

# Global Warming And The Future Of Humanity: An Interview With Noam Chomsky And Graciela Chichilnisky



Noam Chomsky



Graciela Chichilnisky

*truth-out.org*. September 2016. How serious of an issue is climate change? Does

global warming really threaten human civilization? Can it be reversed, or is it already late?

In this interview for Truthout, two scholars, *Noam Chomsky*, one of the world's leading public intellectuals, and *Graciela Chichilnisky*, a renowned economist and climate change authority who wrote and designed the carbon market of the Kyoto Protocol, concur on a few key points. First of all, global warming and climate change constitute the greatest challenge facing humanity, and may pose an even greater threat to our species than that of nuclear weapons. Secondly, the operations of the capitalist world economy are at the core of the climate change threat because of over-reliance on fossil fuels and a perverse sense of economic values. Thirdly, the world needs to adopt alternative energy systems as quickly as possible. And finally, it is crucial to explore technologies to assist us in reversing climate change — as time is running out.

*C. J. Polychroniou: A consensus seems to be emerging among scientists and even political and social analysts that global warming and climate change represent the greatest threat to the planet. Do you concur with this view, and why?*

*Noam Chomsky:* I agree with the conclusion of the experts who set the Doomsday Clock for the Bulletin of Atomic Scientists. They have moved the Clock two minutes closer to midnight — three minutes to midnight — because of the increasing threats of nuclear war and global warming. That seems to me a credible judgment. Review of the record shows that it's a near miracle that we have survived the nuclear age. There have been repeated cases when nuclear war came ominously close, often a result of malfunctioning of early-warning systems and other accidents, sometimes [as a result of] highly adventurist acts of political leaders. It has been known for some time that a major nuclear war might lead to nuclear winter that would destroy the attacker as well as the target. And threats are now mounting, particularly at the Russian border, confirming the prediction of George Kennan and other prominent figures that NATO expansion, particularly the way it was undertaken, would prove to be a "tragic mistake," a "policy error of historic proportions."

As for climate change, it's by now widely accepted by the scientific community that we have entered a new geological era, the Anthropocene, in which the Earth's climate is being radically modified by human action, creating a very different planet, one that may not be able to sustain organized human life in

anything like a form we would want to tolerate. There is good reason to believe that we have already entered the Sixth Extinction, a period of destruction of species on a massive scale, comparable to the Fifth Extinction 65 million years ago, when three-quarters of the species on earth were destroyed, apparently by a huge asteroid. Atmospheric CO<sub>2</sub> is rising at a rate unprecedented in the geological record since 55 million years ago. There is concern — to quote a statement by 150 distinguished scientists — that “global warming, amplified by feedbacks from polar ice melt, methane release from permafrost, and extensive fires, may become irreversible,” with catastrophic consequences for life on Earth, humans included — and not in the distant future. Sea level rise and destruction of water resources as glaciers melt alone may have horrendous human consequences.

*Graciela Chichilnisky:* The consensus is that climate change ranks along with nuclear warfare as the top two risks facing human civilization. If nuclear warfare is believed to be somewhat controlled, then climate change is now the greatest threat.

As difficult as it is to eliminate the risk of nuclear warfare, it requires fewer changes to the global economy than does averting or reversing climate change. Climate change is due to the use of energy for industrial growth, which has been and is overwhelmingly based on fossil fuels. Changing an economic system that is bent on uncontrolled and poorly measured economic growth and depends on fossil energy for its main objectives, is much more difficult than changing how nuclear energy is used for military purposes. Some think it may be impossible.

*Virtually all scientific studies point to increased temperatures since 1975, and [a recent story in The New York Times](#) confirms that decades-long warnings by scientists on global warming are no longer theoretical as land ice melts and sea levels rise. Yet, there are still people out there who not only question the widely accepted scientific view that current climate change is mostly caused by human activities, but also cast a doubt on the reliability of surface temperatures. Do you think this is all politically driven, or also caused by ignorance and perhaps even fear of change?*

*Chomsky:* It is an astonishing fact about the current era that in the most powerful country in world history, with a high level of education and privilege, one of the

two political parties virtually denies the well-established facts about anthropogenic climate change. In the primary debates for the 2016 election, every single Republican candidate was a climate change denier, with one exception, John Kasich — the “rational moderate” — who said it may be happening but we shouldn’t do anything about it. For a long time, the media have downplayed the issue. The euphoric reports on US fossil fuel production, energy independence, and so on, rarely even mention the fact that these triumphs accelerate the race to disaster. There are other factors too, but under these circumstances, it hardly seems surprising that a considerable part of the population either joins the deniers or regards the problem as not very significant.

*Chichilnisky:* Climate change is new and complex. We don’t have all the answers. We are still learning how exactly the Earth reacts to increased CO2 and other greenhouse gases. We know it leads to warming seas which are melting the North and the South Poles, rising and starting to swallow entire coastal areas in the US and elsewhere, as the New York Times article documents. We know that the warming rising seas will swallow entire island nations that are about 25 percent of the UN vote and perhaps at the end, even our civilization. This realization is traumatic and the first reaction to trauma is denial. Since there is some remaining scientific uncertainty, a natural response is to deny that change is occurring. This is natural but it is very dangerous. Signs of a poorly understood but treatable house fire requires action, not inaction. While denial leads to certainty, it is only the certainty of death. This is true for individuals and also for civilizations.

Political parties often take advantage of denial and fear in a moment of change. This is a well understood phenomenon that often leads to scapegoat-ism: blaming outsiders, such as immigrants, or racial and religious minorities. The phenomenon is behind Brexit and the violence in the political cycles in the US and EU. After denial comes anger and finally, acceptance. I think some are still between denial and anger, and I hope will reach acceptance, because there is still time to act, but the door is closing fast.

*In [global surveys](#), Americans are [more skeptical than other people around the world](#) over climate change. Why is that? And what does it tell us about American political culture?*

*Chomsky:* The US is to an unusual extent a business-run society, where short-term concerns of profit and market share displace rational planning. The US is also

unusual in the enormous scale of religious fundamentalism. The impact on understanding of the world is extraordinary. In national polls almost half of those surveyed have reported that they believe that God created humans in their present form 10,000 years ago (or less) and that man shares no common ancestor with the ape. There are similar beliefs about the Second Coming. Senator James Inhofe, who headed the Senate Committee on the environment, speaks for many when he assures us that “God’s still up there and there’s a reason for this to happen,” so it is sacrilegious for mere humans to interfere.

*Chichilnisky:* The “can do” logic, by its own nature, does not accept limits. And an empire does not have a graceful way to evolve out of this role. History demonstrates this time and again. Trying to conserve a privileged global position makes change traumatic for the US.

The first reaction to trauma is denial, as I explained, then comes anger and finally, acceptance. I think the US is still between denial and anger, and I hope we will reach acceptance because almost perversely, right now, only the US has the technology that is needed for global economic change.

*[Recent data related to global emissions](#) of heat-treating gases suggest that we may have left behind us the period of constantly increased emissions. Is there room here for optimism about the future of the environment?*

*Chomsky:* There is always room for Gramsci’s “optimism of the will.” There are still many options, but they are diminishing. Options range from simple initiatives that are easily undertaken like weatherizing homes (which could also create many jobs), to entirely new forms of energy, perhaps fusion, perhaps new means of exploiting solar energy outside the Earth’s atmosphere (which has been seriously suggested), to methods of decarbonization that might, conceivably, even reverse some of the enormous damage already inflicted on the planet. And much else.

*Chichilnisky:* This is good news, it is a step in the right direction. But the road is miles long and the first step, while necessary, does not determine success. It is far from enough. The problem that few people appreciate and was only recently observed in the IPCC [Intergovernmental Panel on Climate Change] data is that CO<sub>2</sub> stays hundreds of years in the atmosphere once emitted. It does not decay as particles or sulfur dioxide does. We have used the majority of our carbon budget and we are already at dangerous levels of CO<sub>2</sub> concentrations, about 400 parts

per million. The levels were 250 before industrialization. So the problem is what we have done already and, therefore, what must be undone.

According to the Fifth Assessment Report of the IPCC, page 191, in most scenarios we now have to remove the CO<sub>2</sub> we emitted. These emissions were recent, mostly since World War II — 1945 — which was a turning point of the world economy. This was the era of US dominance and of globalization based on over-extraction of natural resources from poor nations and overconsumption of those same resources by the rich industrial nations. The era of galloping increase of wealth by the very few and the even faster galloping and record inequality and poverty in the world economy as a whole. This is the divide between the [global] North that houses 18 percent of the global population and the [global] South that houses over 80 percent.

*Given that change in human behavior happens slowly and that it will take many decades before the world economy makes a shift to new, clean(er) forms of energy, should we look toward a technological solution to climate change?*

*Chomsky:* Anything feasible and potentially effective should be explored. There is little doubt that a significant part of any serious solution will require advances of technology, but that can only be part of the solution. Other major changes are necessary. Industrial production of meat makes a huge contribution to global warming. The entire socioeconomic system is based on production for profit and a growth imperative that cannot be sustained.

There are also fundamental issues of value: What is a decent life? Should the master-servant relation be tolerated? Should one's goals really be maximization of commodities — Veblen's "conspicuous consumption"? Surely there are higher and more fulfilling aspirations.

*Chichilnisky:* We seem to have no alternative. I would like to say that the problem could be solved by green energy sources. However, they can no longer solve the problem: many studies have demonstrated that the long-run solutions, such as planting more trees, which are critical to human survival, and adopting cleaner forms of energy, which are the long-run energy solution, cannot be utilized in the timescale that matters. That is the problem. Technology is a many-headed monster and perhaps it would be better to regress to a safer past and avoid technological change; it is tempting to think like that. But UN studies have shown

that even if we planted a tree on every square yard available in the planet by the end of the century we would only capture at most 10 percent of the CO<sub>2</sub> we need to reduce. This does not mean that we should not plant trees; we should, for biodiversity's sake, and for our long-term future together with the other species.

