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THE BIBLICAL BASIS FOR CARING FOR THE CREATION

Implications for Issues relating to Population, Global Warming and Tackling Biodiversity Loss

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God saw all that he had made and it was very good.
(Genesis 1: 31)

Sturt's Desert Pea

10th International Conference on 'Environment, Sustainability and Climate Change,' held at University of Oxford, ENGLAND

This presentation covers:

A. The Biblical basis for creation care
B. Human numbers linked to environmental degradation via the economy
C. What is more effective: to reduce population *or* per capita consumption?

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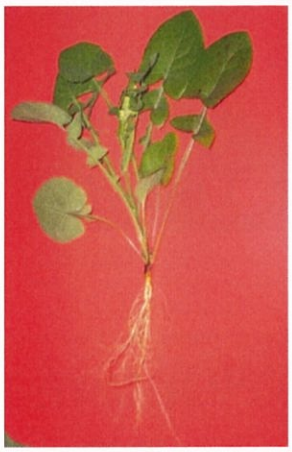


Rada

The Biblical Basis for Caring for the Creation - implications for issues relating to Population, Global Warming and Tackling Biodiversity Loss

Introduction:

This paper aims to show that our ecological crisis can best be addressed by tackling human population (while not forgetting per capita consumption) - that population is the foremost of our problems. It aims to show that the churches have an important role to play, because there is a Biblical basis underlying the imperative to care for Creation.

Christians who read a Bible passage, whether they see it as poetic or literal, historical or figurative, usually have this in common; their aim is to understand its spiritual meaning. That is what is intended here.

Unless otherwise indicated, quotes are from the New International Version of the Bible (NIV).

Presentation:

There are 3 interwoven parts to this presentation:
(a) An outline of the Biblical basis for Creation Care
(b) The linking of human population to environmental degradation via the economy, illustrated in comic book style
(c) A comparison of the effectiveness of reducing population with reducing per capita consumption for mitigating global warming and tackling biodiversity loss.

(A) The Biblical Basis for Creation Care

For those with a religious input into their lives, a belief in God as Creator is probably fundamental. For those with a Christian background, the Bible will feature in that belief and, for others, hopefully this Paper may also be of interest.

1. The Bible opens with the words,
'In the beginning God created the heavens and the earth' *(Genesis 1:1)*

Genesis chapter 1 sets out an order for the creation of life on Earth: plants first, then animals, then humans. The non-living world is also mentioned.

What does God say about all of his Creation?

And God saw everything that he had made, and it was very good. *(Genesis 1:31 RSV)*

Everything from the smallest sub-atomic particle to the furthest quasar is declared 'good.'

Life may be regarded as a great miracle and each species of plant or animal seen as God's evolutionary product, an investment in time of millions, even billions of years, and therefore most precious.

2. Genesis 1 sets out the role of humans in relation to the other species.
Then God said, "Let us make man in our image ...and let them rule over the fish ...the birds ...the livestock ...all the earth and over all the creatures that move along the

ground. So God created man in his own image ... male and female he created them." *(Genesis 1: 26, 27)*

Humans are made to be in God's image; that is, they are to have God's holy, righteous character, whether they be male or female. This is not a text by which humans are to give themselves elite status. Jesus was God's perfect revelation of himself and the New Testament shows him to be a 'servant Lord'.

To 'have dominion over,' according to Dr Matthew Sleeth in 'Serve God, Save the Planet,' is derived from a Hebrew term RADA, meaning 'a point higher up on the root of a plant'. [1]

Where is 'rada' on this plant? It's at the top of the root; the place from which shoots radiate above ground and roots radiate below the soil. Rada is the centre of strength for the plant as a whole.

So also, humans are to be the centre of strength for other living species. The conjugation of the Hebrew verb used, 'RADAH,' is forceful [2]. 'Radah' provides humans with an imperative; to be the centre of strength for all created species. To be a leader, with delegated authority from God, is to hold life in the biosphere together so it thrives in a healthy way.

'Dominion' (rada) does not imply ownership or even unrestricted use [1].

