

Prannoy Roy Talks To Bill Gates On Pollution, "Climate Pandemic"

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Bill Gates, the Microsoft founder and philanthropist, talked to Dr Prannoy Roy in an exclusive interview on the "climate pandemic". He said the climate crisis triggered by global warming is worse than the coronavirus pandemic. He said every year the climate crisis kills five times more than the pandemic at its peak. "We must do the hardest thing humanity has ever done," he said.

Here is the full transcript of the interview:

NDTV: Hello and welcome to this very special programme about a very special issue, with one of the world's most special human beings, Bill Gates. I do remember a few years ago interacting with Bill Gates in front of an audience of IIT and tech students, and before the start of the show the producers asked Mr Gates to do an audio check, which normally involves counting 1,2,3 to 10. Bill Gates without batting an eyelid started his audio check with 1 billion, 2 billion, 3 billion. The young audience was in splits of laughter.

Today he may start with 51, 50, 49 to zero, you will see why those numbers in a moment. Today is also special because of his really excellent book that Bill Gates has written. It is a very important book on the disaster we could be facing because of pollution and climate change. The book is full of transparency, it has no jargon, and most of all it is full of excellent information put simply and clearly.

Bill Gates, thank you very, very much for joining us and spending the time. I know your schedule is really tough. In fact, I shall be asking you about how your personal life, Melinda, you and the kids, has changed because of the pandemic. I must say this book is one of the most informative books I've read on climate change. What I love about it that it is so clear about the challenges that lie ahead and the disaster that all of us and our children could face. And there's one chapter you say it's going to be hard, but don't be depressed when you read this. I had a laugh when I read the first sentence. But then you do give a lot of positive examples where things have gone well. But bottom line, if you could just explain to all of us your concept of 51 to zero, 51 billion tonnes of emission that we pollute the air with every year and to bring that down to zero emissions. and is that too ambitious going to zero? An idealistic target versus a practical target.

Bill Gates: Yes. Getting it from 51 billion, which was the total number of tons emitted per year globally, down to zero is going to be the hardest thing humanity's ever done. And it's going to require more capital investment, more innovation, more collaboration. But it's pretty imperative that we do it. The destruction of natural systems and the change to the weather and just the heat that a country like

India will be dealing with, and what that means about outdoor work. It's really disastrous. And I wish the goal was only to reduce 30 or 40%, but as long as you add CO2 to the atmosphere, it stays there for thousands of years. And so, the increase in temperature is basically the sum of all the emissions over a long time in the past. So as long as you're adding any, the temperature is going up, and that means we have to look at all the sources of emissions.

NDTV: Yes. You have a very clear chart in the book that clarifies what are the different sources of pollution.

The varying extent to which we are damaging our environment, with greenhouse gas emissions. And the worst five polluters are Coal with 19% of all pollution; Cars and Buses with 12%; Livestock with 6%; Cement is a major polluter too with 6%, and Iron & Steel and Natural Gas with 6% each too.

Bill Gates: And most people don't realise that's actually a very broad set of things. Many people would say it's coal plants making electricity, it's gasoline cars, but it's also all the industrial processes, a cement factory, steel factory, and even in transport, there's aviation and trucks that are very difficult to electrify. And so, if you look at how much electricity capacity India will need, as it shifts things that don't use electricity to use electricity and as its economy grows, and people are expecting air conditioning and lighting, its mind blowing. The challenge of building that cheap, reliable, clean electricity capacity. So, India is going to be one of the most affected countries in the world because it's near the Equator.

NDTV: You know, what I like about this is that this book, it tells you the advantages of going on a particular path, it's got incentives built in. For anybody to do anything, especially in India, you have to have both fear and incentives. Danger warnings versus positivity and hopeful outcomes. And what is encouraging is that you do give some positive examples from around the world, where things have gone well. Like in Tokyo, the storage of electricity. Give us two or three examples that you think could be replicated in other countries like we could do these in India too.

Bill Gates: Well, lithium-ion batteries for electric cars. You know, that's a great story. The cost of solar panels, the cost of land-based wind. There's work in the UK now to incent the price of offshore wind to come down. So that's very promising work. There's various ways of growing food or making food that mostly US companies are working on, that you can create something that...

NDTV: Exactly, it tastes and looks like meat, but it actually isn't. Yes, I have eaten it in restaurants in San Francisco and it is amazing.

