

WHO TAKES CARE?

- a call for Christians to care for God's creation

EXECUTIVE SUMMARY

This paper is addressed to Europe's Evangelical Community. We share the belief articulated in the Bible that God is the Creator. He created the earth and everything in it, including us human beings whom he made the caretakers of his creation. After a brief Introduction, Section Two examines what the Bible teaches about our creation care responsibilities, cautions against both complacency and despair and points to grounds for hope linked to the second coming of Christ.

Section Three examines how and why the world's climate seems to be changing and the possible consequences. These include rising sea levels that could submerge low lying coastal areas and precipitate mass migrations from countries such as Bangladesh. Fresh water supplies are threatened when climate change brings extended periods of drought. Farming is closely dependent on climate and climate change will inevitably affect agriculture and food supply. Pollution, water shortages and heatwaves will also affect human health. Coping with all these effects will cost money and have an impact on national economies, budgets and taxation.

The rapid growth of the world's population, which is expected to double in the next 50 years, raises questions about the planet's capacity to provide sufficient food, clean water, energy and medical provision which are discussed in Section Four.

Our Creator has given us all we need to sustain the way of life he intended for us but we are using up those resources faster than they can be replaced. Section Five examines the depletion of energy resources, clean water and air as well as fish stocks. Soil erosion and deforestation reduce our capacity to feed the world and waste disposal is another huge problem.

Future generations will pay the price for our negligence as caretakers. Section Six rejects both the view that the earth is finished and the naïve optimism that thinks technology and human ingenuity will find a way out of the mess. Instead, hope is to be found in the biblical conviction that God is sustainer as well as creator of all that he has made. Nevertheless, we caretakers still have our part to play and will have to give account for our conduct on the Day of Judgement. The Conclusion gives three reasons why we should not downplay our creation care mandate and offers some practical examples of how we can be better caretakers. A reading list is appended.

1. INTRODUCTION

Rarely a day goes by without the broadcast or newsprint media somewhere in Europe reporting some new information or story about an environmental issue or problem.

Sometimes it concerns the effects of climate change, or the pollution of the land, sea or atmosphere. On other occasions, the report focuses on population growth and the future difficulties in feeding everyone. Then again, it could be stories of rare plants, animals, birds or fish that need conserving. For some, such as those employed in the fishing industries, these measures could mean unemployment and poverty. For those living at sea level in areas prone to storm surges and flooding the future could be one of homelessness and the need to migrate. All is not well with planet Earth and we, its inhabitants, can no longer pretend otherwise. There are tough questions and even tougher answers.

Christians have dual citizenship; we are citizens of both the Kingdom of God and of our nation state. In the former capacity, we are commanded to go into all the world and make disciples. As we seek to do this, it is highly likely that eventually we will be challenged with some of those tough questions; such as where was God when hurricane Katrina wreaked havoc in New Orleans. Or why did God allow that tsunami off the coast of Thailand that killed so many people? If we want to tell them about their need of a Saviour, a need they might not yet have recognised, we must be prepared to respond intelligently to such questions and do so with biblical consistency.

This short paper examines some of the major environmental issues and problems that are causing concern today. There is nothing original here; we have simply searched through the Bible and the writings of people¹ whose expertise we trust in the hope that this brief review will help others who have not the time, resources or opportunity to do this for themselves. We have done this out of a conviction that God's people have a prime responsibility to understand and fulfil the very first command that God gave us and if we do not our collective impact, as evangelical Christians will be impaired. This conviction is totally different from contemporary attempts to make creation the meta-narrative. The only meta-narrative informing this paper is the Bible, which teaches us that the earth is God's creation and he made us its care-takers. The following section unpacks that teaching.

2. A BIBLICAL FRAMEWORK FOR CREATION CARE

IN THE BEGINNING: GOD CREATED

Christians have both pragmatic and biblical reasons for caring about the state of the planet. Like everyone else, we will be affected by any adverse consequences of climate change. More important, though, for Christians who look to the Bible as our ultimate authority on matters of belief and behaviour, we understand that the earth belongs to the Lord² because he made it and found it to be good. Moreover, we understand that a good creation could only have been the work of a good God, not some impersonal chemical or

¹ The writers on whose work we have drawn are identified in footnotes and in the Resources section at the end of the paper but we owe a special debt to John Stott, Roy McCloughry, Chris Wright and Sir John Houghton. They are not responsible for the use we have made of the material.

² Psalm 24:1; Deuteronomy 10:14; Job 41:11)

biological process.³ Nevertheless, there is an important question to be addressed before we attempt to identify a theological framework for creation care. It is not enough simply to search the Scriptures for verses that seem to relate to this subject and then pull them out of their specific biblical context in order to use them for our own purposes. That would be to impose our purposes on the Scriptures instead of reading the Bible faithfully and obediently as the word of God.

So, for example, we have to be sure that it is legitimate to draw on the Old Testament creation narratives in order to lay a foundation for this theological framework for creation care. Some have argued that we should not do this because the idea of caring for creation would never have entered the thinking of those who lived in Old Testament times.⁴

However, Chris Wright reflects the majority view amongst evangelical Christians that there is a clear call in the creation narrative for humankind to subdue the earth and care for it. Thus any biblically based theology of creation care will be based on two core principles: that the earth belongs to God; and that he has given into human hands the responsibility to care for it.⁵

That the earth belongs to God has some stunning implications. First, although only his human creatures bear the image of God, the earth nevertheless reflects something of the character of its Creator, especially its beauty and, on occasions, its power.⁶ It follows that if we deliberately neglect to care for his creation, or worse, damage it by our misuse and abuse; we will betray its Creator's explicit intentions.