3. Genesis chapter 1 sets out the role of reproduction in the continuation of a species. First plants:
"Let the land produce vegetation: ... plants ...that bear fruit with seed in it, according to their various kinds." *(Genesis 1:11)*

After plants, animals:
"Let the water teem with living creatures, and let birds fly above the earth..."
And God blessed them, saying "Be fruitful and multiply ..." *(Genesis 1: 20, 22 RSV)*

After animals, humans also:
God blessed them, and ...said to them, "Be fruitful and multiply" *(Genesis 1: 28 RSV)*

Were humans the only ones to which the words, "Go forth and multiply" were addressed?
No. We see provision for plants to reproduce in verse 11. Animals are given this blessing in verse 22 and humans in verse 28, so it applies to all living creatures, not just humans. There is meant to be a balance in nature.

4. *Is "Go forth and multiply" a command or a blessing?*
The text says it is a blessing. A blessing is a good wish for personal well-being. It's different from a command, which can be difficult to keep. "Have a nice day," is a blessing – we don't go around checking at the end of the day to see if the person has 'obeyed' us. It just happens that commands and blessings both use the Imperative Mood in English. Humans are very poor at obeying all of God's commands and this in itself should alert us to the fact that 'Go forth and multiply is not a command. It's easy for all species to follow. Instead, it is a blessing and blessings are meant for particular circumstances.

What is the context?
A rule for interpreting the Bible is that a passage must be taken in context. Here in Genesis chapter 1 and again in the story of Noah after the Flood, the context is that of near zero populations. The first members of each species had arrived on the Earth. 'Go forth and multiply' was appropriate in those circumstances.

Here we see a graph of world population which includes biblical times through to the present day. Abraham is the first Bible figure for whom an historical date can be set, at around 1800BC. When Jesus lived on Earth, there may have been around 250 million people in total. Have our circumstances changed? We now have over 30 times that number.

If "Go forth and multiply" was appropriate 4000 years ago, what is the corollary for today's human population of over 7 billion? Also, what is appropriate for species of plants and animals whose numbers are now so low they are being driven into extinction? The corollary is that we need to turn round the exponentially increasing human population graph and let other species 'Go forth and multiply.'

5. Genesis Chapters 2 and 3 are the story of Adam and Eve. They also speak of Creation care. Humans are to serve the earth and take care of it. Theologically these chapters are about the Fall and show Man's disobedience led to broken relationships, between himself and God, himself and his fellow man and himself and Nature.

The Old Testament has many passages showing God's care for Nature.

Proverbs 12:10 says, ***A righteous man cares for the needs of his animal.***

The commandment to rest on the seventh day also covers farm animals:
On it *(i.e. the Sabbath)****, you shall not do any work ... nor your animals*** *(Exodus 20:10).*

There are passages in Job which say Nature has intrinsic value; that God would care about other species even when people are not around to appreciate them. *(e.g. Job chapter 38)*

There are warnings about what happens when humans fail to provide a place for other species in the land: ***Woe to you who add house to house and join field to field till no space is left and you live alone in the land ...*** *(Isaiah 5 : 8)* (...production will decline)

That is why your land is not producing ...and all living things grow sick and die ...and even the fish begin to disappear *(Hosea 4: 3)*

The Old Testament reveals God's plan of hope amidst human sinfulness, to bring about a change of heart. Through the prophet Jeremiah, the Lord says,
"I will put my law in their inward parts, and write it in their hearts." *(Jeremiah 31:33)*

A change of heart is shown through Jesus, who said he would draw all people to himself by what was accomplished on the Cross. John 3:16, says, ***For God so loved the world that he gave his one and only Son, that whoever believes in him shall not perish but have eternal life.***
The word for 'world' in Greek, 'kosmos,' is not limited to people, it can refer to the universe as a whole and so include plants and animals [3].
Relationships can be restored between humans and God, between humans and each other and with Nature, because a person united to Christ is given a changed heart.