Trees and clean energy [are] the long-run solution but we have no time to wait for the long run. We need a short-run solution now, and one that encourages and facilitates the transition to the long-run solution. This is the technology that IPCC proposes, to remove CO<sub>2</sub> directly from air. I cofounded a company called Global Thermostat that uses the heat and the power from clean and fossil energy sources, such as solar plants and wind farms, to remove CO<sub>2</sub> from air. It provides a short-run solution that facilitates and accelerates the advent of the needed long run.

*Many in the progressive and radical community, including the Union of Concerned Scientists (UCS), are quite skeptical and even opposed to so-called "geo-engineering" solutions. Is this the flip side of the coin to climate change deniers?*

*Chomsky:* That does not seem to me a fair assessment. UCS and others like them may be right or wrong, but they offer serious reasons. That is also true of the very small group of serious scientists who question the overwhelming consensus, but the mass climate denier movements — like the leadership of the Republican Party and those they represent — are a different phenomenon altogether. As for geoengineering, there have been serious general critiques that I think cannot be ignored, like Clive Hamilton's, along with many positive assessments. It is not a matter for subjective judgment based on guesswork and intuition. Rather, these are matters that have to be considered seriously, relying on the best scientific understanding available, without abandoning sensible precautionary principles.

*Chichilnisky:* The remedy could be worse than the disease. Certain geoengineering processes have been proposed that could be very dangerous and must be avoided. Geoengineering means changing the Earth's fundamental large-scale processes. We know little of the consequences of the geoengineering process, such as spraying particles into the atmosphere that shade the planet from the sun's rays and could decrease its temperature. But this process is how dinosaurs disappeared from the Earth about 60 million years ago, by particles spewed by a volcano or a giant meteorite impact, and our species could follow

suit. The sun is the source of all energy on planet Earth and we cannot experiment with our only energy source. Changing the world's oceans to increase their uptake of CO<sub>2</sub>, as other geoengineering solutions propose, is equally dangerous, as the increased resulting acidity of the oceans kills tiny crustaceans, such as krill, that are the basis of the pyramid of life on the planet as we know it.

*What immediate but realistic and enforceable actions could or should be taken to tackle the climate change threat?*

*Chomsky:* Rapid ending of use of fossil fuels, sharp increase in renewable energy, research into new options for sustainable energy, significant steps toward conservation, and not least, a far-reaching critique of the capitalist model of human and resource exploitation; even apart from its ignoring of externalities, the latter is a virtual death knell for the species.

*Chichilnisky:* Here is a plan consisting of realistic and enforceable actions that can be taken now to tackle the climate change threat: We have to remove the CO<sub>2</sub> that the industrial economy has already emitted, which otherwise will remain in the atmosphere for hundreds of years and alter the Earth's climate irreversibly. It is possible to do this. The technology now exists to remove carbon directly from the atmosphere and is proven, very safe and inexpensive. This new technology works by taking the CO<sub>2</sub> directly from pure air — or a combination of industrial sources and pure air — using as a power source not electricity, but mostly the inexpensive heat that is residual of most industrial processes. The CO<sub>2</sub> removed from air is stabilized on earth by selling it for useful commercial purposes with a benefit. CO<sub>2</sub> from air can replace petroleum: it can produce plastics and acetate, it can produce carbon fibers that replace metals and clean hydrocarbons, such as synthetic gasoline. We can use CO<sub>2</sub> to desalinate water, enhance the production of vegetables and fruit in greenhouses, carbonate our beverages and produce biofertilizers that enhance the productivity of the soil without poisoning it. Carbon negative technology is absolutely needed now as reported by the UNFCCC [United Nations Framework Convention on Climate Change] Fifth Assessment Report of the IPCC, p. 191, and also in four articles of the 2015 Paris Agreement.

*Is there a way to predict how the world will look like 50 years from now if humans fail to tackle and reverse global warming and climate change?*

*Chomsky:* If current tendencies persist, the outcome will be disastrous before too



long. Large parts of the world will become barely habitable affecting hundreds of millions of people, along with other disasters that we can barely contemplate.

*Chichilnisky:* It is easier to create the future than to predict it. Right now we must implement the requirements of the UN Intergovernmental Panel on Climate Change and the UN Kyoto Protocol, as well as the Paris Agreement recommendations: immediately we must remove the CO<sub>2</sub> we have already emitted from the planet's atmosphere and extend the Kyoto emission limits. This is the only possible alternative in most scenarios to catastrophic climate change. This can and must be done.

The funding provided by the Kyoto Protocol Carbon Market could build carbon negative power plants in poor nations. Carbon negative power plants can provide energy while they overcome poverty and change economic values in the right direction.

The UN carbon market, which is international law since 2005, will produce a much needed change in global economic values. The change in economic values created by the new markets for global public goods will reorient our global economy and under the right conditions can usher the satisfaction of basic needs of the present and of the future. This is what is needed right now. We need to support our future instead of undermining human survival. Let's do it.

*About the author:*

*C.J. Polychroniou* is a political economist/political scientist who has taught and worked in universities and research centers in Europe and the United States. His main research interests are in European economic integration, globalization, the political economy of the United States and the deconstruction of neoliberalism's politico-economic project. He is a regular contributor to Truthout as well as a member of Truthout's Public Intellectual Project. He has published several books and his articles have appeared in a variety of journals, magazines, newspapers and popular news websites. Many of his publications have been translated into several foreign languages, including Croatian, French, Greek, Italian, Portuguese, Spanish and Turkish.

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# The Gates of Damascus



Someone else's things are in the house: school notebooks that don't belong to Asma, a cardboard box of cheap cookies Hala would never buy, a small bottle of Syrian perfume. My cupboard is full of junk, and there's an unfamiliar dress hanging on the line.

Hala comes in around noon, in a hurry, plastic bags full of groceries in both hands. She looks tired - her face is swollen. 'I thought you'd never come back!' We hug, clumsily as always.

'We have guests,' she says.

'Yes, I noticed.'

'Sahar and Aisha, they're not staying long.' Sahar is a Christian, I suddenly remember, her husband a Muslim. There you have it - the religious differences everyone has been talking about during the last few days don't apply to Hala and her friends.

'Have you heard the news? They say the prisoners are going to be released. Sahar is having her house fixed up; that's why she's staying here.'

'What about Ahmed?'

Hala shrugs. 'He asked me to bring him his winter clothes. That means he's planning to stay for a while.'

She begins peeling potatoes in the kitchen; the children will be coming home any minute. I bring in the folding table from the hallway, pull up a plastic chair and apply myself to the green beans. Hala gives me a searching look. 'How was it? Anything interesting happen?' She sounds skeptical.

I tell her about Father Léon's weird cap, the grumbling hikers, the ups and downs of Louise's love life. I suddenly realize that when I arrived in Syria I didn't even know whether Hala was a Christian or a Muslim - we didn't talk about those things back then.

'Do you consider me a typical Christian? Have you ever thought of me that way?'

Hala laughs in surprise. 'No, what makes you think that?'

'Oh, I don't know, I just wondered.'

She says nothing more about it. She doesn't seem at all interested in what's preoccupying me. She tells me about Tété, Zahra, Shirin and Farid. Every name she mentions is accompanied by a heartfelt 'umph!'. Shirin has moved in with Farid. 'You know what? The cows wake them up every morning.' Hala makes a disgusted face. To wake to rural sounds - as a city dweller, she can't imagine anything worse. 'Farid is used to it, of course, but Shirin...' She lights the oven, puts in a casserole dish of potatoes, onions and ground beef, and says peevishly: 'Just the thing for them, they can drink fresh milk every day.'

Tété is worried sick that they 'll want to move in with her again before long; after all, how can they make it through the winter without heating? 'She's begging me to come and live with her for the next few months,' Hala laughs. 'She says I can even bring you along!' Asma's school is closer to her house, Tété reasons, and it would save on the heating bill. 'The price of oil has gone up again: one hundred pounds for two days' worth. How can a family ever afford that on a monthly salary of two thousand pounds?'

'But everyone here has more than one income, don't they?'

It pops out before I know it. That's what Father Léon says, and he's right too, everyone here has something going on the side. But Hala isn't used to having me contradict her - until now, she's been my principal source of information about this country. 'No, not at all,' she protests, 'most people have to make do with just their salary.' More and more children are being sent out to work, she says. Every morning on the way to the university she passes a little boy, who must be about eight, selling bread; when she comes home in the afternoon, he's still standing there.

How long have I been gone? Barely three days, but Hala talks to me as if I've just come from abroad, as though I know nothing about what goes on here! Before I have time to reply, Asma and Aisha rush in. They throw their schoolbags on the floor, change their clothes and lock themselves in the front room with a Madonna tape.

Hala tosses my clothes in the washing machine, sweeps the courtyard, scolds the neighbors who have their TV on much too loudly, runs back and forth between the kitchen and the bedroom, and grumbles the whole time about a colleague of hers at the university. He knows nothing about the subject he teaches - what he would really like to do, she says, is become head of the *mukhabarat* (the Syrian security police).

Gradually I feel my defiance ebb away. The clarity of the last few days, the empty

desert landscape, the broad hallways in Ibrahim's house, the cool guest room with its high bed – it all starts to seem like a mirage. I'm back at the school of hard knocks.

After dinner, Hala, Sahar and I lie on the bed in our nightgowns. Asma and Aisha are doing their homework in the front room, and Madonna blares through the walls. Sahar is excited by the rumors about the release of the prisoners. Aisha and she have already been to the tailor's for new dresses.

'You'll never guess who I ran into this morning,' Hala interrupts her. 'Who?' 'Omayya!' Omayya's husband was released a few years ago after fifteen years in prison. 'Well?' Sahar asks inquisitively, 'what did she say?' 'She cried, right there on the street. "Don't wait for your husbands," she said. "I waited so long for mine and now I wish they'd lock him up again."' "

'Why?' I ask.

Hala sighs. 'He's become old, he doesn't know how to be happy anymore. The only thing he thinks about is how his friends in prison are doing.'

'Did you see Tadmor prison?' Sahar wants to know.

I shake my head. 'No, *abuna Léon* wasn't so interested in that.'

I tell her about Louise. 'By the way, how did you do it? Weren't your parents opposed to your marrying a Muslim?'

