

## **Pastoral Solutions Emphasized by the Catholic Church as a Response to the Adverse Effects of Climate Change in Asia**

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### **Introduction:**

The last decade of the twentieth century was the warmest ever, and the first decade of the twenty-first century is expected to be hotter still. All these changes will result in devastating impacts with a high socio-economic toll. Climate change is threatening agriculture, especially in developing countries where farming is dominated by small-scale farmers. These growers typically own marginal land and rely on rainfall to sustain their livelihoods. According to the FAO, extreme weather events such as flooding and storms can “contaminate freshwater and damage facilities used by farmers to store and carry water”.<sup>1</sup> Climate change also poses severe risks to food security.

In the Asian continent, for example, Bangladesh is very vulnerable to climate change. Sea-level rise and coastal inundations is a very probable picture of the land. A significant portion of the deltaic country of Bangladesh gets flooded on a yearly basis. About 21 per cent of the population, or 30 million out of the 130 million Bangladeshis, live in coastal areas vulnerable to sea-level rise. At the same time, 36 per cent of Bangladeshis live on less than one dollar a day. What will happen in Bangladesh when climate change occurs – i.e. when global warming increases the average temperature of the earth by more than 2°C and sea levels will rise about one metre – is clearly devastating.<sup>2</sup> The world requires massive and coordinated global efforts through diplomacy, projects and financing to prevent vulnerable countries like Bangladesh from feeling the worst irreversible impacts of climate change.

Nepal was devastated by drought for 3 consecutive years. In 2007 the land was swept by floods. This lethal combination inflicted widespread damage. 44 of Nepal's 75 districts were inundated due to heavy rain. The rising waters and accompanying landslides killed 130 people and destroyed 70,000 homes.

Globally, more than 250 million are directly hurt by land degradation, sparked by factors such as climate change, soil erosion, over-farming and the deterioration of the physical, chemical, biological and economic properties of soil, according to an October 2008 report from the United Nations Convention to Combat Desertification (UNCCD) High-Level Policy Dialogue in Bonn. Asia is the worst hit in terms of the number of people afflicted by desertification and drought.<sup>3</sup>

The United Nations Framework Convention on Climate Change provides the following analysis of Climate Change in Asia: Asia has the highest population of any continent in the world, and partly as a consequence it faces some of the most difficult environmental and socio-economic challenges. Land and ecosystems are already being degraded and would ultimately undermine food security. Water and air quality are deteriorating while continued increases in consumption and associated waste have contributed to the region's existing environmental problems. The region is also highly subject to natural hazards, such as the 2004 Indian Ocean Tsunami, the 2005 Pakistan Earthquake, and the 2006 landslides in the Philippines.<sup>4</sup> There is evidence of increases in the intensity and frequency of many extreme weather events such as heat waves, tropical cyclones, prolonged dry spells, intense rainfall, thunderstorms, and severe dust storms in the region (Cruz et al. 2007).<sup>5</sup> The impacts of such disasters range from hunger and disease, to loss of income and livelihoods, affecting human survival and well-being. For example the extreme weather events in China during 2006 included major storms and flooding in the east and south, as well as heat and drought in central, western and north-eastern regions, killing more than 2700 people and causing USD 20 billion in damages. Climate change will affect many sectors, including water resources, agriculture and food security, ecosystems and biodiversity, human health and coastal zones.<sup>6</sup>

Under climate change, predicted rainfall increases over most of Asia, particularly during the summer monsoon, could increase flood-prone areas in East Asia, South Asia and Southeast Asia. In Central and South Asia, crop yields are predicted to fall by up to 30 per cent, creating a very high risk of hunger in several countries. Global warming is causing the melting of glaciers in the Himalayas. In the short term, this means increased risk of flooding, erosion and mudslides in Nepal, Bangladesh, Pakistan, and north India during the wet season.<sup>7</sup> Throughout Asia one billion

people could face water shortage leading to drought and land degradation by the 2050's.<sup>8</sup>

The global burden of climate change-attributable diarrhoea and malnutrition are already the largest in the world in Southeast Asian countries including Bangladesh, Bhutan, India, Maldives, Myanmar and Nepal in 2000. Illness and death are expected to increase from diarrhoeal diseases due to drought and flooding, and are also expected from increased amounts of cholera bacteria in coastal waters.<sup>9</sup> The Indian National Crime Records Bureau data recorded 16,632 cases of farmers committing suicide in 2007 due to crop failure caused by lack of water, the global economic meltdown and uncertainty in local markets over the prices of commodities like cotton and soya bean.

Among Asian countries, Vietnam will be one of the most severely impacted by Climate Change, because of its long coast which is vulnerable to storms and seas, and because of its large low lying areas in the southern Mekong Delta, which is the country's largest rice-producing area. The International Centre for Environmental Management (ICEM, 2007) <sup>10</sup> shows the impact of a one metre sea-level rise (SLR) in the Mekong Delta area.

According to the World Health Organization: "Overall, the effects of global climate change are predicted to be heavily concentrated in poorer populations at low latitudes, where the most important climate-sensitive health outcomes (malnutrition, diarrhea and malaria) are already common, and where vulnerability to climate effects is greatest. These diseases mainly affect younger age groups, so that the total burden of disease due to climate change appears to be borne mainly by children in developing countries." In this regard, Pope Benedict XVI insists that the earth "must not be bequeathed to future generations depleted of its resources"<sup>11</sup>

Further, it is feared that multinational companies, will get easy access to natural resources in Asia and they may not be sensitive to the environment, nor towards the livelihood interests of the local communities. A policy framework is needed to regulate the use of natural resources to a sustainable level and to encourage their regeneration and to protect the rights of the local communities. This would ensure

the economic use of natural resources and would prevent environmental degradation and accentuation of poverty.<sup>12</sup> The restoration and rehabilitation of degraded resources like land and forests have high potential for employment generation and poverty reduction. One of the consequences of large amounts of foreign capital entering the economy is a skewed development of tourism. India is fast becoming a medical tourism hub. This does bring forex into the economy but the accessibility of poor to health-infrastructure and facilities is reduced. Again, with the virgin lands being developed for tourism, the fragile ecological diversity is destructed.

