

Harry Ridgewell: So, first of all, could you please just give a bit of background about yourself?

Diana Coole: Yeah, well I'm a professor of political theory at Birkbeck University of London. And my work has been mainly in political philosophy, but I've thought for a long time that philosophy and political theory ought to be not a highly abstract discipline, but it should ... My background's in critical theory, and I think it should deal with real tangible events and processes.

So, I'd always been interested in population, and in 2010 I got a three year Leverhulme fellowship to spend three years looking at the population questions. So, I had a vague interest in demography before that, but actually political theorists and political scientists hardly ever talk about demography.

There seems to be a real gap in the literature, and I've subsequently realized why, because it's so fraught with moral and political controversy. But even so, demographic change is a really fascinating aspect that has an important part I think in social sciences. So, for about the last eight years I've been looking at the way demographic change impacts particularly the environment, and a lot of the issues that surround it, and questions about why people don't want to talk about it.

And yeah, I suppose it dovetails with my more theoretical work, because I've been working on a big project for a few years called the new materialism. And I think the new materialism also really invites us to go back to looking at these really substantial material issues.

Harry Ridgewell: So by 2100 the human population may exceed 11 billion. What are the problems of Earth's population rising to this?

Diana Coole: Okay, you're just breaking up a lot and I'm going to just move into another room where it's possible the WIFI might be a little bit better.

Harry Ridgewell: Okay, sure.

Diana Coole: Okay. Right, well we obviously don't know what a population of 11.2 billion would look like, but given that since the 1950's world population has trebled, we can imagine that adding around another 4 billion is going to have a huge impact, particularly since most of the rise is going to be in Africa.

So I think there are different components to it. One is the developing countries, the United Nations, and lots of bodies suggest that it's going to be incredibly difficult for a lot of the poor African countries, which are just undergoing demographic transitions, to sustain the kind of population increases that are being projected.

And one real difficulty is that as they're trying to develop, they obviously have to be building infrastructure, schools, health systems, transport systems,

agricultural capacity, and so on. And if you're trying to do that with a population that's constantly increasing, in a way you're having to run just to stand still. So it makes it much more difficult.

And some countries are projected to have increases of around five times over the next 70 years or so, and imagining countries like Nigeria having such massive, or Niger having such massive population increases when they already have all sorts of environmental and social and economic problems, it's hard to imagine it's in their interests to have increases of that kind of scale.

I think there are also much more general global problems where we don't quite know what role technologies will play. But for example if we see the kind of displacement from jobs associated with robots and AI that people are talking about, we could have a huge global population without jobs. And how are we going to support them.

We're also talking in the context of climate change, and biodiversity loss. Are you getting me okay, because you're breaking up?

Harry Ridgewell: Yeah, yeah.

Diana Coole: Okay. So, this is not only a huge increase in population, but it's an increase in population in very diverse circumstances. In as much as food production just where it's most needed is likely to be most vulnerable to changes, with temperature change, drought, desertification, forest fires, and so on.

So, I think that kind of population growth is both going to be probably an environmental disaster, but it's probably going to impact most seriously on the most vulnerable people, who have the least capacity to adapt to the most serious effects of global warming and climate change.

Harry Ridgewell: So, if rising world population puts pressure on food resources and increases food prices, what do you think the average person's diet will be in 2100?

Diana Coole: Well, it depends a lot what choices are made. A lot of people suggest that we could easily feed 11 billion people if we all became vegans for example. Personally I think the chances of that happening are very remote if we just look at countries like China, as populations become wealthier and more developed, they tend to have diets much richer in meat and higher calories, and increasingly unsustainable.

So, I think it's unlikely that we're all going to become vegans, especially as the food industry has a vested interest in obviously selling us more processed foods, and meat products, and so on.

Other people say they think that continents like Africa could feed themselves through well organized organic farming, in which there won't be so much

wastage in fields. But, again, that depends on an awful lot of political will and capacity to build the kinds of systems that are going to transport food, which is itself probably going to increase climate change. And to be much more effective.

And well, I suppose on the one extreme we could have a world of vegans. On another extreme we could have a world which went back to massive famines, [inaudible 00:07:24]. And I think the whole world system is recognized now to be very vulnerable, because there are lots of ... it's so interconnected that for example a really bad harvest in Russia can impact world food prices everywhere. So we don't have the kind of grain storage capacities that we used to do.

So, yeah, we could have periodic famines, or I suspect we'll just have a lot of people who are malnourished and just don't have enough food. And particularly they're going to be obviously in the least developed countries.

Harry Ridgewell: So, I've also read that the rising world population will affect poverty and people's quality of life in the future. I was just wondering if you could talk about that?

Diana Coole: Well, it's an interesting question that I broached in my book that I think has hardly been researched at all, certainly not recently, which is the affect on people's everyday lives of rising population densities. And when we think of very densely populated countries, we tend to think about places like India. And then other people say oh well, it's just ... we're talking about lots of poor people, and it's racist, and they're just worried about the poor and so on.

But I've spent a lot of time in India when I've been doing my research. And I think it just makes ordinary every day lives very challenging beyond a certain density. And my particular interest is in rising densities in developed countries, and obviously that's not the case everywhere, but I live in London where around 100,000 people have been moving to the city every year. And it's projected, like most world cities, to increase massively.