Sahar thinks about it. 'At first they were, but later on not anymore.'

'What if they had tried to stop you, what would you have done then?'

She laughs. 'I didn't need their approval, it was my life. We belonged to the same political movement, we didn't care much about religion – we had other things on our minds!' I'm reminded of what a Lebanese acquaintance once told me about leftists in the Arab world. They had done nothing to change tribal consciousness, he said, they had simply started a new tribe: the communist one. There they found the security they had known before among their own people.

That night Hala and I sleep in the same bed again. We both lie dreaming, tossing and turning. In my student quarters in Utrecht I find that three little urchins have moved in with me. I try to explain to my roommates that I can't work with these kids around, but no one understands what I'm so worked up about.

Hala dreams that she's at a reception, where she meets a very bad Egyptian actress. While she's talking to her, she suddenly discovers that she forgot to put on her shoes. She's embarrassed: a faculty member of the University of Damascus without footwear! But a bit later she feels an enormous rage welling up inside

her. She looks at the actress with fire in her eyes and shouts that she doesn't even *want* to talk to her.

I'm startled awake by the rasping gutturals of the muezzin in the nearby mosque. It's still dark outside. *Allahu akbar, Allaaaah ...*It sounds like he's sitting in the corner of the room. How have I been able to sleep through this for the last few months? Once my eyes become adjusted to the dark, I see that Hala is awake too. She looks at me and smiles, but says nothing.

At first, Asma was wild about her new paramilitary uniform. She put it on as soon as Hala brought it home, stuck a toy pistol in her wide leather belt, took her whistle out of the drawer and ran outside. She wanted to keep it on as long as she could at night. It took some getting used to - it was like having a little soldier around the house. After her bath she would lie in front of the TV in her pajamas, her kepi on her head.

But the first morning she had to go to school in uniform, she acted bashful. She turned endlessly before the mirror in the hall, schoolbag strapped to her back. At the bus stop she was reluctant to join her classmates; some of the girls were wearing white headscarves with their uniforms.

By now the novelty has worn off: after school she kicks off her khaki pants in the bedroom, her shirt and kepi fly through the air. One afternoon Hala picks up the pants with a sigh and discovers a tear in them. 'Look at this - what a little monkey, these have to last her six years!' Schoolbooks and notebooks with pictures of Assad on the covers lie tossed all around. Classroom stories seep into the house and begin coloring our lives.

Asma would like to be put in a different class, where more of her former classmates are, but when she asked the teacher about it, her reply was: 'Do you have a *wasta*?' This same teacher appointed one of the girls to inform her about everything that goes on behind her back. 'That's how they teach children to spy, even at this age,' Hala sighs.

Sometimes we pick up Asma from school. In the taxi one afternoon she asks: 'Mama, are the *ikhwan muslimin* - Muslim Brothers - bad people?' Hala looks at the taxi driver in alarm, signals to Asma to talk more softly and whispers: 'Why do you ask that?' Asma says they learned a new song at school. Later, when we sit down to dinner at the kitchen table, she sings it for us. It goes like this:

*We vow to combat imperialism  
and Zionism, and backwardness,*

*and that their criminal accomplices, the Muslim Brothers,  
we shall destroy*

They have to sing that every morning in the playground. The last line in particular echoes in Asma's mind. 'But do you know who the *ikhwan* are?' Hala asks. 'Those are the boys in prison with Papa, the ones who sometimes come over to say hello when we visit him. Remember Rafik? Does he look like a bad person?'

No, Asma has to admit, Rafik doesn't look like a bad person. She eats her soup slowly, deep in thought. Then she asks another question. It has something to do with me, although I can't find out right away what it is. Hala answers her quietly, but Asma's voice keeps getting louder. She angrily brushes aside all Hala's demurrals. I listen in amazement: this demagogic tone is so foreign to Asma, it's as if a fourth person had joined us at the table.

'What are you two talking about?'

Hala is visibly embarrassed. 'Asma wants to know why you don't become a Muslim.'

I laugh. 'How did she come up with that?'

'Oh, the things people say around her ...Christians believe that Mary is the mother of Jesus, they say, and therefore the wife of God, which is impossible according to Islam.'

'Where does Asma get these stories?'

'From her religion teacher, apparently.'

Asma gives me a fierce look; the fire of this morning's religion class burns on. Islam is the most recent religion, her teacher said, and therefore the best.

'What do you tell her?' I ask Hala.

'What can I tell her? I don't want to say things that will get her into trouble at school, I don't want her to become alienated from her classmates. I can only hope she'll eventually discover the truth herself, like I did.'

Asma has left the table. Hala follows her with her eyes as she runs outside with her whistle around her neck. This isn't the first time they've had these discussions. Last spring Asma came home from school thoroughly upset. At first she didn't want to talk about what had happened. She just wanted to cry, she said, that's how bad she felt. That evening Hala suggested that they take a walk, like two grown-ups who have something important to talk about. During the walk it all came out, bit by bit. A girlfriend had told her that Mohammed didn't receive his knowledge directly from Allah, the way the religion teacher said, but from

Buhayra, a Christian monk he met on one of his journeys. It's a story Christians often tell about the Prophet - Hala had heard it before. 'And it's probably true; of course Islam adopted some things from Christianity.'

'Did you tell her that?'

'Oh no. I can't tell her everything I'm thinking. To me, Islam is an old carpet: beautiful to look at, but old nonetheless. But if I told her that and her teacher heard it, she'd think I was a communist!' She stares sadly into space. 'Who knows, maybe the things they teach Asma at school are a good preparation for times to come. Maybe before long there won't be any place for ideas like Ahmed's and mine.'

The TV is on, the cassette recorder is playing and the folding table has been moved from the kitchen to the front room - Asma is doing her homework. Sometimes she calls Hala in to help. They bicker about the law of gravity: Asma doesn't understand it, Hala can't explain it. That evening Hala has to quiz her. Another person takes possession of Asma as she recites her lessons, her legs folded under her, her body held taut as a wire. Sometimes I recognize the rhetorical, hollow tone of the speeches of Arab leaders; at other times, the entreating voice of the imam in the mosque. When she's in a good mood, I'm allowed to test her French. Her textbook was published in 1971. It contains drawings of French children, of cats and dogs and French villages in the snow - 'every Sunday, Delphine and Marinette go to church with their parents'.

I'm amazed at the complicated French sentences Asma is able to recite by heart; little stories by Guy de Maupassant, poems by Victor Hugo. They're delivered in tight little packages, with not a single word left out. Afterwards, when I ask her a simple question that isn't in the book, she laughs shyly and Hala has to translate what I've said.

'Did you learn everything by heart too?' I ask Hala.

'No, at least not that way. A military regime doesn't want people to think', she says, 'it would rather have them recite everything.'

That evening I have to go to Father Léon's house to drop off the things I borrowed from him. 'Maybe I'll ask him to come by and visit us sometime,' I say. 'I'm sure both of you would like him.'

When I come home Asma is already asleep. Hala is lying on the bed in her room reading *Le harem politique: Le Prophète et les femmes* by the Moroccan sociologist Fatima Mernissi. Not the prophet again! Father Léon was right when

he said that the Sunni Muslims wallow in Islamic history.

Hala looks up from her book. 'Interesting?' I ask. She doesn't fail to notice the irony in my voice - she senses exactly what's on my mind since my walk through the desert with Father Léon. She nods. 'But I never thought I'd read something like this.'

'So why are you reading it?'

She puts down the book with a sigh. 'Did you hear Asma at the table this afternoon? That teacher of hers comes up with the biggest nonsense about Islam, just like the fundamentalists. I want to be able to defend myself when people attack me, and I can do that better with the words of the Prophet himself than with Marx or Sartre. Do you think people understood Ahmed and his friends when they talked about communism? No, they only understand the language of religion.' Even the communists realized that after a while, she says, but just when they were trying to find common ground with the Muslim Brothers, to form a united front, they were arrested.

She likes the book. 'There's even something in it that will appeal to you.' She reads me a passage in which Mernissi explains that, to Westerners, the past is like dessert, while Arabs regard it as the main dish.

Hala is sitting up now and laughs secretively. 'Asma and I had an interesting talk after you left.'

'About what?'

'How can Father Léon come to visit us, he's a Christian priest, isn't he?' Asma had asked as soon as I pulled the door shut behind me.

'That doesn't mean he can't come to visit us.' Hala had said.

'But the Christians don't like us, do they?'

'Who says they don't? Where did you hear that?'

'I can tell at school,' Asma said. 'The Christian children always play by themselves, they don't like us.'

'What about Sahar, she doesn't have anything against us, does she?'

Asma had to think about that one. Sahar, that was different, she said.

'And what about Lieve? She's a Christian too.'

Asma thought again. 'Maybe she's not a real Christian,' she wavered. When Hala insisted that I was, Asma ruled: 'No, Lieve is Lieve.'

It's growing cooler in the streets of Damascus - Hala had warned me that the seasons change abruptly around here. Close to Tété's house, little stands selling prickly pear have appeared, and Tété has spent days bottling citrus fruit and



*makdous* - eggplants stuffed with walnuts and hot peppers. At home, Hala puts away the floor fan and covers the bed with heavy blankets. She buys fresh olives at the market and pickles them in brine. They taste bitter, but the Damascenes like them that way - it goes with the season.

The smell of autumn is in the air, an intimate, cosy smell that reconciles me to the domesticity of my life in Damascus. The jasmine tree has lost its scent, the leaves of the fig tree in the courtyard have begun to change color and there's a new sound in our street: *Bloopbloop, bloopbloop*. The first time she hears it, Hala pricks up her ears and runs outside. It's the man who sells heating oil; there's a barrel on the roof that he fills to the rim.

The cigarette boys squat down together in the evening and warm their hands at the chestnut-seller's fire. Whenever I get out of the taxi and see them in the distance, my heart begins to pound. Their leader's leather jacket shines under the streetlights. Ever since I saw him coming out of his house with his groggy face and wrinkled T-shirt, I've felt a peculiar bond with him. But he himself seems to have lost his bravura since that meeting. His friends still judge him when I come by, but he no longer calls out to me, he only looks at me out of the corner of his eye.