St Paul says, ***The creation waits in eager expectation for the sons of God to be revealed ... that the creation ... will be liberated ... and brought into the glorious freedom of the children of God ... We know that the whole creation has been groaning ... right up to this present time.*** *(Romans 8: 19, 21, 22)*

Nature, therefore, is included in God's plan of salvation.

(B) Human numbers linked to environmental degradation via the economy

1.The three YouTube videoclips listed below show how environmental decline is linked to population via the economy.

http://www.youtube.com/watch?v=KUqcw-TxGDA

http://www.youtube.com/watch?v=5wBUIP9Foco

http://www.youtube.com/watch?v=Vgn7WSbRcSs&feature=youtu.be

This comic book style presentation was prepared for high school Science students, written in simple form and meant to be understood by the least capable student, because then all will understand the message. We will look briefly at Part A.

"Conservation through having Smaller Families" **PART A - MONEY**
Are there more people on Earth than is helpful for the planet? Most probably 'Yes.'
World population is increasing.
Better medical care means that people now live longer.
Babies which once might have dies as infants ...
...now live to produce families of their own.
Each living person has 'needs' which the Earth must supply...
FOOD, CLOTHING, SHELTER and ENERGY SUPPLIES are the basic needs.
Money is usually the key to these things.
But where does the money come from?
Trade existed before there was money
Money was developed as a convenient way of selling and buying things.
But money by itself is useless ...
Without things to spend it on
And money cannot be circulated unless it is backed by ...
Production from the ground, e.g. mining
Or from the soil, e.g. agriculture
Or from the sea, e.g. fishing
Or from the bush, e.g. forestry
So money has to be backed by production.
Think about where your money comes from.
Some people have jobs which are directly related to the Earth's provision e.g. Farmer
The jobs of others depend on the raw materials which the Earth supplies, e.g. Builder
Still more people have jobs in the service industries related to goods produced from the Earth, e.g. Driver
Some people's salaries come from the taxes which are paid by others, e.g. Teacher
Some people depend on the work of others for their financial support, e.g. Child
When we trace our money back to where it came from originally, we will find it is from the productivity of the Earth.
And what will we exchange it for?
We will spend it on goods and services
All of which flow from the productivity of the Earth

2. From the booklet, we see that, as population goes up, more money is needed; that all jobs depend on the productivity of the Earth and come at a cost to Earth's ecosystems.

In the state of NSW, out of every 20 jobs, 2 are in Primary Industry, taking resources directly from Earth; 1 is in Secondary Industry, using the raw materials from the Earth for manufacturing and the remaining 17 (everything else) in the Tertiary sector, which relies on

both Primary and Secondary Industry. All jobs can be traced back to Earth's productivity, at a cost to ecosystems. Each worker with a job also supports 2 or 3 without one, so everybody is supported by the productivity of the Earth, directly or indirectly.

3. Money raised via jobs is exchanged ultimately for basic needs, again supplied at a cost to the Earth's ecosystems.

4. Each person has an ecological footprint, due to resources taken and wastes produced. That footprint is measured in global hectares[4] as the area of land and sea required to supply their biological needs for food, clothing, shelter and energy and to absorb their CO_2 emissions. It is based on Earth's biocapacity[5] (the capacity of ecosystems to produce useful biological materials and absorb wastes).
Australians use nearly 7gha per capita. On average the Earth's population uses 2.7 gha per capita but there is only enough for each person to have 1.7 gha each. Note that this calculation makes no provision for the needs of other species [6].

In 1986, when population was approximately 4.7 billion, we began to overshoot Earth's biological capacity to provide for us. Since then we have been using renewable resources like forests, fish, food crops, firewood etc., faster than their replacement rate and producing CO_2 much faster than Nature can absorb it.

Biodiversity overshoot was very much earlier in terms of exceeding the background rate of species extinction; that rate is now somewhere between 1000 and 10,000 times the background rate[7], due mainly to human activities.

The table shows that the date on which overshoot occurs is getting earlier each year on average. In 2013 it was on August 20th. It took less than 8 months for the human population to use up a whole year's biocapacity.

