree international regimes to manage critical global problems.

Governments and investors will need to manage an orderly transition away from a fossil fuel dominated economy in a way that avoids stranded assets and negative impacts on workers. The G20 has established a taskforce on the implications of climate policy on financial stability, which will report in 2016. In 2015 all international development financing institutions agreed to align their financing with the Paris climate goals.

The Paris Agreement has broken new ground and placed adaptation, resilience and response to climate impacts at the heart of the new regime. This includes stronger early warning systems, addressing treatment of environmental refugees, and providing extreme weather insurance to 400 million more people in vulnerable countries by 2020.

These agreements provide positive ways to treasure and care for the Earth. These agreements will not come to fruition without the strong support of not only nations, but the individual citizens that make-up a nation. It rests on each individual to develop a spiritual relationship with the Earth as a foundation for international cooperation in caring for the natural world.

by Jane Remson, O. Carm.

Pope Francis and What Real, Integral Progress for the Person Is

Pope Francis called for the “globalization of solidarity” which places the dignity of persons and families at the center of social justice. According to the Pope, this “means thinking about spiraling unemployment, the constant tears of the poor,” and “the need for real, integral progress for the person,” not just in terms of income.

The pope addressed some 7,000 people, representing various sectors of the work force, gathered at the Vatican for the audience. The pope first spoke of the need to prioritize the creation of “new cooperative enterprises,” while developing those that already exist, thereby creating “new possibilities for work” which are currently unavailable.

Pope Francis also addressed the need for welfare reform, especially in the area of healthcare. Speaking to members of an Italian association, the pope said “I know what you have done for years with heart and with passion, in the peripheries of the city and our society, for families, children, the elderly, the sick and disadvantaged,” he said. “Charity is a gift,” the pope added, “without which one cannot enter into the house of one who suffers.”

Speaking on the economy, the pope discussed “its relationship with social justice,” as well as the “dignity and value of the human person.”

Pope Francis spoke of a “certain liberalism” which believes in the necessity to “produce wealth,” regardless of how, in order to “promote some political redistribution on the part of the State.” The Church believes, the pope said, “in establishing a new quality of economy, one creates the ability for persons to grow in all of their potential.”



Carmelite NGO Coordinating Team

Jane Remson, O. Carm.
Main Representative

Joseph Chalmers, O. Carm.
International Liaison

Beth Fitzpatrick, O. Carm.
Spirituality Reflection Team

Hariawan Adji, O. Carm.
Asian Region

Conrad Mutizamhempo, O. Carm.
Carmelite General Council

Eduardo Scarel, O. Carm.
South American Region
UNFCCC Representative

Andrea Ventimiglia, TOC
European Union Region

Dennis Kalob
New York Office Coordinator

William J. Harry, O. Carm.
Communications

Committees

North American Climate Change
Blaise Fernando, O. Carm.

Spirituality Reflection Team
Beth Fitzpatrick, O. Carm.
Barbara Breaud, O. Carm.
Camille Anne Campbell, O. Carm.
Craig Morrison, O. Carm.
Dionysius Kosasih, O. Carm.
Christopher O'Donnell, O. Carm.
Joseph Chalmers, O. Carm.
Eduardo Scarel, O. Carm.

Carmelite NGO Main Office:

1725 General Taylor Street
New Orleans, LA 70115 USA
Tel: (+01) 504.458.3029
Fax: (+01) 504. 864.7438
jremson@carmelitengo.org
carmelitengo.org