And it just seems to me that things like traffic congestion, pollution, trying to access social services, schools and so on, it begins to feel more and more like musical chairs, where there's never enough to go around. And the stress of constantly having to move around in very crowded congested environments surely has to have an impact on mental and physical health. And also we can see city planning is focusing more and more on reducing people's living spaces, building high rises. It doesn't seem to me that that's congenial to people having good mental and physical health outcomes if we're going to coop people up in smaller and smaller living spaces.

And it also of course then puts more and more stress on public spaces, like parks and roads, and the whole environment. So I think that's rather an un-researched area, just what affect rising population densities have on people's everyday lives.

Harry Ridgewell: It's more sustainable though, isn't it, if we all live in cities rather than spaced out?

Diana Coole: Yeah, it is more sustainable, and it's an obvious solution. But it's a kind of tragedy of the common solution I think, that in a bad situation where everything's become unsustainable, it makes more sense not to have suburban spread and to concentrate people into cities, particularly if you can have economies of scale, and say get people out of their cars and into public transport.

But somewhere like London, public transport is running absolutely at full capacity. So what do you do? You keep building more and more transport, like Cross Rail, and you end up with a city which feels like a permanent building site. And there's also some ... I don't know if you've seen work by Jane O'Sullivan. She's an economist and has looked at economies of scale, and argued that for every 1% of population increase, you need to invest about 12.5% at least of investment in scaling up your infrastructure.

So, those economies of scale arguments definitely work until you've got a certain critical mass. And I think the interesting question is can you go beyond that threshold of that critical mass and start getting dis-economies of scale?

So, I mean it's true that probably concentrating people in cities and building upwards is a good solution to over-population. But whether that's a good way for people to live ... or, I don't think most people would choose to live that way. So if we had fewer people, and people could have more living space, they could have a bigger garden, they could have more access to green amenities and things, it seems to me that that would actually be a better existential outcome for most people.

Harry Ridgewell: So what do you think is the maximum number of people that Earth can support?

Diana Coole: Honestly, I couldn't say. I think it's a bit of a red herring to ask that, because then immediately critics say, and rightly, they contest the number. And there's a huge variety of numbers thrown out. And then they say okay, if you found a number, how could you possibly, without really draconian policies, enforce that?

Some people suggest maybe half a billion is really sustainable. Other people say maybe seven or eight billion, closer to where we are now, but not more. Other people would say, well, resources are elastic, and with the right technology we could support any number of people. But I think we do have to remember if we concentrate everybody in cities, or as people like to say put everybody in Texas or on the Isle of Wight, we're still using the rest of the planet as our hinter-land to support us.

So, we can't stand everybody on the Isle of Wight and also grow all the food we need on the Isle of Wight. And that has a huge impact on biodiversity. So, I'm sure we can support 11.2 billion people as projected, but I'm very skeptical that we can support them in a way that we would think is desirable, or without massive inequalities and deprivations.

Harry Ridgewell: And what role does rising global obesity play in that? And if everyone ate the necessary amount of calories that they needed and no more, would we be able to support many more people then?

Diana Coole: Well, I think that's only one bit of the puzzle. Also people have got to drink fresh water, they've got to have a certain amount of space, which impacts on biodiversity. They're using fossil fuels to create energy and so on.

So, yes, it would help if people ate less, but it's a bit like most socialists wouldn't agree that simply taking money off the rich and distributing it to the poor was going to sort out the problem of global inequality. You'd have to do a lot more than that, than just distribute a scarce resource more equitably.

And anyway, these things are all happening quite quickly, and the idea that somehow politically we're going to say wean Americans off their high calorie diets, and get them eating like Indians over the next few decades. It just seems to me that that's not really going to happen. And then how are we going to distribute the food to where it's needed?

Yeah, it would help, but I don't think it's a solution. And even if it was, it's only the solution to one part of the problem. So when people talk about a perfect storm of many factors, I think that's really part of the difficulty. Food is part of that storm, and it's only one part of it.

Harry Ridgewell: So you say we can reduce our numbers in a way that's compatible with human rights. How should we go about reducing world population?

Diana Coole: Well, I think the first thing is that we absolutely would have to ensure that we have excellent family planning services for women everywhere. So that nobody should conceive and carry a pregnancy to term who doesn't want to, because multiple pregnancies are really bad for women's health. Early pregnancies are poor for maternal health and infant health. And many women bear many more children than they would choose to do, and it's estimated often that something like 40% of worldwide conceptions are accidental.

So I think as a beginning if we could make sure that every child born is a planned and wanted child, and that every woman has the knowledge and the services available to ensure that every birth is actually chosen and wanted. That in itself could make the most enormous impact, and it's entirely compatible with women's rights.

Harry Ridgewell: Do you support any legally enforced measures, like a one child or two child policy?

Diana Coole: I don't support a one child policy, I think that would just [inaudible 00:17:30] create so much antagonism. I know Sarah Connolly's recently made a case for that. And in my little book I say that I think that's unnecessarily draconian. I think if we could encourage people to only have two children, I think two children per couple has an intuitive appeal. And given that replacement level is usually worked out the 2.1 children per woman, it would be slightly below that.

And obviously there are a lot of women who would remain childless, or who like me would only have one child. And so we gradually reduce numbers. But at the same time I don't think you can absolutely enforce a two child policy, but I certainly think that you could encourage people to not have more than two children, and explain to them what the benefits both to their own family is, and the benefits to the environment.

