



Graciela Chichilnisky (*1944) acted as a US Lead Author of the Intergovernmental Panel on Climate Change, which received the 2007 Nobel Prize. She is a world renowned economist and mathematician whom the Washington Post calls an “A-List Star” and who appeared in the 2009 Time Magazine on “Heroes of the Environment”. Chichilnisky is the author of the carbon market of the UN Kyoto Protocol that became international law in 2005.

Chichilnisky has a Masters and a PhD in Mathematics from MIT and a second PhD in Economics from UC Berkeley. She taught previously at Harvard, Essex and Stanford Universities and is a founder and Managing

Director of Global Thermostat LLC. Dr. Chichilnisky has authored 14 books and over 250 articles published in leading academic journals including Nature, American Economic Review, Transactions of the American Mathematical Society, and the Journal of Mathematical Economics, as well as in popular news media, such as Time Magazine and the Financial Times. She is a frequent commentator on CNN, ABC, BBC TV News, and Bloomberg News. Her books include Saving Kyoto, published in 2009, and The Economics of Climate Change, published in 2010.

Dr. Chichilnisky is currently a Visiting Professor at Stanford University. Silicon Valley magazine Fast Company just selected her company, Global Thermostat, as the “World’s Top Ten Most Innovative Company” in Energy. Dr. Chichilnisky was selected as the 2015 “CEO of the Year” awarded by IAIR at Yale University Club in NYC on April 16.

You were born in Argentina and your father was a minister in Juan Peron’s government. What was it like to grow up in Argentina?

Growing up in Argentina was wonderful. Argentina is an exceptional, beautiful country, with highly educated people and a warm and interesting culture. My father was a Professor of Neurology at the University of Buenos Aires and a Secretary of Public Health in the Government of Argentina.

At the age of 20 you went to study to Massachusetts Institute of Technology. How did you manage it?

The University of Buenos Aires closed down while I was in high school due to a coup d’état by the Argentine military, and I was offered by University professors who knew me well to become a special PhD student at MIT with a fellowship from the Ford Foundation. I competed for a year with the top graduate students at MIT in Mathematics and came on top of the class, so I was accepted as a regular PhD student at MIT due to my performance. After I completed my PhD in Mathematics, I obtained a second PhD in Economics at the University of California at Berkeley.

As far as I know you were single mother without university degree?

That is correct. My son Eduardo Jose Chichilnisky, who is now a Professor of Neurosurgery and Experimental Physics at Stanford University, was born when I was a teenager. At the time I had no husband. Separately, I never went to college, I went to MIT directly after completing high school in Argentina.

What exactly was the reason to study math and economy?

I love mathematics; I feel it is the language that the brain uses to speak with itself. In addition to Mathematics I studied Economics because I felt and I still feel that social organization is the weak point of human societies, where more advances are needed.

Was it something like a life mission?

Yes, perhaps you can call it a life mission. I thought that it was my obligation to use my brain for a useful purpose, something that could help others and would alleviate pain or suffering.

Or did you feel it would be wrong to waste such a huge talent?

I suppose I had a large talent but I did not think of it in terms of talent, but in terms of using my resources effectively and for good purposes. I still feel the same obligation. In addition, being useful to others is in my view the only way to be happy. So I was being useful and at the same time I was pursuing my own happiness.

Is it true that after coming to Boston the most fascinating thing for you was the local library opened 24 hours a day?

Yes, at the time MIT had a wonderful library that was open 24 hours a day and I loved to be there all day and all night – it was a huge pleasure. I still recall that there were electrical outlets for male students to shave in the morning. Very few women, though, in fact none.

During one interview you said that you had been interested in sociology and philosophy...

Yes, I have always been very interested in sociology and philosophy. These are truly important topics. I found them difficult to understand, however, since they are both often imprecise and I found they could be confusing.

Is there any connection between them and exact math?

Yes, there is. In fact if one thinks clearly and precisely, one is thinking mathematically no matter what is the topic one is thinking about.

Why do you claim that math is the language our brain uses to communicate with ourselves?

This is the way I feel. The brain functions like electrical equipment. It transmits information electrically. It processes information electrically. And one way to represent its functioning is using binary logic, gates that open or close, as we do with electrical systems. This is traditional logic. In quantum theory the logic is more complex, it is not binary – but it still operates like an electrical system.

What do you think about the myth that women are not intellectual enough to compete with men in the area of math and other exact sciences?

It is a silly and damaging myth. It is really the essence of discrimination against women. It is used to adduce that women are genetically inferior. This was done by the former President of Harvard University Larry Summers, who lost his job for making such statements in public. The so called genetic inferiority is false, and as you know it is really a pretext used for abusing and exploiting people. The Nazis justified themselves this way. Racists always adduce that other races are genetically

inferior to their own race to justify paying lower salaries, excluding other races from the benefits of society, enslaving people and torturing and killing them and their children.

During your MIT studies, the proportion of men to women was 20 to 1. How did you feel about it?

I did not pay attention to it then, as I was fascinated by MIT's courses and by its intellectual atmosphere. It was a real pleasure. I loved MIT. But later on I found out that every time I competed effectively and scored higher than men in an exam, homework or generally in class, I was treated with scorn and even hate by the male students. It was a choice between a better social and personal life and a better intellectual life. I chose the latter.

You are one of the authors of the mathematical model at the Kyoto Protocol. How did you get this job?

I am the author of the carbon market of the Kyoto Protocol. I designed it, argued for it for years, published books and articles about it before it existed, and I actually wrote the words that define the carbon market into the Kyoto Protocol at the crucial UN COP meetings in December 1997. I tell the whole story in my book *Saving Kyoto* that was published in the UK in 2009.

