Global Issues Part 1

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Preacher: Dr. Olav Slaymaker

[0:00] Well, global issues. What is a global issue? First question. I was asked to speak to the topic. Things like famine. Things like pandemics. Global warming. In fact, it's the geographer's cornucopia of topics all over the place. And geographers love to talk about messy topics that have no limit. And the question, however, is rather more urgent than one of arm-waving and generalization. The issue is, well, for those of us who celebrated Earth Day yesterday, the importance of trying to see whether there's any progress in our treatment of the environment. We're trying to see whether there is any greater respect for the global situation.

And I think that David Suzuki, a person who I'm not commonly known to quote, but he put it very well in his discussion on Friday in the Vancouver Sun, that there does seem to be some progress in the way in which people in general, and to a certain extent governments at a broader level, are viewing global issues with greater seriousness. He indicated in that section that we've got a long way to go, but nevertheless that there seem to be clear indication of progress.

But before we get into the... I'm going to try to summarize some of the literature which I found most interesting, but before we get into that, I want to talk about the metanarrative.

Who can remember the definition of the metanarrative? Dr. Packer introduced it to us the other day. Well, essentially the big picture. I'll tell Jim that nobody remembered.

The metanarrative for us Christians is really very clear, whereas the controversy and the debate in our contemporary society is very unclear. And so it seems to me incumbent upon us, as a group of Christians, to look at what is clear first, and then to, as part of what we call learner's exchange, exchange some of these confusions, and try to get greater clarity on these global issues from our discussion. But let me then say what I see as being the metanarrative, or the big picture.

[3:30] We say it every morning when we go to the communion service. Holy, holy, holy, Lord God of hosts, heaven and earth are full of thy glory.

Now, those of you who can remember, well, if you can't remember Jim's talk two weeks ago, you probably can't remember my talk six months ago. I did use that quote when I talked about the theology of nature.

But in terms of global issues, this seems to me an appropriate starting point. Heaven and earth are full of the glory of God. And also, in the other quote from the prayer book, O all ye works of the Lord, bless ye the Lord, praise him, and magnify him forever.

In more specific terms, a global issue for a Christian starts with God so loving the world that he gave his only son.

So that everyone who believes in him may not be lost, but have eternal life. It's a very interesting verse which is used not only at football matches, but in a great variety of circumstances.

[4:54] When you look at it carefully, it has the full range of scale that global issues imply. God so loved the world the whole world who gave his only son that everyone, every individual who believes in him may not be lost, but have eternal life.

So what that statement says for a Christian is the global issues have to do with a whole range of connected events at a variety of scales from the individual through to the community through to the global society.

That's part of the metanarrative. Another part of the metanarrative is what's wrong with the earth.

The groaning of creation that Paul talks about in the letter to the Romans is something that we are aware of, that the creation has also been affected by the fall.

And fifthly, in terms of this metanarrative, with whom does God make a covenant? We read in Genesis 9, I am establishing my covenant with you, that is Noah, and your descendants after you, and with every living creature that is with you, the birds, the domestic animals, and every animal of the earth with you, as many as came out of the ark.

[6:35] So these five points, I'll repeat, that the earth is full of the glory of God, that all his works are called upon to praise him and to magnify him forever.

And God so loved the world that he gave his only son so that each one who believes may not be lost but may have eternal life. The fact is that creation is groaning under the general influence of sin and under specific influence of many sins.

and the importance of recognizing that God has made a covenant not just with individual people or not just with the children of God but with the whole of the created order.

so what I'm suggesting is that that is the big picture and that global issues as we have them debated in our contemporary society have something to do with the disturbance of these personal and created order and global values.

right? There's some disturbance that has been happening and is still happening around us. That is the clear the most clear part of my presentation both this week and next because immediately we go into looking at the explanation for these disturbances.

[8:16] it is the case that there's not a single widely held theory that explains what is taking place and we can discuss that in the discussion time.

So that's the introduction and I want to first of all then identify four components of global issues two of which I propose to address this time and two next time and those of you who are brave enough to come to the second presentation will receive the outline of the talk.