His presence imparts a certain wistfulness to our street. One evening when he's not there I saunter home, disappointed, searching for a glimpse of his jacket and his proud head with its combed-back hair. Suddenly I remember Siham's story. She lived in a neighborhood just like this one, in the old part of Baghdad. As she was walking home one evening, a young man came up to her. He pressed his body against hers and she smelled his breath - he had been drinking. He kissed her, hard and desperately. She was too stunned to resist, but before she even realized what had happened, he murmured 'Excuse me, excuse me' and ran off around the corner. Only then did she smell his scent - a pleasant, spicy smell. For months the mysterious meeting was on her mind: she kept feeling his body against hers, smelling his scent. She searched for him in every young man she came across. She was twenty-five when I met her; that stolen kiss in the night seemed the most substantial thing that had ever happened to her.

Hala and Asma are taking a bath together. They talk and chortle like turtle doves; I listen to them with a mixture of tenderness and envy. They're discussing who's the best hairdresser in Damascus, Georges or Johnny. Wrapped in her robe, a towel around her head, Hala comes walking into the bedroom - 'Oh, are you back already?' Asma calls from the bathroom to ask for a robe, using her sweetest

voice. 'Coming right up, *ya habibi.*'

Hala winks at me. *Habibi*, my dearest, is a masculine form of address.

'My daughter is growing up,' Hala whispers laughingly. Not long ago, Asma was looking at herself in the mirror in the hall. 'When will the boys start calling out to me?' she wanted to know. 'Soon,' Hala said, 'but only if you start dressing less boyishly. They won't whistle at you if you always wear jeans.' Some time after that, Asma asked her about the difference between a girl and a married woman. Hala gave her a vague answer about a married woman usually working more around the house and taking care of the children, but that apparently wasn't what Asma was waiting to hear. Tonight she started talking about it again. 'Mama, is it true that girls have something fragile inside them?' She heard that from Leila, one of her girlfriends at school. When a woman marries, Leila claims, that delicate membrane gets broken. 'And if a woman is divorced and then marries again, Mama, does it grow back by itself?'

The curse of virginity! The same curse Hala decided to shake off at the age of eighteen. 'It all repeats itself,' she says. When Asma comes out of the tub she throws herself on the bed and looks at me, eyes gleaming, still under the spell of the chatter in the steam bath. Her hair is wet, her skin glistens, she smells soapy, and when I reach out an arm to her she snuggles up to me.

She peers at Hala through her wet hair. 'Tell Lieve about Rami,' she says. Rami is a classmate she's had a crush on for months. Of course I've already heard all about him, but Hala plays along. Asma shows me the picture she keeps in her wallet, next to the one of her father: a plump little boy with a worried expression - not exactly what you'd call a playboy. But Rami is popular, and Asma isn't his only girlfriend: she's second in a line of five. While Hala combs her unruly curls, Asma announces that she's going to invite him over for lunch next week. When he comes, she says sternly, Hala and I will have to stay out of the room.

That evening she lies in front of the TV and sings along exuberantly with the commercials for Lebanese shampoo, powdered milk and corn oil. She changes channels with her foot. Suddenly, Assad appears on the screen, seated across from a blonde female journalist. They're talking about the peace conference in Madrid. Hala comes in from the kitchen. 'This was taped at his new residence,' she remarks. 'See those enormous vases? Just like in Saudi palaces.'

'What's he saying?'

'Wait, they'll translate it in a bit.' She's right: later we see the interview again,

this time subtitled in English and French.

Assad's shirt is blue, then white, depending on the quality of the reception. The American journalist asks him about political freedom in Syria. Assad smiles affably and points out that there are only two political parties in America, but seven in Syria. 'And now the only thing we'll hear for days is how wonderful the Americans think our president is,' Hala grumbles.

Tomorrow she has to visit Ahmed; the preparations take up all her time. In the bedroom I find her standing high on the ladder, her head practically hidden in a leather suitcase on top of the cupboard. She pulls out a baggy beige sweater and looks at it lovingly. 'I knitted this for Ahmed myself.' She tosses it to me. 'Put it on the pile. It doesn't look so great anymore, but Ahmed would wonder why it wasn't there, he'd think something was going on.' He still wears the blue shirt he had on when he was arrested, even though it's in tatters by now.

'Maybe I should buy him a shirt,' I say.

'You'll probably still be here when he comes home.' Hala has turned around. 'Don't you think? You heard what Sahar said, didn't you? The prisoners are going to be released. After all, Assad has to show the Americans that he's a real democrat!' She laughs. 'Nothing's happened around here for eleven years, then you come along and everything happens at once. The presidential elections are coming up in December. There's no way you can leave now.'

'But I can't just wait here until they free Ahmed. Who knows how long that will take? I can't stay away that long. What would my boyfriend say...?'

'Why don't you have him come over?'

'And stay in this little house?'

'We could all move out to Wadi al-Nakhleh.'

'And take Ahmed along?'

'Why not? Or maybe Ahmed would rather stay here alone.'

'I'd have to have my winter clothes brought over from Holland, and send my summer things back.'

'I'd wait before sending those summer things if I were you. Maybe you'll still be here next summer.'

It's nice to bob along on her sea of fantasy. The air suddenly tingles with excitement again, and the end of my stay fades into the indefinite. Who knows, maybe important things are about to happen here.

Hala has come down from the ladder. The floor of the cupboard is covered with

more plastic bags full of things. Last winter she was in mourning for her father – she hasn't looked at her winter clothes for two years.

'Take a look at this.' She sits down in the cupboard and hands me a light-pink compact. '*Amour absolu*' is printed on the lid in graceful letters. I open the little box and carefully pick up the powder puff. 'It's at least forty years old,' Hala says. 'It was one of my mother's wedding presents.'

'And from the looks of things she never used it.'

'No, she gave it to me just like this.' She carefully wraps the box back up in its white tissue. Sighing, she explores further. 'All this junk, what am I going to do with it?' She pulls out a muff with a fake gold chain, stands before the mirror and presses it to her side coquettishly. 'What do you think?' It's not her style. 'I'll wear it when Ahmed comes home.' We both know that's not true.

She digs in the cupboard again and comes back up with a black shawl with a picture of St. Peter's on it. 'Remember that Italian cinematographer in Baghdad? She gave me this.'

'And you put it in the cupboard right away.'

'Sure, what else would I do with it?' I catch a glimpse of the little bathrobe and the T-shirt with a motorcyclist on it that I brought for Asma. Meanwhile, Hala has run across three flat boxes with silk nightgowns in them. 'Look, I bought these when I thought Ahmed was coming home.' Pink and light-blue little nothings with bows – she's never worn them and she wonders whether they're still in fashion.

'Why don't you give them to Shirin? I'm sure she'd be happy to have them.'

Hala looks at me from between the piles of clothing, incomprehension on her face. 'But Lieve, these are my dreams!'

'How do I look?' She's standing in the doorway, bags full of winter clothes and books in each hand, taut from head to toe, braced for the journey. 'Well, those earrings...' The silver hoops with tinkling bells and blue stones are much too heavy for her little face. 'Ahmed likes them,' she says bravely, 'I do it for him.'

This time she's going alone. I hug her – now it's as though she's the one going on a trip. But it's only a little past noon when I hear the gate open again. She has his summer clothes with her, and a present for me: a pen box made of wood and palm resin, decorated with copper arabesques and lined with red velour.

She collapses on the couch. 'If you knew what I've been through this morning!' She had to wait forever before they let her in, so she started talking to the woman in front of her, someone she'd never seen before. 'Is your husband in there?' The woman nodded. 'Politics?' The woman turned up her nose in contempt. 'No,

money.’ She looked at Hala without a smidgen of curiosity. ‘What about you?’ Hala thrust her chin in the air and said: ‘Politics.’ Neither of them said a thing for a moment; Hala was trying to imagine what ‘money’ could be about. ‘Bribes?’ she enquired. The woman threw her a withering glance: ‘That’s what they say.’

The rumors about the political prisoners being released had made everyone nervous. When their names were finally called, they saw that the guards had an enormous dog with them to sniff out any drugs being smuggled in. Some of the women were frightened and started screaming. The dog was as big as a pony, and Hala didn’t dare walk past it either. One woman took the bag of sugar she’d brought for her son and threw it at the guards. This caused such a commotion that they had to take the dog away.

Then, out of revenge, the guards began skimping on the food the women had brought for the prisoners. They confiscated Ahmed’s mother’s homemade *kibbe*, and another woman had to leave behind a plate of fish. ‘They’re afraid to surrender power,’ Hala says, ‘they want to show us they’re still the boss.’ But the women protested so loudly that the guards finally had to give in again.

‘What did Ahmed say?’

‘He doesn’t know. He’s hoping, but at the same time he’s afraid to hope.’ A smile crosses her face. ‘He says he’ll cook when he comes home, and that he wants at least four more children. I just let him talk, I didn’t feel like arguing with him.’

She looks at me, a gleam of amusement in her eyes. ‘He even said I should try to convince you to have children!’

The Jordanian spy he had spent a lot of time with had been transferred to the prison at Tadmor, making Ahmed’s life a lot less interesting. ‘In fact, he’s desperate. If he were a criminal he’d at least know how long he had to serve, but this way... no one knows when it will be over.’ Some of the prisoners have been called in by the *mukhabarat*. Since then all kinds of rumors have been making the rounds about a document the prisoners have to sign before being released.

‘What would Ahmed do in that case?’

‘That depends on what he has to sign,’ she says despondently. ‘Leaving the prison with his tail between his legs after serving eleven years for his ideals – that’s not Ahmed’s style.’

Campaign posters start appearing in the streets of Damascus. I look around wide-eyed. At the beginning of a busy shopping street hangs a banner reading: ‘The shopkeepers of Salhieh say ‘yes’ to President Assad, the true Damascene’. The bit

about the 'true Damascene' in particular makes Hala laugh. Armored vehicles with photographs of the president zip by, and amateur painters give their fantasy free rein: from the side of a bank in the center of town, Assad's stern features stare down at us from a canvas twenty meters high. Elsewhere they've given him a baby face and fat little arms - just like a cherub.

