The great imperial city of Nineveh was asked to repent and mend its ways. God had given the city forty days to do that. God did not want Nineveh to be destroyed. Rather God wanted Nineveh to turn and to repent. God wanted to save Nineveh. Rossing identified two insights in the story of Jonah which are relevant to our context of climate change. First of all God is not a God who intends to punish us for our inequities. Rather God is a God who loves God's creation. God does not want the creation to be destroyed. Secondly, God believes in the possibility of human beings to turn and repent. The very fact that the great imperial capital city could turn back to God and mend their ways in forty days is the assurance for us to make global warming history through our act of repentance.

The God indwelling world is the site of grace and healing. Nineveh is a paradigm for all of us. The unbelievable good news that we find in the story of Nineveh should inspire us to journey from a politics of cynicism and despair to a politics of hope: the audacity of hope as President Obama would put it. But it demands from us a costly commitment to undergo a social *metanoia*.

What is the mission of the Church in this context? God is at work in our midst inviting our nation to turn and to repent. Fragmentary manifestations of this process of social *metanoia* are visible in our villages and small towns. Our responsibility in this historic moment is not to Christianize the movement of social *metanoia*, rather to enable and inspire our faith communities to join this movement for enhancing life. This involves re-engagement with bible and tradition, and re-imagination of liturgy and *kerygma* so that our faith communities will discern climate change as a wake up call to turn and repent. Energy audit, introspecting life style patterns, and reducing carbon footprints, are effective means to lead us to the experience of social *metanoia*. But the primary responsibility of the Church in India is to instill in our community the absurd faith to believe that if Nineveh can change, we too can change.

Climate change, according to Walden Bello, "is both a threat and an opportunity to bring about the long postponed social and economic

reforms that had been derailed or sabotaged in previous eras by the elite seeking to preserve or increase their privileges. The difference is that today the very existence of humanity and the planet depend on the institutionalisation of economic systems based not on feudal rent extraction or capital accumulation or class exploitation, but on justice and equality." This is the challenge before the Christian community as we grapple with the gospel imperative to discern the times. When we become intentional communities forging alliances with the subaltern movements we can strive together for the realization of the vision of a future where we celebrate life in abundance and weave that vision into our creative resistance to the sway of death. As Barak Hussein Obama reminds us, "Yes, we can."

Another root cause for our water scarcity is that we don't learn to calculate water, to understand the mathematics of water and its annual cycle. It is said wherever people treat rain as a headache, there will be water shortage. Rain is a great wealth. The rain that falls on our roofs and land today is our drinking water next year.

We never care to calculate our expenditure - the water we use - and our income - the rain we get. Increasing the rainfall is not in our hands. But using all the water that falls on our land very carefully is in our control. Dr. Rajendra Singh who has done outstanding work in watershed development here in Rajasthan suggests to use water a 'poor man's ghee.'

Generally, everybody complains about lesser rains. One question we never have posed so far is this: 'How much is the minimum rain required to run our lives smoothly?" In Khandwa, Madhya Pradesh, they did an a study years ago. With the participation of local people, they drew a water budget. In the rural areas, there were only three heads of water consumption. For domestic use, for livestock and for agriculture. The annual rainfall there, as per records is 800 mm. They were surprised to note that if only 16% of these rains get percolated in the earth, their requirements would be met. But there are variations in rainfall. Whenever they get 500 to 600 mm, they required 25%.

Well, this is paper calculation. They wanted to crosscheck it. In some selected areas, they went for what they called as 'total water harvesting.' In simple terms, they didn't allow the rainwater to run beyond 10 metres. Before that one or the other RWH structure would catch it. In areas wherever they carried out this experiment, within one year, they could bid good-bye to water tankers.

An important lesson in RWH is to give enough opportunity time for the rain to percolate. In a similar way, we should give sufficient time for communities to be convinced about this concept. In our country, there are enough lessons and success stories of RWH. The greatest challenge lies in creating awareness among people towards self help and in melting their mental blocks.

I would compare he process of community RWH to that of repainting a car. The actual painting process takes only few hours. But if that job has to be effective, one has to slog for days carrying out patch work, tinkering, leveling, etc.