Thank you. There is strategy here. So in the secular literature global issues are commonly defined as phenomena which affect the whole planet Earth whether for good or ill and the emphasis is on the rapidly increasing rate and intensity of interaction among four major components and this is my interpretation you won't see these four components necessarily on everybody's list and some lists you'll see a dozen or more but the four components that seem to me to be dominant are the question of population growth its absolute amount and its uneven distribution secondly the global environmental change its accelerating rate and intensity thirdly the intensely conflicting views on the relations between society and environment and fourthly the rapidity and intensity of information flow and this information flow includes such things as ideas inventions culture values religion spirituality art music literature and institutions of governance so you can see that some people would make a separate category for each of those kinds of things but it's in my sense of it it's the rapidity and the intensity of the information flow that comes from this globalized world which focuses a number of global issues now what I propose to do with those four issues is to give you a case study under each one so that those can actually make the issue clearer hopefully and so first of all we'll have a case study under the question of population growth its absolute amount and uneven distribution and then we'll go on to global environmental change and presumably next time look at the conflicting views on society environment relations and then the rapidity and intensity of the information flow as the fourth case study so let me just then show a few pictures someone said that we time these events at nine o'clock on a Sunday morning because people are still not awake so we may just see whether this is a rather outdated cartoon but it nevertheless expresses some of the issues surrounding population growth it was produced for the 25th anniversary of Earth Day and now we have the 35th anniversary the situation hasn't changed a great deal in relation to this cartoon it is expressing the fact that we are celebrating this birthday we like to think of every day as Earth

Day as the feeling of the group around the feast here the feast is actually looking remarkably complete at this point but of course with more and more people taking part in the eating up of the global resources the situation is a little more serious each year the population issue has been a controversial one for many reasons but I think we can think about the extraordinary times under which we have all seen this happening when I was born there were 2 billion people on the planet and there are now 6.5 billion people on the planet and this is a quite extraordinary and unique phenomenon totally different from anything that the

Earth has seen with respect to demand on its resources as a result of that kind of issue we become increasingly aware of the finiteness of the planet hard even to see it but anyway there are actually two perspectives on the same planet in this picture and the reason for showing two planets is because of course the discussion with respect to population growth suggests that we need at least two planets to accommodate the demands on the Earth's resources and I'm going to suggest later on in the morning that we'd all find it instructive to google the ecological footprint if you google ecological footprint you will find about 11 to 13 easy steps to calculate your impact on the planet it also has the audacity to tell you in the answer at the bottom line what this would mean to the rest of the universe if everybody had the same standard of living as you and I it's a shocking kind of statistic there are difficulties with the ecological footprint which we'll talk about later but nevertheless more in the way of planetary resources are evidently needed in the context of this population situation well here's the graph of the way in which population has increased over time and it's strategically shown off the top of it but you know here we're looking at the time of Jesus something of the order of 250 million estimate something of the order of 2 billion here you see this is and then 6.5 and thought to be moving towards 9 billion but no prediction of global population in the past has ever proved accurate so I wouldn't wish to risk my reputation on the figure of 9 billion but if 9 billion is the most likely that means we have another 2.5 billion miles to feed within a short time this by the way interestingly the plague in the 14th century is the only significant impact on that graph showing a dip in the global population around 1400 it doesn't always work out that way because if you look for example at the estimated population of Egypt population does not go these estimates of course are all considerable error bars around them but going from the 3 million or so population of Egypt in about 600

[17:16] BC then affected by military action then affected by plague in the 8th century the black death in Europe and Turkish conquest there's a combination of military and disease effects that will change the shape of the population curve but none of those impacts on one particular country have much effect on the overall picture this is a way out of date map but nevertheless instructive in terms of showing the distribution of population and the way in which China and India dominate and the way in which Canada becomes an appendage of our friends to the south but the dimensions of our population problems of course are minuscule compared to those of the global situation and as a result of all this the decision by

Billy Brandt's commission in 1980 to define the north south divide which of course consists of the north in blue you all recognize the north here and the south which is specifically here and then intermediate colors of degrees of southness or northness in different parts of the world but basically the depending on and also influencing population growth now I said I would introduce one case study and the case study is mysteriously entitled the harbor bush process why does the harbor bush process have anything to do with this well it could be said that the harbor bush process is the most important invention that occurred in the 20th century you may think of airplanes and nuclear energy space flight television and computers as being more important but the world's population could not have grown from 2 billion in 1900 also 1.6 billion in 1900 to today's 6 billion without the harbor bush process harbor fritz harbor was a german who invented the process of inorganic inorganic nitrogen fertilizers and this in order to allow the growth of food at the rate at which it has been growing in the last few decades has meant that land surface is not a constraint the extent of the land surface on which crops are grown is not the constraint that it used to be because one can increase almost indefinitely the intensity and the production of these inorganic fertilizers in such a way that intensive agriculture can be developed now the practical implication of that if we look at it from the point of view of crop production in the