It is worth stressing at this point that this insight is completely different from New Age thinking about caring for the earth. There is a clear duality in the biblical account of creation between the Creator and the creation. This contrasts with New Age monism that holds that all reality is ultimately one, and also with pantheism, that believes everything is God so we can find him in the natural world around us. It is also different from polytheistic thinking, which considers the earth to be divine and to be honoured and placated with fertility rights. Some of the Psalms personify the earth, mountains and forests and portray them as worshipping God. They also call us to worship our Creator but *never* his creation. It follows that if we love God with all our heart, soul, mind and strength, we should also treat what belongs to him with care and respect. "To devalue what God values is to mute God's praise and to diminish his glory."⁷

The second implication of God's ownership of the earth is that it is not our planet to do with as we please. That may seem obvious until one observes the normal behaviour of humankind today and for at least the last two hundred years. Whilst for much of human history people have striven and even fought to 'own' land as a source of wealth, income and power, the way they then used that land was commonly influenced by what they perceived to be 'natural laws' that kept them from over-utilising the land and rendering it infertile. Since the industrial revolution, however, these practices of good husbandry have sometimes given way to human greed that has degraded the environment. We see

³ See Psalm 106

⁴ Cyril Rodd is one proponent of this view, quoted in C.J.H. Wright, "Old Testament Ethics for the People of God", IVP 2004 (pages 104-5)

⁵ C.J.H. Wright *ibid* page 106ff

⁶ See for example Job 12:7-9; Psalms 19, 29, 50:6; 65; 104; 148; Acts 14:17; Romans 1:20.

⁷ C.J.H. Wright, "*ibid*, page 116.

evidence of this in the dust bowls of North America, the deforestation of the equatorial rainforests, and the over-fishing of the seas that has made some fish species virtually extinct. Such behaviour shows no respect for God's ownership of the earth and no concern for the well-being of future generations.

The second core, biblical principle, that God has given humankind the responsibility of caring for his creation also has some important implications. First, this responsibility is not given to any of his other animate creatures even though the earth is also their place of habitation. There is one key difference between them and us: uniquely amongst all his creatures God made human beings in his own image.⁸ Nowhere in the Bible is the meaning of this spelt out but it surely includes the possibility of enjoying a relationship with him. If that is so we will want to live in ways that please and glorify God, including caring responsibly for all that he created.

This leads to consideration of what it means to be good caretakers, which requires a careful exegesis of Genesis 1:28. Having created humankind in his own image, God blessed them and said to them, "Be fruitful and increase in number, fill the earth and subdue it. Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground." The command to subdue and rule, (have dominion)⁹, is controversial for some ecologists who attribute the present disordered state of the planet to the way humankind has fulfilled this command. Even if the blame belongs elsewhere, there is no doubt that Genesis 1:28 has been seriously misunderstood by some in the Christian Church. John Stott quotes the story of a Church of Scotland Minister who shot two rare otters brought from Nigeria by the author Gavin Maxwell and justified doing so by claiming, "The Lord gave man control over the beasts of the field".¹⁰ It is possible, perhaps, that the Minister had Psalm 8 in mind. This Psalm speaks of humankind as "little lower than the heavenly beings" and "You made him ruler over the works of your hands; you put everything under his feet: all flocks and herds, and the beasts of the field and the birds of the air, and the fish of the sea, all that swims the paths of the seas." If this were so, however, it would be important to exegete these verses in the context of a biblical understanding of 'ruling' and kingship, the strongest model of which is surely that of servant kingship as exemplified by Jesus, not the tyrannical abuse of power about which Samuel warned Israel.¹¹ The creation exists primarily for God and to behave as if it exists primarily for us is arrogant and wrong. Of course, he gave us the fruit of the earth as our food but we share this fruit with all the other animate creatures¹² and when we behave in a manner that makes other species extinct, we are not honouring their Creator and ours. "We care for the creation because we love the God to whom it belongs and because we long to see God's glory enhanced through creation and God's pleasure in creation served through our loving care."¹³

Once again we need to recognise that this is different from the arguments advanced by New Agers and, especially, by secular animal rights activists. One of the latter has

⁸ Genesis 1: 26-27.

⁹ As per the Authorised version of the Bible.

¹⁰ JRW Stott "Issues Facing Christians Today", Marshalls 1st Edition page 117. (4th Edition page 151.)

¹¹ See 1Samuel 8:10-18

¹² Genesis 1:29-30 but note also Genesis 9:1-3.

¹³ C.J.H. Wright *ibid* page 127

suggested that the destruction of human life is no more serious than the destruction of the wilderness. Even more extreme is the view that “human beings are an evolutionary mistake.” Pentti Linkola, an activist of the Finnish Green Party has declared, “He has more sympathy for threatened insect species than for children dying of hunger in Africa”.¹⁴ That is to go from one extreme to the other and most definitely not part of the case for Christians to be caretaking God’s creation. At the same time, it is possible that some evangelical Christians will be tempted to place a very low priority on caring for the planet and even to see it as a distraction from the higher priority of evangelism. There are several responses to that mindset. First, caring for God’s earth is not an alternative to proclaiming and sharing the Gospel, it is an aspect of our lifestyle even as we evangelise. As Chris Wright aptly puts it, “Creation care is a fundamental dimension of our humanity, not an optional dimension of our Christianity. In this, as in so much else, to be Christian is to be called to be more human, not to behave as if the first great responsibility that God laid on the human race somehow does not apply to us.”¹⁵ Moreover, a lifestyle that takes God’s word seriously is surely a powerful witness to those who do not and, conversely, disobeying God’s word is not a sound basis on which to evangelise.

John Stott has helpfully suggested two other implications of our caretaking role. The first is that it has to be one of co-operation with God. Humankind can plough, irrigate, fertilize and plant or sow the land but God had already created the processes of nature that make the earth fruitful before he created us. Certainly modern farming techniques and technology can increase crop yields but they have also created soil erosion and destroyed countless species of insects, birds and plants. At best, we “co-operate with the laws of fruitfulness which God has already created”.¹⁶ The second is that humankind’s dominion is delegated. As we have already observed, the earth is not ours to do with however we please, it remains God’s¹⁷ and therefore we shall have to give an account of our caretaking. What stronger justification can there be for a Christian to take seriously a duty to care for the planet?