5 Global Warming is a major threat to Biodiversity Loss

The 3 levels of biodiversity are: diversity of Ecosystems, Species and Genetic diversity. All are under threat.

(1) Ecosystems

"Overall, any clear dichotomy between pristine ecosystems and human - altered areas that may have existed in the past, has vanished" - Peter M. Vitousek
Main Causes: (1) Increase in atmospheric CO_2
(2) Increase in fixation of N_2 for fertilisers
(3) Human land use ... has transformed 1/3 to 1/2 of Earth's ice-free surface.
"These three and other equally certain components of global environmental change are the primary causes of anticipated changes in climate, and of ongoing losses of biological diversity. They are caused in turn by the extraordinary growth in size and resource use of the human population."[8]

We disadvantage ourselves by allowing the loss of natural ecosystems, which have an economic value in their natural state. They supply us and other species with fresh water, clean air, regulate the climate and so on. Studies have been done to place an economic value on ecosystems. A recent study by R. Costanza et al., states:

"We estimate ... that the loss of ecosystem services from 1997 to 2011 is in the order of $20 Trillion/yr." [9]

(2) Species Biodiversity

The Center for Health and the Global Environment (CHGE), initiated by Dr Eric Chivian at Harvard Medical School, says the following on its website:

"Climate change is a threat (to species) because species have evolved to live within certain temperature ranges ... when these are exceeded and a species cannot adapt (in time) ... or when the other species it depends on to live cannot adapt ...(they become extinct.)"
"Climate change alone is expected to threaten with extinction approximately one quarter or more of all species on land by the year 2050 ... Species in the oceans and in fresh water are also at great risk ... especially those that live in ecosystems like coral reefs that are highly sensitive to warming temperatures ..." [10]

(3) Genetic Diversity

Scientists have discovered that, by 2080, more than 80 % of genetic diversity within species may disappear in certain groups of organisms
The distribution of nine European aquatic insect species, which still exist in the headwaters of streams in many high mountain areas in Central and Northern Europe, was modelled ...
If global warming does take place in the range predicted (by the IPCC), these creatures will be pushed back to only a few small refugia, e.g. in Scandinavia and the Alps, by 2080.
The aquatic insects that were examined are representative for many species of the mountainous regions of Central Europe. [11]

(C) Which is more effective to reduce – population or per capita consumption?

1. (a) IPCC: Population main factor in emissions growth for 40 years from 1970 to 2010
   The recently released IPCC Report from Workgroup III says that every additional person adds to global CO_2 and that global CO_2 emissions from fossil fuel combustion have been growing at about the same growth rate as global population for most of the 1970–2010 period[12], i.e. population has been the main factor in emissions growth over those 40 years.

   (b) Population has more weight numerically
   It is also the main factor in absolute impact, because it's a multiplier in billions. In the 20th Century, population went up 5 times and per capita consumption rose ten times; however, per capita consumption was modest initially and population was over one billion, an extremely large multiplier.

   (c) Population increase outstrips waste reduction by recycling
   What about cutting per capita consumption by recycling? A study in the UK found that up to 80 lifetimes of responsible recycling was completely cancelled out by the arrival of one person via the airport or the maternity ward[13], which made population comparatively 80 times more important by this measure.

2. The population graph has significant upward momentum, due to descendants left behind
   The world population graph has strong upward momentum in terms of births exceeding deaths – or else it would level out. Unlike possessions, which a person cannot take with them when they die, those descendants left behind continue the upward trajectory of the graph. The human population was in overshoot at 4.7 billion just 30 years ago. All descendants remain as consumers, so population once again is the main factor to tackle.

3 Other considerations

(a) A 'theoretical person' has zero consumption

The human population is a problem for the environment because of resources taken and wastes produced. It is more effective to reduce the actual population by cutting down on family size than to reduce per capita consumption by, say 10%, because then, 100% of the consumption of every theoretical person that does not become an actual person is saved, including that of their theoretical descendants.

(b) If personal consumption is cut, money left over is usually spent on something else

How about reducing personal consumption? While commendable, money left over is likely to be spent on options such as travel, which adds CO_2 to the atmosphere. The only way to be sure of capping personal consumption is to cap income at a lower level.