The growing environmental crisis in the recent years is posing a great challenge to Asia. There is a greater awareness today that the goods of the earth cannot be used as it was unfortunately used in the past. Many countries, states and people are consuming the very earth on which our very livelihood depends. The growing phenomenon of climate change and natural disasters call into question our use of the earth's resources. Pope Paul VI in *Populorum Progressio* asserts that "the whole of creation is ordered in the first place towards its creator and the rationality of humans is directed not to using nature in a thoughtless way but to a recognition of God's plan and thus to the 'prior God-given purpose' of nature"<sup>13</sup>.

The environment affects the nation's economy at all levels. Industrial and economic sectors depend on the natural resources. Climatic shocks, like droughts or floods, land degradation, soil erosion and industrial pollution have a negative impact on an economy. Human development is obviously linked to health and the root causes of health problems are often linked to environmental conditions. Hence, each one of us is called to examine the choices we make and our lifestyle, and how we can be responsible stewards of God's beautiful creation.

### **Food Insecurity leading to hunger, malnutrition, ill health in Asia**

The environment and human development are inexorably linked. According to WHO, which maintains that household food and nutrition security are basic human rights, nutrition security exists when food security is combined with a sanitary environment, adequate health services and proper care and feeding practices to ensure a healthy life for everyone<sup>14</sup>. The Food and Agriculture Organization of the United Nations

(FAO) estimates that globally about one billion people, or around 17% of the world's population, are "hungry" or undernourished. According to Dr Gro Harlem Brundtland, "Nutrition is a key element in any strategy to reduce the global burden of disease. Hunger, malnutrition, obesity and unsafe food all cause disease, and better nutrition will translate into large improvements in health among all of us, irrespective of our wealth and home country"<sup>15</sup>.

The problem of hunger in Asia has not been sufficiently addressed. A new UNICEF report has revealed that the number of chronically hungry people in South Asia has touched the figure of 400 million, aggravated by high food and fuel prices and the global economic slowdown. The report also said that more than 1.18 billion people, or three quarters of the region's population, survive on less than \$2 a day<sup>16</sup>. Governments need invest heavily in agricultural production and put more money in the hands of the poor. Wide-spread hunger also stunts the development of the economy. Hungry workers are tired, weak, and prone to falling sick. Food scarcity leads to billions of dollars in lost productivity, which leads to further food scarcity<sup>17</sup>. In 2007 and 2008 the price of rice, the staple food throughout South Asia, increased more than 70%, fueled by poor harvests resulting from extreme weather conditions in key rice-growing areas. Even in March 2011, the U.N. Food and Agriculture Organization (FAO) reported that food prices reached another record high, as the price of basic food staples continued to soar<sup>18</sup>.

South Asian people usually eat rice and other food grain at every meal, which is 50 and 70% of their total daily caloric intake. Rice is the staple food for 65% of India's one billion people. 84% of the South Asian population lives on less than \$2 per day, and a near-doubling of rice prices is having a catastrophic effect. And because of the low purchasing power of South Asia's poor, even a small increase in prices can cause a sharp fall in real incomes. In response to this crisis, major rice exporting countries such as India, China and Vietnam announced a ban on export of the grain, so that they can feed their own people. This has forced the price ever-higher, and raised fears of famine in rice-importing countries such as the Philippines, Afghanistan, Bangladesh, and North Korea<sup>19</sup>. In Bangladesh, spiraling rice prices have left the people facing their worst food shortages since the major famine of 1974. Severe flooding in 2007 and also devastating cyclones Sidr in 2007 and Aila in 2008 also

contributed to the price rise. From that time onwards, prices have nearly doubled to about 35 taka (50 cents), while there has been no corresponding increase in wages. Myanmar, the poorest country in Southeast Asia experienced great misery a May 2008 cyclone that killed more than 130,000 people and laid waste to the delta. Burmese farmers are struggling under debt and face declining yields from their rice fields which is grown from low-quality seeds and milled in rusted factories<sup>20</sup>. Over the past 20 years, the Philippines, the world's top most importer of milled rice in 2007, lost nearly half of its irrigated land to rapid urban development. Domestic demand for rice has risen as the population has grown, pushing up prices. President Gloria Arroyo has asked authorities to crack down on hoarders who could be charged with economic sabotage - a crime that carries a life sentence. The government has also asked the public to save leftover rice. Thailand, the world's largest exporter of rice has enforced a rule that exporters set aside at least 500 tonnes of rice to prevent shortages. Rice prices increased by more than 50% in 2007 and have doubled since the beginning of 2008. Though China has an abundant supply of rice to feed its population of more than 1.3 billion, it had stockpiled about 40-50 million tonnes of rice and clamped export restrictions which have had a big impact on importers including North Korea<sup>21</sup>. Half of Pakistan's people are at risk of food shortages due to a steep increase in food prices, according to the World Food Program. The price of wheat flour has more than doubled over three years. 24% of the Pakistan population lives below international poverty line<sup>22</sup>.

### **Denudation and Appropriation of Land and Forests in Asia**

30 percent of Nepal's rural population is landless, most of who are Dalits who live in extreme poverty and starvation, whereas 54 percent are tenants on the land. For example, 70 percent of the Gandharva community of Dalits are landless and face chronic hunger. The Nepali government has failed to redistribute land to the landless even though in 2008-09 it formed a High Level Scientific Land Reform Commission in order to abolish feudal land ownership.

Deforestation is the most serious and widespread problem in the Asian and Pacific region. Its rate has accelerated from 2 million hectares per year during 1976-1981 to 3.9 million hectares per year during 1981-1990. The countries experiencing the

most rapid deforestation are Bangladesh, Indonesia, Pakistan, Philippines, and Thailand.<sup>23</sup> There are many reasons for deforestation, but a major reason is that the commercial timber companies strip the forests and hills of trees, and the poor peasants living on the flood plains suffer the most.<sup>24</sup> Another reason is the cutting of the wood from the forest for fuelwood. However, according to the assistant director general of FAO's forestry department, for the first time, the rate of deforestation has decreased globally as a result of concerted efforts taken both at local and international level. Over the 10-year period from 2000 to 2010, Asia registered a net gain of some 2.2 million hectares annually in the last decade, mainly because of large-scale afforestation programmes in China, India and Vietnam. The growth of new forests has helped bring down the high level of carbon emissions from forests caused by deforestation and forest degradation<sup>25</sup>.