So, for example I think there's been a fashion among wealthier families in Europe and the United States, some places, to have three children recently. And people say, oh well I can afford it. But those children are all going to use far more than their share of ecological resources. So I think it's important for the wealthier people to realize that they're actually being quite selfish having more than two children.

And it's quite worrying that on the one hand in much of Europe we're seeing real pronatalist policies in place to try and persuade people to have three or more children, in order to tackle population ageing. Which of course is an issue, but I think it's a very short term solution to encourage us to have more children. And of course the more those children will also age, it's rather parallel to the migration argument. If you want to use net migration to solve the problem of population aging, those migrants will also age. So you're also committing yourself to increasing your rate of population into the indefinite future.

I mean societies may choose to do that, but I think they should be aware of what they're choosing, and what the stakes are. So, my own view is that dealing with population aging is a fiscal challenge for advanced societies, but I don't think they should try and solve it demographically. I think it would be to the advantage of the planet enormously if wealthy countries populations dwindle, perhaps to early 20th century levels. And that people should be encouraged to recognize the advantages, whereas constantly economists are encouraging us to have more children.

And government policies, EU policy is very overtly pronatalist. And the same in Australia, Singapore and so on. We also see countries like Turkey, Iran, and so on encouraging for nationalist reasons to have more children. So Iran's a good example of a country which was very effective without abusing human rights at reducing its population growth, but now a lot of those countries, Turkey's

another good example of a country which is really putting pressure on women to have more children. They argue that they're not being good citizens if they don't grow their populations relative to other countries.

Harry Ridgewell: Is it possible to reduce world population and have a growing economy, when as you say it would lead to at least temporarily a globally aging population?

Diana Coole: Well, an aging population's only a temporary problem, at least in the acute way we're seeing it now in some countries. So, I don't know if you're familiar with demographic transition theory, but as countries move through their demographic transition, the last big youthful population, the last large population or cohort produced by high fertility moves through it, so you have an economic boom when it's of working age. China's a really good example of that. And then as that age bulge passes through to that next stage and retires, we have the kind of phenomena that we see in Europe now, with a population aging problem.

So the aim of economists is to bring people into that workforce again for labor markets. But first of all, as I was saying at the beginning, it looks as if within a few decades we're going to have intelligent robots doing a huge amount of that work. So I think the situation with labor markets is going to change enormously. There are all sorts of other possibilities for dealing with population aging, and we're already seeing those. Raising the retirement age, raising the pension age. Encourage people back into the workforce.

So, it doesn't seem to me that it's a good solution. And I think it's actually self-evident. We can't say we want more and more economic growth, and therefore we need more and more people to spur that growth. It's simply not sustainable, and I'm a bit skeptical about this ideal that we have to keep having economic growth. It seems to me at a certain point a steady state economy ... I mean why do we need to be even wealthier in developed societies? Why do we need to keep producing more and more and consuming more and more commodities?

So to stabilize our economy, to stabilize our population, and to really have very different values, which are very different from the ones about constantly growing and expanding seems to me massively to our advantage. And really the only pattern that's going to be sustainable in the long run, and also as a model for other countries, the emergent economies, you could ... when I started looking at population, the big issue was in Asia, and particularly India's population growth and poverty.

Well, now India has pretty much got its population under control. And it's an emergent economy. There's still a lot of poverty, but the model for them surely has to be that they have to grow sustainably. They can't grow in the same way that say the United States has grown its economy during the 20th century.

Harry Ridgewell: What do you say to those that say that technology will solve the problems associated with the population crisis?

Diana Coole: Well, you know, I'm deeply skeptical, because I think it's very easy to pull out technology as a magic bullet. We're asking an awful lot of technologies which haven't even been invented, and I think there's still maybe technology will solve the energy problem by giving us an economy that isn't based on fossil fuels. Whether it will do that quickly enough I think is a real moot point.

Whether technology will allow us to produce enough food to feed everybody in the time available. What is it, 9.6 billion by the middle of this century? Again, I have my doubts that that's going to happen, and I think we also have to look at the unintended consequences. Maybe if everybody could eat genetically modified crops. I don't think that's going to probably be ecologically a good solution. I think there are lots of political and environmental problems with a lot of the technologies we use that have unintended consequences.

But, say we do have the technology to support over 11 billion people, I think it still comes back to the question - what kind of lives are those people going to live? And for me the best quote I've ever found is John Stuart Mill in this 1848 Principles of the Political Economy, where he says doubtless the Earth could support many more people, but why, what kind of lives are we going to have where every single bit of non human nature has been subordinated to satisfy human needs. And we've lost all our meadows, we've lost our hedge rows, we've lost all our wildlife. Simply everything is like a gigantic factory to support the human population, who no longer has any experience of the non human.

So, yeah, maybe technology will support 11 billion people. But I very much doubt that it will support them in an egalitarian way, or one which would give them a quality of life that we would consider desirable.

Harry Ridgewell: If we don't make a conscious effort to reduce world population, will it reduce by itself because of people choosing to have less children, people coming out of poverty, rising infertility, and increasing atheism?

Diana Coole: Well, going back to my earlier point, I think having excellent reproductive healthcare and universal family planning is absolutely key, because people can't choose to have fewer children if they're not given the means to do it. And I mean that might seem obvious, but I'm horrified for example that Donald Trump has withdrawn American funding for the United Nations population fund.