(c) Does sharing help the environment ?

What about sharing income with other people and worthy causes? Personal consumption goes down but net consumption does not. The Earth does not 'understand' per capita consumption, only totals.

(d) What about reducing consumption of fossil fuels through using renewables? While very important, renewables take money to manufacture. It has been said that just a small percentage of GDP would be enough; however, the following points need to be taken into consideration:

(i) All money is raised at a cost to natural ecosystems in the first place so the greater the number of people needing renewables, the greater the cost to biodiversity itself.
(ii) GDP takes energy to raise, e.g.in every dollar of Australian GDP there is the energy equivalent of a quarter litre of petrol[14], the burning of which results in CO_2 emissions to the atmosphere.
(iii) In the UK the organisation 'Population Matters' notes that, if the UK population continues to increase in line with its highest projected trajectory to mid-century then, in order to meet CO_2 reduction targets to 20% of 1990 levels, 260,000 *additional* wind turbines would have to be built, or 20 a day more, than would have to be built with its lowest predicted trajectory. The total *additional* cost could be up to 1.02 trillion pounds.[15]
(iv) Renewables such as solar, wind etc. are comparatively low energy sources. Most have a low EROEI (Energy Return on Energy Invested) They are most useful when there is a correspondingly low population.

(e) Human population growth is similar to that of bacteria, given favourable conditions

Any species of plant, animal or bacteria increases in numbers exponentially, if given favourable living conditions such as food, water, temperature and living space. For example, if one bacterium lands in a warm chicken broth and divides every 20 minutes, there will be 1 million bacteria in 6 hours 40 minutes and 2 million just 20 minutes later.

Never before in human history have conditions been as favourable to the human species as they are in modern times. The population graph shows that, in regard to exponential population increase, we behave no differently from bacteria, given favourable conditions. Therefore appropriate, active intervention is needed.

4 The Bible: Procreation superseded by New Creation

Jesus chose 12 disciples from the existing population, representing the 12 tribes of Israel in the Old Testament, for whom 'Go forth and multiply' had been appropriate in its own context. To his apostles (the word means 'sent') Jesus did not say, 'Go forth and multiply,' but 'Go forth and make disciples of all nations.' The hearts of those who became disciples and subsequently received God's Holy Spirit changed. Such a continuing change of heart gives hope to Nature.

Human nature helped through the Bible teachings

Tackling either population or consumption may go against human nature. This is where the teachings of the Bible come in, enabling Christians to be among those who can act effectively:

- Jesus taught his followers not to store up treasures on Earth but in heaven *(Matthew 6:19 – 21).* 'Treasures' are those things a person values in this life, whether spiritual or material.
- He taught that this life is to be lived with the next in mind. (What good is it for a man to gain the whole world, yet forfeit his soul? - *Mark 8:36*)
- The Bible says, 'Let us fix our eyes on Jesus ...who for the *joy* set before Him endured the Cross ...' *(Hebrews 12:2)* Christians become willing to make efforts and sacrifices with a worthwhile goal in view.

Gifts come with responsibilities

The Earth's ecological predicament is due, not so much to bad things as to two great blessings – increased survival rate and improved living standards. Both have come through the hard work of good people like doctors (survival rate) and engineers (high living standards). There is a corresponding responsibility to counterbalance the deleterious effects of these blessings to achieve ecological sustainability. Everyone who accepts modern medical care and improved living conditions has responsibility to do so.

Tackling population addresses total consumption as well.

5 Collision course with Nature

As the saying goes, 'We cannot have our cake and eat it too.' Earth cannot be maintained in good condition while population continues to increase. The human population already has a cumulative voracious appetite.

We are on a collision course with Nature.

There is an urgent need to turn around the exponentially increasing human population graph and maintain habitats that will allow other species of plants and animals to 'Go forth and multiply.'