THE FALL AND THE EFFECTS OF SIN

To what extent is the mess that the human race has made of caretaking God’s creation a consequence of ‘the fall’ described in Genesis 3? The Bible is in no doubt that one consequence of human sin and disobedience was alienation between humankind and the rest of creation. “Cursed is the ground because of you; through painful toil you will eat of it all the days of your life. It will produce thorns and thistles for you and you will eat the plants of the field.”¹⁸ Given the interdependence of the natural world and the dominance of the human race in the world, it is hardly surprising that ‘the fall’ should also affect the earth and the rest of creation. Chris Wright reminds us that the prophet Hosea drew

¹⁴ Cited in G.E. Veith, “Guide to Contemporary Culture”, Crossway Books, 1994, page74

¹⁵ C.J.H. Wright, *ibid* page 127

¹⁶ Stott *ibid* page 113 (1st Edition) and pages 148-9 (4th edition)

¹⁷ See for example Psalm 50:10-11; Matthew 5:45; 6:26-30

¹⁸ See Genesis 3:17-18 & Genesis 5:29.

attention to the ecological effects of human sin:¹⁹ “Because of this the land mourns, and all who live in it waste away; the beasts of the field and the birds of the air and the fish of the sea are dying.”²⁰ In his commentary on Hosea,²¹ Derek Kidner suggests that Hosea was not commenting on his contemporary scene but anticipating God’s future judgement on corporate sin and quotes Leviticus, “If you defile the land, it will vomit you out as it vomited out the nations that were before you.”²² Significant in this context are the number of species, animal, bird, insect and plant, that God created and are now extinct. We will return to this reduction in bio-diversity later but note here that one authoritative estimate in 2004 was that “a total of 15,589 species face extinction”²³, not counting those that are already lost.

However, when one seeks to identify evidence of these effects of ‘the fall’ and is tempted to include earthquakes, volcanic eruptions, hurricanes, tornadoes and tsunamis, bacteria that cause painful diseases and cruel behaviour amongst animals, one is confronted with a challenging question. Are these phenomena the consequence of the fall of humankind or did they predate the creation of humankind? Those who interpret the early chapters of Genesis literally may not be troubled by this question; those who believe that there is geological and paleontological evidence for the existence of life before the creation of human beings may suspect that these phenomena are not all consequences of ‘the fall’. The biblical scholar, Richard Bauckham takes this view. “If we can interpret such features of nature as amoral rather than immoral, then we may be able to see them as imperfections, indicative of the incompleteness of the process of creation thus far, rather than as departures from God’s creative purpose.”²⁴ Nevertheless, if people are killed by any of these phenomena because of human greed, neglect or carelessness, for example by building on unstable ground or floodplains, or by not working hygienically in a hospital ward, then surely all evangelicals would agree that those deaths are consequences of ‘the fall’.

It would be easy as one ponders the effects of human sin and its effects on God’s creation, and on our collective failure to conserve what God created and considered good, to be filled with shame and despair. Vicarious shame would be legitimate but despair would not, for that would be to forget the possibility of repentance and redemption, the harbingers of hope at the heart of the Christian Gospel.

REDEMPTION AND HOPE IN CREATION CARE

The heart of the Gospel is the good news that God, our Creator, came and dwelt among us as the man Jesus, to make it possible for his fallen human creatures to repent of our sins, to be reconciled to him through the death and resurrection of Jesus the Saviour and to be transformed by the work of his Spirit within us. Moreover, this good news includes hope for the rest of creation as well as God’s people. “For the creation was subject to frustration, not by its own choice, but by the will of the one who subjected it, in hope that the creation itself will be liberated from its bondage to decay and brought into the

¹⁹ C.J.H. Wright, *ibid* page 136

²⁰ Hosea 4:3

²¹ D. Kidner, “The Message of Hosea” IVP/The Bible Speaks Today 1981, page 48

²² Leviticus 18:28

²³ The IUCN Red List of Threatened Species, cited in J.R.W. Stott, *ibid* page 141

²⁴ R. J Bauckham, ‘First Steps to a Theology of Nature’, *Evangelical Quarterly* 58 (1986) page 241

glorious freedom of the children of God.”²⁵ The one referred to here as subjecting the creation to decay was God himself. “Only God, being both Judge and Saviour, entertained hope for the world he cursed.”²⁶ St Paul is not alone in recognising this; Isaiah prophesied it and the Book of Revelation confirms it.²⁷ This will not happen until Christ returns and in the meantime, we still have our original calling to be God’s caretakers of his creation. “The certain hope of a renewed future creation is not a licence to abandon care for this one. Rather, the opposite is the case: because there is some continuity between this world and the next, because it will be the fulfilment of God the creator’s plans for this universe, there is every incentive to foster and to use the innate underlying goodness and fruitfulness of this material world to do what is pleasing to God in our time and place.”²⁸

3. GLOBAL WARMING AND CLIMATE CHANGE

Variations in weather occur from day to day and variations in climate from year to year. However, in the last 50 years we have experienced extreme climatic phenomena that have killed large numbers of people. For example, natural disasters occurring between 1947 and 1980 had the following disastrous effects:

Type of disaster	Deaths caused ²⁹
1. Tropical cyclones (hurricanes, typhoons etc.)	499,000
2. Earthquakes	450,000
3. Floods	194000
4. Tornadoes & thunder storms	29,000
5. Snowstorms	10,000
6. Volcanoes	9,000
7. Heat waves	7,000
8. Avalanches	5,000
9. Landslides	5,000
10. Tidal Waves (Tsunamis)	5,000

Since the 1980’s meteorological records seem to have been broken somewhere on the planet almost every year, often with disastrous consequences for some countries and peoples. Some examples are listed below:

²⁵ Romans 8:20; see also Colossians 1:20

²⁶ J.R.W. Stott, “The Message of Romans”, IVP/The Bible Speaks Today, 1994, page239. See also F.F. Bruce, “Romans”, IVP Tyndale New Testament Commentaries, 1985/1992 reprint, page 163.