Second important aspect to be noted is that RWH demands site-specific or location specific solutions. What is proved to be successful in Tamilnadu need not be so for Rajasthan. What is done in 'A's farm, if copied in the same way in 'B's farm too, need not necessarily yield fruits.

If you carefully look back in the country, one main factor is noticeable in all our RWH success stories. Wherever water sustainability is achieved, it is only be self-help or People's participation. Wherever people carry out *'paani ka kaam'* from heart, the results are always good and long-lasting.

We shouldn't forget that we can not conserve only water in the nature. The cement or plastic jars are very limited. The biggest and cheap water vessel we have is the mother earth. So, if we have to save water, we have to save topsoil and forests too. There is an inseparable linkage between *jal, jameen and jungle*.

We should try to understand similar linkages water has with different aspects of human life. Say for example, one can impassionately say that 'groundwater level is decreasing by two feet every year.' But if you care to go to further depths you will learn more. The open wells might have gone dry. The monoblock pumps turn futile as bore wells and submersible pumps are required. Poor farmers in such a situation can't compete with the rich and have to migrate subsequently. Slowly the 'water market' starts raising its head, throwing all the human values to the air. With more and more bore wells going deeper and deeper quality of potable water suffers. Pumping costs raise up. *Rabi* crop turns to be dream. A new expenditure head for buying tanker water opens up even for poorest people, if they have o make a living.

such bridges is possible anywhere in your country?" he asked. "People's minds are polluted with subsidies and petty politics. A state that has very conducive atmosphere for such self-help is Rajasthan", I replied Toni, "where by community efforts alone they are successful in making their lifeline - the river - to flow again."

I am always insisting that subjects like RWH, sustainable farming and sustainable living should be incorporated in school syllabus. Elders don't seem to take such things seriously. Let us at least groom a more responsible tomorrow's generation. It's not suffice if these subjects are brought in the curriculum. Water conservation related activities have to be encouraged at school level. Our neighbor, Bangladesh, where arsenic problem in water is playing havoc with the lives of people, they have introduced these subjects in school syllabus in a very effective way. Why can't we?

11

NEW PARADIGMS IN NATURAL RESOURCES MANAGEMENT: RELEVANCE OF RIVER BASIN APPROACH IN WETLAND MANAGEMENT

Dr. E. J. James

The last few decades have witnessed the recognition that the Earth's resources are finite and call for implementation strategies which ensure the maintenance of these resources for future generations. At the same time, development is undoubtedly a desirable economic and social objective which seems to achieve or maximize a number of attributes such as: increased income, improvements in health and nutrition status, educational achievements, access to resources and a 'fairer' distribution of income (Pearce et al 1990). The World Conservation Strategy (WCS) acknowledged that 'development and conservation are equally necessary for our survival' (IUCN 1980). The strategies outlined by WCS include: (i) the maintenance of essential ecological processes within 'life support ecosystems' such as agricultural land and soil, forests, and coastal and freshwater wetlands; (ii) the preservation of genetic diversity; and (iii) the promotion of sustainable utilisation of species and ecosystems. The concept of 'ecodevelopment' advanced by the WCS was brought into the realm of political development by the establishment

The integrated water resources management is based on the concept of water being an integral part of an ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilisation (UN 1992). The World Bank (1996) states that degrading the quantity and quality of water in rivers, lakes, wetlands and aquifers can inextricably alter the water resources system and its associated biota, affecting present and future generations. The holistic management of freshwater as a finate and vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policy, are of paramount importance to ensure sustainable use of water.

The inter-connected nature of river systems means that successful water management requires the adoption of methodologies which consider all the activities within an area instead of focusing on only one or perhaps a small number of limited objectives. The river basin provides the natural unit for such an approach. According to Young et al (1994), the fact that water interacts with and, to a large extent, controls other natural components within a basin such as soils, vegetation and wildlife suggests that human activities, which are so strongly influenced by water availability and quality, might best be coordinated within administrative structure which reflect river basins. This management approach should enable the incorporation of both upstream and downstream considerations into decision making and subsequently the management of water resources. It should also help to avoid the problems associated with the isolated, often short-slighted, use of water- land resources in one area which often have knock on impacts elsewhere within the river basins. In the context of a river basin, it is a natural integrator of all hydrologic processes within its boundaries and therefore a rational and ideal unit for soil, water and biomass management. These resources are closely linked and can be rightly designated as a 'trinity' in the context of a basin/watershed. If one among this trinity, namely, the bioresources is overexploited by deforestation, more soil erosion and degradation will take place; this in turn will have its impact on water balance and *flora* and *fauna* as such.