Meanwhile, the peace talks are rapidly approaching. One morning in bed I hear the BBC correspondent wonder aloud whether there are enough halal restaurants in Madrid; in the front room, Hala is listening to Radio Monte Carlo. We don't learn much from the Syrian press, and Hala says that's the way it will stay - the journalists Syria has sent to Madrid are notorious dunces. They speak only Arabic, but that doesn't matter - they'll obediently write whatever their editor-in-chief tells them to. On the first day of the conference, Hala and I are out running errands for Tété. Am I only imagining things, or is the city in a more subdued mood than usual? In the taxi everyone listens tensely to the radio; no one says a word. I think of Sadat, who signed the Camp David agreements - two years later he was dead.

Most of the sellers at the *souq* are also glued to the radio. Now that things have come this far, I feel a slight exhilaration, but when I look at Hala I see tears running down her cheeks. 'For years they've been stirring us up against Israel, and now they suddenly go over our heads and cook up something completely different!' She takes a handkerchief from her bag. 'No one ever asks us a thing, they do exactly what they want.' I can imagine her sense of helplessness. Her years of passive resistance have been fruitless; the world has rolled on without her.

'It's all so confusing,' she says defiantly. 'If only they'd just say what it's all about - but while our Minister of Foreign Affairs sits at the table with the president of Israel, the papers still talk about the 'Zionist foe'. Assad puts on his left blinker, but turns right.'

We have lunch at Tété's. Farid and Shirin are there too. Suddenly Tété says: 'May Allah punish the Israelis and undo everything that happens today in Madrid.' The sentence clatters on the table like a weapon, but no one picks it up. Farid acts as though he has heard nothing. Hala looks at me conspiratorially - even she doesn't harbor such radical thoughts. 'My mother has been listening to the radio all morning,' she says in an attempt to smooth things over. 'The Israelis are keeping up the bombing of southern Lebanon.' For her mother, this conference is

unacceptable. 'It's like...,' Hala searches for an accurate comparison, 'like someone asking her to walk down the street in a bathing suit.'

Back at the house, Hala turns on the TV right away. 'Maybe Assad has decided in his infinite goodness to give us back Jordanian TV.' She flips through the channels, hoping against hope. Jordanian TV is much more varied than its Syrian counterpart, but it's been jammed ever since the Gulf War, because Jordan sided with Iraq. This evening we once again have to settle for the Syrian news.

The camera roams from the Palestinian speaker to al-Sharaa, the Syrian Minister of Foreign Affairs, and from him to the Jordanian delegation. There we have Shevardnadze, then Baker... no sign of the Israelis. We sit in front of the TV for the next three evenings. The speeches by the members of the Arab delegation are broadcast in their entirety: endless, numbing monologues that blend in with the monotonous drone of Asma reciting her lessons.

Hala remains on an emotional roller-coaster. At somber moments she says that these talks will cost the Alawites dearly, that they will bear the eternal shame of being the first to make contact with the Israelis. Then she complains about how the Israeli delegation is kept off-camera. 'Al-Sharaa is sitting in the same room with Shamir,' she shouts one evening in desperation, 'why can't I see that, what do they have to hide?' We remain hopeful to the bitter end, but when the conference is over we still haven't caught a glimpse of the Israelis.

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Lieve Joris

**Lieve Joris**, who was born in Belgium and lives in Amsterdam, is one of Europe's leading nonfiction writers. She has written an award-winning book on Hungary and published widely acclaimed reports of her journeys in the Middle East and Africa. Her books about the Middle East include *De Golf* (The Gulf) and *The Gates of Damascus*.

In 1985 she set sail to the former Belgian colony of Zaire, where her great-uncle had been a missionary. The journey resulted in *Back to the Congo*. 'For years we have been without a major book about Africa,' the Polish writer Ryszard Kapuściński wrote. 'Lieve Joris' book fills this painful, rather disgraceful void.' Congo became a recurring theme in her work, leading successively to *Dans van de luipaard* (The Leopard's Dance), *The Rebels' Hour* and *De hoogvlaktes* (The High Plains). *The Rebels' Hour* was nominated for the T.R. Fyvel Book Award. For the French edition of *The High Plains*, Joris was awarded the Prix Nicolas Bouvier 2009.

*Mali Blues*, the account of her travels through Senegal, Mauretania and Mali, gained Joris the Belgian triennial award for Flemish prose (1999) and the French Prix de l'Astrolabe 1999.

Joris' books have been translated into English, French, German, Spanish, Catalan, Norwegian, Hungarian and Polish. She is currently travelling back and forth between Africa and China, doing research for her new book.

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# Lieve Joris On Congo ~ The Rebels' Hour In Brief

At a time when UN Peacekeepers are trying hard to maintain peace in the Congo, award winning author and journalist Lieve Joris discusses her work in the region and shares the history of the conflict as seen by a Tutsi rebel leader who eventually became a high-ranking general in the Congolese army. Lieve Joris is one of Europe's leading travel writers with reporting that has spanned the globe—from Hungary to Africa.

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## A New Economic System For A World In Rapid Disintegration



*truth-out.org. September 2016.* We live in ominously dangerous times. The world capitalist system — having fueled colonialism, imperialism and the constant intensification of labor power exploitation for roughly 500 years — now threatens the planet with an ecological collapse of

unprecedented proportions. Unsustainable resource exploitation, water pollution (the transformation of lakes, rivers and oceans into garbage dumps) and massive economic inequality are at the root of the possibly irreversible collapse of industrial civilization. Meanwhile, however, too many of us remain caught up in abstract and ahistorical predictions of collapse that fail to offer an alternative realistic vision of a future socio-economic order.

Simultaneously, the phenomenon of global warming, driven mainly by the dynamics and contradictions of a fossil-based economy, has prepared the soil for the eruption of new sources of conflict with the manifestation of historically unique destabilizing social forces. Climate change directly threatens billions of people and most other beings — besides the occasional cockroach, diadem or tardigrade — with outright extinction brought on by droughts, floods and other “natural” disasters.

Nonetheless, the catastrophic scenario sketched out behind the operations of global capitalism does not merely represent the other side of a wild socio-economic system bent on constant and abstract growth in pursuit of ever greater rates of profit. The so-called Golden Age of capitalism ended decades ago and the system has now run into a brick wall, as it appears to have reached a point where it is no longer capable of sustaining a constant momentum of growth to keep the economy reproducing itself at a pace that generates higher standards of living for the next generation.

Indeed, the productivity rates in the advanced industrialized regions of the world (such as the US, Europe and Japan) since the eruption of the financial crisis of 2007-08 are [far slower than those of previous decades](#), thereby confirming the claims of various experts who argue that we have reached the [end of the age of growth](#).

Moreover, in spite of all the talk about the marvelous and awe-inspiring accomplishments of the high-tech revolution, these innovations pale in comparison to the innovations of the Industrial Revolution. The new technologies reach billions of people, generating mythical fortunes for founders and investors, but [increasingly employ only a handful of privileged workers](#). In the meantime, the problems of massive unemployment, increased inequality, growing economic insecurity, and dangerous levels of public and corporate debt are mounting.

In this context, the present crisis facing the world economy as a whole “consists precisely in the fact,” as Antonio Gramsci put it in his [Prison Notebooks](#), “that the old is dying and the new cannot be born,” and all of the above represent the “morbid symptoms” of this antinomy that the great Italian revolutionary underscored as being part of this interregnum.

*Corporate Capitalism and Social Disintegration*

Still, there are optimists among us who believe that the current system can be rescued from its apparently imminent decay by the implementation of certain [government interventionist policies, such as those that guided the New Deal era](#). However, the global economy has changed fundamentally since the 1930s, with neoliberalism being a direct outcome of the new wave of economic globalization that has swept the world since the 1980s. And the reliance on fossil fuels to power growth is actually increasing the consumption of primary energy sources, such as coal, oil and natural gas, in spite of the phenomenon of global warming, which threatens to destroy human civilization as we know it.

Worse, the call for a New Deal has been adopted by several allegedly progressive political movements in Europe, as well as by Bernie Sanders and many of his supporters in the United States, thereby making it even more challenging to create political and ideological momentum for the emergence of a new economic system free from the chains of capital accumulation and the exploitation of labor power and natural resources.

It is only realistic that the germs of the future society will be built within the present one, [as Russian anarchist Mikhail Bakunin advised](#), which means reform is always needed to move from here to there. Reform, however, must not have as its ultimate aim the maintenance of the existing social and economic order, which is what most versions of social democracy and Keynesian economics aim to do with their policy prescriptions.

Yet, the choice between “barbarism or socialism” has never been clearer. The need for an end to capitalism and its replacement by a new economic system based on cooperation, rather than competition; socially owned means of large-scale production, rather than private ownership; and participatory structures of social organization, rather than hierarchical and oppressive/repressive ones, has never been greater.

Indeed, unless we are willing to accept social disintegration, increased conflict and even wars as irreversible processes and stand idly by while global warming caused by the drive of a fossil-fuel-based economy destroys the planet, the existing system of neoliberal transnational corporate capitalism needs to be replaced by an economic order that is aligned with human interests and sustainable/balanced growth.

In actual practical terms, this means making a great shift away from the processes of constant capital accumulation, possessive individualism and economic globalization. It also means putting an end to the destructive practices of western industrial extractive technologies and being respectful of the natural resources that sustain life.

Economic globalization, which lies at the heart of the current economic system, is promoting a “[monoculture economy](#)” that has devastating effects on the well-being of most communities in the global South and the environment alike.

Putting a halt to the current dynamics and contradictions of economic globalization does not mean eliminating international trade. But it does mean doing away with the neoliberal trade treaties that have already given global corporations and banks such immense wealth and power that they can promote their own interests without concern for community interests, workers’ rights and sustainability.

### *Rethinking “Development” and “Progress”*

As such, we need to rethink terms like development, growth and progress. These terms are directly linked with the historically-based socio-economic system of capitalism, which surfaced around the 15th century in northern Europe. There is nothing to suggest that it will be around forever. In fact, it is in a process of rapid disintegration, although it won’t disappear on its own without direct action from below.