Bill Gates: ...but no animals were involved in that. And that is another surprisingly big source of emissions. A lot of people are going to try and make cheap hydrogen in a green way, because if you could have that, you could use that for a lot of processes. But that's an example of something where we've hardly begun to work on that because people didn't realise that you have to cover every one of these activities.

NDTV: You point out in the book that there are so many exciting new ventures happening. New technologies. But many environmentally friendly processes are more expensive. It's called the Green Premium, that is the extra cost it takes to produce something using green technology.

The book highlights how variable this Green Premium is, the extra cost of switching to green-friendly technology. Some new technologies are not that much more expensive, like Electric Cars and Buses. Electric Cars cost only 15% more than petrol cars over an 8-year period of use. But producing Cement, for example, using green technology, costs 75% more than the existing methods. That's prohibitively expensive.

This extra cost of switching to green production methods, the green premium, faces this question when we come up against, when we talk about being environmentally conscious, oh, India is a developing country. First let's become a developed country with less poverty. Then think about the environment. You know, it's kind of sequential rather than a parallel. How do you overcome that objection?

Bill Gates: Absolutely. The key is that you measure for all these activities, what I call the green premium, which has had extra costs. And so, I always think that the world wants to get to zero by 2050, the world has to say to India, please use green approaches and India will look and say, okay, that costs a lot more. Are you willing to subsidise us? Well, if it's trillions of dollars, the answer is no. And if India has to build less buildings or have less air conditioning in the face of those needs, that's a dilemma. It's not likely that you'll reduce that activity because the historical responsibility for emissions is not India's, it's the rich world. And now somewhat China. India emissions are still quite low. So, unless we innovate what I call this green premium, this extra cost, down over the next 30 years by about 95%, then it's hard to believe that middle income countries, which India is a good example of, that they'll choose to make less houses or less cement or all these things when you're still trying to meet basic needs. You know, it's not as extravagant as the consumption is in the rich countries.

NDTV: Actually, I just wanted to go back to something which I've seen you actually do, and which really blew my mind, and I really feel India should learn from you and we need this. Our rivers need cleaning. They're very polluted and a lot of it is because sewage and industrial waste come into the river. You have a video which shows a technology plant which, if the source of water, the input is sewage, and that sewage after going through the plant comes out clean. In fact, you actually drank that cleaned sewage water. Tell us a bit about that because it could transform our rivers.

Bill Gates: Yes. So, toilets are a huge problem, because the way it's done in rich countries is you bring a lot of water in, which is expensive and you make it dirty and then you send it out and you have to have all those pipes, and those processing systems. A lot of sewage isn't processed at all. It goes straight into the river as a raw thing. Even the Ganges, sadly. Now the government has set some goals for doing these clean-ups. And we do have some new processing capabilities that don't take as

much land and they don't create as much smell as a typical way of processing faecal sludge. We keep reducing the cost of those, so that they become attractive. In the long run what we actually want to do is make the toilet itself do that work. So, it burns the solids and it filters the liquids. And so, we call that the reinvented toilet, and that would be a huge benefit to not only clean up rivers, but stop all these diarrhoeal disease and the unpleasantness of pit latrines or, the woods getting just lots of human waste there. And so, our Foundation specialises in this toilet or waste management.

NDTV: It's really crucial for India and you know it could transform things here. Because diarrhoea, in fact child disease of various types is still unacceptably high in India. And this could change that dramatically.

Bill Gates: Absolutely. Diarrhoea is because you're not processing that sewage properly. And so, it's getting out and then kids play and then they touch their hands to their face and that's how diarrhoeal diseases are transmitted.

NDTV: Right. Now, coming to the really frightening part, the awful future that our children could face. The data you highlight is how much the earth's temperature is rising.

It is shocking that Our Earth's temperature is rising alarmingly. In fact, already in the period from 1850 to now, the earth's temperature has risen by 1 degree to 1 and half degrees centigrade. And what this 1% rise means for all of us, especially if it carries on rising at this rate, it could mean more terrible storms in which people die and are left homeless, massive wildfires, the sea-level rises as icebergs melt and coastal villages and islands could get submerged, and the productivity falls of growing vegetables and plants.

And your book shows that this destruction caused by a rise in the earth's temperature is directly related to pollution.

The earth's rising temperature is caused by a huge rise in Carbon Dioxide emissions. This chart shows how the emissions are rising faster and faster, especially over the last 50 years. It's frightening.