Water resources and river basin management in Asia can be viewed at a range of scales. Some of the local level water management practices followed for hundreds of years include:

* Small dykes with simple sluice gates covering 2-4 ha of rice fields in the mangroves of Vietnam;
* Lined tanks of Thar Desert in India and the k*undi* consisting of a tank surrounded by hardened surface with mud that funnels rainwater;
* Contour bunds constructed in the hillslopes at different parts of India and Pakistan;
* Wells dug in the downstream portion of the bunds to provide water for the livestock; etc.

These types of local scale integration rarely grew into river basin scales in Asia, though several major hydraulic structures were constructed in the later half of the twentieth century.

One of the attempts made in Philippines to achieve basin-wide management is worth mentioning. The National Power Corporation of Philippines is in full control of Angat River Basin, and has succeeded in achieving multiple objectives. These include: (i) maintenance of the watershed's capacity to support and sustain the generation of electricity by maintaining adequate forest cover and minimize, if not control, soil erosion; (ii) regulating land use activities and controlling exploitation of forest resources; (iii) improving socio-economic conditions of human population within the river basin and ensuring their participation in watershed management and protection; and (iv) generating income from agricultural plantations to partially subsidise the cost of watershed management and development.

Another attempt towards achieving integrated river basin management in Asia has been done in the Mekong basin of 7,95,000 km^2 area; the river is the longest in Southeast Asia and twelth longest in the world. The six riparian countries of the river include China, Cambodia, Vietnam, Laos, Thailand and Myanmar. The governments

recognize that all wetland types perform the many functions which have been attributed to them while the degree to which any one function is performed varies between wetlands.

As with the elements within river basins, wetlands do not function in isolation. They are highly dependent on upstream conditions within their river basin. Changes in the hydrology of river feeding a particular wetland will inevitably have an impact on the wetland's water level regime. Similarly, water quality changes in an inflowing stream are likely to result in modifications in wetland *flora* and *fauna*, which in turn also will affect wetland hydrology. Wetlands generally provide benefits downstream; improving river flows downstream; controlling floods; groundwater recharge; etc. Inland wetlands often influence the coastal wetlands. On a global scale, wetlands have an influence on global nitrogen, sulphur and carbon cycles. Conversely, changes in the global environment such as sea level rise have its impact on coastal wetlands.

Management of River Basins in Relation to Wetlands: Case Studies from India

The large-scale population growth in India paved the way for great pressure on land, water, and bio-resources of the river basins. The landuse pattern underwent several changes, as manifested by deforestation, urbanisation, and distribution of infrastructure facilities. Several water resources development projects came into existence during the past five decades to meet the demand of water to cater to different requirements. However, all these changes and developments took place without giving due weightage to an integrated and sustainable management of the wetlands. The concept of river basin as a unit for planning and management of the resources did not receive due recognition.This has often resulted in the over-use and mismanagement of the water resources in the upstream sub-basins, while the downstream reaches often faced water shortage and even water quality problems. Uncontrolled water use upstream often adversely affected the ecology of the downstream wetlands, especially the coastal

wetlands. In certain cases, the claim of upper riparians adversely affected the farmers in the delta region, who depended on their irrigated crops for many decades. Many of the river basins in the subcontinent spread over more than one federal state of this vast nation and some of the rivers flowing through the north of India have their basins in more than one country. The interstate and international rivers add to the gravity of the problem, since there is no coordination among the upper and lower riparian federal states and countries. Even within a state, proper coordination of different departments and agencies and understanding among actual stakeholders do not exist. All these have led to imbalances in water availability, quality, and use pattern in different sub-basins within a river basin. Many stakeholders have come up with grievances and several agitations and disputes have resulted. Some such water disputes are referred to special tribunals and courts of the country.