Until recently, large areas of India, like the rest of the world, were covered with thick forests. Great Civilizations were built where these forests flourished, in the valleys of its great rivers, like the Ganga, the Yamuna and the Indus. These were civilizations that reached a high degree of sophistication, and urbanization. Unfortunately, there has been large scale destruction of these forests. However, even today there are diverse and extremely sustainable forest cultures that survive and flourish in the areas where the forests still exist. Across India one has also seen many people's movements where communities have voluntarily come together for the purpose of conservation or in response to environment and ecological crises.

Studies have established beyond doubt that the large scale destruction of the forests was started by the British, India's colonial ruler. This large scale destruction of the forests in India is rooted in the commercially oriented forest use and ownership policies of the British government which continued even after India gained independence in 1947. After independence, agricultural expansion, which was often state sponsored, was the other major cause of deforestation. What has been even worse was that development projects alienated the communities living in the forests, depriving them of their basic sources of survival, forcing them to move away and in the process making them refugees in their own land<sup>26</sup>.

In this regard, the Andaman and Nicobar Islands make an interesting case study. The islands are clothed in thick evergreen forests that are home to a large biodiversity and also have some of the finest mangroves and coral reefs found in the world. The islands are also home to six indigenous tribal communities. Their knowledge and understanding of the forests is extensive and they share a close relationship with it. The British were responsible for starting forestry operations in these islands. After independence, thousands of people were brought from mainland India and settled here as a continuation of the colonisation scheme. Consequently, the growth in the timber extraction operations corresponds directly to the growth in the population of the islands. This destruction of the forests for the extraction of timber was in addition to the clear felling that was done for the settlements themselves.

As the population of migrants on the islands grew there was a need for the government to create employment opportunities for the people. The abundant forests and the timber within it became the obvious source for the generation of both income and employment. Thus, timber based industries sprang up. The profits made and the incentives offered by the administration encouraged the plywood mills to go in for substantial augmentation of their production capacities. Today, however, with growing awareness, intervention by the courts and change in policies, logging in the islands appears to be reducing. The people who have suffered the most in these islands are the indigenous communities for whom the forests are home. This has resulted from the combined impacts of the destruction of the forests and the imposition of an alien and insensitive culture that brought along with it various diseases and other vices such as alcohol and tobacco.

In advocating care for the environment, the *Compendium* of the Social Doctrine of the Church (henceforth will be called as the *Compendium*) states that the destruction of forests also through the inconsiderate and malicious setting of fires, accelerates the processes of desertification with risky consequences for water reserves and compromises the lives of many indigenous peoples and the well-being of future generations.<sup>27</sup>



## **Land degradation**

Land degradation is also widespread in Asia. Most of the developing countries in Asia suffer from soil erosion and degradation due to high deforestation, poor irrigation and drainage practices, inadequate soil conservation, steep slopes, and overgrazing.<sup>28</sup> In India alone, about 18 percent of the total agricultural land is affected. In the dry belt stretching from Iran to Pakistan and India, wind erosion causes extensive and severe land degradation. About 59 million hectares are affected by wind erosion in the countries of South Asia alone, as well as in Afghanistan and Iran.<sup>29</sup> Landslides have been severe in countries like India, Nepal, and Thailand. Some factors associated with landslides are heavy rainfall, volcanic activity, deforestation, overpumping of groundwater, compressibility of the soil and infrastructural activities such as road construction, and mining activities. In referring to lands subject to erosion and other such issues, the *Compendium* gives an important principle: “The environmental crisis and poverty are connected by a complex and dramatic set of causes that can be resolved by the principle of the universal destination of goods, which offers a fundamental moral and cultural orientation.”<sup>30</sup>

A few measures to deal with this problem can be considered. Migration of people from mainland India should be discouraged. Subsidies that make the timber industry profitable should be stopped. The tribals should be involved in conservation and wildlife protection activities. They should also be educated and made aware of the beauty and fragility of the forests, the cost of destruction of the forests and their rights<sup>31</sup>. In promoting care for the environment, the *Compendium* states that the destruction of forests also through the inconsiderate and malicious setting of fires accelerates the processes of desertification with risky consequences for water reserves and compromises the lives of many indigenous peoples and the well-being of future generations<sup>32</sup>.

## **Farmer’s Livelihood at stake in Asia and particularly in India**

From 1997 to 2009, 200,000 farmers ended their lives in India, leaving behind families plunged even further into poverty and with no one to work in the fields, a very tragic phenomenon. Farmer suicides is partly due to an increase their

indebtedness caused by the rising of costs of production and the falling prices of farm commodities as a result of the World Trade Organization's (WTO's) free trade policies<sup>33</sup>. The crisis of suicides shows how the survival of farmers is incompatible with the seed monopolies of global corporations. The region in India with the highest level of farmers' suicides is the Vidharbha region in the state of Maharashtra - 4000 suicides per year, 10 per day according to the National Crime Records Bureau (NCRB) in India. In another Indian state, Chattisgarh which was hit by falling water levels from above 40 feet to below 250 feet, led to crop failure and over 1500 farmers committed suicide<sup>34</sup>. Nearly every day, newspapers report more farmer suicides in Andhra Pradesh, an Indian state of 80 million people where 70 percent of the population depends on agriculture - and which has suffered badly from weak monsoon rains<sup>35</sup>. A study carried out by the Research Foundation for Science, Technology and Ecology (RFSTE), Dehra Dun, India shows that due to falling farm prices, Indian peasants are losing \$26 billion annually. This is a burden on their daily livelihood and they find it difficult to accept it. A spate of suicides in poor rural areas of Sri Lanka has drawn attention to the terrible social conditions and economic difficulties confronting farmers in many parts of the country<sup>36</sup>.

