Condoms and Climate

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Greg Dalton: I'm Greg Dalton. And today on Climate One we're talking about condoms and climate.

One of the biggest drivers of carbon pollution is the number of consumers on the planet. And demographers say global population could exceed a whopping 10 billion by the end of the century. Hundreds of millions of those people will climb out of poverty into the middle classes in Brazil, China, India and other countries. That's good news for their quality of life and the economy. But if those people have the same carbon footprint as Americans, the earth's climate will be thrown into disarray.

Over the next hour, we'll talk about growing population and efforts to curb it by educating women, by government fiat and other measures. We'll also talk about food production and the role of innovation and human ingenuity. Joining our live audience at the Commonwealth Club in San Francisco we're pleased to have with us two guests. Alan Weisman is author of *Countdown: Our Last, Best Hope for a Future on Earth*. And Malcolm Potts is professor of population and family planning at the School of Public Health at UC Berkeley. Please welcome them to Climate One.

[Applause]

I want to welcome you. And before – I want to mention that we invited and actually had Christine Mugridge, Director of Communications and Outreach from the Archdiocese of San Francisco, accepted our invitation to participate. And unfortunately she wasn't able to make it on a short notice. So we did have – it wasn't intended to have three men up here talking about population. And we look forward to having her and others in future population programs.
Alan Weisman, let's start with you and say how you came to write this book about the population story.

Alan Weisman: Well, some people will remember my last book, *The World Without Us*, got a lot of attention. And for those of you who don't know, suffice it to say that I wrote it because I would like a world with us. The gist of that book was – it was a thought experiment that theoretically wiped humanity off the planet to show how when we leave the daily pressures that we keep on it, nature could recover in surprisingly beautiful and swift ways. And even eventually refill empty niches.

And what I was hoping leaders would take away from that once they saw this lovely restored world was to think "Isn't there some way that we can add ourselves back into that picture only in harmony and not in constant combat with the rest of nature?" And in the epilogue, I just wanted to talk about how we could do that but I ran into a rather stunning fact, and that is that every four and a half days, we're adding a million people to the planet, which just did not seem like a sustainable figure to me.

So at the end of the book, I ended up, surprisingly to myself, doing another little thought experiment in the epilogue. Setting aside all social implications, I asked one of the world's leading demographic institutes, it's in Vienna, to calculate what would happen if we all participated in the Chinese one-child policy? And the surprising answer was that by the end of the century, we would be at 1.6 billion people which was exactly the population of the world in 1900 before our numbers doubled and then doubled again. We quadrupled in a single century.

Now, nobody likes the Chinese one-child policy, not even the Chinese like it very much. But still, I left dangling at the end of that book this question of “What is the safe caring capacity on this planet for one very overgrown species that happens to be our own?” And leaders turned out to be so interested in that. Wherever I went, they wanted to talk about that in a surprising array of venues, including in discussions with Archdiocese and in Mormon Utah to give some classic examples of the extremes.

And yet it's such a loaded topic. It's one that makes us really uncomfortable. We don’t like the idea of somebody telling us how many kids to have. Like any other organism, we’re designed to make copies of ourselves. So there's just something unnatural about the idea of having to limit that. Nevertheless, there's no question that we have become far more numerous than nature ever intended for one species to be in relationship to its environment. And we can talk later about how that came to be.

So finally, I decided I had to look at this as a journalist as dispassionately as possible, not being pro- or anti-population “control,” but just to understand what it's about that’s all ended up writing *Countdown*.

Greg Dalton: Thank you. Malcolm Potts, tell us how you got into the population. You're an MD. So tell us a little bit about how you came to this.

Malcolm Potts: Yes. I think it comes from being an obstetrician. I'm practicing in England. Before the abortion law was changed and every night I was on duty, I had to get up and treat a woman who’d had an unsafe abortion. And I just thought this was a very curios and bad way to treat women. And I began at the postnatal visits when I delivered a baby to offer women family planning advice. And often they would say – I would say to them “Can I help you? I'm a doctor.” And they would say, “I was just going to ask you that, doctor” which means that it was sort of a code. “I never would have asked you but thank you for bringing it up.” But my consultant, I was responsible she said, “Obstetricians don’t do that.” And I was young and rebellious and I thought obstetricians ought to do that. And I wrote the textbook of contraception and I became very interested. And for the rest of my life has been committed to giving women choices.

And my experience all over the world is when you respect women and give them choices, they will decide just to have relatively few children, and on average, probably about two children or less. And we are species that was evolved to have a very late puberty, probably about 18 or 20 years, to have perhaps four to six children in a lifetime, half of whom could die before they could reproduce. And the one certainty in demography is that for 200,000 years, there was not a population explosion. We were roughly in balance with our environment. We were large animal. We evolved to have a rather slow growth in our numbers. And as Alan said, that's what we've changed. And we've done wonderful things to reduce infant mortality. And we're being blind and stupid and curious about not offering people family planning at the same time.

Greg Dalton: Well, tell us what's on your tie and how that's one of the success stories of addressing family planning. I just can't read it.

Malcolm Potts: To read it, it says Cabbages and Condoms which is – anybody who has been to Cabbages and Condoms? It's a very successful restaurant in Thailand. Okay. A few people.