And like every Republican president since Ronald Reagan, he's withdrawn US funding for any organization that supports abortion. So, that has massive implications for overseas aid, and support for family planning in countries across the globe.

So I think it's absolutely essential that politicians particularly should recognize that there's a problem of over-population, that's all part of the sustainable development issue. And should recognize that obviously abortion itself is a very controversial issue, but as Bill Clinton once said, it should be rare. In other words abortion is a last ditch solution, where other family planning technologies have failed.

So I think having much more research on reproductive technologies, ensuring that people don't have unwanted conceptions, so they don't have to resort to abortion, could get rid of all those controversial issues. And there should be much, much more focus on ensuring that unwanted conceptions, child brides, obviously a whole load of sexual violence, but just women being pressurized into having a lot of children, we need a cultural change, we need a value change, we need a shift in priorities.

So if people are talking about technology as a solution to world population, then reproductive technologies I think are absolutely key. Beyond that, you know it is possible we will get a more Malthusian solution, where some populations become unsustainable and mortality rates start to rise again. We're already starting to see that to some extent, even in countries like the US, where life expectancy is falling. And it's quite possible that ... I don't think you can separate population growth from other aspects of environmental change.

So, if all those start hitting at the same time, it's quite possible that some places I think will start seeing life expectancy going to reverse, which is obviously really an undesirable way to reduce numbers.

I mean something I throw up in my book, and I've no idea but I think it's a really fascinating question, is if we see labor markets shrinking because of robotic technologies, so people don't have jobs, I could imagine either people might have fewer children because they realize that their children are very unlikely to have work, and their lives could be really difficult, especially if they're on a really basic universal basic income.

Or, alternatively, people could find their lives so meaningless that they might decide that raising children and family life is the only way to give their lives meaning once they no longer have jobs.

So I think it's interesting, it could either cut population rates drastically, or it could actually engender a rise in the birth rates. I think it's really hard to tell, there are so many factors. And all I would say is, again, excellent universal family planning on the one hand, and persuade politicians that it's simply not environmentally sustainable to encourage people, whether it's because of patriarchal values or because of population aging, that people should have more than two children.

Harry Ridgewell: Since the book was released, what have been the biggest criticisms that you've received?

Diana Coole: Well, I haven't yet, because it's so recent that it hasn't really come out. I haven't had any reviews yet, or any responses. I know it's a really controversial area, and I mean usually people's responses are that ... I find that there's a generation, the baby boom population like me often say to me oh yeah, what happened to the population question? I think people are very ... people who grew up in the 60's are much more sympathetic. Including the women's movement, the ecological movement, the new left were all very sympathetic to the idea that reducing excessive consumption and reducing population numbers went together.

But since then, I think there's been a whole generation that simply associates reducing world population with population control. With eugenics, with racism, with colonialism. And I think those tend to be the charges, and people assume that if you want fewer people, you're going to use coercive methods, abuse human rights. And in that context I think the Indian example did more damage to the cause than anything.

Nearly everybody who looks at coercive population interventions looks at Indian policies of compulsory sterilization during the 1970's. But there are lots of counter examples of countries which, for example in Iran, the mullahs were on the side of reducing numbers during the 1980's. And they made it compulsory that anyone getting married should learn about the advantages of having small families. They disseminated contraception from the villages. And they rolled out a fantastic program to get people on board with using contraception and understanding the values of small families.

So it absolutely doesn't seem to me that this has to be coercive, and I think yes of course sometimes there have been racist agendas with reducing populations, but I just think we've got to move beyond that. Some of them have been racist, but by no means all of them have been. And wealthy people could certainly ... wealthy white people could certainly set an example by saying I'm going to have far fewer children, and I'm going to explain why that example is so important. There should be fewer of us, and I certainly don't think it's a eugenics policy, or it doesn't need to be. It's just that the shadow of Nazism looms very large.

Harry Ridgewell: Where did you go, and who did you speak to as part of research for your book?

Diana Coole: I went to India, I've been about four times to India. I went to Australia too because Australia was a really interesting case study because around 2009 to 2012 they had a very overt discussion about population in Australia. And it was really driven by Kevin Rudd, who was then the Australian Labor Party prime minister, who talked about a big Australia. And it was very much encouraging open migration to inflate the labor market with population aging and so on.

And then his opponent within the ALP, Julia Gillard said well, I think we should pause and think about it. Migration should be part of a bigger population policy. And there are a lot of environmentalists in Australia who were saying we have a very fragile ecology, and we can't simply have more and more people.

So, the great thing about the Australian example was it was very high profile for a while. And that three different discourses really emerged. Those who wanted more migration for economic reasons. The ecologists who wanted to stabilize numbers for environment reasons. And then there was a moral argument about open borders and people's rights to have lots of children.

And then there was also a fourth discourse with Pauline Hanson's one nation policy in the 1990's, which was saying we should stop immigration, and it co-opted some of the environmental arguments. So it was very messy, but I think the point was it was actually one of the very few recent examples of a country where all those different positions were being brought into a political platform. And they were being reported on, there were high profile television programs such as Q&A, their equivalent of our Question Time, but lots and lots of articles written in things like the Sydney Morning Herald. And people really engaged with the issue very explicitly.