United States is as follows the intensity of agricultural production in the Mississippi basin which is outlined in this unpleasant brown color has given rise to unbelievable surpluses of food as we know there's far more food available than can be consumed and this scandal of the throwing away of masses of agricultural food is well known but the point is that what used to be calculated as the land base potential for food growth is no longer that much of a constraint but what is happening of course is that there is a zone just off the delta of the Mississippi which is colored in red here which is a dead zone the effect of the nitrogen that is running off the fields from intensive agricultural production is destroying all life forms off the coast of the

Mississippi Delta and what this does for us is to pose an important question as the extent to which technology can substitute technology can substitute for the natural productivity in terms of producing food but at the same time there are results permanent results from that activity which lead to significant problems off the coast of the delta what are the problems well we couldn't be worried about dead zones in the offshore because we don't live there but of course it's an area that is right in the middle of extensive exploration for oil and other resources and it actually has meant that the conditions under which the exploration takes place are unacceptable so in a practical sense it limits exploration but in a more general sense of course in terms of the topic that we're thinking about and the way in which the earth reflects the glory of

God the complete destruction of that part of created order is a result of the artificial development of these inorganic fertilizers and the intensity with which they're applied of course we could give more spectacular examples from the Yangtze Delta and from the coast of India and so on all of these coastal zones are effectively being destroyed by this extremely important way of keeping people alive by producing more food so we have an ambiguity here we've got all these people who are able to be dead at the same time there are permanent impacts which are or were were not predicted I'll just show you this in a little more little more detail this is what is happening alongside the immediate coastal region so that concentrations of NO2

[25:03] NO3 N2O and various compounds of nitrogen and hydrogen sulfide are such that they are concentrated up against the coastline in various parts of the world this is actually from the west coast of India and there's a detailed study that was published in 2000 so this case of the Haber-Busch process that's to say the artificial production of nitrogen just poses the question of population in a rather dramatic way because what that process has done has been the detonator of the population explosion and then it has in other words it's met the need for more crops and for more food and at the same time the result of those production of those crops has led to some permanent destruction of the environment and this becomes important in our discussion later because for example and I'm sure you in this room would claim to be a technological fix person well maybe there are some the technological fix in many respects has this built into it that we can solve many of these environmental and global problems at one level and then generate a set of downstream problems which mean that the actual technological fix is not in itself a fix but a short band-aid solution there are many other things that we could say about population growth obviously and the question of the uneven distribution the way in which we are focusing our population within urban areas is probably the point that becomes most obvious an issue here and how we can claim to be earth keepers or stewards of the environment under circumstances where we are essentially focusing our impact in such a way so the second issue the global environmental change its accelerating rate and intensity is illustrated by a map of the world which you can't see the detail of but it's there to remind me of the fact that soil is being lost at an accelerating rate and intensity 15% of the surface soil which cannot be replaced in less than periods of the order of tens of thousands of years 15% of the earth's surface soils have now been moved off into the oceans there are many reasons and this particular map goes through each region of the world with the particular soils problems or soils troubles that are present to me the climate change discussion has hijacked the publicity and this is a far more important issue

I think again I must heed the warnings of the last three presentations here humility is in order when we talk about these things if I sound as if I know the answers please disregard that impression the answers are not easy but my persuasion is that the most important issue has to do with the loss of soil which has taken so many years to produce and so therefore the whole question of what impact we are having on the land is critical I'm not suggesting that climate change is unimportant indeed it's extremely important but what we do to the soil represents permanent destruction and permanent loss whereas what we do to the environment to the climate in many cases is resolvable and recoverable now there's a sub discussion there about the long term impacts of climate change which are very important but in terms of an immediate issue and something about which we as responsible citizens can do something what we do to the land is extraordinarily important

I'm reminded of this as I Margaret and I go regularly to Fort Moody to inspect our grandchildren and in the course of inspecting the grandchildren we also notice that the hillside is falling apart behind the houses of our two children and we notice that the guidelines for development of those hillsides have been relaxed well it seems to me that there is an issue about which we can make a rather more distinct decision than some of the climate change issues anyway that's a net matter for discussion also what the issue of climate change is well it's illustrated by what it's doing to a place like Greenland and you may not worry too much about