²⁷ See Isaiah 11:6-9; 65:17, and Revelation 21:1; 22:3

²⁸ R. White, “A Burning Issue: Christian care for the environment” Cambridge Papers Vol 15/No4 December 2006

²⁹ Source: John Houghton, “Global Warming: the complete briefing”, Lion 1994, p11. This paper relies heavily on the work of Sir John Houghton F.R.S... He is an eminent atmospheric physicist, former Director of the UK Meteorological Office, Chairman of the Royal Commission on Environmental Pollution and a committed Christian. No other specific attributions are made to his work because they would be too numerous. Sir John is not responsible for the selections I have made from his work.

- October 1987 storms in South East England, Northern France, Belgium and Holland (the worst since 1703) caused enormous damage to buildings and trees. (15 million trees were destroyed in Southern England alone).
- January 1990 another storm of similar intensity swept across much of Western Europe.
- The Caribbean, Gulf of Mexico and South East USA experiences hurricanes and tornadoes on a regular basis between June and October.
- Bangladesh has experienced numerous storm surges and flooding. In 1970 250,000 people were drowned in one flood and in 1988 80% of Bangladesh was flooded.
- In China the Yangtze River region experienced devastating floods in 1991.
- The Mississippi and Missouri rivers flooded an area equivalent to one of the Great Lakes in 1993.
- Large areas of southern Africa and Australia have experienced droughts of a duration and scale unprecedented in living memory.
- The El Nino phenomena (warmer than usual temperatures in the Pacific off the coast of South America) have been associated with floods and droughts in different parts of the world. In 1990-93 this had exceptionally serious effects.
- Volcanic eruptions also influence the climate as dust and gases (particularly sulphur dioxide) enters the atmosphere, reduces radiation from the sun and cools the atmosphere.
- The flooding of St Louis (USA) in 1993 and the impact of Hurricane Katrina on New Orleans in 2005
- The Asian tsunami of December 26th 2004 that left 186,983 people dead and another 42,883 missing.

The purpose of listing these disastrous events is to recognise the seriousness of climate change that has already occurred. These incidents leave no room for complacency but equally there is no call for the alarmism that inhibits a constructive response. Many people have already suffered the effects of climate change. The right response is to do everything we can to minimise further suffering. We can do no more but we should also do no less.

THE CAUSES OF CLIMATE CHANGE

So how do we interpret these extreme climatic events? Climatic variations are normal but are the events listed above really abnormal? In the late 1960's and early 1970's there was speculation that we were heading towards another ice age but the cold period ended. Now we see evidence of global warming. Will that end in the same way or is it something new and entirely different?

Global warming occurs because of the greenhouse effect. It happens naturally but has been enhanced by the increased production of carbon dioxide resulting from human activity. The Earth receives radiant energy from the sun and also emits its own radiation.

Water vapour, carbon dioxide and other minor gases³⁰ absorb some of the thermal radiation coming from the Earth's surface, which has the effect of blanketing the planet, making it warmer than it would be otherwise. Without this blanketing effect the planet would have an average surface temperature of -6 degrees Celsius. With it the average surface temperature is 15 degrees Celsius. However, the increased emission of carbon dioxide and other greenhouse gases is increasing the greenhouse effect. If carbon dioxide levels are doubled in this century the average surface temperature of the planet will increase by 2.5 degrees Celsius with substantial consequences for our climates.

Carbon dioxide in the atmosphere has been increasing over the past 200 years and substantially over the last 50/60 years. This is attributed to human industry and, especially, to deforestation. Every year some 7,000,000,000 tons of carbon are released into the atmosphere. In the past trees absorbed much of this but the clearance of forests, especially in areas such as the Amazon Basin of South America and in Indonesia, has reduced levels of absorption. The carbon dioxide absorbs heat radiation from the Earth's surface and acts like a blanket, keeping the Earth's surface warmer than it would be otherwise. The estimated rate of increase in the average global temperature of 2.5 degrees Celsius in a century may seem small but the rate has not been this much over the past 10,000 years. (Compare this rate of change with the change in global average temperatures between the coldest part of an ice age and the warmest period between ice ages, which was only 5/6 degrees Celsius).

How reliable are these estimates? Whilst there is no doubt that modern studies of climate and meteorology are highly sophisticated, how reliable is the data from the past? Is there any reason for distrusting the scientific analysis of today's evidence? Measuring sea and land temperatures around the world to calculate the average surface temperature of the planet involves an enormous amount of information. Corrections have to be made for differing methods used and standards applied but reputable scientists are confident about the outcomes and the conclusions they draw from them. Charting climate change over long periods of history is no easy business and allowances have to be made for the less accurate instruments used in the past. Nevertheless, the data from the past can be checked against nature's record. Sources such as ice cores³¹, tree rings, records of lake levels and glacial advance/retreat, and the evidence of pollen distribution can all be used. So too can human records such as private diary entries that record Londoners skating on the frozen river Thames in the 19th century.

The evidence derived from these various and numerous sources suggest that over the last 8000 years climate change has been slow. However, ice core data from Greenland suggests that further back during the glacial period up to 100,000 years ago temperature variations of up to 5 or 6 degrees Celsius occurred over periods of less than 100 years. So, what we are now being told could happen in this century is not unprecedented but the cause is totally different.

If we are to expect faster than normal climate change over the next century, what could that mean for different parts of the world. For Central USA and Southern Europe the most likely consequence is a fall in average summer rainfall with prolonged periods of no

³⁰ Methane, nitrous oxide, the chlorofluorocarbons (CFCs) and ozone.