At the same time, we need to come to terms with the political economy of socialism, a subject that has received very little attention since the origins of Marxian socialism. For now, however, we can state categorically, and based on the proper lessons drawn from the experience of “actually existing socialism,” that the economic system of socialism in the 21st century cannot be a top-down control system and completely centralized. It should be based largely on localized forms of industry and finance, participatory democracy, and the use of technologies that are congruent with community needs for the production and distribution of food in order to eradicate poverty and hunger and provide sustainable livelihoods.

In this future socialist society, centralized planning would be confined to the strategic sectors of the economy while worker-owned cooperatives would make

up the bulk of the type of economic enterprises under the new socio-economic order. Eliminating private property entirely would be both an impossible and an undesirable outcome in today's world. Prices for everyday goods and products would probably still be based on the basic laws of demand and supply but without the presence of monopolies and with government supervision in place in order to prevent possible unlawful profiteering practices. Education, health care and all vital social services would be provided free to all members of society, and taxation would be strictly progressive. Employment would be guaranteed, while those unable to work due to physical and mental limitations would receive a guaranteed income sufficient to provide a decent living.

All this suggests, of course, that the future socialist society — no matter where it might first take place — would still involve the circulation of money as a means of exchange. This is because, first, socialism would still be in its very initial stages and second, since there would still be a world out there where many nations remain capitalistic, money would be needed for international trade. Nonetheless, there would be no financial speculation, as the banking system would be publicly run.

### *Imagining a Mature Form of Socialism*

As socialism matures, the economic system could shift gradually to a non-monetary form of exchange where time serves as the basis for payments and purchases of goods. We can call this a non-monetary economy — an economy that would be based on labor certificates or on a system of time-prices, the details of which would have to be worked out by the people living under such a system. The same could be said about the educational and judicial systems and a host of other institutions, including the family.

In this context, it is important to stress that any future social order deriving inspiration from socialist ideals and values represents necessarily a historical process, not a ready-made society.

Still, even under this new form of socialism, there would be a need for development and growth, albeit new versions of these processes. There would still be a need to conceive of how new wealth would be generated and how technologies can continue to improve for the betterment of society and humanity in general. The new economic system would not be static, and it would be utterly utopian to think of it in such terms. Like all systems, it would face challenges and

would need to adapt to new realities and newly emerging needs.

In sum, the socioeconomic and political order envisioned above would be diametrically opposed to the experience of “actually existing socialism” that prevailed in the former USSR and Eastern Europe after World War II. It is now beyond any doubt that “actually existing socialism” was not only centered around state ownership of the means of production but continued to rely on the economic exploitation of labor power in exchange for basic forms of economic security. Meanwhile, the very reproduction of the system depended heavily on the utilization of highly repressive state apparatuses in order to maintain its legitimacy and ensure conformity on the part of the citizenry to the prevailing mode of social, economic and political organization. The claim that the Soviet Union had introduced a “non-capitalist extraction of surplus” under Stalin was belied by the new and brutal form of exploitation that the Russian working class had been subjected to under the tyrannical regime of the “Red Lord.”

In this context, whether “actually existing socialism” represented a form of state capitalism or some type of a “deformed workers’ state” is hardly an issue of substantive matter. In any case, political terms are always insufficient in capturing the true nature of the phenomena they wish to identify and describe. The point is that it is not a model to be emulated by those seeking to bring socialism back in the 21st century, unless the future proletariat is also to be sacrificed in the name of an anti-capitalist but highly authoritarian and repressive social order that bears not even remote semblance to the vision of a socialist system with direct democratic participation and cooperation at its core.

The realization of an alternative socio-economic system based on the utilization of economic resources for the common good — with the direct participation of the citizenry in all decisions affecting the workplace, communities, and the general polity on the whole — requires the raising of consciousness to ensure that capitalism ends up in history’s dustbin. By extension, it also requires the formation of social movements and political parties that have a strong anti-capitalist mentality, with a clear vision of the future socio-economic order to replace capitalism and well-laid-out strategies for its execution. The realization then of the new economic system based on socialist principles and values mandates serious ideological and educational work, and social movements and political parties organized on a national level and in possession of a fully fledged programmatic agenda built around the attainment of the aims and goals guiding

the vision of a socialist society for the 21st century.

The failure behind the organization of large-scale, nationally based radical left movements and parties in the US is related to a whole set of different factors. One of these factors is the geographical vastness and cultural diversity of the country. Another factor is the dominance of an overall mainstream political culture that idealizes individualism while simultaneously pledging unquestioning allegiance to authority and uncritical nationalism and, by extension, to the nation's most repressive institutions (the police and military). This mainstream political culture detests intellectualism and what may generally be described as the political and sociological imagination, and remains overtly insular, racist and militaristic. In this context, radicals in the US clustered around the distinct strand of socialism sketched out in this essay have their hands full as they must overcome an authentically individualistic and reactionary political climate just in order to rouse people's consciousness of the need for a tentative non-capitalist socio-economic order.

Unfortunately, this has become no less of a task for radical socialist organizations and movements throughout the Western world. The experience of Soviet "communism" had an adverse effect in the push toward socialism in Europe after the 1980s, once all the pitfalls of the given system and the crimes of Stalinism became widely known. Moreover, the Left has been losing ground against its capitalist opponents, even in Western nations with fairly strong socialist and communist traditions, as evidenced by the rollback of many gains that had been made by the labor and socialist/communist movements in many Western countries after World War II.

Nevertheless, while the struggle ahead for a rational, just and democratic social order — which is what the drive behind socialism has always been about from its early origins — may be rife with challenges, we must draw strength and inspiration from the fact that as the old system is dying, a new one begs to be born. Whether it will be a democratic vision of socialism (or something yet unimagined) or an even more regressive and authoritarian form of capitalist rule will depend on the outcome of the class struggles that will rage on.

The class struggle has always been, and remains even more so today, a key motor of history. The only problem in the contemporary period is that the class struggle raging on has been largely one-sided, with capitalists doing all the attack and the

working classes taking all the blows. Progressive and radical movements of all sorts must rediscover the class struggle and embrace a cooperative, participatory, environmentalist-based economic system (where man is not above nature), in order to rescue a world in utter disintegration and a planet in near collapse.

*About the authors:*

[Lily Sage](#) is a Montessori pedagogue who is interested in questions of symbiosis, intersectional feminism and anti-racist/fascist praxis. She has studied in the fields of herbalism, visual/performance art, anthropology and political theory in Germany, Mongolia and the US.

[C.J. Polychroniou](#) is a political economist/political scientist who has taught and worked in universities and research centers in Europe and the United States. His main research interests are in European economic integration, globalization, the political economy of the United States and the deconstruction of neoliberalism's politico-economic project. He is a regular contributor to Truthout as well as a member of Truthout's Public Intellectual Project. He has published several books and his articles have appeared in a variety of journals, magazines, newspapers and popular news websites. Many of his publications have been translated into several foreign languages, including Croatian, French, Greek, Italian, Portuguese, Spanish and Turkish.

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# How Schools Use Language As A Way To Exclude Children





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Kenyan author Ngũgĩ wa Thiong’o [once described](#) language as “the most important vehicle through which that [colonial] power fascinated and held the soul prisoner”.

He illustrated this with a disturbing account of receiving corporal punishment, being fined and wearing a “plate around the neck with inscriptions such as I AM STUPID or I AM A DONKEY”. His “crime”? Speaking Gikuyu at his English medium school.

Today, decisions about which language resources should count in schooling – as the language of instruction, a subject, or a legitimate language for learning – continue to be informed by the relationships between language and power. Schools and universities in post-colonial contexts still operate within the logic of coloniality.

These realities have been thrown into sharp relief by revelations that some South African schools [discipline their pupils](#) for speaking any language but English (or Afrikaans) while on school grounds. At Cape Town’s Sans Souci High School for Girls, pupils obtain “losses” (or demerits) for a range of “offences” – like being caught speaking isiXhosa. For many of Sans Souci’s pupils, this is their home language.

Sadly this problem isn’t unique to South Africa. It’s been seen in other post-colonial contexts like Nigeria, Kenya and Zimbabwe. Nigerian novelist Chimamanda Adichie has spoken about not having the opportunity to learn Igbo proficiently at school. This, she says, left her with no option but to write exclusively in English.

These girls' stories have foregrounded the crucial issue of language in processes of assimilation and exclusion. Over the past ten years there has been a major shift in our understandings of language, bilingualism and bilingual education which show the [learning advantages](#) of using [more than one language](#) in the classroom for learning.

### *A cycle of blame and bad faith*

African children - whose home languages are by and large not English - are generally not recognised for the experiences, knowledge and linguistic resources they bring. They're expected to adapt to pre-existing school cultures.

African children in ex-Model C schools are expected to feel grateful at being given the "opportunity" of a quality education in a state school system that performs very poorly.

The apartheid government designated all "white" state schools Model C in 1992. This semi-privatised them. Research conducted in such schools since the 1990s has consistently pointed out these schools' overwhelmingly [assimilationist ethos](#).

Many previously white primary and secondary suburban schools offer only English and Afrikaans as "home language" and "first additional language" subjects. This continues apartheid's ideology of bilingualism. Where an African language is offered, it is given marginal status as "second additional language". African languages get little space on the timetable and few resources.

Primary school principals have [defended](#) the fact that they offer only English and Afrikaans by saying their pupils continue on to high schools that only offer these languages. High school principals, in turn, reported that they had to offer English and Afrikaans because their feeder primary schools were not offering African languages.

This is a convenient cycle of blame which signals bad faith. If school leaders and parents were committed to embracing African languages and the spirit of the multilingual South African language in education policy, surely they would consult each other and design collaborative language policies?

But society's collective beliefs about whose languages "matter" and should be privileged scupper any meaningful collaboration.

### *Language ideologies*

The concept of language ideologies - people's beliefs about what language is, as well as what particular uses of language point to or index - are central in shaping whose language resources count in formal schooling.