(Resources helpful in tackling human population - *Listed at the end*)

Summary:

To counterbalance the impacts of BETTER MEDICAL CARE and IMPROVED LIVING STANDARDS, population needs to first be stabilised, then reduced in order to combat global warming and tackle biodiversity loss.

REFERENCES AND FOOTNOTES

1. J Matthew Sleeth, *Serve God, Save the Planet*, (Grand Rapids, Michigan, USA: Zondervan, 2007), p. 35.

2. JUSSIVE The Jussive conjugation is used to express either a mild command or a strong wish. It occurs in the third person. When translated, it may be used as either the term let or may

Brown, Driver, and Briggs. Bible Hub, "7287.radah." Last modified 2006. Accessed April 23, 2014. biblehub.com/hebrew/7287.htm.

3. Re: John 3:16 ton kosmon (not limited to people)

Teknia, "Search the Greek Dictionary." Accessed June 26, 2014. https://www.teknia.com/greek-dictionary/kosmos

4. The global hectare is a common unit that quantifies the biocapacity of the earth. One global hectare measures the average productivity of all biologically productive areas on earth in a given year.

   Accessed June 26, 2014. http://en.wikipedia.org/wiki/Global_hectares

5. Biological capacity or biocapacity : The capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans.

"Global Footprint Network Glossary." Accessed June 26, 2014. www.footprintnetwork.org/en/index.php/gfn/page/glossary/

6. www.footprintnetwork.org/en/index.php/gfn/page/glossary/

Biological capacity available per person (or per capita) : There were ~ 12 billion hectares of biologically productive land and water on this planet in 2008. Dividing by the number of people alive in that year (6.7 billion) gives 1.79 global hectares per person. This assumes that no land is set aside for other species that consume the same biological material as humans.

7. If one followed the fates of one million species, one would expect to observe about 0.1–1 extinction per year—in other words, one species going extinct every 1–10 years.

www.britannica.com 'Calculating background extinction rates'

Background or "normal" rates of extinction vary through time but are typically in the order of one to two species per year. Current rates of extinction, however, are estimated to have reached 1000 to 10,000 times this rate.

Ritchie, Euan. THE CONVERSATION, "Extinction: just how bad is it and why should we care?." Last modified MAY 02, 2013. Accessed April 25, 2014.
www.theconversation.com/extinction-just-how-bad-is-it-and-why-should-we-care-13751

The biodiversity of species and their rates of extinction, distribution, and protection
Science, 30 May 2014: Vol. 344 no. 6187 DOI:10.1126/science.1246752

A new study published in the internationally recognised journal *Science* has determined that the current rate of species extinctions is more than 1,000 times greater than the background rate calculated from the fossil record and genetic data, spanning millions of years. The primary cause of this dramatic rise in the loss of species is human population growth and increased consumption, according to the study.http://www.sciencemag.org/content/344/6187/1246752.abstract?sid=a4435a49-708d-44b5-9101-e5c5abf91eb0

8. Peter M Vitousek, *Beyond Global Warming:Ecology and Global Change*, .
"Overall, any clear dichotomy between pristine ecosystems and human - altered areas that may have existed in the past, has vanished" - Peter M. Vitousek
Main Causes: (1) Increase in atmospheric CO_2
(2) Increase in fixation of N_2 for fertilisers
(3) Human land use ... has transformed 1/3 to 1/2 of Earth's ice free surface.
"These three and other equally certain components of global environmental change are the primary causes of anticipated changes in climate, and of ongoing losses of biological diversity. They are caused in turn by the extraordinary growth in size and resource use of the human population."