Greenland well it's part of Denmark it's not part of us however we do have little little hate-a-tates from time to time on Hans Island but those two maps illustrate the extent of melting of ice as between 1992 and 2002 and you'll see that the greatly expanded melt that is in 2002 compared to 1992 reflects the fact that there is an accelerating warming and why should we worry why should a Christian be concerned apart from the fact that there are people living on Greenland believe it or not who are sitting in the path of glaciers that are surging the implications of sea level change if the acceleration of melt continues could affect all of us and of course far from predicting that that's going to happen

I'm just suggesting that these are warning signs and indicate the importance of this question of environmental change there's some interesting numbers here about ways in which our activities as our human activities have changed the fossil fuel and land use carbon dioxide fixation of carbon dioxide going to rice cultivation combustion of fossil fuels and so on production of fertilizer mining activities and so on and these figures are in percentage changes from 13 to 400 percent changes and these are examples of accelerating rates of change and in particular one can see some of these numbers which are again someone is going to ask me what are the error bars around these numbers and of course the error bars are very large but nevertheless these are percentage changes the alteration of several major components of the earth system expressed as percentage of the land surface transformed percentage of the current atmospheric carbon dioxide concentration that results from human action percentage of accessible surface water used percentage of terrestrial nitrogen fixation that is human caused this is the one that we were talking about under the

[33:54] Haberbush process percentage of bird species on earth that have become extinct in spite of what the Fraser Institute tells you you read the Fraser Institute on this they say the amount of extinction is negligible and in this case almost all of these are a result of human activity the percentage of major marine fisheries that are fully exploited over exploited or depleted which is this highest bar graph here close to 60% so that there are these accelerating rates of change in the midst of this our ecological footprint is also accelerating and I don't want to give the impression that I'm a doom and gloom person I'm just trying to give you my sense of the seriousness of the situation this may be too serious a book by Jared

Diamond called Collapse which is this year's Christmas gift or birthday gift to all people who would like a good read the thesis of Jared Diamond is that the intensity of the ecological footprint is has been the main reason for the collapse of societies in the past it's not exclusively the effect of ecological footprints there are many examples that one could quote for example the events of 1989 and 90 and the demise of the Soviet Union is not a function of ecological footprint the destruction of Carthage by Rome is a military intervention it's not an ecological footprint but very many examples historically of societies that have collapsed and the most famous one of course is Easter

Island an Easter Island where the whole of the surface vegetation was removed and is now a completely arid wasteland had a population of the order of 30-40 thousand and there are now fewer than a thousand people living on the island and there is no internal food base but Easter Island is not alone it's just the one that's had greatest publicity if you look at a number of other societies such as the Mayan society and the Incan societies and many of the island nations of the Southeast Asia some of the events in Java Indonesia have been well documented as a function of some aspect of the ecological footprint being exceeded well what is this ecological footprint you should be very proud of it

Bill Reese who is the innovator on ecological footprints is actually a colleague at UBC and so Vancouver has in fact had a major influence on thinking with respect to ecological footprints and the idea is that there is a certain area of land and water and air that is required to sustain a certain standard of living and this as I mentioned earlier the Google site that you can find on your home computer will indicate to you what is the area of land water and air volume of air that is required for sustainable existence sustainable under the circumstances of the kind of standard of living that you and I have become used to in each of the cases of past collapse the ecological footprints were far smaller than our own ecological footprints today and that of course is a reflection of the fact that technology has allowed us to make such a much larger ecological footprint and still flourish and survive but it's at a cost and this cost is what the burden of

Jared Diamond's discussion is all about one of the most interesting parts of it if I could recommend it for your reading and hopefully it's not entirely affected by my Scandinavian origins but the discussions about the Norse migrations the Norse migrations from Scandinavia through the Shetland and Orkney islands the Faroe islands Iceland Greenland and Newfoundland are traced in order to illustrate how the ecological footprint of the Norsemen was gradually increased as a function of their of their arrival in these new islands and then the way in which their difficulty of maintaining their societies became greater as distance from their homeland namely