However, farmer suicides are not inevitable and there is much hope. This would mean that farmers are helped to make the transition of shifting from chemical farming to organic farming and from using non renewable seeds to using organic seeds. Further, a shift from unfair trade based on false prices to fair trade based on real and just prices necessitated by the State. About 3000 villages in southern India have benefited by giving up the use chemical pesticides and practicing organic farming. Enabavi, a village of 52 families, in Andhra Pradesh, India is hosting farmers from the nearby Kallem village for tips on profitable agriculture. Pesticide-free tomatoes, okra, brinjals, gooseberries, chillies, leafy vegetables and other vegetables are grown through non-pesticidal management, called NPM vegetables. Farmers are learning ways of increasing productivity without applying synthetic chemicals. These fresh stocks are bought off immediately and farmers experience a rise in their income. Further, farmers no longer have to spray pesticides and hence no longer complain of giddiness, skin problems, breathlessness and burning sensation in the eyes<sup>37</sup>.

In *Mater et Magistra*, Saint Pope John XXIII in speaking of the common good, repeated the teaching of Pius XI of the need “to maintain a balance between wages and prices”<sup>38</sup> and of “a reasonable relationship between the prices obtained for the products of the various economic groups: agrarian, industrial, and so forth”<sup>39</sup>. Like Pius XI, he based this teaching of his on the principle of the common good. However, he developed and extended the teaching of Pius XI. According to him, the State and public authorities have an expanded role in coping with social problems<sup>40</sup>. When he examined agriculture as a sector of the economy, he discovered that it was unjustly treated in comparison with other sectors<sup>41</sup>. So he proposed an expanded role for it in dealing with special difficulties of those working in agriculture<sup>42</sup> - price support<sup>43</sup> and price regulation<sup>44</sup> and even directing the industry into rural areas<sup>45</sup>. The principle that the Pope suggested may be applicable to unfairness in other sectors of the economy- namely, that the responsibility for the price structure rests with various social groups and the State<sup>46</sup>. Thus, the Pope gave a mandate for this extra involvement by the State in his desire to curb injustices in the economy.

Having great concern for the agricultural labourer, including the farmer, the *Compendium* underlines the important social, cultural and economic role that they have in the economic systems of many countries, especially in the context of an ever more globalized economy as well as their role in safeguarding the natural environment<sup>47</sup>. Hence, agrarian reform becomes a moral obligation<sup>48</sup>.

### **Disastrous Consequences of Climate Change and Global Warming in South Asia**

Climate change is one of the most challenging crises affecting the future of our generations. The climate change phenomenon is a complex one. According to the Food and Agricultural Organization (FAO), the Asia Pacific region is the world’s largest producer of aquatic products and employs at least 32 million people. The region accounts for some 51 percent of global fisheries production and close to 90 percent of global aquaculture and employs 85 percent of world’s total fishers and aquaculture farmers. Many fishing households which rely on the fish they produce for basic income are already under stress from overfishing, habitat degradation and

pollution, and now are facing added anxiety from climate change including severe weather events, storms and droughts, declining stocks of fresh water. Climate change could lead to livelihood loss, increased poverty and malnutrition, and conflict over fish stocks in the Asia Pacific region's fisheries and aquaculture sector<sup>49</sup>.

The widespread loss of snow and ice in the Himalayan mountain glaciers is one of the most visible changes attributable to global climate change. Many small glaciers are disintegrating and both the greenhouse gases and air pollutants like soot and ozone contribute to the melting<sup>50</sup>. Global warming is certainly shrinking the Himalayan glaciers and is leading to the rapid swelling of Himalayan glacial lakes and a high risk of floods in Nepal. Hence, glacial lakes in Nepal are increasingly at risk of bursting the natural dams containing them - endangering the lives of tens of thousands people. The glacial lakes are growing so quickly that the risk of a disaster occurring throughout the Himalayas is increasing. The Nepalese regime has identified about 20 "priority" lakes at risk of leading to glacial lake outburst floods (GLOFs), which not only move very fast but also carry great big boulders that can push down rock walls, destroy river banks and cause rivers downstream to rise up to 35 metres, destroying everything in their path<sup>51</sup>. The Nepalese government, in coordination with the World Bank, the UNDP, ICIMOD and local NGOs, has been trying to monitor and mitigate the threat, by using methods such as controlled breaching of the dam, pumping or siphoning water from the lake, or tunnelling through or under the barrier and various methods to reduce the volume of water in some of the lakes. Recommendations included the immediate reduction of worldwide carbon dioxide emissions and reduction of concentrations of warming air pollutants such as soot, ozone, methane and hydrofluorocarbons<sup>52</sup>.

The Indian Institute of Tropical Meteorology (IITM) predicts that temperatures in the Himalayan region will increase by 0.9 degrees Celsius on 1970s levels, to 2.6 degrees, by the 2030s and rainfall intensity will increase from 2% to 12%. There is evidence to suggest that this rising temperatures in the Himalayan region could make many new areas vulnerable to malaria transmission<sup>53</sup>. People will also become more vulnerable to water-borne diseases like diarrhea. Unfortunately one area that is still not getting the attention it deserves is the health impacts of global warming.

Studies carried out by scientists at the NIMR - one of the leading institutes under the Indian Council of Medical Research suggest that climate change will significantly increase both the intensity and geographic spread of malaria and other vector-borne diseases in areas which have been largely insulated from them in the past. Urgent action needs to be taken in this regard. Health awareness programmes for the people in these hilly remote areas needs to be undertaken<sup>54</sup>.

Asia is more and more embracing environmentally-friendly technologies. Many Asian companies are focusing on how best to recycle waste products and innovate new technologies to bring about renewable energy development, better waste management and water treatment. China is spending tens of billions of dollars every year on renewable energy projects. Its latest five-year economic plan commits to stringent renewable energy targets<sup>55</sup>. The Polygenta processing plant in Nashik, India, recycles plastic bottles from patented technology to make polyester fibre. According to the company, the process is more cost efficient and the resulting polyester is of higher quality<sup>56</sup>.

About one-third of the food produced globally for human consumption each year is wasted, according to a report from the Food and Agriculture Organization (FAO). The FAO found that about 1.3bn tonnes of food is wasted somewhere along the supply chain each year, with wealthier consumers in North America and Europe wasting nearly twice as much as those in poorer countries. While most food wastage in richer nations occurs on a consumer level, in developing countries about 40 percent of wastage happens at the post-harvest or processing level due to poor infrastructure and lack of investment in food production systems. According to FAO, food loss and waste amount to a major squandering of resources, including water, land, energy, labor and capital and needlessly produce greenhouse gas emissions, contributing to global warming and climate change. Developing countries in Asia should strengthen their processing, packaging and transportation infrastructure, and create better links between small farmers and buyers. Consumers should be educated about the impacts of food wastage and taught that throwing away food is unacceptable<sup>57</sup>.