9. R. Costanza et al. "Changes in the global value of ecosystem services" Global Environmental Change 26 (2014) 152 - 158

   http://www.sciencedirect.com/science/article/pii/S0959378014000685

10. http://chge.med.harvard.edu/resource/sustaining-life-how-our-health-depends-biodiversity
11. http://www.sciencedaily.com/releases/2011/08/110824091146.htm
12. www.ipcc-wg3.de/assessment-reports/fifth-assessment-report

Blanco, Gabriel et al., International Panel on Climate Change, "Drivers. Trends and Mitigation IPCC WGIII AR5." Last modified APRIL 12, 2014. Accessed April 25, 2014, p. 23

www.ipcc-wg3.de/assessment-reports/fifth-assessment-report

13. Mark O'Connor, and William Lines, Overloading Australia, (Canterbury, Australia: Envirobook, 2008), p. 1 (Re 80 lifetimes)

14. Mark O'Connor, and William Lines, Overloading Australia, (Canterbury, Australia: Envirobook, 2008), 217 (Re: every $ of Aust GDP)

15. Chan, Steven. Population Matters UK, "Impact of Population Growth on Cost of United Kingdom Energy Infrastructure and Practicability of Meeting Carbon Reduction Commitments to 2050" Last modified SEPTEMBER 2012. Accessed June 26, 2014.
    https://www.populationmatters.org/documents/population_infrastructure_summary.pdf

GLOSSARY

Biocapacity is the capacity of an area to produce useful biological resources and absorb wastes generated by humans in any one year. When ecological footprint exceeds biocapacity, an ecological deficit (overshoot) occurs.

Biological capacity available per person (or per capita): There were 12 billion hectares of biologically productive land and water on this planet in 2008. Dividing by the number of people alive in that year, 6.7 billion, gives 1.8 global hectares per person . This assumes that no land is set aside for other species that consume the same biological material as humans.

"Useful biological materials" are defined as those demanded by the human economy. They include forests, fish, firewood, fibre, food and the ability of all plants to remove CO_2 from the air.

Global hectare (gha) A common unit that quantifies the biocapacity of the earth. One global hectare measures the average productivity of all biologically productive areas (measured in hectares) on earth in a given year. Examples of biologically productive areas include cropland, forests, and fishing grounds; they do not include deserts, glaciers, and the open ocean. "Global hectares per person" refers to the amount of biologically productive land and water available per person on the planet. e.g., in 2005 there were 13.4 billion hectares of biologically productive land and water available and 6.5 billion people on the planet. This is an average of 2.1 global hectares per person. Due to rapid population growth, this figure is decreasing.

Carrying capacity Carrying capacity is the number of individuals an environment can support without significant negative impacts to the given organism and its environment.

Population The number of individuals of a particular species in a given area at any one time, e.g. the global population of humans on 31st October 2011 was 7 billion

NIV – New International Version of the Bible

RSV – Revised Standard Version of the Bible

Dominion Rule (assumed responsible)

Overshoot When a population exceeds the environment's carrying capacity.

USEFUL WEBLINKS ON POPULATION

1. http://www.youtube.com/watch?v=F-QA2rkpBSY

Explanation of exponential growth: Prof. Al Bartlett's 'Arithmetic, Population & Energy'

2. http://www.population.org.au/sites/default/files/resources/ConservationThroughHavingSmallerFamilies2012.pdf

"Conservation through Having Smaller Families" educational resource by Nola Stewart

3. www.popoffsets.com

Offsetting carbon through donating to ethical family planning projects. A tonne of carbon is offset by donating 4 pounds sterling to PopOffsets. This is more effective than tree planting (8), wind energy (15), solar panels (31) or hybrid vehicle technology (56 pounds)

4. www.populationmedia.org/

Find out how radio dramas bring about change in social attitudes relating to reproductive issues.

5. http://www.theguardian.com/global-development/2014/jun/06/bangladesh-female-health-workers-family-planning

Proactive steps taken in Bangladesh have helped curb high fertility rates.

6. http://farm1.static.flickr.com/235/517388286_9fae13deca.jpg

Kerala India 'Does it Right' in managing fertility.

7. http://www.youtube.com/watch?v=LPjzfGChGlE&feature=player_embedded

Roy Beck's YouTube videoclip "Gumballs" on Immigration

8. http://www.confessingcongregations.com/resources/creation-care-resources/

ACC "Caring for the Creation" Working Group (CCWG) webpage

9. http://www.ecouganda.org/

Ecological Christian Organisation (ECO) Uganda website shows consciousness of need to address population in order to save the Creation.