Do you have any interesting stories regarding the Kyoto Protocol?

Yes, the whole thing of how the carbon market was designed, negotiated, and created by me, how I got the words for it inserted into the Kyoto Protocol is a story of intrigue and suspense. You can read it in the chapter "The Road to Kyoto" of my book.

Regarding the environmental issues, why do you criticize both American presidents – Bush and Obama, even if they are supporters of different opinion streams?

I did not criticize President Obama, who has done extraordinary work, and President Bush had enough critics on his own that my words were not important.

How has the economy changed since 2007, eight years after the global economic crisis?

In my recent book *The Transformation of Capitalism* I explain that capitalism is transforming in response to two major internal developments: The enormous increase in inequality it caused in the period of globalization since WWII, and the extraordinary and abusive use of the world's resources by the rich nations, resources that were extracted and exported by the poor nations for consumption by the rich.

In the Czech Republic we say: Every bad thing moves you forward. Is it also true in case of the global economic crisis?

As I have already mentioned, the economic crisis is the result of deep and extensive use of natural resources which started in the post-war decades. This period culminated in the current geological period known as Anthropocene, in which humans have become the largest geological force on the planet. As a result, the survival of the human species is now in question.

The Nobel Prize laureate in economics and the Yale university professor Robert Shiller believes that fear and worries rather than euphoria lie behind the growth of global stock markets. Do you agree with him?

The growth of global stock markets represents an aspect of capitalism that has its own dynamics, as Robert Shiller says, but it is also in the process of change. As capitalism is transforming itself, so will the global stock markets. There is no way to avoid the need to reduce the use and improve the distribution of the world's resources, and in this century the global economy is increasingly and clearly founded in the use of global public goods – such as knowledge, the planet's atmosphere, and its bodies of water, the world's biodiversity. These are Basic Needs, a concept I introduced and defined in my early 30s when I created in Argentina the Bariloche Model of the world economy that provided a developing nation response to the MIT Limits to Growth controversy. Basic Needs are the foundation of Sustainable Development, a term that even the Group of Twenty recognizes is the foundation of the global economy. Shiller is not wrong, but his vision is limited. Capitalism is transforming together with the global capital markets.

Professor Shiller also claims that technologies will soon change our lives totally and people will be asking: “Where will we and our children be within 30 years?” Would it be the reason for them to buy bonds with negative profit?

The transformation of capitalism is real. The crisis that caused this transformation is the enormous overuse of the world resources since WWII, a period of rapid economic globalization that was shepherded by the Bretton Woods Institutions created in 1945 – the World Bank and the IMF among them – led by the US and based on the extensive and intensive use of natural resources from poor nations, resources that are imported and consumed by the rich nations. This global trend was accompanied by an extraordinary increase in inequality between the rich and the poor on the global level – both trends are one and the same and both embody the limits of capitalism that are causing its current transformation.

Do you agree with the opinion that we live in times when politics rapes the economy?

Bad politics can make a lot of harm and so can corrupt business.

However, as the famous investor Faber stated, there were more and more people who earned money from elections instead of own work.

These words are a misunderstanding of the role of political processes, but I can see how an investor may view things that way.

In the past you employed Jeff Bezos at the post of director of technology development. Could you tell us about your cooperation with this man who is now the owner of Amazon.

Yes, Jeff Bezos was my employee after he graduated from Princeton University. Jeff worked as my Chief Technology Officer for about three years when I was the CEO of FITEL (Financial Telecommunications), a firm I founded, with offices in the UK, US, and Japan. Jeff is very intelligent, a very hard worker, a positive person, and it was a pleasure working with him!

What are your plans for the future?

I am preparing the ground writing and working politically for the resolution of the climate change crisis, which is needed to avert what could be the extinction of human societies as we know them. Even Pope Francis in his recent encyclical recognizes this danger. A resolution that averts climate change requires both new technologies and new political solutions. In terms of technology, I have co-invented and patented a path breaking technology that captures carbon directly from the air – and captures more carbon than it emits, so it reduces the CO₂ in the atmosphere. This is called carbon

negative technology™, a term I introduced and trademarked. The UN IPCC recognizes that only carbon negative technologies can avert climate change now, since we achieved very high concentrations of CO₂ after all these years. I created a firm, Global Thermostat, which I lead as CEO, to commercialize our technology. One can use it not only to clean the atmosphere from CO₂ but also to make profits in the process, as the CO₂ is sold for food and beverage markets, for enhanced oil recovery, to produce industrial materials such as graphene, to feed algae who produce biofuels, to produce synthetic fuels, and even to desalinize water. There is a \$1 Trillion market for CO₂ on earth. In political terms, which are at least equally important, I introduced the Green Power Fund (GPF) at Copenhagen COP15 in 2009, which was accepted and promoted by Hillary Clinton, then US Secretary of State, and was partially made into international law in Durban South Africa in 2011, with the name Green Power Fund. The GPF is a \$200 Bn/year fund that draws its resources from the UN carbon market, with the funding used for building carbon negative power plants in poor nations. This way it can assure cleaner atmosphere and more economic development that is so important for poor nations. Politically I introduced a solution using the GPF so that developing nations such as India and China will accept limits on their emissions within what the GPF funds them to do. This will allow universal limits in CO₂ emissions, a restriction in the use of fossil fuels, and a transformation of energy markets around the world. It will combat poverty and clean the atmosphere at the same time. The process can take 15 years, but it is a solution, both technologically in terms of business, and politically. It also resolves the huge wealth gap between the rich and the poor nations, the North-South global divide.