³¹ For example the Russians have drilled to a depth of 2.5 Km at their Vostock Station in East Antarctica. The ice that far down fell as snow more than 200,000 years ago.

rainfall at all – meaning drought, with implications for domestic and industrial water supply and for agriculture. Australia, that has recently been experiencing periods of drought, might expect that the number of days with small amounts of rainfall will decrease but the number of days of heavy rainfall could double. This would mean floods in the rainy season followed by periods of drought. In Asia, the summer monsoon season is expected to bring up to a 15% increase in precipitation and flooding.

Another probable consequence of global warming is more violent windstorms. The energy for these largely comes from the latent heat of sea water evaporated from the warm oceans which is condensed in the storm clouds releasing energy. Warmer seas might be expected to fuel more frequent and more intense storms. Climate models suggest that the Atlantic seaboard of Europe could experience more of these storms, as in 1987 and 1990.

The effects of global warming will vary from one part of the world to another. Some parts will experience a milder climate and adapt. Some will experience frequent or severe droughts, whilst others will have to contend with floods or hurricanes. Tree, plant life and agriculture will be affected, as will the fishing industry. Many species of insects and wild life will also be threatened. Low lying land will be flooded as sea levels rise and countries such as Bangladesh may become unsustainable, triggering massive people movements. Buildings will be affected, with subsidence in drought stricken areas and in sub-arctic areas where the permafrost melts, or destruction by hurricanes and tornadoes in other parts of the world.

Politically, national boundaries will become increasingly irrelevant as people are forced to migrate from flooding and drought or where their traditional form of agriculture is no longer sustainable. Pollution ignores frontiers and solutions will need to be transnational. No one nation can slow down or reverse global warming on its own. The global challenge will have to be met with global solutions.

THE CONSEQUENCES OF CLIMATE CHANGE

Three questions follow once we recognize that global warming will lead to significant climate changes. First, what practical differences will these changes make to the way we live? Second, why should we be concerned and prepared to change our lifestyles to reduce our carbon ‘footprint’ in order to moderate these changes or, at the very least, not make them any more severe for future generations? Third, what can we do that would help to make a real difference? The practical differences that climate changes are expected to make relate to the effects of rising sea levels, the impact on fresh water supplies, the impact on agriculture and the food supply, and the effects they might have on our health. Each will be examined in turn.

- **Rising Sea Levels**

There have been substantial changes in sea levels before. For example, before the last ice age the average sea level was approximately 5 or 6 metres higher than it is today. Towards the end of the last ice age the sea level was 100 metres lower than today. That was when Britain was joined to the European mainland. In the 21st century, sea levels are expected to rise by 15 cm (by 2030), and by approximately 50cm (by 2100). Some of this will result from melting glaciers but the biggest single cause will

be thermal expansion as the sea warms up. Other influences will include natural movements of the land and how much water is extracted for human use. Rising sea levels will obviously affect most of those who live at, or near to, sea level. For the people of Bangladesh, the Netherlands, and those who live in the Nile Delta, or on one of the Indian Ocean islands, the consequences could be devastating. 7% of Bangladesh will be submerged under the sea with massive consequences for its agriculture which constitutes half of its economy and employs 85% of its population. On top of the direct effects of the rising sea level, Bangladesh will be even more vulnerable to storm surges and to the intrusion of sea water into its fresh groundwater supplies. It is a poor country: how will it cope? Where will its displaced peoples go?

The Netherlands will have similar problems in that something like 50% of its land is at or below sea level. Hitherto the Dutch have coped by building 400 km of dykes and coastal sand dunes. The dunes will have to be raised, the dykes reinforced and pumps installed to prevent the salt water contaminating fresh groundwater. One estimate is that it could cost the equivalent of 10 billion dollars to protect itself from a 1 metre rise in the sea level but the Netherlands is not a poor country like Bangladesh.

- **Fresh Water Supplies**

Fresh water is a precious resource for everybody. We drink it and use it in food production, for our health and hygiene. Water resources vary from country to country but population growth and rising living standards are increasing the demand for water. Even so only about 10% of fresh water supplies are used domestically. Agriculture consumes about 60% and industry 25% and in some countries adequate water supplies are under pressure. In others, long periods of drought threaten the survival of whole communities. Many countries share access to the same water basins and pressure on supplies could become the cause of friction between them.³² Warmer climates will increase the amount of rainfall lost through evaporation and combined in some place with decreasing levels of rainfall, would mean less run-off to reservoirs and aquifers. The restrictions imposed on domestic water use in South East England in 2006 were necessary because a long dry summer meant reservoirs and aquifers were being emptied and water rationing became a possibility unless rain came in time which, fortunately, it did. In other parts of the world reduced rainfall is the consequence of deforestation. This is because in forests there is a lot more evaporation of water, producing water vapour for rain.

- **Impact on Agriculture and Food Supply**

Farming is closely dependent on climate. Crops and livestock thrive in particular climatic conditions and fail when they are absent. The relationship is complex because crops can adapt and different strains can be sown. Irrigations can compensate for reduced rainfall, if the water supply permits. Moderate climate

³² For example, the Danube flows through 12 countries which use its water. The Brandt Commission in the 1970's warned that competing demands for access to water could lead to wars in the future. The former U.N. Secretary General also said "the next war in the Middle East will be fought over water, not politics."

changes combined with accurate forecasting and advanced planning will enable commercial farmers to adapt. Poor subsistence farmers will probably struggle to survive and the more extreme the climate change the greater the struggle for all farmers. Studies of the effects of climate change on agriculture suggest that with appropriate adaptation the effect of the climate change associated with a doubling of carbon dioxide in the atmosphere will be modest except where drought or floods make farming virtually impossible. The global food supply can be sustained but those in arid areas will either have to move or be depend on foreign food aid. Whether there will be sufficient food for an increasing world population is also an issue unless those in the developed world consume less. Technical developments in agriculture and improved management of water resources will be essential. The deforestation of the equatorial rain forests is another major issue. In so far as deforestation is driven by poor people seeking to make a living, stopping this may require financial aid from the rich nations.