Since hydrology is the single-most important characteristic of a wetland, it is necessary to consider the wetland together with the entire drainage basin for the purpose of management. This is also significant since the transport of various bio-geochemicals such as sediments and nutrients, waste materials and pollutants, and suspended and dissolved materials, into and out of the wetlands will have a marked impact on the system. Also, this movement of matter through the drainage basin depends mainly on the different phases of the hydrologic cycle. Therefore, an integrated approach, with due reference to the drainage basins, is important for the wise use of the wetland.

Need for Cross-Sectoral and Interdisciplinary Approach : Case Study of Ganges – Brahmaputra-Meghna Delta

The flood waters of the Ganges, Brahmaputra and Meghna provided multiple benefits to the people of the delta in the past (Hughes et al 1994). These include agricultural production, fisheries, and grazing. Very often, different water management activities have a tendency to conflict with one another. Some stakeholders may have an upper hand over another, which can create hinderance to the wise use of the

Improvements to the Estuarine Ecosystem: Case Study of Chilika Wetland

The unscientific management of the river basins draining into the Chilika wetland has resulted in the degradation of this aquatic ecosystem, which is a Ramsar site. After the construction of Hirakud project for the purpose of irrigation in the Mahanadi river, which is the largest fresh water source draining into the Chilika, the wetland was not getting its full quota of fresh water. The Naraj barrage, which is under construction, is expected to further deprive of this wetland from fresh water supply. Certain hydrological and biological investigations carried out have brought to light that the reduction in flows has changed the hydroperiod, increased the residence time, adversely affected the flushing phenomenon, modified the entire circulation and mixing characteristics and above all caused the partial blocking of the mouth to the Bay of Bengal. All these in turn have accelerated sediment deposition tendencies and have also affected the flora and fauna of this wetland. Over-exploitation of the watersheds on the western side of the wetland, especially deforestation, has also contributed to the increase in sediment load to the wetland.

An attempt has been made to cut open a new mouth to the sea, the consequences of which on this ecosystem are not yet properly understood. The artificial channel created, namely Magaramukh, is gradually stabilizing. Large quantum of sediment is flushed out into the Bay of Bengal due to the velocity of flow in the channel. The salinity levels in the estuary has improved and the fish catch has gone up. Chilika was included in the Montreux Record in 1993; this was lifted recently considering the positive signs observed based on the activities undertaken to conserve the ecosystem.

Salinity Problems in the Coastal Wetlands: Case Study of Indus Delta

The Indus delta covers an area of 6,000 km^2 and stretches from 200 km south of Karachi to the Kutch in India. The delta comprises of 17 major creeks, extensive mudflats and around 2,600 km^2 of

mangrove forests. The annual rainfall in the area is of the order of 200 mm and the only other source of fresh water is the river flow. This is needed for the mangroves and also to maintain the sediment supply. The productivity of fish is high in the mangrove areas. It is estimated that now only 28% of the total annual flow of Indus reaches the delta and the dams upstream trap 75% of sediments (Ahmed et al 1993). This has resulted in increase in the salinity levels of creeks; the evaporation is also very high in the region. The salinity levels in many creeks are as high as 40-45 ppt, higher than that of sea water. The salinisation and water-logging are affecting more and more areas and some of these areas are not fit for crop production. A total area of 57,000 km^2 is affected by salinity. This case study brings to light how the diversion of water from the upstream areas with less rainfall will affect the flora and fauna in the coastal zone.

Wetlands and River Basin Management: Case Studies from South-West India

On the southwest coast of India, the estuarine stretch of the Periyar river is facing severe salinity intrusion and pollution concentration. This has adversely affected the drinking water project to the Greater Kochi and Alwaye urban areas, industrial water requirements of Udyogamandal complex and also the entire ecology of this estuarine ecosystem. The barrages constructed during summer to prevent salinity intrusion from the sea add to the problems faced by the estuarine ecosystem. All these are caused by the transfer of waters more than a century ago from the upper reaches of this river to the east-coast and another transfer to the Muvattupuzha basin on the south for power production arising out of the Idukki project, and also limitations of the operation rules of the upstream reservoirs.