After that it got kind of buried with Tony Abbott, and then it got really confused between the argument about refugees and migrants. And again, it got very co-opted about the issues about migration. But it was a very interesting debate, and there were those who said that Australia can't really sustainably support a population bigger than the original aboriginal population, all the way through to those who thought that the then current population of around 22 million was about right for Australia, to those who just said we can keep packing in more and more people, for example by irrigating the desert and having new communities there.

So, there were the usual kind of arguments. But what was interesting was that they were being very publicly debated, and brought into a conversation with one another. So Australia was my main example of a developed country that was looking at these questions in a new way, and India was my main example of asking well ... was India exceptional in that it did use very coercive policies, or was it in a sense just indicative of what happens when you try to bring down your birth rate in a developing country, where people have traditional pronatalist values?

Yeah, so those were my two big case studies. I spent more time in the US as well, but I wasn't really looking at the US, I just used that as a place to look at some of the moral and ethical arguments. And I had a fellowship at the University of Virginia for a semester too, so they just provided a home for me to discuss these issues with other academics, and think about them.

Harry Ridgewell: So, as well as simply in your view in the future that there'll be too many people in the world, where in the world should those people be? So, where at the moment do you think is over-populated, and where do you think is under-populated and there's room for more people to be?

Diana Coole: Well, that's a really difficult question. Well, I think one of the problems as you'll know as you're a geographer, is that take somewhere like the UK, it has a very unequally distributed population. London and the South-East I would say is massively over-populated. Not because we've got some kind of great malthusian catastrophe, but there is a lot of stress on water and so on.

So, if there was going to be population growth in the UK, it would be ideal if we could move more people into parts of the North, especially where they've got a housing surplus and so on, and where they want to build more jobs. Ideally Scotland wants more people, we could move people up into Scotland and Wales. But it's very, very difficult.

Same in Australia, most people including almost all migrants want to live in Sydney or in Melbourne. The Australian government has all sorts of strategies to try and persuade people to go and live in the outback, or to move to other less populated parts of Australia. But people are very reluctant. People have been telling me that a lot of the Syrian refugees who went to Germany initially were placed in East Germany, but as they've got their papers and they've become more skilled and fluent in German, an awful lot of them have moved into Western Germany, which is where there are more better paid jobs.

So, I think within different countries it's difficult to pick out particular places, because they've nearly all got problems of a mal distribution of population. And it's extremely difficult, as long as you allow people freely to move around, which of course you want to do. And of course labor markets are going to encourage them to. It's very difficult to get equitable populations internally.

I was in Southern Africa a couple of years ago, particularly in Namibia and Botswana, where they've got very low population densities in the parts I was in. You could travel all day and hardly see anybody. But these were really, really arid areas. I spoke to one man who had a vineyard, he said last year we had 45 days at over 45 degrees centigrade. I can't continue farming under these conditions.

So I think we most definitely have to look at the carrying capacities of different parts of the world. Somewhere like India has a very high carrying capacity, it's incredibly fertile as long as the monsoons don't [inaudible 00:41:59] fail. But then that's not true of say Rajasthan, which is a desert state.

Or I've just come back from Colombia, virtually the entire population lives in the Andean area. There's only 4% in the huge tracks of land between the Andes and the Venezuelan border, which is all jungle. But if they clear all the jungle so that

they can have a much higher population there, it has a huge detrimental effect on climate change.

So, I think there's so many factors involved in asking that question, it's a really complex question. I'm sure you know, France has about the same population as the UK and twice the landmass. I happen to think that France is pretty near perfect in terms of its current population density, but obviously a lot of people here are worried about rural de-population. But having more people I don't think's going to solve that, people don't want to live in these little villages in the middle of nowhere, where there are no jobs.

It feels almost to me like a really, really livable country. That this is probably about right. I would say Britain, even in the 18th century people were describing it as over peopled. I would say the quality of life in much of the UK would be much higher with fewer people. I think the US is probably in parts ... it's got a hugely lower population density than most of Europe. It could probably increase its population in many areas. But then again, if you increase the US population, you increase the per capita footprints of people that do a lot more damage to the global environment.

Yeah, so ideally the UN's low projection, which would go down to about 7.7 billion by mid century, I think that would be ideal. And then you could worry about some places would be better off with fewer people, some with more people. But yeah, it's a really complex question how you're going to move people around.

But it seems to me clearly if Africa goes from its current, what is it, 1.6 billion to the 4 billion projected by the end of the century, you clearly can't move say 3 billion Africans to Europe, or the United States. So, somehow you've got to make the places where the populations are growing much more habitable, I don't know how you're going to do that. But it doesn't seem to me it's in anybody's interest to be forcing people to uproot, because their own habitats have become unsustainable.

Harry Ridgewell: So I was just going to give you a few technologies, and I was just wondering what your thoughts were on them being able to combat the problems to do with over population, and how realistic you think they are, and what effect you think they could have?

So, lab grown meats, do you think that that could be a big deal when it comes to the developing world, which is going to want to eat more meat and protein in the future?

Diana Coole: Well, I think if you can persuade people to eat it, then it would be very helpful, especially if it got rid of domesticating animals to eat. Yeah, I think that would be great if we could stop eating cows and chickens and all the other animals that people eat. If people were prepared to do that, yes, I think that would be a

good thing. I don't think it's going to solve the problem, but I think it would be a really, really useful thing to do.

I think with that, and with most other technologies, the huge question is who owns the tech, and whose interest it serves, because most technologies, especially most food technologies are owned by agri-business. And it's not clear really whose interests are being served.