[39:45] Scandinavia became an impediment in other words the ability to supply the needs of the colonizers became progressively more difficult so the Orkneys and the Shetlands and the Faroes prospered Iceland had considerable difficulty in surviving but as you know is a flourishing nation state of all of a quarter million people Greenland they died out because they simply couldn't the combination of the ecological footprint and the difficulty of supplying the resources and continuing trade was great and also there was a problem with respect to the Inuit who were also competing for space in Greenland but finally getting to Newfoundland the situation was desperate and not only were they unable to eke out an existence but of course the supply lines were impossible to maintain all that model it's a model of what is inferred to have happened is used as an illustrative device for the collapse of societies in many other parts of the world and that discussion

I think you'd find very helpful now opinions vary of course and there's huge controversy this book has been said to be the best thing since sliced bread in one review and has been said to be a disaster for social science and other contexts the argument being that it's giving the environment too great a role and that human ingenuity is far greater than would be suggested by Jared Diamond but I can leave you to get your own sense of that but it's the it's the fact of the intensification of the ecological which is the burden of my second point so that we have a context in which not only is the population increasing and intensifying in its distribution and localizing in its distribution but we also have a greater rate of ecological impact and that ecological impact of course is made up of a combination of the population and technology and intensity of the activity so those are the first two points that I wanted to raise and let me before

I conclude this morning also recommend to you a book by Buma Prediger Buma B-O-U-M-A hyphen Prediger P-R-E-D-I-G-E-R which is entitled For the Beauty of the Earth it's a Christian vision for creation care I found this to be a very helpful and balanced read and then the book by Sir John Horton called Global Warming the Complete Briefing in particular Sir John Horton is a Christian and as he was a contemporary of Jim Packers at Oxford we should really take this very seriously there are a couple of chapters 8 8 and 9 chapter 8 is called

Why Should We Be Concerned and 9 is called Weighing the Uncertainties These two chapters are reflective The first seven chapters are essentially giving you the data of Sir John was the chair of the international panel on climate change and he was the person who was receiving the advice from several thousand scientists around the world and had the responsibility of summarizing these and so the attacks from some of the other sources like the Fraser Institute are in my view quite poorly directed nevertheless the reflective parts of this which really indicate his Christian conviction and his sense of the need for balanced discussion of the climate change issue Why Should We Be Concerned and Weighing the Uncertainties is the most balanced Christian commentary that I've seen on this whole issue of environmental change

I'm going to then halt with just a few comments about where to go from here and in particular the question will be asked are you a doom and gloom person do you see any hope well there's no problem in that question because the matter narrative is clear I do see every hope in the meta narrative that the covenant that God has made with not only his people but also has created order will be maintained but I do see also that there is a very serious situation that is accelerating around us and my position is really one of cautious optimism it's optimistic because it seems to me that there is amongst the younger generation at least an accelerating interest in and concern about these issues things there's also very clear evidence around our homes with respect to the whole vexed problem of waste production that we are taking the issue far more seriously as a society

[46:00] I mean any of you who have traveled extensively will recognize that Canada is doing pretty well in terms of this issue of waste disposal in terms of the way in which we categorize different aspects of waste and the way in which we're concerned about how to reuse and recycle materials so there seem to me to be a lot of indications that there is an increasing sense of the fragility of the earth when our ecological footprint accelerates and when our technology proceeds in advance of our understanding of the after-effects of the application of technology so the issue then becomes really where is one's optimism based one's optimism is based in the meta-narrative one has no absolute ability no scientist and no

Christian has any ability to predict what the outcome of these increasing tensions may be but next time I want to look at the way in which the intensely conflict civilizations the way in which Samuel Huntington has described in this little book the clash of civilizations remaking of the world order as a function of the way in which civilizations cultures and religions are increasingly located close to each other and rubbing shoulders with each other when Samuel Huntington wrote that in 1997 he was laughed out of court by the academics at least at UBC but his analysis is making more and more sense in terms of the way in which the rise of fundamentalisms and the way in which our interaction with Islam is increasingly explosive so I'd like to look at those global issues next time and confine the discussion if I may this time to the population and ecological footprint part of the issues thank you applause applause applause did you hear the question is there a threat from the United