A case study conducted in the ten river basins draining into the Vemebanad-Kol wetland system in south west India has shown several problems created due to the unscientific management of the river basins. Some of the measures suggested to improve the situation include diversion of waters from the river systems to the wetland

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SOME IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY

Dr. John B. Sale

As stated in the recent Stern report to the UK government, 'the scientific evidence is now overwhelming: climate change presents very serious global risks, and it demands an urgent global response' (Stern, 2006). Sir John Houghton in his foreword to Spencer and White (2007) also emphasises that it 'is a *global issue* because nearly everybody in the world is contributing to it and everybody will be affected by it.' And he adds, '…it is not only humans that will suffer. The rate of change is such that much of the world's flora and fauna will be unable to adapt.' The proportions of carbon dioxide and other 'greenhouse gases' in the atmosphere are already at levels not experienced for over 160,000 years and are set to rise to more than double the present level by the end of this century unless determined action to reduce their emissions is taken (Houghton, 2004). Resulting from these changes in the composition of the earth's atmosphere - the so-called 'greenhouse effect'- is producing increases in global temperatures. An average rise of 2ºC is now thought to be unavoidable and even this will melt ice caps, change ocean currents, cause floods and famines, and put millions of human lives at risk.

While it is clearly important to consider the implications of these rapid climatic changes for the world's human communities and matters such as health, agriculture and economic stability, it is also essential that we examine the effects on biodiversity and the various natural ecosystems that are increasingly affected by human activities. Only a little over 10 per cent of the earth's land surface is under cultivation, and while the rest is largely unmanaged by humankind (Houghton, 2004), we nevertheless depend on it in numerous ways and are impacting it to an unacceptable degree. It is now estimated that 60 per cent of the world's ecosystems are degraded or used unsustainably. For example, natural forests that cover about 30 per cent of the unmanaged land protect our water supplies, provide much of our timber, resins and fibres, not to mention the provision of habitat for the majority of the plants from which about 25 per cent of our medicines originate, are disappearing at an alarming rate. But even more important in the present context is the fact that these forests remove large amounts of CO^2 from the atmosphere, produce oxygen and regulate the amount of water vapour reaching the atmosphere from the soil. Forests and other vegetation types also furnish a great variety of animal species with appropriate habitat, including some that have provided the genetic base for domestic species and are essential to our human existence in the provision of transport, meat, hides and some medicinal products. So that, in addition to our concerns over climatic effects more directly related to human livelihood, it is vital that we maintain all natural ecosystems and aim as far as possible to protect them from additional negative impacts of climate change.

Respected organisations such as Conservation International and IUCN (The International Union for the Conservation of Nature) emphasise that climate change is among the greatest threats to biodiversity today. In addition to their obviously deleterious effects on wildlife, deforestation and land-use practices such as slash-and-burn cultivation, soil loss and degradation, road building and urban sprawl, contribute 25 per cent of global greenhouse gas emissions. It is believed that unchecked climate change is likely to lead to the extinction of

will lead, over time, to large changes in the composition and functioning of an ecosystem. In the much longer term, the distribution of biomes and the major vegetation types that characterise them will change as a result of varying patterns of mean annual temperature and precipitation.

Many existing tree species will not be able to cope with changing climatic conditions; they will decline in health, becoming vulnerable to attack by pests and forest fires. In Canada, for example, die-back of trees has shown to be related to climate change, especially warmer winters and drier summers. A drying climate in Borneo is contributing to the frequency and intensity of forest fires that not only worsen air pollution, and thus climate change, but are also destroying the habitat of many wildlife species such as the endangered Sumatran rhino, Orang-utan and other primates, and many rainforest birds.

Effects of Warming on Breeding Seasons and Population Ranges

Warmer air temperatures mean shorter winters and spring arriving up to several weeks earlier, which is already showing a profound effect on birds and mammals that traditionally migrate away from the tropics to breed during the spring and summer of temperate zones. For example many migratory bird species that spend the winter in Africa are arriving on their European breeding grounds earlier than usual, with the result in some cases that hatching of the chicks no longer coincides with a peak in the food supply, such as caterpillars or other small prey. Many of these young birds are thus subjected to starvation. Around Britain, populations of sea birds such as the Puffin are collapsing as the adult birds are no longer able to find sufficient sand eels, their main food source, to feed their chicks. It is believed that the rise in ocean temperatures in the last 20 years has forced the sand eels and the plankton on which they feed to move to cooler waters. In the St. Kilda archipelago off western Scotland, home to 136,000 pairs of Puffins, many of the surviving chicks are in very poor condition and large numbers of dead chicks are seen lying around the nesting

colonies during the breeding season. A similar fate befalls some migratory fish species, where temperature rise triggers migration and subsequent early spawning but a flush in plankton growth, essential to feed the young fish, takes place at the usual (later) time as it is controlled by day-length.