- **The Effects on Human Health**

Atmospheric pollution, polluted or inadequate water supplies, poor quality or insufficient crops, floods, drought and violent storms can all damage human health. Warmer climates may also enable the mosquito and other disease carrying insects to breed where previously they could not, increasing the risks of malaria and other diseases. Humans can adapt their behaviour and domestic environments to moderate changes but sudden, unexpected and extreme changes such as the flooding of St Louis caused by Hurricane Katrina in 2005 can be killers. Similarly, the heat wave in France in 2005 led to the deaths of many elderly people.

- **The Financial Implications**

It is difficult, for a number of reasons to calculate the costs of coping with the effects of climate change. First, we cannot yet be certain how much effort will be made to reduce carbon emissions and how effective those measures will be. Second, whilst the costs of these measures will be incurred in the near future, many of the costs of dealing with the consequences of climate change will be incurred in 20 or 30 years time. Third, some of those costs will fall on low income nations who will depend on aid monies from the richer nations. Four, some of the costs will be for adaptation and others will be for coping with disasters. Nevertheless, studies undertaken so far suggest that every nation will need to budget for at least 1 or 2% of their Gross Domestic Product. For poor nations that could mean shifting expenditure from other budgets, say, for education, defence or economic development, which will have knock on effects.

These financial implications may seem modest, even manageable at least for the richer nations but there are other factors to be considered. First, any delay in reducing carbon emissions now will mean more climate change and therefore more severe and costly consequences in the long run. Second, the better off nations will be on the receiving end of mass migrations from the worst affected poor nations with consequences and indirect costs in assimilating immigrants and coping with the increased demand on their public services and the impact on their social and political

stability. One estimate is that global warming will lead to 150 million migrants by 2050.³³

4. POPULATION GROWTH

When God created Adam and Eve he told them to be fruitful, increase in number and fill the earth. The table below shows estimates of subsequent population growth.³⁴ We have no idea how reliable pre 1750 statistics are but the significant point is the rate of growth in the last century attributable to advances in medical science and food production. Today the world's population is growing at the rate of 1.17% p.a. or 211,090 persons per day. The projected total for 2050 is 11,000,000,000 and the key question we have to consider is whether or not the planet can sustain so many people.³⁵

1750AD	791,000,000
1800AD	978,000,000
1850AD	1,262,000,000
1950AD	2,521,000,000
2000AD	6,000,000,000
2007AD	6,602,224,175

The rate of population growth varies from country to country. In Europe population growth is slow and in 12 countries the populations are actually shrinking³⁶. The fastest population growth is in the poorest countries such as Indonesia, Brazil, Pakistan and Bangladesh.³⁷ Is there enough food, clean water and medical provision to provide for everyone in these low income countries? The statistics certainly help to explain the increasing number of economic migrants, trying to enter Europe to obtain a sustainable standard of living. It would be wrong, though, to see this as only a 'third world' problem whilst those in the high income countries consume (and waste) so much more food, clean water, energy and medical provision per head than those in the low income countries. "The wealthy consume too much, while the poor are preoccupied with their immediate survival, rather than the long-term care of the planet. Worldwide, sickness through crowded urban conditions and rural land degradation are pushing millions to the brink of starvation."³⁸

³³ 100 million migrating because of rising sea levels and 50 million because of drought and its effects on agriculture.

³⁴ Source: Wikipedia World Population statistics.

³⁵ The source of this projection is the UN and is cited in J.R.W. Stott, *Issues Facing Christians Today* (4th edition), page 137

³⁶ These are Germany, Poland, Romania, Czech Republic, Hungary, Bulgaria, Croatia, Moldova, Lithuania, Latvia, Slovenia and Estonia.

³⁷ For example: the rates of population growth in these countries are, respectively: 1.21; 1.01; 1.83; 2.06% compared with those in Germany (-0.03%) or France (0.59%) & UK (0.28%).

³⁸ J.R.W. Stott, *ibid* (4th edition) page 137

The Christian ethicist, Roy McCloughry, has argued that these problems should not be treated primarily as economic or environmental but as moral issues. There are strong biblical reasons for this. Those people who live on the brink of starvation are made in the image of God and deserve the same quality of life as the rest of us. We have already observed that this is God's earth not ours, so it is illegitimate for some to have so much that they can afford to be wasteful whilst others do not have enough simply to live. God's command to Adam and Eve was to be fruitful and fruitfulness is a sign of God's blessing.³⁹ Jesus' parable of the rich man and Lazarus tells us that the rich will be judged for ignoring the needs of the poor and denying them the opportunity to enjoy God's blessing.⁴⁰

5. CARELESS WITH GOD'S CREATION

Apart from climate change and population growth there are three other issues to be considered if we are to be responsible caretakers of God's creation. The first of these is the rate at which we are **depleting the natural resources** that God gave us in the world. These include fossil fuels – coal, oil and natural gas – as well as water, clean air, marine resources, and the good earth in which to grow crops. These are our natural inheritance, we contributed nothing to their creation. Nor can we replace them, so the more we use up the less we leave for the benefit of future generations. Our profligacy means our grandchildren's poverty.

There is much debate today about finding **new sources of energy**. Some people see the way forward lies with nuclear energy, which has the virtue of not emitting carbon gases once the power stations are built. The problem with nuclear energy is what to do with the radio-active waste materials, which remain radio-active long after they are decommissioned. They can be securely buried in disused mines but there is fear of accidents and contamination.