Harry Ridgewell: What about space mining, how profound of an effect do you think that could have, if any, on problems to do with ...?

Diana Coole: Well, I mean it depends what you find where. I don't know much about space mining, I'm actually reading Kim Stanley Robinson's book 2312 at the moment, which is obviously a very futuristic idea about the whole solar system as being given over to space mining and off world communities and things.

You know, in a sense can you find things like [inaudible 00:47:12], asteroid and things? Honestly, I don't know, but can you do it on the scale that's needed in the time scale it's needed? I would be very doubtful about that. And I would be skeptical that those technologies are going to be used to everybody's benefit. I don't know, what do you think about space mining?

Harry Ridgewell: I'm supposed to be neutral, so I'm probably not allowed to say my views on what effects I think it would have. The only thing I would say is I'm writing a piece about it actually, so you can have a look at that, and you're more than welcome to contribute to it, because like Wikipedia, all of our articles anyone can edit.

Diana Coole: Okay, I'll have a look.

Harry Ridgewell: And then the last one was in terms of fresh water access and water use, sometimes it's said about how if scientists are able to find a way of desalinating sea water, then that could solve all our water problems.

Diana Coole: Yeah, well countries like Australia do have massive desalination plants. The problem at the moment is they're so energy intensive that they massive contribute to global warming. If you could do that sustainably, I don't know, could you do it on the scale that's needed? I've no idea.

But again, I think all these things come back to the idea of can we use technology to produce enough resources to keep 11, 12 billion, whatever people on the Earth? I'm very, very doubtful, but possibly you could. But I think it still comes back to the same question, why would you want to do that? Why have a big solution? What kind of lives are these people going to have? Are they going to end up eating ... we could imagine people just eating something nutritional, pale living in some little box, living a virtual life with headphones on so they never really go out. Drinking desalinated water from decluttered oceans.

Yeah, maybe it's possible, but it sounds like a really horrible life. Why would we want to do that, rather than having six or seven billion people say living, able to enjoy the countryside and biodiversity, and eating delicious nutritional foods not grown in laboratories?

And yeah, I can't think why that would be a better solution than just saying let's encourage people not have more than two children?

Harry Ridgewell: How hopeful are you that humanity will do something of significant effect to reduce world population before 2050, or 2100?

Diana Coole: Well, I'm not that hopeful, but you asked me earlier about different ways that could happen. And when I looked at countries which have reduced their population, it happened at a certain point of their demographic transition. First they reduce their mortality rates, so things like better health and food. That causes massive population growth, and so the next stage that has to happen is to reduce the fertility rate.

And the countries which have successfully done that have I think always had the political will to do it, so they've had governments which have built capacity as their let's to produce good family planning, let's educate people of the advantages. If we for example put in good social services, of pensions, people won't rely on children to support them in their old age.

If we reduce infant mortality, people won't produce extra children in case some die. So, I think there's a huge role for governments to recognize the ills of population growth, and to have a win win situation to incentivize people to have fewer children. But I think without political will of governments and transnational organizations, I would say I'm deeply pessimistic about the world reducing its population, at least through voluntary gradual methods.

Harry Ridgewell: So, you think it will probably have to reach a crisis point before we make any significant efforts?

Diana Coole: Well, I hope not, because when I started working on population in 2010, there were virtually no reports I could look to, official reports, which proposed that population growth was a problem. It had been such a taboo subject for about 40 years. There was one report came out in 2007 by the all party population group, it's called something like that, in the UK, that was saying world population growth was a real problem, particularly for developing countries. And that it should be included in the Millennium development goals, which it wasn't.

But since then, I think there's been a real shift. So for example in 2012, I don't know if you know a report that came out from the Royal Society called people and the planet? And I think that had a huge impact. And it was saying environmentally the planet would benefit enormously not only from reducing

consumption, but also from reducing population growth rates, both in developing countries and in developed countries.

And I think that was a very thoughtful, well researched report. And I think it kind of legitimized certain environmental groups which had just been very dismissive of population issues, to start looking at it again. And then there are people like Rockstrom with his planetary boundaries approach, who's been very adamant that if we're going to keep working within safe operating systems, we need to reduce numbers as swiftly as possible within the constraints of voluntarism and human rights.

So, I think more and more environmental groups now are starting to recognize that limiting ... well, halting world population growth, as long as it's within a human rights framework, is part of the sustainable development puzzle. And you can't simply ignore it as a very risky politically contentious issue, because just like over-consumption, over-population is also part of a strategy to mitigate and adapt the worst effects of an environmental crisis.

And also I think we're beginning ... population growth is still continuing at pace, and I think we're becoming much more aware of the effects of more and more people in the world. So I think people are becoming more attuned to thinking about this, and to thinking of ways that we could persuade people to have less children.

And I think in that case we're often pushing at an open door, the UN often quotes statistics suggesting that there are well over 200 million women, mostly in developing countries, who would use modern contraception to limit their families if it were available. So it's not as if there aren't lots and lots of people who would prefer to have fewer children if they had the means to do so.

Harry Ridgewell: And finally just one follow up question I think I forgot to ask you. So when I asked you do you support either legally enforced one child or two child policy, I think you said you said support the two child policy.

Diana Coole: But not legally enforced.

Harry Ridgewell: Oh, I was just going to say, how would you economically, I produce economically, but how would you motivate people, encourage them to have two children? And if they didn't, what would you do, if anything?