The “India Water Forum” (IWF) 2011 organized by The Energy and Resources Institute (TERI)<sup>58</sup> in April 2011 gave a clarion call to bring water into the global and

national agenda in order to meet the challenges of water security posed by the threat of climate change. South Asia with its 2.5 billion people is facing water scarcity as a result of which many people do not have access to sufficient drinking water and sanitation. With the burgeoning population, water stress will only grow. For example, demand for water resources in India is expected to double and exceed 1.4 trillion cubic meters by 2050. Pakistan faces the greatest water crunch. According to the Economic Survey of Pakistan 2006-07, water supply was just over 1000 cubic metres per person. A fall below the mark would make it a water scarce country. Climate change in the Himalayan basin increases tremendously the problem of water insecurity. Further, most of South Asian countries are agrarian economies requiring water-fed irrigation facilities. Water resources are also required to feed the growing demands of industrialization and urbanization. The thirst for energy, especially hydro-power is widespread and pressing. Further, gross mismanagement of water resources and lack of adequate water storage facilities aggravate the water situation in the region. It is imperative for these Asian countries to develop their own efficient water management systems and learn how to minimize wastage and ensure conservation. Bilateral, regional and multilateral cooperation are essential<sup>59</sup>.

Climate change in India stems from poor water management, regional mistrust and vested interest in the water sector. Since Cancun, the dramatic news or change is that the Environment and Forest Ministries of India and China have decided that a cleaner, better environment is good for growth. The *Compendium* clearly states that “the right to safe drinking water is a universal and inalienable right”<sup>60</sup> In admitting that inadequate access to safe drinking water often causes diseases, suffering and even death, it recommended that “for a suitable solution to the problem, it must be set in context in order to establish moral criteria based precisely on the value of life and the respect for the rights and dignity of all human beings”.<sup>61</sup>

The *Compendium* also urges that every State “should also actively endeavour within its own territory to prevent destruction of the atmosphere and biosphere, by carefully monitoring, among other things, the impact of new technological or scientific advances ... [and] ensuring that its citizens are not exposed to dangerous pollutants or toxic wastes”.<sup>62</sup>

The ruthless exploitation of the earth's resources may benefit a few people but has adverse effects on the masses in Asia. The absolute thirst for profits over the dignity of the human person and unbridled technological development divorced from integral human development are the root causes that are alienating us from our natural environment. In his 1990 World Day of Peace Message, Saint Pope John Paul II affirms that the ecological crisis is "a profound moral crisis of which the destruction of the environment is only one troubling aspect"<sup>63</sup>. In this regard he urged that we must go to the heart of the ecological degradation. Saint Pope John Paul II advocated an education in ecological responsibility because "we are all really responsible for all"<sup>64</sup>. In this regard the *Magisterium underscores human responsibility for the preservation of a sound and healthy environment for all*,<sup>65</sup> and consequently the *Compendium* urges the need to eliminate the causes of pollution and to guarantee adequate conditions of hygiene and health for small groups as well as for vast human settlements.<sup>66</sup>

After stating that poor countries lack the economic means either to gain access to existing sources of non-renewable energy or to finance research into new alternatives, Pope Benedict XVI then urged the international community to find institutional means of regulating the exploitation of non-renewable resources of these poor countries. He also called for a worldwide redistribution of energy resources.<sup>67</sup> His encyclical *Caritas in Veritate* expressed the hope that that the international community and individual governments will succeed in countering harmful ways of treating the environment. The covenant between human beings and the environment should mirror the creative love of God, from whom we come and towards whom we are journeying.<sup>68</sup> Pope benedict XVI clearly stated that individuals in rich countries must change their lifestyles and their consumption without responsibility if the world's resources are to be protected. *Caritas in Veritate* observed that the phenomenon of international tourism could be a major factor in economic development and cultural growth, but can also become an occasion for exploitation and moral degradation. People are often exposed to immoral or even perverted forms of conduct, as in the case of so-called sex tourism, to which many human beings are sacrificed even at a tender age.<sup>69</sup>

### **Environment Protection is Necessary for Development**

Pope Paul VI in *Populorum Progressio* also emphasized that “the whole of creation is ordered in the first place towards its creator and the rationality of humans is directed not to using nature in a thoughtless way but to a recognition of God’s plan and thus to the ‘prior God-given purpose’ of nature”.<sup>70</sup>

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In Asia, “lack of access to potable water, inadequate sanitation facilities, poor water management and inappropriate waste management of effluents are major environmental and health problems. Agricultural and industrial chemicals and pollutants, like pesticides, can affect the health of populations. Land degradation, desertification, droughts, earthquakes, hurricanes and floods can create disease, famine or malnutrition in certain areas”.<sup>71</sup>

### **Water Pollution and Lack of safe drinking water Vs. Responsible care in the Chemical Industry**

Of the 1.1 billion people using water from unimproved sources, nearly two thirds live in Asia. In 2005, 1.6 million children under age 5 (an average of 4500 every day) died from the consequences of unsafe water and inadequate hygiene. Quality of and access to water has an enormous impact on the health of populations and thus their human development.<sup>72</sup> The primary sources of organic matter pollution are domestic sewage and industrial pollution from tanneries, sugar factories, distilleries, petrochemicals and paper and textile factories. South Asia and the People’s Republic of China (PRC) are most severely affected by organic matter pollution due mainly to waste from the pulp, paper, and food industries. The waste products from the mining industry and the industrial areas where pollutants are discharged directly into neighboring river systems have resulted in heavy metal pollution throughout the Asian region.<sup>73</sup> Coastal and marine water pollution in the



South East Asian region are due to direct discharge from rivers, drainage from port areas, domestic and industrial effluent discharges and various contaminants from ships. Rivers in the region are contaminated with municipal sewage and industrial waste. Asian rivers account for nearly 50 percent of the total sediment load transported by the world's rivers.<sup>74</sup>