Greg Dalton: We got one, yes.

Malcolm Potts: And it coincides with an article I wrote in 1970s about a friend, Mechai Viravaidya, who is a pioneer in offering family planning in the villages of Thailand. And I wrote an article called Cabbages and Condoms because it was a metaphor for saying contraceptives. They're not a medical thing. They are choices. They should be available. Like cabbages, they should be where your vegetables are. And we were distributing condoms and packets of pills in the little women, the market women who had little boats in the market. And then when the organization I was involved with got bigger and more successful, they founded a restaurant. And it's now a very successful restaurant in Thailand. It makes a million dollars a year profit which goes into the dry north eastern Thailand which still needs to be developed. And an awful lot of the staff are HIV positive. And it's just a wonderful place and it sells ties.

Greg Dalton: Alan Weisman.

Alan Weisman: I wanted to add something about this program in Thailand that started with Cabbages and Condoms. Often times people say that the idea of bringing the population down to sustainable size is in conflict with the idea of keeping a robust economy because economy's health are usually defined by whether they grow or not. And so how are we going to continue to grow economically if we're going to be shrinking our numbers of laborers, our numbers of consumers, et cetera?

Mechai Viravaidya who brought Thailand to below replacement rate – replacement rate is two people having two children. Effectively, that's zero population growth. And anything below is population reduction. Mechai Viravaidya is not a family planning professional. He's an economist. He was working in development for Thailand. He started going all around the country to institute development programs in every village, when he saw them swarming with children, he realized development is never going to happen in this country with so many people. They're just going to overwhelm our best efforts.

And Thailand today not only has low fertility rate but it also has probably the best economy in South Asia. There are several other examples. I talked about them in *Countdown*; we can talk about them again, where successful family planning programs that were not this coercive Chinese one child policy were instituted. And generally, it was an economist who is the visionary that set the thing in motion.

Greg Dalton: Well, one of the other success stories is Iran. I think that's particularly interesting because you opened your book with a quote from Ayatollah Khamenei about vasectomy. Khamenei - I don't know if I said that correctly.

So Iran is a very interesting story.

Alan Weisman: Yes. I spent over two weeks in Iran. It was the last country that I went to out of 21 counties. And the reason was that in 1979 when the Islamic Revolution took place, within a few months Iran was attacked by Saddam Hussein. He attacked because there's an oil rich province on their border, and he thought that this new Islamic republic, which was just getting itself organized after centuries of dynastic rule, they would not be able to defend themselves. And of course, 10 years later he invaded Kuwait trying to do the same kind of thing.

Now, back then, Saddam Hussein had the backing of NATO. He had sophisticated weaponry provided by NATO. And he also had, sad to say, the components of nerve gas provided by NATO. And Iran didn't have that kind of support. They didn't have much sophisticated weaponry. All they had was people. So first, the Ayatollah actually did the opposite of what we're going to be talking about.

He asked every fertile female in Iran to do her patriotic duty and get pregnant to help build a 20 million man army to fight off the invaders. And for eight years, they held Iraq to a truce. Finally, when that truce was brokered, again, an economist, who was the head of planning and budget for Iran, realized that they were going to have a terrible problem, that within a decade or so, all these kids that were born during that population burst which was so intense that it probably hit the biological limits for fertile females, it was 4.2% annually.

They were going to be needing jobs and the economy wasn't going to be able to provide them all. And he warned the Ayatollah that we're going to have a nation full of particularly frustrated, angry, underemployed and unemployed young men which is a very destabilizing thing for a country. And basically it's describing today's Pakistan which is another country I went to. So they decided to institute a family planning program but they wanted to make it not a coercive one like China's which it was already 10 years old. They wanted a voluntary program. So they did four things.

First of all, this is the passing from Ayatollah Khamenei to our current Ayatollah Khamenei. He issued a fatwa saying there's nothing in the Koran that says when wisdom dictates you have the number of children that you can responsibly care for, that you can't use any form of birth control from condoms all the way up to an operation for males or females. Second they made all of those birth control methods available throughout the country. There's a devout Muslim OB-GYN in my book, a woman who talks about the horseback brigades that they would go on, bringing surgical teams to the most remote villages and later a four-wheel drive and even helicopters.
The only thing that was obligatory was premarital classes for everybody either in the mosque or in a health center. By the way premarital classes are not a bad idea for anybody. Among other things, they talked about how much does it cost to raise, feed, clothe and educate a child. Well, people had access to contraception and they got that idea fast but the fourth thing that they did may have been just as important as the other three, and that was they encouraged women to stay in school.

At the time, Iran had about 1/3 literacy among females. But they realized if girls stay in school, women tend to postpone their childbearing until their school age is done. So they're going to have a later first birth. And then they've got something interesting and useful to do with their lives. They could possibly be an economic help to raise their family, but you can't do that if you got seven kids hanging on to your apron strings. So they tend to have, as Malcolm said, two or fewer. Today, 60 percent of university students in Iran are female. And Iran brought themselves down to replacement rate, according to some calculations, a year faster than China.

Greg Dalton: Alan Weisman is author of the book Countdown: Our Last, Best Hope for a Future on Earth. I'm Greg Dalton. This is Climate One. Malcolm Potts, if educating girls is so simple and effective, why isn't it done more consistently around the world?