Diana Coole: Well first of all I think education is really, really important. So for example children, most children say in the UK have sex education in schools. I think that's incredibly important, and I think it should include a discussion about having many children as a source of household poverty. And certainly environmental degradation.

I think a lot of young people are really concerned about the environment, but they haven't been encouraged to recognize the importance of demographic issues. So, there was a report came out last year, and it synthesized a whole series of reports and came to the conclusion that having one child fewer was by far and away, like 1,000 fold more environmentally effective than say recycling, or traveling by bicycle and not flying, or any other environmental measure that people could make.

But they looked at it in the context of the Canadian education system, and they found that that strategy was never mentioned. When Canadian children were encouraged to be good, green citizens, the debate was always about using your bicycle and not flying and things, but nobody mentioned having one child fewer.

So I think just bringing these issues onto the public debate, and encouraging people to think about the consequences of having large families, in tandem with excellent family planning, could go such a long way to reducing unwanted conceptions, or encouraging people to think.

For example, at Birkbeck the last five years I've taught a course on population environment. And one student in particular said to me, she was a student who'd converted to Islam and she said at the end of the course, "Me and my boyfriend always wanted five children. And after doing your course, we've decided we're only going to have two children."

And that was just an example of I think if you show people what the consequences are, and encourage them in an open way to think about the long range consequences and implications, you could actually go a long way. Or when I've traveled in India in the last few years, I've been really impressed, because people there are very open about talking about population issues. And whenever I ask them how many children do you have, virtually always people have said to me I only have two, or I only have three. And they almost invariably say as the government encourages me to.

And I think they've come to think of it as an act of good citizenship. But also in their own interests, because their own family fortunes are greatly enhanced by having fewer children on whom they can concentrate their resources. They're very concerned about good education for their children, it's expensive. And they realize they can give their children many more opportunities, and therefore boost their own household's status and income by having fewer children.

So, I think India actually, although it has some of the worst examples of compulsory sterilization, it's also a very good example of how a nationally rolled out campaign of trying to explain to people why it's in their interest, and in the national interest, and in the interest of the environment, can make a big difference to people's perceptions about what would be the norm for family size.

I certainly wouldn't punish people for having more children, but I think they should realize that they're in some ways punishing themselves and their children, because they're reducing in many cases their children's life chances, and also having much more impoverished lives. Or, if they're wealthy enough to have many children, to a extent they're being selfish in terms of the resources that those children are going to use up.

Harry Ridgewell: And finally I was just going to ask you what might be quite a personal question, so obviously you don't have to answer it if you don't want to, but did you deliberately decide to only have one child yourself, because you didn't want to contribute to the problem?

Diana Coole: Yeah, absolutely. And I think actually a lot of people of my generation, people born in the 1950's made that decision. I had lots and lots of friends who only have one child, or don't have any. I don't think one child is absolutely ideal, and I know there are problems in places like China with lots of singletons. But my own experience is my child has lots of friends and peers, and he's a well adjusted child.

And yeah, I think having one child is an environment sustainable option. And I think a lot of white middle class people in developed countries are very concerned about the environment, but they'll tell you how they recycle, and they're proud of the fact that they cycle everywhere and that they're vegetarian and so on. But, for my generation they will often say and I only had one or two children.

So, yeah, I think that is a conscious decision that people can make. And I think people have a right to have children, but I don't think they necessarily have a right to have endless numbers of children. And at the moment I hope that we can persuade people voluntarily to have fewer. But who knows, maybe if we start getting up into 9, 10 billion people on the planet and the kind of environmental trajectories we're seeing continue, maybe more draconian policies will be introduced. And I think that would be a great pity, because obviously we've got a window now, and if we can persuade people voluntarily to limit family sizes, it's infinitely preferable than either having coercion later, or having some kind of horrible malthusian outcome from over-population.

Harry Ridgewell: Okay, thank you, that's all of my questions. If I wanted to speak to someone who had some of the opposite views to you, who would you recommend that I go speak to?

Diana Coole: Well, you could go and talk to Catholics. You could talk to Melanie Phillips who writes, I'm not sure which newspaper she writes in now. She used to write for the Observer, but I think she might write for the Daily Mail. I'm sure you could find loads of people on the Daily Mail who would argue that.

There are also economists, I'm trying to think which ones, I mean Julian Simon, I don't even know if he's still alive, but he was one of the people that was very keen on population growth ...

Harry Ridgewell: I just wondered if there were academics in your field who say oh it is a problem, but technology will enable us to conquer it, rather than people who simply say it's morally wrong to use contraception? I was more looking for people with expertise in the field who are more optimistic and more of the ... what's the word? There's malthusian, and what's the other one?

Diana Coole: Boserup.

Harry Ridgewell: Boserup, yeah, the kind of technology will solve everything type thing.

Diana Coole: I suppose because it hadn't been an issue on the agenda, when people talk about technology solving our environmental problems now, they tend ... Oh, I know who you could talk to, Danny Dorling at Oxford University. He's a geographer.

Harry Ridgewell: Okay, you don't happen to have his contact details or anything?

Diana Coole: No, but if you look up, you know he's become a big public intellectual, but he wrote a book that came out about four or five years ago called Ten Billion.

Harry Ridgewell: Right.