Meeting the water and sanitation targets of the Millennium Development Goals (MDGs) will be one of the most effective means of raising the health and general living standards of many of the world's poor.<sup>75</sup> Safe drinking water and basic sanitation are very essential to health that they risk being taken for granted.<sup>76</sup> "Efforts to prevent death from diarrhoea and other diseases are doomed to failure unless people have access to safe drinking water and basic sanitation. For example, ground water is the main source of drinking water in India and Bangladesh. The arsenic concentration in groundwater in these areas are in excess of the WHO guidelines. People drinking such water are at a risk of arsenical dermatosis – black spots, eruptions and cracking of the skin. Both the governments introduced consultations and action plans to deal with this public health issue.<sup>77</sup> The recent *Thimphu Declaration* realized that the impact of the threats on human health has serious implications for morbidity and mortality, and would delay internationally agreed upon development goals.<sup>78</sup>

The Daly Index has established a disease burden due to environmental risk showing the relative effects of water-borne diseases on life expectancy in developing countries.<sup>79</sup> A shortage of clean water and inadequate facilities for the disposal of human excreta, waste water and solid wastes contribute to the development of gastrointestinal infections, such as diarrhea, and facilitate the spread of infectious disease. Poor water quality, a limited quantity of water, poor excreta disposal practices and poor food hygiene are all associated with increased diarrhea prevalence in infants.<sup>80</sup>

The *Compendium* clearly states that "the right to safe drinking water is a universal and inalienable right"<sup>81</sup> In admitting that inadequate access to safe drinking water often causes diseases, suffering and even death, it recommended that "for a suitable

solution to the problem, it must be set in context in order to establish moral criteria based precisely on the value of life and the respect for the rights and dignity of all human beings”.<sup>82</sup> The *Compendium* also urges that every State “should also actively endeavour within its own territory to prevent destruction of the atmosphere and biosphere, by carefully monitoring, among other things, the impact of new technological or scientific advances ... [and] ensuring that its citizens are not exposed to dangerous pollutants or toxic wastes”.<sup>83</sup>

### **Air pollution from industries and vehicles**

Air pollution from industries and vehicles in urban areas can have a severe impact on the rate of respiratory illnesses and health.<sup>84</sup> As a consequence of rapid urbanization and industrialization, air pollution has become a major concern in most countries of the region. Urban air pollution is due mainly to sulfur dioxide, nitrogen oxides, carbon monoxide, and suspended particulate matter (SPM, including lead). It has a direct health impact on human beings. Further, air pollution creates three major global environmental issues: global warming, ozone depletion, and acid rain.<sup>85</sup> 10 of 11 major cities of Asia had exceeded dangerous levels of SPM. The problems of sulfur dioxide, lead, and carbon monoxide pollution were also prevalent.<sup>86</sup> SPM and sulfur dioxide are associated with respiratory illnesses. A recent report of the WHO states that a pollutant released indoors is one thousand times more likely to reach people’s lungs than a pollutant released outdoors. About one million women and children die each year from indoor air pollution in India and amounts to 28% of such deaths worldwide.<sup>87</sup> Even in medium and small cities, air pollution is expected to rise. Most governments are attempting to address the problem of vehicular and industrial pollution by laying down various strategies and plans.

*The Magisterium underscores human responsibility for the preservation of a sound and healthy environment for all,*<sup>88</sup> and consequently the *Compendium* urges the need to eliminate the causes of pollution and to guarantee adequate conditions of hygiene and health for small groups as well as for vast human settlements.<sup>89</sup>

## CONCLUSION:

There is an urgent need to promote cooperation with the non-governmental sector for the conservation of biological diversity<sup>90</sup> and the sustainable use of its components is enshrined in the preamble to the Convention on Biological Diversity (which is an International treaty to sustain the rich diversity of life on earth). For example, there is the need to promote the use of bio-degradable products. In this regard the *Compendium* has cautioned the use of various types of biotechnology and their consequences for human health<sup>91</sup>.

Poor countries lack the economic means either to gain access to existing sources of non-renewable energy or to finance research into new alternative. It will be very beneficial to tap **natural sources of energy** such as the use of the windmill and solar energy panels. Hence Pope Benedict XVI urged the international community to find institutional means of regulating the exploitation of non-renewable resources of these poor countries. He also calls for a worldwide redistribution of energy resources<sup>92</sup>. *Caritas in Veritate* expressed the hope that that the international community and individual governments will succeed in countering harmful ways of treating the environment. The covenant between human beings and the environment should mirror the creative love of God, from whom we come and towards whom we are journeying<sup>93</sup>. The *Compendium* asks that particular attention be given for the complex issues surrounding energy resources,<sup>94</sup> and through the contribution of the scientific community to identify new sources of energy and develop alternative sources.<sup>95</sup>

To collaborate with the non-governmental organizations to effectively dialogue with the municipal corporations **to clean the water sources** and to lay down rules for individuals and industries in order to **prevent them from polluting** the air or water. The *Compendium* states that “Governments should feel encouraged by such commitments, which seek to put into practice the ideals underlying the international community, “particularly through the practical gestures of solidarity and peace made by the many individuals also involved in *Non-Governmental Organizations and in Movements for human rights*”<sup>96</sup>.

There is need to encourage **ecumenical collaboration** and ongoing participation in various environmental initiatives to benefit from the richness and diversity of other Churches. The *Compendium* notes that “the social teaching of the Church is also fertile soil for dialogue and collaboration in the ecumenical sphere”.<sup>97</sup>

Saint Pope John Paul II urged the need for an **education in environmental responsibility** that will lead people to a genuine conversion in thought and behaviour. This has now become urgent<sup>98</sup>. For this, the *Compendium* recommends “an effective change of mentality leading to the adoption of new lifestyles...inspired by sobriety, temperance and self-discipline”<sup>99</sup>.

The *Compendium*, aware of the countless number of poor people who live in polluted suburbs or unsafe houses, recommends relocating them by offering them beforehand **choices of decent housing**, and clearly states that “people directly involved must be part of the process”<sup>100</sup>. The *Compendium* urges all individuals as well as institutional subjects to protect the heritage of forests and, where necessary, promote adequate **programs of reforestation**<sup>101</sup>.