South African schools' language policies proceed from an ideology of "language as a problem" rather than "language as a resource". As is the case in other post-colonial societies, this sets linguistic diversity up as a barrier to rather than an advantage for learning.

The language ideology and practices that exclusively valorise English can be viewed as [Anglonormativity](#): the expectation that people will and should be proficient in English, and are deficient (even deviant) if they are not.

In ex-Model C schools it's not just English but a particular variety of standard South African English which aligns with whiteness that is privileged.

[Research has revealed](#) how early-grade primary school teachers buy into the myth that there's one single correct pronunciation for English. They deviate from maths and literacy lessons to teach children to produce pronunciations and vowel sounds that align with white South African Englishes. This practice ignores the content or substance of children's answers.

It is also Anglonormativity that renders the typical South African child entering schooling as linguistically deficient.

A typical learner in an ordinary South African school will have learned in their home language until the end of Grade 3. They're then expected to switch to exclusively English instruction in all of their subjects from the beginning of Grade 4. This Anglonormativity is clearly a gross abuse of the child's right to quality education.

All textbook materials, notes and assessments are given in a language that the child has been learning as a subject for a few hours per week in the first three years of schooling.

The child is expected to learn and be assessed exclusively in English to the final year of school and beyond. White middle-class English and Afrikaans speaking learners aren't expected to make this sudden transition from learning in their home language.

### *A long shadow of colonial racism*

This is not an argument for mother tongue education instead of English medium education. It's an argument for bi- or multilingual education.

Parents and children should not be forced to choose either English or an African language. Instead, children must be equipped with the ability to learn through and develop all their language resources throughout their schooling.

The continuing denigration of African languages and exclusive valuing of English is evidence of apartheid's long shadow. It also points to the [internalisation of colonial racism](#) and the continuing power of whiteness. It's time to realise that access to English will not be achieved through English-only instruction.

About the authors:

[Carolyn McKinney](#) - Associate Professor in Language Education, University of Cape Town

[Xolisa Guzula](#) - PhD Candidate in Language and Literacy, University of Cape Town

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# Avoiding Extinction: The Way Out Of Climate Change



Professor Graciela  
Chichilnisky

For the first time ever, humans are dominating planet Earth. We are changing the basic metabolism of the planet: the composition of gases in the atmosphere, its

bodies of water, and the complex web of species that makes life on Earth. What will come next?

We see that the changes we are precipitating in the atmosphere are fundamental and can lead to disruptions in climate and global warming. Both the North and the South Poles are melting. Water expands when it is heated. Since the seas are warming, sea level is rising all over the world. This irrevocable upward trend is well documented: slowly but surely the rising waters will sink most island states. There are 43 island states in the United Nations representing about 23% of the global vote and most or all could disappear soon under the warming seas.

The current shift in climate patterns threatens many species. It has allowed for the spread of insects that are migrating to areas they did not previously inhabit, bringing with them a variety of vector-borne illnesses. For example, new outbreaks of malaria in Africa are on the rise. Humans are also shifting ground. The UN reports that 21 million people are reportedly migrating due to drought and other climate change induced conditions, and the numbers are increasing rapidly

(<http://newsroom.unfccc.int/unfccc-newsroom/human-mobility-and-the-paris-agreement/>). The 2014 migration of one million people into the EU is causing considerable political stress leading to anti-immigration candidates in German, UK, and US elections, and some anticipate that it could damage the fabric of Western democracy.

In the U.S., the consequences are less extreme but still evident: the mighty Colorado River is drying up, prompting orders to turn off farm water in several states. Lake Mead's waters in Nevada are exhibiting record lows, threatening the main supply of water to Las Vegas. Wild fires from drought conditions have multiplied and have spread rapidly around the region and in California since 2006.

The world is aware of the connection that scientists postulate between climate change and the use of fossil energy. The largest segment of carbon emissions, about 45% of the global emissions of CO<sub>2</sub>, originate in the world's power plant infrastructure, 87% of which are fossil fuel plants that produce the overwhelming majority of the world's electricity. This power plant infrastructure represents a value worth \$45-55 trillion according to the International Energy Agency (IEA), which is about the scope of the world's economic output. New forms of clean

energy are emerging, such as wind farms in Scotland and solar farms in Spain and the US, in an attempt to forestall carbon emissions. But the process is necessarily slow since the world's fossil power plant infrastructure is comparable in monetary value to the world's entire GDP, and changing this infrastructure can take decades. Transforming the power plant infrastructure is too slow to avert the potential catastrophes that are anticipated in the next 10-20 years. What is the solution?

Below I propose a realistic plan that involves market solutions in industrial and developing nations which will simultaneously resolve the problems of economic development and climate change and the global climate negotiations. But climate change is just one of several global environmental areas that are in crisis today. Biodiversity is another; industrialization and climate warming threaten the world's ecosystems. Endangered species include sea-mammals, birds such as cockatoos, polar bears, and marine life such as coral, saw-fish, whales, sharks, dogfish, sea turtles, skates, grouper, seals, rays, bass, elephants, and even primates, our cousins in evolution. Scientists know that we are in the midst of the sixth largest extinction of biodiversity in the history of our planet, and that the scope of extinction is so large that 75% of all known species are at risk today. The UN Millennium Report documents rates of extinction at 1,000 times higher than fossil records. The current extinction event is the largest following the dinosaurs' extinction that took place 60 to 65 million years ago. But today's extinction event is unique in that it is caused by human activity. And it puts our own species at risk. There is a warning signal worth bringing up: all major recorded planetary extinctions were related to changes in climate conditions. Through industrialization we have created environmental conditions that could threaten our own species' survival. 99.9% of all species that ever existed are now extinct.

Are we next?

Will humans survive?

The issue now is how to avoid extinction.

### *Bacterial Altruism*

To avoid extinction, we have to develop survival skills for a changing environment. This seems reasonable and natural - yet the social skills that are needed are not here and are not obvious either. These skills could be quite

different from what human societies have achieved, such as the individual survival skills that we are familiar with. A simple but somewhat unexpected experimental finding involves colonies of bacteria, which are one of the world's oldest living species. They have been around for billions of years and have shaped the planet's geology and atmosphere to suit their needs. Bacteria are champions of survival. They needed appropriate survival skills, and developed unexpected skills based on what can be described as "altruism." Since bacteria are some of the oldest species on the planet, much older than relatively recent humanoids, we need to take their skills seriously as a model of survival. Bacterial colonies know how to avoid extinction. Here is new data: findings indicate that *Escherichia Coli*, and indeed most known bacteria colonies, when exposed to a pathogen or stressor such as antibiotics not only mutate and evolve to develop resistance but the evolved members produce specific resistance tools that they do not need in order to share with the rest of the (non-evolved) members of the colony (see Hyun Youk and Alexander van Oudenaarden, "Altruistic Defence," *Nature*, Vol 467|2 September 2010). In other words " when exposed to stress, mutant bacteria use some of their own energy " altruistically " to create a chemical called "indole" that protects non-mutants from the pathogen. This way the entire group survives. A way to summarize this finding is to say that altruism is an effective survival tool and bacteria " those champions of survival " have developed and mastered altruism for this task.

This finding is quite different from what we believe to be effective survival skills in human colonies or societies. Until now human survival skills have focused on avoiding natural risks and confronting successfully the threats posed by other species that preyed on us, species that are dangerous to us. Altruism has been considered to a certain extent to be a weakness in human societies; it is considered to be a desirable ethical trait rather than a survival skill. Yet, it is a survival skill. Aggressive and individualistic behavior may have been a useful survival tool until now. The war society that humans have created has become an efficient killing machine. But when things change, as they are changing right now, strengths can turn into weaknesses. And things have fundamentally changed and they continue to evolve quickly. Indeed, physical strength and aggression matter much less today for human survival than does intelligence. Some of the worst risks we face today are caused not by other species that prey on us, but by traits that evolved to succeed against our predators " for example, extracting energy and burning fossil fuels in order to dominate nature and other species. In

other words, we are now at risk due to the impact of human dominance on the planet. Our success as a species has become the source of our main risks. Humans are causing some of the worst risks that we are facing. The situation is somewhat unusual and is new for our species, and it is also new for the planet itself. As the situation changes, the rules we used to follow for survival must change too.

Let us start from some basic principles. Survival is about protecting life, not just about inducing death. Life is difficult to define, but we all agree that it is a phenomenon characterized by reproduction. Only those systems that incorporate reproduction are said to be alive. Life forms are able to reproduce. To be alive means to be part of a time series of reproductive activities. Reproduction characterizes life. Destruction does not. Asteroids destroy very effectively, and so do volcanoes. But they are not alive, because they do not reproduce. We humans are alive because we do.

Reproduction requires in essence altruism rather than dominance and aggression. How so? This is simple. We must donate our energy and even our bodily resources and substance to be able to reproduce.

Yet, in our culture, the essence of survival is viewed differently. It is generally viewed as the ability to conquer, dominate, and kill. Research shows that men tend to think of life skills as those skills that allow them to win the battle for survival. War is an example. Surveys asking men what characterizes life find that they are likely to say "the survival of the fittest" or "dog eat dog." This may be because of the evolutionary role that males originally had in human societies, a role that is somewhat outdated. The reality is that humans could not live — and indeed could not be part of the chain of life — if they did not have the nurturing skills needed to reproduce. Women understand that reproduction requires altruism. Women donate their physical substance such as eggs, blood, and milk, and they do so voluntarily for the sake of reproduction. This is what reproduction is all about: the most voluntary donation of one's substance. Most living beings, animals and plants, do the same. They donate their substance voluntarily to the next generation, sometimes at the cost of their own welfare and even their own lives. Observe that voluntarily donating one's own substance, one's flesh and body fluids, is the very essence of altruism. This altruistic donation is the key to the survival of the species.



The great British author and social commentator Jonathan Swift once suggested, as a "humble proposal," that the problem of hunger in Ireland can be resolved by humans eating their own children (Jonathan Swift, *A Modest Proposal*, 1729). This is not as outlandish a proposal as it may sound at first. In any case it helps to illustrate the point I want to make. If the essence of life was the survival of the fittest, then humans would eat their children who are powerless at birth — nothing is less fit than newborn infants. Their bodies could certainly provide protein and nutrition to fit adults.