Malcolm Potts: Well, first of all, we need to understand that it's a two-way process. Women that are educated find it easier to jump over the many unnecessary barriers that we often put between the woman and the information that means she needs to control her fertility. But secondly, when fertility declines rapidly then you're better able to educate your children so that in Thailand they went from six to 1.8 children in 30 years. In the middle of that change, we did a very careful study and we asked families who have had two children or had four or more children how much money they earned, whether they had straw or tiles on the roof, how big their land holding was. And the children from the smaller families were more likely to go to school and stay in school.

And I think this is the primary driver why people in developing countries want fewer children because they all know the power of education and they all know if you have a smaller family, your kids are more likely to get educated. It's not rocket science.

But if we remove the barriers between family planning, the knowledge and means to do it, then even illiterate people will have fewer children as we've shown in Bangladesh as the perfect example of that. And so the fact that what's happened in Iran is that more women are now in university which I think is a great thing. Last time I was in Iran I drove from Mashhad which is a religiously conservative city, into Afghanistan and to Herat.

In the villages in Iran they have two children and they're making progress. You cross this dusty border, which I think my British ancestors drove in the 19th Century, and you've got the same religion, the same language, the same culture and they're having seven children and they're so poor that the girls don't have any shoes in the snow. So we could have done the same in Afghanistan if we've made things available. And that country would have been profoundly different from the mess it's in the present moment.

Greg Dalton: And what are some countries where there's troubling population trends? Is it Pakistan? Where are the ones where things are going in a troubling direction?

Malcolm Potts: Pakistan is clearly a disaster. I mean, it's got a very – again, in 1960 Pakistan was east and west. It was the same country, the same religion. And then East Pakistan became Bangladesh. Bangladesh was poor and less urbanized but it now has about 2.3 children which is very near replacement level in a country that still has a high infant mortality. Pakistan just had an incompetent family planning system. It never respected people. It never made things universally available. It was very medically conservative.

It's very difficult to understand how important medical conservatism is in holding back access to family planning. First of all, family planning is a choice. You don't come to me as a doctor saying, "I've got a disease called too many children." You make a choice. If anyone tells a story about Mechai Viravaidya, we started –the first day that we started taking family planning into the villages of Thailand. It was about four hours' drive outside Bangkok. We had about about half as many people as we are in this room. We were going to teach them how to sell pills and condoms to their neighbors in a group of villagers.

And a telegram came from the Ministry of Health in Bangkok to the local doctor saying, "Do not cooperate with Dr. Malcolm Potts and Mr. Mechai Viravaidya because they are breaking the law distributing pills or contraceptives without prescription." The very nice doctor looked at this telegram and he said, "In this part of Thailand sometimes telegrams take two days to arrive. I think this one will come tomorrow."

[Laughter]

And within six months, the villages have been so successful that the Ministry of Health changed the rules and they bought in to distributing contraceptives. And you have to sort of push the envelope and listen to people. Family planning is not telling people what to do. It's listening to what they want.

Greg Dalton: And on prescriptions, is there a reason why prescription for birth control pills exists in the United States?

Malcolm Potts: Absolutely not. I mean, we should take and pull of the prescription tomorrow. This is the only drug – how many people in this room, be honest when I ask this question, know that if you take oral contraceptives for a few years, you will halve your rate of a very ovarian and uterine cancer

later in life? Yes, just a handful. That is really stunning. And so this is an extraordinarily safe drug. You can't commit suicide with it unlike aspirin. If you take too many, you'll vomit. If a baby takes all 28 pills, not a good idea, but the baby also vomits.

So it's an extraordinarily miraculous drug. And the only thing that keeps it on prescription is Big Pharma's greed. I could make pills available in any place for $8 in CVS Pharmacy, and it should be there. That is what they – there was a study in the United Kingdom. I remember it starting on 27,000 women using the pill, 27,000 not using it, followed for 39 years. And the women using the pill actually live longer than the women who didn't. And there's a lot of biology. There isn't time to explain. But it's a very good example of how difficult we make it. You've got to go in to a doctor and be examined. There's things that aren't related to the pill.

Greg Dalton: Malcolm Potts is a professor of population and family planning at UC Berkeley's School of Public Health. We're talking about condoms and climate at Climate One. Alan Weisman, let's talk about the climate part of this. With growing population, what is the connection between climate and population? What are we looking at?

Alan Weisman: Well, there are a couple of connections. Number one – I mean, this is pretty elementary. All of our environmental issues are caused because of what we do to the environment. No other species out there is pushing on the environment in a way that is stressing out its habitat. We started doing that because, as Malcolm said, for 200,000 years of the history of Homosapiens, our population stayed pretty much constant because people were dying as fast as they were being born like it happens to any other species. But then we started to repeal some of natural law starting around 1796 when we defeated smallpox.

A vaccine for smallpox was followed by all these other medical advances, other vaccines, pasteurization of milk, and suddenly we had people living longer and many fewer babies dying. And then we got into the 20th Century and then we did something that far more accelerated it because we hit 1 billion around 1815 and then a little over one and a half year billion in 1900. But then we did something that changed everything enormously by learning how to pull nitrogen out of the air and chemically slide it on the soil and create much more plant life than nature had ever created before. That translated into a whole lot more food, famines didn't occur, the Green Revolution with improved crops that produce much more food per stalk, added to that, and as famines were avoided, more people survived to beget more people and suddenly we quadrupled.