#### (Endnotes)

- 1 Christopher Samuel, *Agrolinks*, June to November 2009, Vol. 10, no. 1, p. 14, Crop Life Asia, Singapore
- 2 Yasuko Kameyama, Agus P. Sari, Moekti H. Soejachmoen and Norichika Kanie, eds. *Climte Change in Asia, Perspectives on the Future Climate Regime*, United Nations University Press, Tokyo, New York, Paris, 2008.
- 3 Ibid.
- 4 The United Nations Framework Convention on Climate Change (UNFCCC), 2007. Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries, Bonn, Germany.
- 5 Cruz R V, Harasawa H, Lal M, Wu S, Anokhin Y, Punsalmaa B, Honda Y, Jafari M, Li C and Huu Ninh N. 2007. Asia. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Parry M L, Canziani O F, Palutikof J P, van der Linden P J and Hanson C E (eds). Cambridge University Press. Cambridge, UK. pp. 469 – 506.
- 6 The United Nations Framework Convention on Climate Change (UNFCCC), 2007. Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries, Bonn, Germany.
- 7 The United Nations Framework Convention on Climate Change (UNFCCC), 2007. Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries, Bonn, Germany.

- 8 Christensen J H, Hewitson B, Busuioc A, Chen A, Gao X, Held I, Jones R, Kolli R K, Kwon W-T, Laprise R, Magaña Rueda V, Mearns L, Menéndez C G, Räisänen J, Rinke A, Sarr A and Whetton P. 2007. Regional Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt K B, Tignor M and Miller H L (eds)]. Cambridge University Press. Cambridge, United Kingdom and New York, NY, USA.; Cruz et al.
- 9 Epstein Y, Sohar E and Shapiro Y. 1995. Exceptional heatstroke: a preventable condition. *Israel Journal of Medical Science*. 31: pp. 454 – 462; *Ibid*, (UNFCCC), 2007.
- 10 ICEM, 2007. Rapid Assessment of the Extent and Impact of Sea Level Rise in Vietnam, by Jeremy Carew-Reid.
- 11 Pope Benedict XVI, *Caritas in Veritate*, no. 50.
- 12 ILO, ILO Asia –Pacific Working Paper Series, T.S. Papola, *Employment Challenge and Strategies in Asia*, Subregional Office for South Asia, New Delhi, January 2008, p. 14.
- 13 Archbishop Diarmuid Martin on ‘Populorum Progressio’, Zenit News, 22 October 2007. Confer Pope Paul VI, *Populorum Progressio*, no. 16.
- 14 WHO, A Review of Nutrition Policies, December 2010. Further, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food.
- 15 Director-General, WHO at the World Economic Forum 2000.
- 16 Matthias Williams, *Reuters*, New Delhi, 3 June 2009.
- 17 Kallie Szczepanski, Hunger in Southeast Asia in *Helium*, 14 April 2008.
- 18 Population Institute, 8 April 2011.
- 19 Kallie Szczepanski, *Ibid*.
- 20 Bogalay, Burma, *The Christian Science Monitor*, Burma’s empty rice bowl, 7 July 2010.
- 21 BBC News, One Minute World News, “Asian State feel Rice Pinch”, 11 April 2008.
- 22 Right Vision News, Pakistan, 28 March 2011.
- 23 FAO, 1993.
- 24 James Petras and Henry Veltmeyer, *Globalization unmasked*, Madhyam Books, p. 124.
- 25 FAO Report 2010. See also the Independent, UK, *Sunday*, 28 March 2010
- 26 Pankaj Sekhsaria, *Kalpavriksh*, World Rainforest Movement. Underlying Causes of Deforestation and Forest Degradation : Asia. – Prepared by Pankaj Sekhsaria, *Kalpavriksh*, Environment Action Group, Pune, India. <http://www.wrm.org.uy/deforestationAsia/India.html>
- 27 *Compendium*, no. 446.

- 28 Natasha Kanjee and Philip Dobie, NHDR Unit of the Human Development Report Office, *Environment Thematic Guidance Note*, January 2003, Ch 1.
- 29 United Nations Environment Programme (UNEP), 1997.
- 30 *Compendium*, no. 482.
- 31 *Pankaj Sekhsaria, Kalpavriksh*, Ibid. Case Studies of Andaman Island, Uttara Kannada and Gadchiroli - Chandrapur, India.
- 32 *Compendium*, no. 446.
- 33 According to Vandana Shiva “Corporations prevent seed savings through patents and by engineering seeds with non-renewable traits. As a result, poor peasants have to buy new seeds for every planting season and what was traditionally a free resource, available by putting aside a small portion of the crop, becomes a commodity. This new expense increases poverty and leads to indebtedness”. See Vandana Shiva, Director of the Research Foundation for Science, Technology, and Natural Resource Policy in New Delhi in ‘Why Are Indian Farmers Committing Suicide and How Can We Stop This Tragedy?’ in *Voltaire.net* on 23 May 2009.
- 34 The Belfast Telegraph, 15 April 2009.
- 35 Associated Press, Hyderabad, India, 27 August 2009.
- 36 W.A. Sunil, Suicides highlight desperate conditions facing Sri Lankan farmers, *World Socialist Website*, 10 June 2005.
- 37 Savvy Soumya Misra, *Down to Earth*, Science and Environment Online, 15 January 2009.
- 38 MM 79.
- 39 MM 139.
- 40 MM 120.
- 41 MM 140.
- 42 MM 128-141.
- 43 MM 137.
- 44 MM 140.
- 45 MM 141.
- 46 Bernard Häring, *The Law of Christ*, Vol. 3, *Special Moral Theology*, trans. Edwin G. Kaiser (Cork: The Mercier Press, 1967), 456-457.
- 47 *Compendium*, no. 299.
- 48 *Compendium*, no. 300.
- 49 Thin-lei win in Alertnet, A Thomson Reuters Foundation Service, Bangkok, 10 September 2010.