And you do talk in this book about five grand ambitions. It's a spectrum of action to quote, about manufacturing, electricity, agriculture, transport, building, and construction. That's a huge area here as well. Just explain that in a little more detail for our viewers.

Bill Gates: Yes. So, the first thing, after you learned the number 51 billion, the next thing to learn is the sectors of the emissions and electricity is about 27%. You know, that's mostly coal plants, but a bit natural gas. Then you have manufacturing, which is even bigger, 31%. And that's the category, steel and cement and all the plastic paper is in there. Agriculture, partly because of livestock, partly because of fertiliser, and partly because people are cutting down forests, that's about 19%. And then transportation, and this is including planes and cars and everything, is about 16%. And then heating and cooling buildings is the fifth. That's, only about 7%. Now for India, those numbers would vary

by country. But you know, that's the global mix and it is daunting that we don't have solutions for many of those areas. That is the green premium, to make steel in a green way, you know, it's more than double the price, or cement in a green way, is more than double the price.

NDTV: That's the key. Yes. How do we overcome that aspect, the price factor for a poor country? You know, what is called the Green Premium we mentioned, it's really daunting and that's what we face all the time.

Bill Gates: Yes. Well, that's where innovation comes in. And so, we have to have policies that we spend more on the basic R&D and we target that R&D at all the areas of emissions. And then we have to have innovative companies who can partner with the big companies to actually pioneer these new approaches, some of which will fail, many of which will fail. And then we have to have a market, that even if the green premium isn't zero yet, if somebody is bringing it down, then there's some volume that rewards them and they get on a learning curve. And so, the rich countries, they did buy a lot of solar panels and the prices came down even more than expected and things like electric cars and electric buses, those prices because of the lithium-ion battery improvement, those will come down.

So that's almost a solved area over the next 10 or 15 years. Electric cars will not have a green premium over gasoline cars. Their range, their costs, the quickness, you can recharge them, the charging points. So that's going to be a good, a good one. That's the easiest. But for steel, the rich countries are going to have to create a market and get that. You know, I believe we can get the green premiums down by 95%, which would be on a global basis. It's only 250 billion a year, and we should be able to come up with the money to, to subsidise that. But the current 5 trillion a year green premium costs, there's no way that's going to get funded. So, we have 30 years to innovate in all of those areas and get a 95% reduction. And then it becomes reasonable to say to India, please, you know, use the green approach for all these activities so that you participate in allowing us to get to zero.

NDTV: You know, that makes it so clear. We need to and we can reduce the green premium, the extra cost of using green technologies, reduce that green premium from what it is today at 5 trillion dollars down to 250 billion or a quarter of a trillion dollars. That's a huge change. And 250 billion is tractable you feel?

Bill Gates: Right. The global economy, it's about 80 trillion. So although that's double all the foreign aid from rich countries, the world will be a lot richer in 2050, and climate change is so important to all of us. That's do-able for the remaining 5%.

NDTV: Yes, it does sound tractable the way you put it. I just want to divert for a second and congratulate, really thank you for the amount of work you've done on COVID. There are certain parallels. I think you have said earlier that this environmental disaster, is as big a crisis as the COVID pandemic, and we have to learn lessons from how the world has handled COVID. The good points

and lessons from the mistakes made. But you talk about a forthcoming pandemic, you saw this pandemic coming much earlier and invested, I think a billion dollars on various aspects in the war on coronavirus, especially on the development of vaccines?

Bill Gates: Right. So, our Foundation, because of our work on infectious disease, is expert in vaccines. So, the people who've run the rich country vaccine efforts, and even some people, some of the best people in India, work or consult for us. And so very quickly, well I did a talk in 2015, well in advance saying we're not ready for the pandemic. Then as it came, almost identical to the scenario I painted in that TED talk, we started investing and our goal was to take our partners, particularly in India, people like the Serum Institute and Bio E, and get the vaccines being made by the Western companies into those factories, without any royalties. So, the Indian companies actually have big factories. They don't charge as much for the vaccines, but they sell by volume, a lot of vaccines.

And so, we're working now, the AstraZeneca is being made by Serum. But that's a little complicated now because, depending on what variant you have, its efficacy can be higher or lower. But the next two, which do work pretty well against variants, Novavax and J&J, we're moving as fast as we can with great support from our Indian partners to get those manufactured. And then the Indian government's agreed that half of what's made can go to other developing countries, and India will take half and get the priority, people in India vaccinated. So that's the next six months will make a huge difference. But I gave a TED talk on climate in 2010 and then I gave the pandemic one in 2015. So, these are two areas that I've been learning and thinking a lot about.