Now, the two aspects of climate change is, number one, there are many more of us demanding something else that happen right along those same 200 years, and that was our mastery of concentrated energy. Basically we took a lot of energy in the form of carbon that nature didn't need so it had buried it away. We dug up millions of years' worth of buried stuff, and we've been burning it for the last 200-250. And we've jet propelled society. We can do all these incredible things. We have electricity but we also have these waste products and they float up into the atmosphere. And the more of us demanding this stuff, the more carbon dioxide is up there. There's more carbon dioxide in the atmosphere right now than there has been in 3 million years.

And the last time there was this much in the atmosphere, the seas were 80 to 100 feet higher than they are today. That also occurred 15 million years ago, same sea levels. This is what we are doing. Second, as those temperatures go up, they are going to affect the amount of food that we can control. Just as our population rose with our food growing capacity, the rising temperature as a result of all that carbon dioxide, this is no secret to anyone in this room, is starting to play havoc with the weather and we all know that we are headed to probably beyond a 2 degree centigrade average temperature by the middle of this century.

Now, agricultural literature is filled with studies and a lot of them are cited in my bibliography in*Countdown*. It showed that for every one degree centigrade, crops yields are going to go down about 10 percent. And we're already headed beyond two degrees. And in that same time by the middle of the century we're scheduled to add about 2.5 billion more people. Folks, this doesn't compute.

Greg Dalton: There have been previous scares about population starting with Paul Ehrlich in The Population Bomb, concerns about growing population, overshooting the earth's capacity. Technology came along and solved the day. So what do you say to people who say, "Well, some – whether it's GMO crops or some new technologies or growing corn in Canada, that we will adapt and we will feed the number of people that are coming along."

Alan Weisman: I was in Iowa last night talking about this. And Iowa claims as a native son Norman Borlaug who was the head of the Green Revolution who is credited with saving more human lives than any single person on earth because he staved off the certain famines that were about to occur in India and Pakistan which is the first place the Green Revolution was tried out.

But as a result, India is about to surpass China during the coming decade as the most populous nation on earth. And Pakistan, you heard a little bit about it before, here are the numbers. Close to 200 million Pakistanis right now in a country the size of Texas which has 26 million. And by the middle of the century, it will have nearly 400 million. That's way more than the population of the United States right now. And it will still be the size of Texas. And they can't employ these young men that they have. And it's a breeding ground for terrorism and it happens to be a nuclear power. I mean, the place is out of control.

Now, in both of those countries, I met people who implemented the Green Revolution and they repeated – and I also went to the Green Revolution Centers where they design this technology, and they all pointed out that Norman Borlaug himself when he accepted the Nobel Peace Prize didn't gloat about solving hunger in the world. He said that we have postponed a problem that we can only solve if we couple it with population control. And he spent the rest of his life on the board of population groups because he knew that the more food we produced, that would drive population upward. And so now we've got a chaotic situation in Pakistan and in India, the wells for the Green Revolution which are originally were about 50 feet deep to grow all these new jet propelled crops, then dropped 100 feet. And then by the time they hit 250 and 500, a lot of Green Revolution farmers there could not afford to keep drilling deeper and deeper and deeper.

I spent a day while I was researching this book just interviewing widows of farmers who have committed suicide. Since 1995, 270,000 Green Revolution farmers in India have committed suicide, and they do it symbolically by drinking pesticide. This is not saving the world at this point. It's too much of a good thing.

Greg Dalton: Alan Weisman is author of the book *Countdown*. We're talking about carbon and climate at Climate One. Malcolm Potts, is technology going to save us?

Malcolm Potts: I'll tell you of a place where it's not going to save us. We're very focused on the Sahel at the present moment. Sahel is the Arabic word for shore. And that's an area below the Sahara Desert that is dry and dusty and goes to the Atlantic to the Red Sea. In 1950, there were 30 million people. Today, there are 125 million people. And in 2050 which isn't all that far away, there'll be 325 million people. And at that time when we've had some studies done by Lawrence Berkeley National Lab at the hill above our campus, the temperature won't rise by two degrees. It will

probably be by four or six degrees because this is already a very hot place. The rainfall may go up a little bit but it will be so hot, the water will evaporate before it can go to the roots of the plants.

And so you'll have more people than live in the United States of America watching their crops wither and their cattle die. And those people will either die or migrate or they'll be involved in conflict and literally kill one another. And I think all three things will happen. I think the infant mortality will go up again. And we will see many of the triumphs of the past 50 years in International Health rolled back by these catastrophic situations. I think there'll be huge migration.

The third largest town in Kenya after Nairobi and Mombasa is a refugee camp, and those are refugees from Somalia and Ethiopia. And that's going to be multiplied many, many times. And so I was looking at a report yesterday by the UN that says by 2050 there'll be 300 million ecological refugees in this world. Now, many countries can take and welcome a small number of migrants. But if you suddenly double the population, different people with different religion or different language, that's just not going to work. This is a recipe for disaster.