States with respect water and well yes NAWAPA is back on the table NAWAPA is the North American water plan which envisages the free flow of water from the Yukon through British Columbia down into California because California's supply from the Colorado River is now virtually at its limit so there's a huge issue there it was on the table in the 1960s and was wiped off the table by the rise of environmental concerns in the 1970s because of the concerns that there would be the danger of Arctic species moving through the water course from the Arctic to a totally different ecological region and the implication of the invasive species being a problem and so as the water pressure in the 1960s was not as intense as it is now the whole issue was dropped but it's back on the table and there are discussions going on about what are the feasibility of water supply from

Canada and there are critical issues being decided right at the moment and whether you've read about the Devil's Lake question which is an issue of water diversion from Saskatchewan into Montana so yeah I mean I think but the other part of your question Bill had to do with the issue of the island fortress mentality of the United States which I think is probably the bigger issue so I realize that some people hold this position in but I mean it seems to me very difficult to justify and to see what the implications are of maintaining a fortress mentality the idea that one locks oneself off from terrorism seems on the one hand to make some sense we're locking yourself also off from influences around the world which are flowing anyway you cannot stop the flow of ideas and inventions and of the whole sort of so that you can lock up the border with guns and with various other devices but in the long term these things will break down so there has been a very strong push from the United

States to essentially ignore Africa in that context but that's a very important global issue and we'll say a little more about that next time yes the question of soil salinity let me look at it in two ways first of all it's most obvious effects in a quantitative sense or in an obvious sense are through the increasing salinity of groundwater supplies I don't know how many of you are aware of the dependence of the middle part of the United States on groundwater and the so called Ogallala aquifer which covers huge areas and Jared Diamond discusses this but it's been massively depleted and is now essentially up against saline water and the limits of fresh water supply are well within so it's a buildup in the case of groundwater over the time of the salinity of the groundwater itself in the case of soils you're usually looking at the salinization process in an arid context and you're looking at the well if you look carefully in the

[52:50] Okanagan next time around our Soyuz you'll see some very obvious examples of salinization salt plans where previously it was possible to carry out agriculture because the soils in principle are rather rich but they have now been temporarily put out of action because of the extent to which salt has accumulated and the salt is simply I mean if you evaporate the water you've got even if you've got quite fresh water there are elements that are going to be accumulating if the evaporation is greater than the amount of water that's being supplied from rainfall so you can you can you can take that whole salinization picture to global scale by looking at the zone of desertification which goes right across the globe from southern United States across Africa and into

Asia where the salinization problem is very serious so India has got the problem certainly Iraq serious salinization problems in southwestern United States and many other places so it is a global issue and it's a reflection of this intensification of the ecological footprint so yeah Yeah, one of the charts is...

... ...

... ...

... ... Well, the first part of your sentence is exactly right.

[55:00] Yeah, the water vapor issue is much, much bigger in terms of volume. But I'm not sure that the second part of the statement follows. I mean that... ...

Yeah, but we're talking about change, right? not just absolute amounts. So the question is whether the rate of change is greater.

Well, that's an interesting question. I mean, you've got a whole series of components. You've got the issue of greenhouse gases of a variety of kinds.

You go from methane to carbon dioxide to HCHs to a whole range of... And that's a... I mean, it's a very interesting issue that you raised.

But I mean, the point of the issue is the rate of change rather than the absolute volumes. Yeah? I think...

[56:09] I don't think I'll back up. I heard several years ago now. I think I'll be doing that. I think I'll be doing that. Yeah.

Well, this is a question of... This is a question of acid rain, which was spectacularly damaging for a while. but it's one of those things where the ecology can recover.

And there is considerable evidence of recovery of the black forest now. Basically, the effects of... This feeds into my general conviction that the climatic elements are a little bit more possible to control, a little bit more possible to work with because the change back, the recovery of the black forest is something quite spectacular.

It's also true of the Scandinavian forests, which were essentially being bombarded by the pollutants from the UK. Yeah, well, legislation has been brought into effect.

And I don't know whether any of you have followed the latest budget in the UK, but there's a new so-called ecological budget. And I don't know whether this is Blair's last attempt to hold on to power, but it's an extraordinary thing.

[57:49] It's, in fact, an ecological budget that is based on ecological footprints. And it calculates for each region of the United Kingdom what are the emissions, what are the materials, input and output from each region.

And so this kind of approach is not a pie-in-the-sky thing, but we're way behind in North America on this kind of approach.

Denmark was the first country to apply this. And small countries sitting behind industrial countries, or in the wake of industrial countries, have been most sensitive to it.