- 50 Veerabhadran Ramanathan, Scripps Institution of Oceanography, University of California, San Diego, [Vatican-Commissioned Report Calls Attention to Glaciers](#), 9 May 2011.
- 51 IRIN News, 21 September 2010. According to an International Centre for Integrated Mountain Development (ICIMOD) report released in May 2010, Nepal experiences more than 1,000 earthquakes a year, has 2,323 glacial lakes and is particularly vulnerable to GLOFs. The UN Development Programme (UNDP) says glacial lake outburst floods (GLOFs) have occurred in the recent past roughly every 2-5 years.
- 52 Veerabhadran Ramanathan, *Ibid.*
- 53 [Patralekha Chatterjee](#), Diseases of climate change, in the Third Pole, New Delhi, May 12, 2011.
- 54 *Patralekha Chatterjee, Ibid.*
- 55 Richard Anderson, BBC News Business, 11 May 2011.
- 56 *Ibid.*
- 57 Caroline Scott-Thomas, One-third of global food production goes to waste: FAO in Food Navigator-USA.com, 13 May 2011.
- 58 The India Water Forum was in consonance with the Ministry of Water Resources and the Department of Drinking Water Supply, Government of India.
- 59 Arpita Mathur, S.Rajaratnam School of International Studies (RSIS), Eurasia Review and News Analysis, New Delhi, 9 May 2011.
- 60 *Compendium*, no. 484.
- 61 *Compendium*, no. 484.
- 62 *Compendium*, no. 468. See also, John Paul II, Message for the 1990 World Day of Peace, 9: AAS 82 (1990), 152.
- 63 Pope John Paul II, World Day of Peace, 1990, no. 5. Cfr. Also no. 7 and no. 15.
- 64 Pope John Paul II, SRS no. 38.
- 65 Cf. John Paul II, Encyclical Letter *Sollicitudo Rei Socialis*, 34: AAS 80 (1988), 559-560. See also, *Compendium*, no. 465.
- 66 *Compendium*, no. 465. See also, John Paul II, Address to participants in a convention on “The Environment and Health” (24 March 1997), 5: L’Osservatore Romano, English edition, 9 April 1997, p. 2.
- 67 Pope Benedict XVI, *Caritas in Veritate*, no. 49.
- 68 Pope Benedict XVI, *Caritas in Veritate*, no. 50.
- 69 Pope Benedict XVI, *Caritas in Veritate*, no. 61.
- 70 Archbishop Diarmuid Martin on ‘Populorum Progressio’, Zenit News, 22 October 2007. Confer Pope Paul VI, *Populorum Progressio*, no. 16.

- 71 Natasha Kanjee and Philip Dobie, NHDR Environment Thematic Guidance Note, January 2003, p. 20
- 72 Natasha Kanjee and Philip Dobie, NHDR Environment Thematic Guidance Note, January 2003, p. 20
- 73 Natasha Kanjee and Philip Dobie, NHDR Unit of the Human Development Report Office, *Environment Thematic Guidance Note*, January 2003, Ch 1.
- 74 UNEP, 1997.
- 75 WHO, Geneva, 5 September 2006.
- 76 Dr Anders Nordström, Acting Director-General of WHO.
- 77 WHO/SEARO, Arsenic in Drinking Water and Resulting Arsenic Toxicity in India & Bangladesh, 1998. WHO's Guidelines for drinking water Quality are updated every few years. A three volume publication examines microbiological, biological, chemical and radiological aspects of drinking water. It evaluates 36 inorganic constituents, 27 industrial chemicals, 36 pesticides, four disinfectants and 23 disinfectant by-products.
- 78 Thimphu Declaration on International Health Security in the South-East Asia Region held in Thimphu, Bhutan, from 31 August to 1 September 2007
- 79 World Bank. 2002. HNP Stats (<http://devdata.worldbank.org/hnpstats/DALselection.asp>).
- 80 Esrey et al. S.A., J.B. Potash, L. Roberts and C. Shiff. 1990. Health benefits from improvements in water supply and sanitation: survey and analysis of the literature on selected diseases. WASH Technical Report No. 66. Arlington: Water and Sanitation for Health Project (WASH); Moe et al. C.L., M.D. Sobsey, G.P. Samsa and V. Mesolo. 1991. "Bacterial indicators of risk of diarrhoeal disease from drinking-water in the Philippines". *Bulletin of the World Health Organization* 69(3): 305-317.
- 81 *Compendium*, no. 484.
- 82 *Compendium*, no. 484.
- 83 *Compendium*, no. 468. See also, John Paul II, Message for the 1990 World Day of Peace, 9: AAS 82 (1990), 152.
- 84 Natasha Kanjee and Philip Dobie, NHDR Environment Thematic Guidance Note, January 2003, p. 20
- 85 Natasha Kanjee and Philip Dobie, NHDR Unit of the Human Development Report Office, *Environment Thematic Guidance Note*, January 2003, Ch 1.
- 86 World Health Organization / United Nations Environment Programme (WHO/UNEP) in a survey in 1992.
- 87 Chief of Bureau, National Herald, New Delhi in *Supremacy*, Vol.1, Issue 6, November 2006, p. 35. According to the WHO, cooking on an open coal stove exposes women to risks of lung cancer.



- 88 Cf. John Paul II, Encyclical Letter *Sollicitudo Rei Socialis*, 34: AAS 80 (1988), 559-560. See also, *Compendium*, no. 465.
- 89 *Compendium*, no. 465. See also, John Paul II, Address to participants in a convention on “The Environment and Health” (24 March 1997), 5: L’Osservatore Romano, English edition, 9 April 1997, p. 2.
- 90 See *Compendium*, no. 466.
- 91 *Compendium*, no. 472, 474.
- 92 Pope Benedict XVI, *Caritas in Veritate*, no. 49.
- 93 Pope Benedict XVI, *Caritas in Veritate*, no. 50.
- 94 *Compendium*, no. 470. Cf. John Paul II, Address to the participants at the Plenary Assembly of the Pontifical Academy of Sciences (28 October 1994): *Insegnamenti di Giovanni Paolo II*, XVII, 2 (1994), 567-568.
- 95 *Compendium*, no. 470. Cf. John Paul II, Address to the participants at a Symposium on physics (18 December 1992): *Insegnamenti di Giovanni Paolo II*, V, 3 (1982), 1631-1634.
- 96 *Compendium* no. 443. See also, John Paul II, Message for the 2004 World Day of Peace, 7:AAS 96 (2004), 118.
- 97 *Compendium*, no. 534.
- 98 Pope John Paul II, World Day of Peace 1990, no. 13.
- 99 *Compendium*, no. 486.
- 100 *Compendium*, no. 482.
- 101 *Compendium*, no. 466.