Now, again, there are solutions which begin with offering family planning. There are things you can do to adapt agriculture at least to mitigate some of the harm. And we're looking in the Sahel, then girls' education becomes critically important because many of these areas are polygamous and there's a lot of girl marriage. And unless you can raise the age of marriage of those girls – if you can put up the age of marriage by five years, you cut the birth rate by 25 percent without even the contraceptive. And we are having a fantastic success with Nigerian colleagues. One of them was with us yesterday. Keeping girls in a series of very conservative religions where only four percent of girls ever went to secondary school and not one of them completed that education, now 70 or 80 percent are staying there in secondary school. It's costing about $100 a year per girl.

Now, it costs billions of dollars to bring all the girls in that area to give them some opportunities and raise the age of marriage, and get rid of this human rights abuse of child marriage. But we have to make that investment because if we don't, the cost of inaction will be very, very much greater.

Greg Dalton: Some people say that it's foregone conclusion that world population will get to 9 or 10 billion. There's actually a range from 6 to 16 billion. So let's talk about how high it's going to go and whether that's inevitable or those curbs can be bent. Malcolm Potts.

Malcolm Potts: Well, some additional population growth is inevitable because take China. China now has fewer than two children on average but the population of China still goes up by about 7 million more births than deaths each year because of what we call demographic momentum. The women that were born a generation ago are now having children. So in parts of Africa in the unlikely event that everybody had two children, the population will still go on growing. On the other hand, the UN population division projects population to the end of this century. And the projection for 2100, I hope my grandchildren would still be alive and your grandchildren, is about 9 or 10 billion people.

But if, on average, you have half a child more, there'll be 15.8 billion people, which would be totally unsustainable. If you want an average of half a child or less, there'll be 6.2 billion, which might be a tolerable world that you could sustain. But those decisions are not made after 2050. Those are decision we have to make now. We have to make family planning universally available and we have to make the investment that's needed in these countries that have child marriage and where there are really no educational opportunities for girls. And those are things that we must do. And doing that will be a very, very tiny fraction of the cost of not doing it.

Greg Dalton: But this is not a conversation a lot of people like to have, a little bit embarrassed to say I've been doing Climate One for six, seven years now this is the first program focused directly totally on population. I've asked many environmentalists and energy people, “What about population?” They say “That's not our issue. We don’t like to talk about it. It's a nasty political/social issue.” So why don’t we like to talk about population, Alan Weisman, when it's such a lever for solving a problem?

Alan Weisman: Well, as I mentioned earlier, it's doing what comes naturally, and it just seems unnatural to do something else. And also, of course, there are religious pressures.
Every nation, tribe, et cetera, starts out with a mandate to be fruitful and multiply. And the reason for that, of course, is that you want to be bigger and stronger than the competitive nation or competitive tribe next door. The Israelites in the bible were polygamous for the same reason that the Mormons were later on - to fill up that land and to out-compete the Canaanites. Though it was very interesting when I was in Israel researching *Countdown*, a Talmudic scholar pointed out to me that after Abraham, Isaac and Jacob with their multiple wives and offspring and all begets. Then you get to Joseph. He's one of Jacob’s 13 children who might be the first ecologist in recorded history that we have because he was very observant and he realized that we are going to be entering a time of scarcity.

Well, at first he has just one wife and only two children. And he counsels the pharaoh of Egypt and the Israelites that in order to save themselves, this is not a time to expand. This is a time, so to speak, to refrain from embracing so much. It's a time to conserve because it's a time of scarcity and urgency. And frankly, we’re in a situation like that again. And one of the most interesting parts of getting to research a topic that frankly I knew nothing about and there’s people like Malcolm who helped educate me – it was a talk to so many of the world’s religions and to realize that there are things in their liturgies, in their histories that would accommodate that sort of behavior if necessary. You don’t have to change people’s minds and say, “You're wrong.” Show them that there are examples in their history where they have done exactly the right thing.

Greg Dalton: Malcolm Potts, why is there a sort of awkward reluctance to talk about population?

Malcolm Potts: The beginning point for me is that we are very unusual animal. If we were cats and rabbits, it would be easy to solve this problem because they only have sex when the females are ovulating. We have an enormous number of sexual intercourses over our lifetime. And most people in this room could have conceived 10 or 12 children just because that's something that human beings do because we use sex both to express love and we use sex to conceive children.

And the curious thing about it which separates us from, some may say, chimpanzees is that we’re very shy about it. We do it in private. We do it in the dark. We don’t have sex in the middle of this room. If we were a group of chimpanzees, there'd be probably somebody having sex out there and there'd be absolutely shocked by the fact that we were sharing food. So animals do differ. But the good news about family planning is it's something that's wanted. It is the most cost effective way of reducing our carbon footprint. It's more cost effective than making solar panels or windmills.

There's a wonderful program in California called Family PACT. *[Family Planning, Access, Care, and Treatment]* And it provides subsidized, basically family planning, reproductive healthcare for people at 200 percent in the poverty level. And those people don’t want to have a lot of children. And a very good analysis of that program is showing it diverts about 100,000 unintended pregnancies every year. Now, those 100 – it's difficult to get your mind around an unintended pregnancy or half a child, if it’s sort of like Monty Python. But if those babies had been born and they lived to be 80 years, their carbon footprint would have been enormous even if they're relatively poor.