And then gradually it seems that this is going to be a standard policy. Well, it's certainly possible to cut back.

You're then into the whole question of agricultural subsidies. A very complex issue. But the fact is that the amount of damage that has been caused is now seriously being taken into consideration, and more controls will undoubtedly have to be put in place.

[59:16] Sir? I know what's one factor. Where is that? Well, as I say, nobody's actually managed to predict correctly. There's a wonderful book by a man called Cohen, which asks the question, how many people can the Earth actually support?

And, you know, it ranges from 5 billion to 40 billion. And it depends entirely on what level of technology, what level of ecological footprint you're thinking about.

But it seems to me that the issue is the greed of our society in North America and how we can cut back on our expectations.

Politically, this seems to be an impossible thing to achieve. But, I mean, you know, I said I was cautiously optimistic because of the science and this ecological budget in the UK is another reason for optimism.

But we've gone through a recent election during which the word environment and the word international were not present in the debate. that worries me because that indicates that we're really primarily concerned about our own pocketbooks, which, I mean, is understandable, but surely it can't be the whole story.

[60:42] Yes? No, no, that's...

No, these are... I mean, the local scale is far more encouraging than the national scale. In that respect. And, but, I mean, here we are. We're sitting...

During Earth Day, there was a tent camp in West Vancouver and people protesting the unnecessary avoidance of a tunnel.

I'll show my hand on it. Yes, please. I don't know if you can use carbon credits. Exchange of carbon credits. Yeah, yeah.

Hmm. Hmm. Well, yeah, I mean, the fact is that there is some hope in a system of...

[61:52] Because the accounting of the emissions becomes more honest. And so one can see more precisely what the ecological impact is if one has a system of exchanging credits.

In other words, people are not going to buy the credits if they're not convinced that this is happening. So there's a... There's a... An application which is now affecting many industries and...

Particularly in Europe. It's... It's not widely practiced in North America. Yeah. Well, that's a good question. Two... Two points.

One is that it's almost universal that population decrease occurs with increasing prosperity. So that there is one way in which one can actually likely guarantee a reduction in the long-term population.

Second issue, which... It's not answering a question about my view, but the extent to which the Roman Catholic Church has controlled the discussion on birth control, it's extremely difficult to see how one can actually successfully override that position.

[63:13] So that birth control has been essentially a no-no. And all the the global institutions like the World Population Council, which has struggled to introduce has led to considerable difficulty.

difficulty. So that the issue for me is one of deep ethical concern, because what you are talking about is the question of how clearly you can see the alternative.

In other words, if reducing the number of children born is going to save the lives of many others, then there's a kind of a moral gray here of choosing the lesser of two evils.

So it seems to me that there is an ethical conundrum. If you think you can see very clearly that you're going to save many other lives by stopping the production of new lives, then I guess you can be justified in aggressive birth control policy.

But it seems to me that we can't in general see exactly this. And it seems to me the long-term reduction in the rate of growth of population will occur as economic conditions improve and educational opportunities are improved.

[64:53] India and China are no longer the issue. The issue is places like Africa and large with a fertility ratio of three or greater than the problem is very high.

Because already the ecological footprint for those populations is so high. But in India and in China the fertility ratio is now about 1.5 1.6 I guess.

And that means it's less than the replacement rate. Well this topic we will talk about next time because there are in fact more environmental refugees now than there are refugees from war.

So that people wandering around the earth looking for new homes are essentially fleeing from environmental crises.

what is interesting if you have the opportunity to look at remotely sensed imagery from satellites around the edge of every continent like India or China or the United States you can actually see the level of the pollutants up against the coastline emerging from the rivers.

[66:31] I mean it's not an easy technical problem because the scale is so large happening so extensively. So you can actually see by getting the appropriate electromagnetic signal you can actually see the accumulation of these pollutants.

Well I think you're in the mainstream of conservative Christian thinking. it seems to me that it crucially depends on the extent to which we see ourselves as dependent and interdependent with the environment.

If somehow or other we can be independent of the environment then I might find myself in agreement. But it seems to me that if we are interdependent with the environment and if more importantly the covenant is with the animals and the living things as well as ourselves then I think as conservative Christians we've missed the ball right royally on this one.

So I'm open to correction but I don't hear much from our pulpits about this particular issue. Thank you.

Well now speak. Thank you. Thank you. Thank you. Thank you.