10. www.populationmatters.org

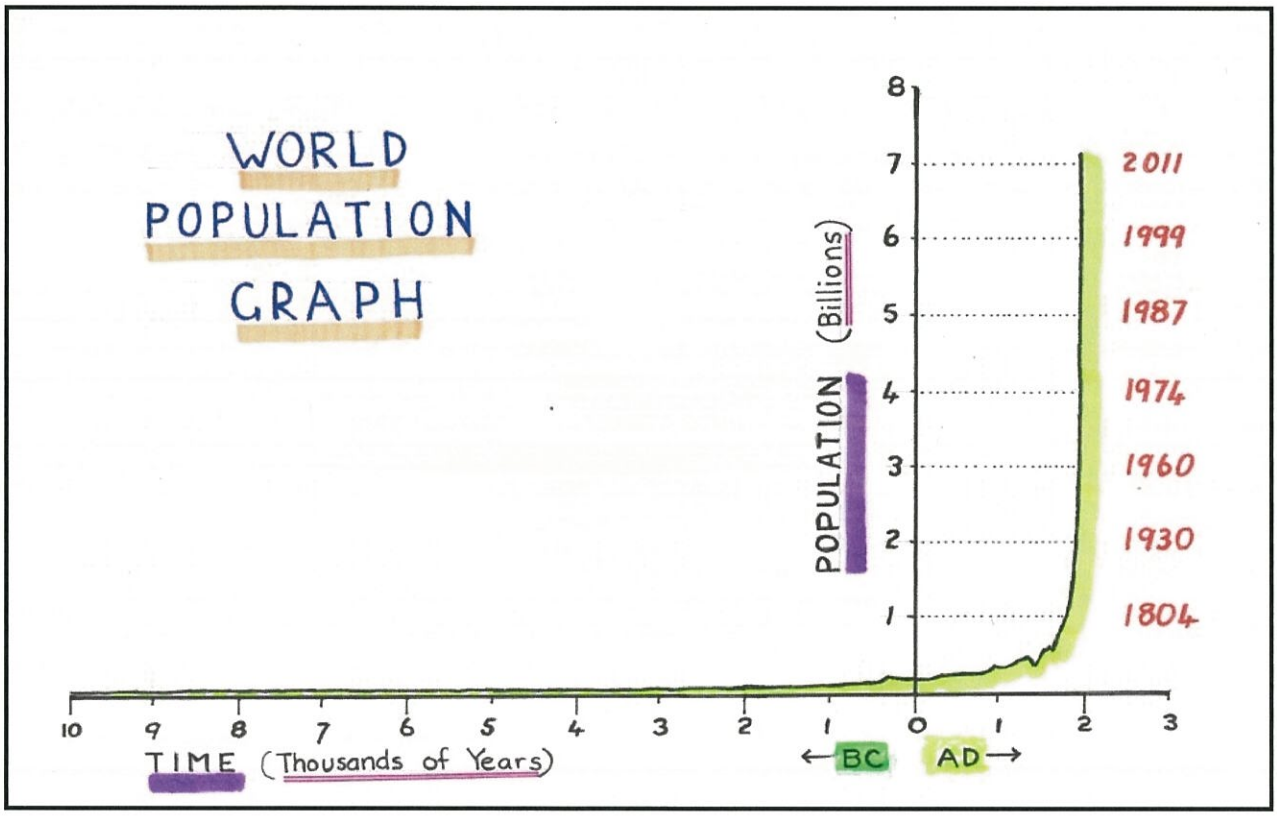
Think of joining an organisation or researching information on population? Population Matters UK is a good place to start.

ACKNOWLEDGEMENTS

The Author would like to acknowledge with thanks the help in editing the manuscript and presentation provided by Dr Suzanne Brownhill, also the encouragement and support of the "Caring for the Creation Working Group" of the Assembly of Confessing Congregations of the Uniting Church of Australia.

Context of "Go forth and multiply"

Woe to you who add house to house … till no space is left *(Isaiah 5:8)*



A righteous man cares for the needs of his animal (Proverbs 12 : 10)