Mechai used to blow out condoms in front of a big crowd of people, and then everybody laughs and the important thing is the person next to you is laughing. The National Condom Week always has a competition for what is the best condom couplet, and the one I remember is this.

"Use a condom and you will learn no deposit, no return."

Now, the important thing is that the person next to you laughed, not that you laughed, but the person next to you is the same. The person next to you has exactly the same opinions about sex being a wonderful, beautiful and loving thing, and not to be shy and stupid about it. So if we bring a bit of humor into this, I think will help everybody make comfortable.

Greg Dalton: Alan Weisman?

Alan Weisman: Can I respond? As I mentioned before, for 200,000 years, our population growth rate was like this, and then it went like this and it's really that hockey stick.

And everybody here in this room, we were born here and it looks normal to us, because this is what we know - crowds. But we are part of the most abnormal population explosion in the history of biology, and there's never been anything like it like that. But because we think it's normal, that's one of the reasons why it's so hard for people to grasp if there's something wrong, because it just looks like what we're used to.

I also wanted to put a different figure on what Malcolm just said when he said that this is affordable. Carbon-free energy, we don't know how to do that really well yet, but even if we did, it would be really expensive. This is not expensive tech. This doesn't involve any technological leaps. To make contraception universally available, it's been calculated that it would cost about a little over $8 billion per year.

Malcolm Potts: And going back to subsidized family planning here in California, probably a lot of you are taxpayers and some of your taxpayers' money is going into this FamilyPACT program. For every dollar spent within about five years, there's $3 saved because, again, unintended pregnancies, premature babies only cost to that. I mean family planning is not a cost, it's an investment. It's an investment in every country in this planet. So we're not asking people now to put up their budgets.

Greg Dalton: We're talking about condoms and climate at Climate One. Our guests are Alan Weisman, the author of *Countdown: Our Last, Best Hope for a Future on Earth*; and Malcolm Potts, a professor of Population and Family Planning at UC Berkeley. I'm Greg Dalton.

Let's go to our audience questions. Welcome to Climate One.

Female Participant: Okay. You talked about educating women, young girls as being a solution to the problem. However, say you get very successful along that lines of educating women, won't that make for more educated populations in different countries, wouldn't they want to then have more of an American lifestyle, hence a larger carbon footprint, what are the tradeoffs on that?

Greg Dalton: Alan Weisman, if we – educated girls want iPads.

Alan Weisman: Well, it's definitely a problem that we are going to have to contend with. A lot of people ask me, "Well, isn't the problem really consumption? It's not population." And it's obviously both. Its consumption and it's the number of people who are doing the consuming. But to quote Paul

Ehrlich, there just isn’t a condom for consumption yet.

Malcolm Potts: Yes.

Alan Weisman: Believe me, if I knew how to solve consumption, I would have written a book about that, but we are all addicted to that concentrated energy that I mentioned before. Imagine living your life without electricity and we don't even have to wait for those girls to get educated to start being demanders of electricity. More and more people are moving to cities now and that's actually helping bring fertility rates down, because kids are an economic asset out in the farm. They do all sorts of farm chores. In the city, kids cost money and they're not providers so much.

But even the poorest cities that I went to, wherever I went, poor people are finding a way to get cell phones, even kids. The electricity maybe pirated, but they're plugging in those chargers every night just like you and me, and that's sending more carbon dioxide up the chimney.

Greg Dalton: There's even a quote in the book about, I think, it's a person in Uganda saying, "I wish we could market condoms the way we market cell phones, they’d be as popular." Let's have our next question at Climate One.

Male Participant: I'm curious about how many people the earth can continue to support and let those people live in a comfortable fashion, given the fluctuations of food production from El Niño and La Niña and so forth north and south of the equator. What's the sustainable population that's comfortable for the earth?

Greg Dalton: Alan Weisman?

Alan Weisman: Yes. I attacked that in a couple of different ways or I get a few different scientists who have looked at it from different ways to respond to that and one of them in terms of food production. I mentioned artificial nitrogen before. Our food supply is now chemically force fed and it is having severe negative repercussions. Besides the incredible amount of greenhouse gases that are involved in nitrogen fertilizer and the fact that – just the meat industry, and the repercussions of eating meat and animal flatulence. And you add all of that up together, it turns out that just meat production is probably responsible for 51% of our greenhouse gases. I mean it's extraordinary, but this comes from the World Bank. It doesn't come from some wildlife vegan I assure you.

We're looking at a situation where this chemistry is starting to backfire on us. You know a lot about it here in California, because rising rates of breast cancer, autism, all of this stuff is starting to be tied to some of the protectors of this laboratory who bred plants that are the basis of our food supply now, and all the antibiotics that are being fed to animals and I could go on here. Before we had commercial levels of artificial nitrogen, there were over two billion people on this planet. 40% of us would not be here without artificial nitrogen.

So if we do a healthy thing for our planet, but gradually phase it out over the next couple of generations as we gradually are bringing our population down so people don't start starving, we're going to have fewer dead zones the size of New Jersey at mouths of the world's great rivers. We're going to have soils that are starting to recover. So many soils have been sterilized by this stuff, and we're going to come back to a sustainable level.