NDTV: Don't give any more TED talks then. But the worry, and the parallel, between this kind of a pandemic disaster and a climate disaster is that, even as we speak, we find the distribution of vaccines across the world a very asymmetric. Much, much more of the vaccines are going to the rich countries and poorer countries are not getting anywhere near their fair share. Fortunately, India is, because of all your initiatives and others, producing its own vaccine. But other poor countries, how do we make sure in the environment disaster that there is a fair distribution of green technology? That it is equitable in terms of your innovations? And that the rich countries don't get it all as is normally the case.

Bill Gates: In the best case we will have a six-month lag. And in the worst case, we'll have an 18-month lag. Now historically, before the Foundation, in a group that we helped create called GAVI came along, it was often 20 years. So, vaccines like rotavirus or pneumococcus, which are key to preventing hundreds of thousands of children's deaths, those were adopted in the West quite a long time ago, but now they've been adopted, it's actually a great achievement that Serum made a low-cost pneumococcus vaccine. And that's partly why India has now decided to give that to all the children in India, which will save many lives. So, everybody involved, Serum, the Indian government, our Foundation, all are very proud of what happened there. But that was a big delay. Here, with the pandemic, even six months feels very unfair. And the big solution to that is to have more factories, and to have these regulators figure out how to do it. For this pandemic, we're having to do it without having practiced. And it's kind of hard, but we're working on that. For the next pandemic, we'll make

sure there's more factory capacity and we'll actually practice. How do you transfer these things? How do you make it? You know, it took a year, which was pretty good. But if we improve the science, we should be able to do it in three or four months for the next pandemic.

NDTV: Right. And we have a bit of a history in India. We produced hundreds of millions of vaccines for HIV and distributed around the world very cheap. So, the way you put it makes me feel a little better, six months. If we can target six months or less, the distribution becomes equitable and you think that's feasible?

Bill Gates: That's the best case. And at this point, it relies on getting the Johnson & Johnson and Novavax in large numbers. Unfortunately, the Chinese and Russian vaccines are made in factories that, unlike the ones in India, they're not high quality enough for what's called good manufacturing practices. So, some countries may accept those, but the World Health Organization really only blesses vaccines that are made in GMP factories, which Serum, Bharat, Bio E, the Indian companies that we do lots of partnerships with, they do have these high-quality factories. And in fact, their factories are very big factories and they've been great partners. So, if everything goes well with J&J and Novavax, yes, it'll be about a six-month delay. If we get some interruption there, it could be 12 to 18, which would be tragic. And everybody wants the whole world to go back to normal, and we get the economy going. And so, we don't have re-infection. The longer we have this disease, the more variants are going to show up. And then even the rich world could have to go back and re-vaccinate and face some of the lockdown and the terrible effects on both the economy and education.

NDTV: Overall, one feels quite happy about the way we developed a vaccine so quickly. It's unbelievable that in a year, 12 months, the way we tackled it, I mean, a lot of things could have been better in retrospect, but there are a lot of positives to be learned for future and for the environment. How, if we put our mind to it, we can do things. But one thing about a pandemic, it's in your face, everybody is terrified and they act.

In fact, just like nuclear plant explosions are deadly, we may all have a misguided view of nuclear energy. You answer the question, is Nuclear Power dangerous. In fact, the data shows it is least dangerous in the sense it leads to the least number of people dying. Coal is the worst with over 24 people dying per terawatt hour produced. And for the same output, Oil leads to 18 deaths, Biomass at just under 5 and Gas at nearly 3 deaths. But the comparative figure for nuclear power is less than one person dying, in fact less than zero point one deaths on average. That is so contrary to perceptions.

The environment is worse than virus pandemics in terms of the number of deaths, but it's a slower process, while pollution causes many more deaths, but it is not in your face and sensational for the media and leaders to focus on enough.

Bill Gates: You're absolutely right. The climate change, because it gets worse every year, it creeps up on you. And, by the end of the century, it's very, very bad. It's killing five times as many people as the pandemic at its peak. So, it's slower and you have to take action way before the bad stuff

happens. And there's not just one invention, like the vaccine, that can get you out of the problem. It does fit in that you depend on your government to look ahead on your behalf. And you know, most governments, including the US, feel like they weren't ready for this pandemic. A few countries like Australia did a better job of getting the diagnostic and limiting the total number of cases. If this had happened 10 years ago, we would have been much worse because our ability to make new vaccines was not as strong.