The geographical ranges of some animals are also changing, as, in response to higher temperatures, they either shift their range to higher latitudes or move up the altitudinal range to occupy mountain areas that were previously too cold for them. Such geographical shifts can put pressure on traditional occupants of the 'new' ranges. In North America, the range of the Red fox is extending northwards and impinging on that of the Arctic fox whose traditional range is thus being reduced by the intruder, in addition to unaccustomed competition for seasonally scarce prey. In the high Himalaya, warming will result in the snowline shifting upward, thus reducing the habitat available for species such as the Snow leopard that will be forced to limit its range to higher altitudes. But some animals, such as many amphibian species, will be unable to move to areas with a more suitable climate. An avian example is the Scottish crossbill, which is predicted to disappear from its habitat as temperatures rise. The future climate of Iceland will probably be ideal for this small bird but it is highly unlikely to be able to move over such a great distance of ocean and get established there. Seven other British bird species will struggle to survive if temperatures rise by 3ºC. At the same time, 19 types of bird are forecast to make an appearance in Britain as breeding species. Throughout Europe it is estimated that bird species would have to move an average of 547 km to find suitable habitat. Other species may find that alternative habitats that would, in theory, suit them are already so altered or destroyed by human activities that they are no longer habitable. In these ways delicately poised food chains and the balance of entire ecosystems are being disrupted by climate change, with the effect of driving many species toward extinction.

as seals, often jumping across gaps in the ice or swimming across moderate stretches of open water. In some areas disappearing sea ice is forcing bears to make much longer, riskier swims and the recent finding of emaciated or dead individuals is adding to the alarm (Nicklen, 2007). The IPCC predicts that arctic sea ice could disappear by the end of the century and some scientists fear that this result of global warming could drive Polar bears to extinction in the same time frame. In the Antarctic, the thinning of the sea ice is a threat to krill, the shrimp-like crustaceans, that live beneath it and constitute the main food source of Emperor penguins that are already showing signs of decline in numbers.

Rising Sea Temperatures and Marine Life

The rise in ocean temperatures is also having devastating effects on many forms of marine life. In some areas it has resulted in blooms of poisonous algae that can contribute to epizootics such as one which caused a major die-off of Striped dolphins in the Mediterranean in the 1990's . Changes in the distribution, abundance and composition of prey species of cetaceans (whales, dolphins etc), such as salmon in the north Atlantic, have also been attributed to changes in sea temperature. Similarly, a long-term decline in amphipod crustaceans in the Bering Sea due to warming waters are thought to have caused the starvation and stranding of hundreds of grey whales along the west coast of the Americas in 1999-2000. While migratory populations of marine mammals can shift their range to adapt to changing conditions, non-migratory populations that are confined to certain areas of the sea, such as the Humpback whales of the northern Indian Ocean, cannot simply move away from adverse changes within their normal range and are therefore especially vulnerable to climate induced changes in their food supply.

Corals are another group of marine organisms that are being adversely affected by rising sea temperatures. Corals normally live close to their upper lethal temperature limit and a rise of as little as 1ºC can lead to the 'bleaching' of corals by killing their symbiotic

algae, a condition that eventually leads to the death of the coral. In 1998 the upper temperature limit was exceeded in the Indian Ocean and over 90 per cent of coral reefs are reported to have died. Coral reefs are a key foundation of much sea life. Many fishes use them for shelter, as a source of food and as a place to reproduce and coral die-off will seriously deplete marine resources on which a large section of the human population depends.