Another calculation for the number of people that the earth could safely sustain has to do with how much carbon per year could be ejected into the atmosphere without really destabilizing both the climate and the chemistry of the seas. And that number which was calculated here at UC Berkeley

by a team of physicists led by John Holdren, who's now President Obama's science and technology adviser. And in keeping with your question, figuring out what would give pretty much an average amount of energy to everybody on the planet so they could have a chance at a lifestyle that most people would feel acceptable, say a European lifestyle, less consumptive than us but certainly higher than in Africans or South Asians. And again, it came down to about one and a half billion to two billion.

Now, that was again the population of the world in 1900, and we had a pretty robust world back then. We had great inventions coming up. The Wright brothers came up with airplanes. Somebody in a debate said to me, "Yes, but if we control population, that next kid, that could be the next Mozart." And I said, “Well you know, when the last Mozart was born there were less than half a billion people on the planet, and somehow we had a critical mass of intellectual activity.

Greg Dalton: We're talking about population and climate at Climate One. Let's have our next audience question. Welcome.

Marian Swain: Great discussion. Thank you. My name is Marian Swain. I work at The Breakthrough Institute over in Oakland. So you're talking about empowering girls and educating girls and women, which is great but then your rhetoric just kind of shifts. And when you talk about booming populations in Pakistan or India, you start to talk about people as if they're like a scourge or a pest, which I find somewhat troubling as a type of rhetoric.

So I think what we're actually seeing in the developing world is countries with rising populations, but also that are developing and getting wealthier. And as they get wealthier, then the population growth does start to slow and we do see birth rates start to converge towards replacement rates. And I think most of the mainstream projections are seeing population stabilization by the end of the century. So I was hoping you could react to that.

Greg Dalton: So Malcolm Potts.

Malcolm Potts: I mean there is a very widespread idea that we don't have to do anything and the population will stabilize. What I think Alan and I are saying is that we have a huge opportunity to accelerate the slowing of human population by making choices available to women.

Now, the first question was a very good one. I think there are levels of human poverty that I've seen that I wouldn't wish any other human being to be in. If we look at measures of GDP, people want to get richer and richer. If you look at measures of happiness, poor people are not happy. They get to a certain level and then their happiness is pretty much horizontal. I think we got to get away from all these silly GDP measures. We cannot bring the whole world to America's standard of living, whatever that is. That is just physically impossible. There aren't the resources. We run out of copper and things like that. And there are realities that we have to live with, but we have an opportunity to slow rapid population growth in the human rights framework, and that's one we should welcome.

Greg Dalton: Let's have our next audience question at Climate One. Welcome.

Female Participant: Thank you for this interesting conversation. As a youth, I would hope to see this population growth change, and I hope to be alive to see it. In your ideal, like reasoning, what sort of time frame do you see for this and what sort of consequences do you see if there aren't enough younger people to support older people who maybe more in need of support?

Malcolm Potts: Okay. Well, first of all, there are a lot of people that are worried about declining

populations in Europe and Russia. Every year the science-based industry makes more stuff with fewer people. They make more large SUVs with robots than they used to make with more people, so there's unemployment in Europe. There's unemployment in America. I think it's crazy to be worried about a slowly falling population. I think it's something that we should welcome.

Greg Dalton: Let's have our next question for Alan Weisman and Malcolm Potts at Climate One.

Male Participant: My thought is, I'm from the generation where progress is our most important product. And I remember in your book that you said that in order to get our economies leveled up, we need to have a stable state economy and I was wondering if you could comment on exactly what a stable state economy? Because, obviously, I grew up where the free enterprise, but it seems like if we're controlling people in a stable state economy that I'm going to have to give up some of my freedom, so I was wondering if you could comment on that.

Alan Weisman: Yes. I mean your freedom doesn't have to go anywhere. I tackled the economic question like on Japan, which is one of the first countries on earth that is really dealing with a shrinking population. For the reason being that in 1949, Japan had to cut off its baby boom, because it lost World War II.

Now, some of you may recall that it entered World War II or it started World War II because it had a population problem, and it wanted to expand in the Manchuria to bleed off surplus numbers. But then, of course, things got out of hand. They kept going and then they lost. When their soldiers came back, they started to rejoin their wives just like our soldiers did, and their population rose by 10 million, and suddenly everybody was starving to death because their economy was wrecked.

So in 1949, as an emergency measure, they legalized abortion. Remember, this is before birth control pills because Japanese women who are pregnant were literally throwing themselves in front of trains, because they didn't want to watch another baby die of hunger. So today, there is a much smaller generation that's about to take the place of that last large generation that was born before World War II, and their population is already dropping. By the middle of the century, it's going to be approaching its 1950 population again, and many Japanese economists are terrified by that because they say they're not going to be able to keep growing economically.

But I met an economist named Akihiko Matsutani, who is part of a major policy think-tank in Japan, who sees this as an opportunity. He sees what's going to happen and it's already starting to happen that instead of everybody living in this crowded court cities where they can import raw materials and create through their heavy industries stuff for exportation, younger people are already starting to move into the hinterlands, away from the cities, because as there are fewer people living there land is cheaper, housing is cheaper and he says that light industries are going to follow them, because there's going to be fewer so they're going to be more valuable. Wages are not going to drop.