And the ability to use the internet to collaborate was not as strong. But this mRNA approach that we've been funding for over 10 years, it really came through for the first two vaccines. And then we used other more conventional techniques for these next three vaccines. But, you know, we'll have five approved in the next few months. Sadly, the mRNA is costly and hard to make. But we'll also fix that in the next five to 10 years.

NDTV: Also, you've been talking about vaccine production, like in India, and they're predominantly produced by the private sector. But in this fight for cleaning up our environment, it is public and private you talk about, right? A partnership?

Bill Gates: That's right, the government has to create the incentives. For the pandemic, we've gotten the rich countries to contribute money, not for India, but for the countries that are the very poor countries. So, they will be paying for the vaccines. In the case of climate change, the number of government policies about encouraging electric buses or requiring, slowly but surely, more use of a green steel when you're doing building and accepting a new type of steel that is less proven than the old type, the amount of government action to create the framework and fund the R&D and encourage the risk taking, is really huge. In the vaccine case, what the government needed was awfully clear. And it came through.

NDTV: There still remains the question that the rich countries still cause much more pollution than the developing countries.

In Carbon Emissions, rich countries are much worse than poorer countries. The United States is by far the worst, Europe is high and so is China now, India and Africa pollute the atmosphere much, much less. Shouldn't that be taken into consideration in the distribution of green technology. Though a warning, while Africa and Europe are showing a falling trend, India is showing a rising trend in pollution.

Finally, to make your message clear. I mean, talking to you like this, the message will get across to a lot of people and people do listen to you, but the media also has to play a role, like us. But fortunately, the youngsters, the millennials, are much more involved in the environment and doing something about it. So, should we all just sit back, our generation, and let the youngsters do it?

Bill Gates: Well, no, because we're still in a lot of the key positions. But their interest in it as a moral cause to not be a generation that's destroying these natural ecosystems and leaving a tragic situation

for their children, that's one of the reasons to be hopeful that, even though we need to work hard for 30 years, and even be a little bit lucky on innovation, the reason I think that will happen is because of that young generation. And so, it's great that they've been activated and it's great we have this goal, but now we need a plan. And my book was to contribute to, okay, what does a plan, a really comprehensive plan, not to do a 20 or 30% reduction, but to drive towards getting all the way to zero. What does that look like? Based on the acceleration of innovation, I got to see in the PC and internet world, and the innovation that I've gotten to see for the Gates Foundation health work, which has also gone extremely well.

NDTV: Well, thank you very much. One last question about your personal life, and how your daily routine has changed. Give us a snapshot of how Bill Gates' life has changed and how we can all learn from that.

Bill Gates: Well, I'm not doing business trips at all. And so, when I talk to government leaders, it's all online. I was speaking to the new Secretary of State, Secretary of Treasury today. I was speaking to President Macron today. They've learned how to use Teams or Zoom or some great tool for this. And I'm actually surprised how well the Foundation, which doesn't go to its offices at all, how much we're able to get our work done this way. I've gotten to see my kids more, because instead of being off at school, they've been home quite a bit. Because they're college-aged. And for me, that's been nice. They would have liked to have a normal year, but we've seen them a lot. You know, of course we're very lucky. We have a lot of room in our house and we have a great internet connection. And even the schools they go to, did a particularly good job on the online learning. But it's the strangest year. And even as we go back, the questions about tele-health and, do you go to the office one week out of four or do you go every day? There's a lot that, because our behaviour has been disrupted now, we're kind of open-minded to new approaches, some of which will get rid of traffic jams and real estate being overpriced. And so, I'll be fascinated in the years ahead. I certainly didn't think a lot of these things would work as well as they have.

NDTV: It's amazing how well it works. And one big downside for me is I'm working harder in the lockdown. I mean, I thought that I'd be able to relax a bit, but no. Is that the same with you?

Bill Gates: If I travel to India and I'm going from one ministry to another, I'm relaxing. But now, I can schedule minister number one 9 to 10, and minister number two 10 to 11. And hopefully I can get up for a minute, stretch my legs, go to the bathroom, but yes, it's tempting to just, you know, be in those solid discussions all the time. And it feels very efficient versus sitting in traffic. But you do have to be careful. You can take that and overdo it.

NDTV: Well, thank you very, very much for this book and for spending the time. And I think I went one minute over, but let's pretend there was traffic.

Bill Gates: No problem. Thank you very much.

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