Changes in Sea Chemistry

The acidification of the oceans, resulting from increased atmospheric CO^2, adversely affects the calcification process of marine organisms including corals and calcifying plankton. It also affects squid because their high energy swimming method and their high metabolism require a good supply of oxygen but increasing CO^2 concentration lowers blood pH and its oxygen carrying capacity. Significantly squid are, in addition to being a human food source, important prey species for many deep-diving marine mammals.

Changes in wind direction, resulting from climate change, can alter ocean currents leading to the upwelling of deep sea waters rich in nitrogen and other nutrients. This can lead to plankton blooms, followed by their decomposition that uses up large amounts of oxygen. High levels of oxygen depletion, as little as one-sixth normal concentration, have been recorded in some areas of the Pacific, causing die-offs of fish and crustaceans, and leading to 'dead zones' in the ocean in which very little life persists.

Conclusions

Climate Change and Conservation Management

It is clear from this review of some of the effects of climate change on biodiversity and the living ecosystems on which human life and all other species depend that there is a mounting threat to life on Earth as we know it; and future development options are becoming restricted thereby. In spite of measures to protect biodiversity, the rate of species extinction is now reckoned to be over one hundred times greater than

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A RETELLING OF BIBLICAL PARABLES

Dr. Mathew Koshy Punnackadu

Jesus' words were aimed at people who had no idea of modern science and technology. There were no environmental problems during the time of Jesus as we have today. Had Jesus lived in the present, he would have used modern terminologies to express God's purpose and mission of the Universe. Hence, it is the duty of theologians and scholars to re-tell the biblical parables in a contemporary context. Here I am attempting to retell a Biblical parable from an environmental perspective.

A Reading from Luke Chapter 12 beginning at verse 16. (Luke 12:16-)

Jesus told them this parable: "The ground of a certain rich man produced a good crop. He thought to himself, 'What shall I do? I have no place to store my crops.' "Then he said, 'This is what I'll do. I will tear down my barns and build bigger ones, and there I will store all my grain and my goods. And I'll say to myself, "You have plenty of good things laid up for many years. Take life easy, eat, drink and be merry." "But God said to him, 'You fool! This very night your life will be demanded from you. Then who will get what you have prepared for yourself?' "This is how it will be with anyone who stores up things for himself but is not rich toward God."

Modern Version in an Environmental Background:

And he went on to say to them all, "Watch out and guard yourselves from every kind of greed; because a person's true life is not made up of things he owns , no matter how rich he may be." Then Jesus told them this parable: " There was once a rich man who had land which yielded good crops. He was interested in Science and Technology. He appointed leading scientists all over the world in his high-tech laboratory and asked them to bring out high yielding rice seeds. As per the direction of the rich man the scientists started research and succeeded in bringing our high yielding genetically engineered seeds.

Scientists told the rich man: " If farmers cultivate this high yielding variety of rice seeds, then famine will become a myth."

The rich man instead of appreciating them became quite astonished. He told the scientists: " Look, you should not eradicate famine with these high tech-seeds. The farmers should come to my company for buying the high tech seeds. They are free to use these seeds, but they may not be permitted to use the seeds in the traditional way. If they make seeds in the traditional way why I should spend money?"

The rich man put the scientists in a dilemma. The rich man again told them. You have manipulated the gene to get better seeds. Using the same genetic engineering, why can't you remove the reproductive part from the seed?"

The scientists started research in this direction and at last they succeeded in bringing out seeds with the terminator gene. The farmers had to buy seeds from the company for cultivation, but they could not set apart the seeds for the next annual cultivation. The rich man became happy.

He began to think for himself, "I have created the best seeds of the grains which are used by the majority of the people all over the world. The farmers all over the world can purchase the best seeds from my company. The farmers will abandon the traditional seeds and will use my seeds. After some more years the other seeds will

conservation and efficiency and production of clean energy are means of practicing faithful and responsible stewardship.

Unfortunately, the motivations of greed and acquisition of goods rather than concern for God's creation continues to drive our economy– and much of our world. The prophet Jeremiah had words for those in his society who were counterparts to our more modern profiteers, saying, "From the least to the greatest of them everyone is greedy for unjust gain . . . . They have treated the world of my people carelessly, saying, 'Peace, peace,' when there is no peace. They acted shamefully . . ." (Jeremiah 6:13-15). We are at a crossroads, and Jeremiah has more to say about how we can proceed from this point: "Stand at the crossroads, and look, and ask for the ancient paths, where the good way lies; and walk in it, and find rest for your souls" (Jeremiah 6:16).