Much of the Europe's most accessible coal stocks have been extracted and what remains will be increasingly expensive to mine but, in any case, coal is a carbon fuel and burning it contributes to the climate change problem. Harnessing and using natural energy from the sun (with solar panels), wind (with wind turbines), and the sea (with tidal flow turbines) are carbon neutral but are unlikely to contribute sufficient energy to meet the needs of modern industrial societies. Research into new energy sources continues but resistance from vested interests has limited the investment needed to drive this forward. Meanwhile we are all urged to economise in our energy consumption by switching off appliances rather than leaving them on stand-by, insulating our homes and offices, using low energy lighting, limiting our car use and flying and other such measures. These measures make a small direct contribution but have a helpful educational impact on public opinion.

Reference has already been made to the **depletion of water resources**.⁴¹ A United Nations report in 2003 suggested that half of the human race would be living with water shortages by the middle of the 21st century. Others have argued that the number could be

³⁹ See Genesis 1:28; 8:17; 9:1, 7; 17:6, 20; 35:11; 48:3-4; Psalm 105:24; 107:38

⁴⁰ See Luke 16:19-31

⁴¹ See page 10 above.

much higher. Pollution, wastage and poor management of water supply are blamed for this but climate change and drought are also major contributory factors. Severe water shortages already affect at least 400 million people and this situation is exacerbated by the fact that 40% of the world's population lack adequate sanitation. Water is one of the prime essentials for life as we know it and shortages will not only cause misery and damage human health, agriculture and industry, but in the long term will be a potential source of international conflict.

The **clean air** is another natural resource that is being depleted by human activity. Pollution is not only responsible for the erosion of the ozone layer in the stratosphere but also for large numbers of deaths and respiratory diseases. The impact of carbon dioxide emissions has already been noted but there are many other noxious gases released into the environment. The exhaust from motor vehicles is a major source of the highly poisonous carbon monoxide. The brown haze seen over many cities in calm weather is the result of nitrogen dioxide emitted from high temperature combustion. Ammonia is emitted from agricultural processes. These and other gases pollute the atmosphere we breath and are one reason for the increasing incidence of asthma and other respiratory diseases. What we may be tempted to see as progress in industry and in our life-styles could be the hidden killers in our midst.

The **depletion of fish stocks** became an issue in European politics when the European Commission imposed fishing quotas on member states. Whilst quotas mean unemployment and hardship in the fishing industries, the need to limit fishing and conserve fish stocks is urgent. The scientific journal, "Nature", published research in 2003 which claimed that only 10% of all large fish⁴² are left in the sea. The seriousness of this is obvious given that fish provides 2.6 billion people with at least 20% of their animal protein intake. Human consumption of fish was 100.7 million tonnes in 2002 and still growing.⁴³ 200 million people world-wide earn all or part of their income from fishing and related activities.

Thus the depletion of fish stocks has major implications both for those employed in the fishing industry and for consumers who depend on their catches for a healthy diet. Prices for increasingly scarce fish are rising beyond the pockets of the poor. Restoring fish stocks by severely limiting and policing what fishing fleets may catch is now essential if there is to be any fish or fishing in the future. The regions with the greatest need for such measures include all parts of the Atlantic, the Mediterranean and Black Seas, the South East Pacific and the Southern Ocean.

In the meantime, whilst these measures take effect, the only way to meet the increasing demand for fish will be by aquaculture, which could account for 39% of all fish production by 2015. However, this will require adequate quantities and quality of water supply, which are also in doubt.

Another cause for deep concern is the continuing **erosion of the soil** in which to grow the food we eat to live. It has been estimated that 25 billion tons of top soil are lost each year

⁴² Large fish include tuna, swordfish, marlin, cod, halibut, skate and flounder.

⁴³ Source: The U.N. Food and Agriculture Organisation.

and 11% of the world's vegetated soil are now beyond recovery.⁴⁴ McCloughry notes that "this is an area the size of China and India". A certain amount of soil erosion is natural – the effects of weather, the gradient of the land and the type of soil and underlying rock. But humankind has greatly added to this through ignorance, poverty, carelessness and greed. Removing vegetation from an area through overgrazing, over-cultivation and deforestation makes the soil more likely to be eroded by wind and rain. Over-cultivation produced the American dust bowls. Deforestation in the Amazon Basin is having a similar effect. Anyone who enjoys hill walking will be familiar with the effects of too many people tramping along the same paths in heavy boots. That is but a small example of the much bigger impact that over-population is having on the urban areas of our planet. Covering the land with concrete, tarmac and buildings makes it much harder for the land to absorb heavy rain and the resulting flooding destroys crops and carries away top soil. Planning authorities need to take account of this possibility when approving new building developments and require the installation of adequate drainage. Similarly the European Commission could use its Common Agriculture policy more effectively to prevent overgrazing and over-cultivation.

Another way in which we are careless about God's creation is the way in which we **dispose of our rubbish**. As populations grow and prosperity increases this becomes a serious issue. The more we consume the more waste we have to dispose. It has been calculated that the average individual in the U.K. throws away the equivalent of his or her body weight every three months. This rubbish is either incinerated or dumped in land-fill sites. Burning waste releases large amounts of carbon dioxide and other potentially hazardous air pollutants, though modern incinerators can use the energy released to generate electricity. Rubbish dumped in land-fill sites decomposes and releases methane. It is estimated that more than 1.5 million tonnes of methane are released from the UK's 4000 sites each year. Methane is a greenhouse gas so this contributes to global warming.

There are three ways in which we can reduce the damage our waste causes. We can reduce the amount of rubbish we create by buying goods that are not sold with unnecessary packaging, not using plastic bags and by actively looking for products that can be repaired if and when they require it. We can re-use what we have and resist the temptation to buy new things whilst the old is still serviceable. We can recycle our rubbish so as to minimise the volume of what has to be incinerated or dumped. Vegetable waste can be composted and used as fertiliser in our garden. Where this is impractical the waste can be composted in anaerobic digestion units installed in blocks of apartments.⁴⁵ The latter method is relatively new and property developers and architects need to be encouraged to install the units when building new apartments.