In fact, he said per capita GDP - if that's not a paradox - is not going to drop. The country's GDP may because its economy is going to be shrinking, but people are going to earn pretty much the same. Only as demand drops, when there are fewer people demanding and fewer people putting carbon dioxide up into the atmosphere I would add, they're going to simply cut working hours so people are going to have more leisure time, and the definition of prosperity is going to be more about quality of life than quantity of stuff.

Now, this is not a bad vision of the future. And, of course, it's going to take some tweaking but he says the way it's going to happen, as population drops gradually as it does, we're going to have a generation or two, a few decades to make this transition towards steady state being that we're not

trying to grow and always demand more resources on a planet that does not grow and does not have an unlimited number of them.

Greg Dalton: Let's go to our next question. Welcome to Climate One.

Male Participant: Thank you. Quick question, Dr. Potts, let us suppose that we do get all of these things that are on both of your wish lists, that we have ample education for women everywhere, and that we have ample access to contraceptives. What then would you estimate would be in the aggregate globally the rate of reproduction for everyone? And if that is more than what would be needed to get down to the 1.5 billion or so that you, Mr. Weisman, see as being sustainable in number, what solution would you then propose and is that consistent with the principles?

Malcolm Potts: I think it's a good question, I think, with fairly good answers. So I think by the end of this century, if we invest in family planning now, we could probably have six billion people with the population continuing to decline. So sometime in the 22nd century we'll probably get to the one or two billion, which I think would be biologically sustainable and I think would be a wonderful and beautiful world. The really dangerous time is between 2015 and 2100, and what we do now will determine what that population looks like.

Greg Dalton: We're going to take two more questions from these young questioners. Yes, welcome to Climate One.

Nina Harpell: Hi. My name is Nina Harpell. I'm a student at Foothill. I just have like a really quick question about if this affects population growth at all. So if healthcare is like decreasing the mortality rate, how do we deal with our current population control if lives are being prolonged?

Greg Dalton: Alan Weisman?

Alan Weisman: Well, just one example, Bill and Melinda Gates have been very concerned about malaria and HIV, and they have devoted a lot of funding to try to eradicate them in the world. And, of course, we all want that to happen. If you've ever seen the ravages of either, you pray that they will succeed. But in recent years, the Gates' have come to understand that solving one problem is going to exacerbate another on a stressed and stretched the planet. So they have now become some of – I mean their foundation, among private foundations, is number one in trying to fund family planning, because just as Norman Borlaug realized with food production, if we solve one problem that's going to increase the number of surviving human beings, we're going to have to couple that with family planning in order to keep a steady balance.

Look, imagine a national park. Every one of us knows it just makes total logical sense that you have to keep the number of predators and prey in some kind of balance. Otherwise, the ecosystem can just get completely out of whack and even collapse. But when the species ourselves, it's a little harder to imagine and yet this is exactly what we have to do.

Greg Dalton: Let's have our last question. Welcome to Climate One.

Rebecca Thompson: I'm Rebecca Thompson. I'm from the San Francisco Waldorf High School. And the question I have for you is with the growing population obviously affecting the climate. We're having some really weird weather, so what kind of physical effects and changes to the U.S. climate can we see after this current polar vortex?

Greg Dalton: Alan Weisman, you've traveled a lot and seen a lot of climate impacts.

Alan Weisman: Boy, I said that I went to 21 countries and then 21 of them, people told me that the weather had changed. And while Malcolm was talking a couple of minutes ago about poor people and how they are impacted by climate change, I was thinking about a country that both of us spent time in Niger - a Sahel nation. And when I went there, every village after village, people would say to me the same thing. They say, "If you have been here 25 years ago, you couldn't have seen that house over there. It's about 100 meters off because a lot of the trees we used to have."

And I said, "What happened to the trees?" "Well, we cut them because more of us need them for firewood and now trees aren't growing back because we used to have this 10-year drought cycle, and then it became a five-year drought cycle, and then it became a three-year drought cycle, and now we're in the fourth year of the three-year drought cycle." And it's just impacting everybody right now wherever we are. And here in the United States, what we're probably looking at, the models are racing to catch up, but it looks like the ice pack in the Arctic was kind of the anchor for the jet streams.

And now, as that ice pack is diminishing, the jet stream has kind of started to wander and drop down into the mid latitudes, and hence we are having – I live in New England, and I was just in Iowa, and I mean we're having subzero weather much longer than we used to have in the winter time. And meanwhile, we're sucking the moisture out of the west, as you well know here in California. And up there in the pole, ask anybody in Alaska, they're having an unusually warm winter up there, and they're having avalanches that are burying highways. We're in uncharted territory now and I think that we can ride this thing up, but not if we keep putting carbon dioxide up there. And this is one of the best ways that I know to start diminishing our use of fossil fuels is by diminishing the number of users.

Greg Dalton: We have to end it there. Our thanks to Alan Weisman, the author of *Countdown: Our Last, Best Hope for a Future on Earth;* and Malcolm Potts, professor of Population and Family Planning at the School of Public Health at UC Berkeley. I'm Greg Dalton. Thank you for listening to Climate One today.

[Applause]

Malcolm Potts: Thank you.

Alan Weisman: Thank you.

[Applause]

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