But stewardship means even more. We are responsible for protecting God's creation because it is intended for the well-being of all creatures, as we are created in God's image (Genesis 1:27). People of faith are called upon to "defend the poor and the orphan: do justice to the afflicted" (Ps 82:3), to care for "the least of these" (Matt 25:35), and to love our neighbors as ourselves (Leviticus 18:19, Matthew 22:39). When we care for God's creation, we practice justice by protecting the vulnerable. Ensuring a cleaner, safer environment means that we care for the elderly and the sick by not putting their lives at risk from harmful pollutants, and that we ensure a safer, more secure future for generations to come.

Christians believe in God as a creator, and we can't honour the maker and disrespect what was made. And since human beings can't live independently of the rest of the biosphere, Jesus' great command to 'love your neighbour' immediately precludes the abuse of your neighbour's land, air, water, and natural resources. Along with the Old Testament's laws about the stewardship of agricultural land for the next generation, the definition of 'neighbour' can mean other people in time as well as in geographical space. And then there are verses of the Bible like Luke 12:48, in which Jesus could well be speaking to the developed nations: "From everyone who has been given much, much

will be demanded; and from the one who has been entrusted with much, much more will be asked."

CSI Synod Ecological Concerns Committee expresses their deep concern over impact of global warming. As the official body of church of Church of South India to formulate and propagate environmental concerns in Church and Society we consider climate change and abuse of the environment is against God's will. We hope to inform and inspire people of faith to take personal and collective action to reduce global warming emissions. We are destroying our earth. We can't protect human rights if we aren't here. Everyone has a stake and a role in reducing global warming emissions. Working together we can change history. The CSI Synod Ecological Concerns Committee would like to take up the action plan to the grass root level to make it a reality. CSI Ecological decided to collaborate with other groups having similar goals and form a net work for effective functioning and co-ordination.

1 Green Cover

The members of Church of South India will plant as much trees to improve the green cover. Forests are one of the most effective carbon sinks and critical for preserving the ecological balance. Besides other plants emphasis will be given in promoting the planting of Vetiver, Jatropha and Mangroves which will reduce green house gases. These plants help in improving ground water recharging.

2. Green lighting

We will promote the use of compact fluroscent lamps (CFLs) which uses one-third of the power than conventional bulbs. The Indian government has launched a massive programme to popularise CFLs by launching schemes to encourage consumers to buy them. It can lead to reduction of 10,000 MW of electricity.

3.Green Fencing

Instead of concrete compound walls that consume loads of cement and brick, not to mention steel, all huge carbon emitters, there is a rising trend of having fences by growing bamboo trees and vetiver

fitted with intelligent sensors to regulate cooling according to the number of people in the room. The Governments should promote green buildings.

6 Saving Rivers

The condition of India's rivers is a barometer of the state of the environment. The rivers are dying. Most are highly polluted with domestic sewage, industrial effluents and an erratic waterflow. With global warming, the stress levels on the country's key rivers will only exacerbate. Both, the Centre and the states will have to launch serious drives to revive the ecosystems.

Appendix 2

CSI Synod Ecological Concerns Committee Members and Resource Persons

Chairman : Rt.Rev.Thomas Samuel
Convener : Prof. Dr.Mathew Koshy Punnackadu

Andhra Pradesh

Rev.T.Praveen Abrham
Mr. S.Premanathan
Rev..K.Edwin Sudhakar,
Mr. B Johnson,
Mr. B Daniel Rajkumar
Rev.M.Jayanand
Dr. Hwelen Davidson

Karnataka

Dr.Mrs. Pamela Suresh
Rev.Premkumar Soans,
Rev.samuel S.Sakkari
Mr. R.Johnson

Tamil Nadu

Dr.J Azariah
Prof. Dr.A.Relton
Rev.D.G.A.Thomas
Rev.A.Stanly kumar,
Dr.Daniel Vincent,
Rev. P.Jayachandran,
Rev.T. Kumar,
Rev. Abraham Renold
Rev. M.Aruldoss