6. COMMENT AND CONCLUSION

This paper has been organised around the beliefs, established in the Word of God, that "the earth is the Lord's" and that he made us human creatures his caretakers of the planet.

⁴⁴ J.R.W.Stott, *ibid* (4th edition) page 140.

⁴⁵ Anaerobic digestion decomposes waste in the oxygen-free environment of an enclosed chamber. Bacteria decomposes the waste and produces fertilisers that can be used or sold.

Our record as caretakers is a very poor one and as a result the future of the planet, as we know it, is not one that God intended. Future generations will experience the many and various consequences of global warming, rapid population growth, the depletion of the natural resources with which God provided us, and the pollution we have made. Two journalists at an environmental consultation concluded, “The earth is finished. What will our children make of our generation, who let this planet, so lovingly created, go to waste?”⁴⁶ Their view reflects the hopeless pessimism prevalent amongst well-informed environmentalists. It stands in stark contrast to the naïve optimism of those who think that science, technology and human ingenuity will find a way out of the mess. A possibly more realistic and less hopeless perspective is found in the biblically theocentric worldview that because God is both creator and sustainer of the earth, there are still grounds for hope so long as we are prepared to repent of our past caretaking sins and failures and to work as agents of change in our local communities and nations.⁴⁷

What is the biblical justification for this claim? Paul’s letter to the Colossians is a good place to start. He affirms that “all things were created by him (Jesus) and for him ...and in him all things hold together”. (Col 1:16-17) The redemption and reconciliation brought about by Jesus are not just for individual souls but for “all things, whether things on earth or things in heaven, by making peace through his blood, shed on the cross”. (V20) As one commentator has concluded, “The one who sustains everything by his word will not abandon his creation but, out of love, will reconcile it to himself. The earth has a future and is safe because of God’s redemptive purposes and divine actions in relation to the earth”.⁴⁸ This hopeful view fits well with what Paul writes to the Romans about the creation being subjected to frustration, “not by its own choice, but by the will of the one who subjected it, in hope that the creation itself will be liberated from its bondage to decay and brought into the glorious freedom of the children of God.”⁴⁹

The temptation for Christians is to downplay our creation care mandate and concentrate solely on leading others to faith before Christ returns. This attitude is rooted in the assumption either that Christ will make all things new, including the earth, when he returns; or that the present earth will be destroyed anyway,⁵⁰ so we have no need to worry about the planet. This is wrong for three reasons. First, it bases Christian mission on just two of the four stages of biblical revelation: the fall and the redemptive work of Christ. It ignores the creation and God’s commandment to care for his creation; and it ignores the fact that at the judgement at the end of time as we know it we will be called to account for our stewardship of God’s earth. Second, as has already been said, it fails to recognise that responsible stewardship of the planet is not only compatible with evangelism but will in many cases be a positive aid to it as those who do not know Christ become increasingly anxious about the future state of the world. Third, it reflects a

⁴⁶ The Tablet 12.2.05

⁴⁷ I am indebted to Dave Bookless, the UK National Director of Arocha for the ideas that inspired this comment.

⁴⁸ Sarah Tillett, “Earth Keeping”, BRF Guidelines Sept-Dec 2007.

⁴⁹ Romans 8:19-21

⁵⁰ These assumptions are probably based on misunderstandings of the vision in Isaiah 11:1-9, especially the last 3 verses; and of 2 Peter 3:10.

selective approach to the Bible when our mission to the unbelieving world depends on the truth of God's word, which we assuredly hold to be without error in all that it teaches!

A different temptation is to adopt a totally negative attitude to everything and advocate giving up flying, driving and anything else that leaves a carbon footprint. There will surely be some things we should give up as responsible caretakers but negative attitudes are rarely persuasive. We are more likely to make a difference if we look for positive actions we can take. How can we make better use of technology to build or adapt our homes and run our cars so that they waste less energy and have a less harmful effect on the environment? Technology alone is not the answer but wisely applied it can help us to be better caretakers. Just as important is that we use technology not just to preserve the relatively affluent way of life enjoyed by a majority of Europeans, but also for the good of the poorest people, especially in the low income nations of the two-thirds world.

So, what practical steps can we take to be better caretakers than we have been until now? This is a difficult question to answer because Europe's 15 million Evangelicals are at different stages of awareness and involvement in creation care. Those who are already active and responsible caretakers do not need advice about how to do it. The list below is for those at the other end of the spectrum, looking for practical ways to get started.

- Monitor, and where possible, reduce our energy use (insulating roof space, using low energy light bulbs, switching off electrical appliances in stand-by mode; reducing household temperatures by a few degrees).
- Review and reduce unnecessary car journeys (using public transport, walking or cycling, sharing car journeys with people travelling the same routes).
- Review one's vehicle emissions, and where possible replace high emission vehicles with more efficient fuel consumption.
- Review the amount of flying (using trains, video-conferencing or Skype, taking fewer holidays).
- Shop for locally produced products instead of imported goods, especially flown in food. Where this is impossible shop for genuine fair trade products and avoid products known to be made by sweated labour.
- Review and where possible reduce water use and wastage.
- Recycle refuse (composting vegetable and fruit waste; recycling paper, glass, cans and textiles).
- Support aid and development charities that work with projects in low income nations most likely to be adversely affected by climate change.
- Support political candidates, parties and policies committed to environmental responsibility at home and internationally.
- Pray for God's mercy, and for guidance for those who have leadership in combating global warming and its consequences.
- Engage with others in understanding the issues and biblical perspectives on them, putting what you learn into practice.

- Encourage friends, neighbours and, where relevant our children to do as we do and help to start a local movement for change.

May Almighty God have mercy on us all and give us time to both become good caretakers and to be effective salt and light in our communities and nations, encouraging others to join us in taking care of God's creation. We ask this in the name of Him through whom all things were created and hold together, our Lord Jesus Christ. Amen

7. FURTHER READING

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