Diana Coole: And I think he's a bit dishonest in that he always takes the low population projection to say that he's optimistic. But he generally thinks that there isn't a population problem. And like a lot of people, he thinks numbers will automatically fall as development occurs. And I think he thinks that technologies can solve the problem. Or he certainly doesn't think over-population is a problem.

Harry Ridgewell: Right.

Diana Coole: There's a guy who used to write about it, but again, I don't know whether he's retired or what, he's called Frank Furedi. I think he was at Sussex for a while. I hated his book at school.

Harry Ridgewell: Was that what motivated you in part to write this book, through hating his book?

Diana Coole: Sorry, you're breaking up a bit there?

Harry Ridgewell: I was just wondering if reading his book motivated you to write yours, by hating his?

Diana Coole: Oh right. No, I was already going to write mine. I was a child on the 1960's, and I read people like Herbert Marcuse, if you look at things like One Dimensional Man, which was one of the big texts of the new left. And Marcuse [inaudible 01:05:51] wrote about living in harmony with nature. He wrote about consuming less, but he also wrote about solving the world population problem, and having fewer people.

So, it wasn't a taboo subject for us, it was a very radical thing that progressive public's generally supported. Or feminists like Shulamith Firestone, very concerned about over population.

And there was a really interesting exchange recently in the London review of books where Donna [Haraway], who's been one of the big icons of the feminist movement out of progressive thinkers recently, she has a footnote in which she says I don't think that we would really want more than half a billion people in the world. And the review in the LRB picked it up and was horrified that she's said had. And Haraway came back with a very feisty response.

It was about last summer, so I don't know if you read the LRB, but you can look back in the letters page and the reviews. It was a review by Jenny Turner. I think it was very interesting, but I think it's indicative of the fact that there's an older generation for whom having fewer people, you know, it wasn't a post colonial or colonial issue, it was about having fewer people primarily in developed countries. And it absolutely went in tandem with reducing consumption, and concern about ... well, we didn't call it biodiversity then, but other species preservation, and our attitudes towards nature.

Harry Ridgewell: Yeah, it's quite surprising you said that, because I thought generally in the past people have more children in the UK. So I was quite surprised when you said about lots of your friends having one child.

Diana Coole: Well, in the 1960's the birthrate peaked, and then by the 1970's, the birthrate started falling.

Harry Ridgewell: Right.

Diana Coole: Unsurprisingly because on the one hand that's when the contraceptive pill, IUDs, modern reproductive technologies became available. So then women used them. And on the other hand certainly for feminists and so on, the nuclear family was seen as a patriarchal trap. So, the 1960's did give rise to a lot of real concerns about population growth. Even people like President Nixon were really concerned about population growth in the US, because the population was starting to rise again after the war, and people were having more children, you're right.

But once women could have fewer children, and once it became a big political issue not to have lots of children, the birthrate started to fall. And then in the

1990's it really reached a low point. And remained low in places like Eastern Europe and Japan, but in other places in the 21st century it's rebounded. And it's still below replacement level in a lot of Europe, but it's been going up again, and it's at a close to replacement level in places like Sweden, France, US. And I think there's no reason to think that it couldn't go up again.

And we've also been seeing a lot of population decline in some developing countries. It's been the decline has stagnated, or been reversed. Places like Egypt or Kenya had reversals. Again, either because governments change their policies, or if you have a war it's very difficult sometimes to maintain contraceptive links. In places like Romania in the 1980's it was state policy to have high birthrates for industrialization. And so contraception and abortion were made illegal.

Or Poland today has a very low birth rate, and abortion's been increasingly squeezed. And then contraception can become more and more difficult for women to access. So I think there's no reason to think that early 21st century falls in populations shouldn't go into reverse in some countries.

Harry Ridgewell: And then the final thing is pictures, I was just wondering if you had any pictures in your book, or pictures you took when you went around the world that you would be able to send as part of the article?

Diana Coole: I could drag up some pictures that I took in India, certainly. But I haven't got them with them. Well, I go back to England for a week in the end of August, so I could send you a few pictures.

Harry Ridgewell: Yeah. So, sorry, did you say you would only be able to send them at the end of August?

Diana Coole: I go back on the 22nd, yeah. I don't have access until then.

Harry Ridgewell: I mean by all means if I haven't sent you ... I'll send you an email when it's published. If I haven't sent you an email by then saying it's published then please do, but I should imagine it will be published before that.

Diana Coole: Oh right. What kind of pictures would you want? Like pictures of very over-populated places, or pictures of ...?

Harry Ridgewell: Yeah, anything related to ... I mean over-population is quite a hard one to get pictures, think of interesting pictures for. But yeah, I guess cities, overcrowding, people struggling maybe to feed themselves, access to water. Anything like that, anything related to over-population, yeah.

Diana Coole: Okay. It's hard because the pictures look like they might be caused by over-population, like I've got lots of great pictures in Rajasthan of people at public

pumps trying to get water, and the water tables falling in India. But the causes are quite complex, so you can't just say oh it's because it's overpopulated.

And actually in India, one of the big problems with water is GM crops, which use a lot of irrigation and degraded [inaudible 01:12:07] ... the water table there has fallen massively.

But for me one of the clinching, actually I didn't say this, but one of the really clinching aspects is that population growth multiplies per capita unsustainable activities. So whatever individuals do that is unsustainable is multiplied by having more of them. And I think it's that factor of population growth as a multiplier that is a really important one.

Harry Ridgewell: Well thank you very much.