The question that we must answer is: Why don't we follow Swift's "humble proposal?" Why not eat our own children?

Some societies may have done exactly that, but those societies are not here to tell their tale because if we ate our children, humans would not be around. Our species would not have survived.

No species that ate its children would survive; it may not even get started as a species. Survival depends crucially on reproduction and this means protecting the weak, the weakest of all, the small children. This is quite different from the blanket policy of survival of the fittest, with regards to the adult members of the species. Indeed, one may say that survival is more than anything about altruism and cooperation, and about the protection of the weakest. It is not about "dog eat dog"; it is not about dominance and survival of the fittest. It is about the nurturing and protection of new generations; it is about voluntary donations, about the protection and nurturing of the weakest, sometimes at the expense of our own survival. Humans are doing the opposite right now by endangering the survival of our children for economic gain today, a modified version of Swift's modest proposal.

### *Women and Survival*

Women understand because their evolutionary role is to protect the weakest of all: children at birth. Women are of course critical to human survival: they are the key to reproduction and they voluntarily provide their substance and energy to give birth and protect babies for the survival of the human species. Men miss this important aspect of survival because their evolutionary roles appear to value physical strength more than anything else. However, this is a role that seems increasingly out of date.

It is fitting to raise the issue of "avoiding extinction" within a male-dominated

world and a culture that is focused on violence, economic competition, and wars. We need to assure a changing role for women so the entire ethos of destruction and dominance that permeates our society is balanced out by a modicum of altruism. Nurturing and protecting the weakest is critical and necessary if we are to avoid extinction.

It is true that there have been changes in the role of women, most of all their rapid entrance into the market for labor in industrial societies. But this change has not been fast enough. Modern societies, such as the U.S., still witness abuse of women at home and elsewhere, both physically and economically. For example, the U.S. has a 30% gender difference in salaries, which seems not to be narrowing. These are the salaries that are paid to men and women even when comparing men and women with equal training, age, and experience. The gender inequality is prevailing, persistent, and systematic. In any given society, there is a statistical correlation between the amount of housework a woman does at home and the difference between male and female salaries in the economy as a whole. These two different statistics — two indices of abuse — are seemingly unrelated, but they are indeed related, because when women are overworked and underpaid at home this leads them to be overworked and underpaid in the marketplace (Graciela Chichilnisky, "The Gender Gap," *Review of Development Economics*, 12 (4): 828-844, 2008). Gender inequality in salaries is in reality legally sanctioned. Research shows that men are admired for traits that prevail in negotiating salaries, while the same traits are considered too aggressive for females. Indeed, the U.S. still does not have an Equal Pay Act. Unequal pay for women and men is still legal in the U.S.A.

Is there a reason to pay women less than men? If so, what is it?

The persistent unequal situation is based on a rationale of "genetic inferiority" of women. Even a former president of the oldest University in the U.S., Harvard University, Larry Summers, presented this suspicion in public as a plausible hypothesis to explain the persistent >30% difference in salaries between women and men in our economy. Furthermore, when he was subsequently voted out by Harvard University faculty, he went on to become an economic advisor of President Barack Obama. One wonders whether Mr. Summers would have been selected as an economic advisor of the president of the U.S. — the first black U.S. president — if he had presented in public his suspicions about the genetic inferiority of blacks, rather than the genetic inferiority of women. I venture to say

he would not have been selected by President Barack Obama if he had said in public that blacks are genetically inferior. But saying this about women is acceptable, and he went through and indeed was rewarded by President Obama with the economic advisory role. This was a discouraging event for many, but not for the men who secretly or openly believe that women are indeed genetically inferior to men. One cannot but draw a somewhat distant but illustrative connection between this situation and the excuses that the Nazis used to explain the most savage Holocaust in memory, namely, they explained Nazism as based on the supposed genetic inferiority of Jews. This illustrates the implications of claiming the genetic inferiority of some groups in our society.

Publicly declaring the genetic inferiority of women to explain their economic exploitation is not an innocent remark even if the genetic inferiority is about performance in the sciences. It is a way to justify a systematic way in which male-dominated societies perpetrate economic and cultural abuse, violence and brutality against women, pornography, torture of women, and rape that represents a form of social control and intimidation. Ultimately it is a deep social rejection of altruism, protection of the weak and the essential reproductive role that women bring to society, which is a necessary precondition for the survival of the human species. Our society's manifested hate and violence against women is critically connected with the self-destructive aspects of our society and the problem of avoiding extinction that we face now.

A U.S. Congress Committee on Violence Against Women is currently evaluating the situation and defining policy. Until we change the current male-dominated culture of abuse and its barbaric treatment of women for example, until we revolt against the acceptance of electronic games involving the systematic torture and killing of women as entertainment that the U.S. Supreme Court found acceptable for children in its recent 2011 decision and until we develop altruism as an efficient survival skill, our society will not be well prepared to avoid extinction.

### *Avoiding Extinction: Summary of What is to Come*

The future of humankind may be played out in the rest of the 21st century. Here is a summary of the situation and what to do about it which is developed further below.

First, let us take stock of the world today: in a nutshell we see energy limits

confronting enormous future global needs for energy today and in the future. The problem of overuse of natural resources, more generally, continues to be a clash of civilizations: it is an impasse between the global North and the global South. The North refers to the rich nations that inhabit mostly the Northern hemisphere of planet Earth, the South refers to the poor. The former represent about 20% of the world population, and the latter about 80%. We examine the market's role in getting us here and in finding a solution, and define three building blocks that are needed for a solution going forward. We discuss the next generation of green markets; how to bridge the global wealth gap and to transform capitalism as needed for this purpose, and whether this is possible. In particular, we examine the role of the United Nations and its Carbon Market in the global transformation process by itself and in conjunction with other global markets for environmental resources for water and biodiversity, which are still to emerge. We examine the critical role of women, how the global financial crisis fits into all this, how it elucidates our future, and the lessons we have learned.

Avoiding extinction is the ultimate goal of Sustainable Development.

### *Financial and Global Environmental Crisis*

While we are still climbing up from the depths of a global financial crisis that started its deadliest stages in 2008, the world knows that the game is not over. Judging by the threats from the Eurozone, including Brexit, it could all re-start next year. For the first time in history, the U.S. was downgraded to a debtor nation a few years ago, and the shocks to its financial markets underscore these points. At the same time, within a larger historical context, the financial crisis takes second place. We have seen such a crisis before. What we have never seen before is the global threat to human survival that is developing in front of our own eyes. We are in the midst of a global environmental crisis that started in a small way with the dawn of industrialization and accelerated with the onset of globalization, ever since the Bretton Woods Institutions were created after WWII to provide a global financial infrastructure for spreading the role of markets and industrialization across the world economy. In both cases, financial mechanisms are at work. The global financial crisis and the environmental crisis are essentially two aspects of the same problem. How so?

It is possible to illustrate this with simple examples available through the media that is read by the average person. The urgency of the situation has become clear. On Tuesday June 21, 2011, The Times newspaper in London wrote "Marine life is

facing mass extinction" and it explained: "The effects of overfishing, pollution and climate change are far worse than we thought. The assessment of the International Program on the State of the Oceans (IPSO) suggests that a "deadly trio" of factors — climate change, pollution, and overfishing — are acting together in ways that exacerbate individual impacts, and that "the health of the oceans is deteriorating far more rapidly than expected. Scientists predict that marine life could be on the brink of mass extinction." All three causes of extinction just mentioned — overfishing, pollution, and climate change — are attributable to the industrialized world who consumes the majority of the marine life used as seafood, 80% of which is believed to be discarded after removing it from the ocean, who generates over 60% of the global emissions of carbon dioxide and who uses 70% of the world's energy, all this while housing only 20% of the world's population. Industrialization is at work, contributing to the impending destruction and mass extinction in the earth's seas.

The complexity of the problem is baffling scientists. The Earth self-regulates its atmosphere, but right now we are tying the Earth's hands in self-regulating itself. There is no quick fix. A standard way that the planet uses to regulate carbon, for example, is to sequester carbon from the atmosphere in its mass of vegetation, which breathes CO<sub>2</sub> and emits oxygen. Animals, such as humans, do exactly the opposite. Animals breathe oxygen and emit CO<sub>2</sub>. In balance, the two sets of realms — flora and fauna — maintain a stable mix of CO<sub>2</sub> and oxygen in the atmosphere. Since CO<sub>2</sub> in the atmosphere regulates its temperature, this cycle maintains a stable climate. But the enormous use of energy by industrial societies is tipping the scales, and our widespread destruction of the mass of vegetation prevents the planet from adjusting. What about planting trees? Can't they do the job? On the same day, June 21, 2011 The Times stated: "Planting trees does little to reduce global warming" and explained how a recent Canadian report (The Times, p.17 ) has found that "even if we were to plant trees in all the planet's arable land — an impossible scenario with the global population expected to rise to 9 billion this century — it would reduce less than 10 percent of the warming predicted for this century from continued burning of fossil fuels." Observe that it is not the developing nations with 80% of the world's population that are causing this problem. This is because over 70% of the energy used in the world today is used by 20% of the world population that lives in industrial nations, who emit 60% of the CO<sub>2</sub>. These are the same industrial nations that created the Bretton Woods Institutions in 1945 and have consumed an overwhelming amount of the Earth's

resources since then (Graciela Chichilnisky, "The Economic Value of the Earth Resources. In E. Gutter (ed), Scientists on Biodiversity. American Museum of Natural History. New York, 1998). Financial markets are the core of industrial societies and are operating globally.

One can say that the financial crisis and the environmental crisis are two sides of the same coin. They are at the foundation of the current model of economic growth in industrial nations and of its voracious use of the Earth's resources. Indeed, one can pinpoint precisely which part of our economic model destroys the environment and creates financial crisis: it is the practice of "discounting the future" which was introduced by the famous economist Tjalling Koopmans, who gave it the name "impatience" in financial markets. It is also called "short termism" and can lead to Ponzi schemes. When "discounting the future" comes into play in environmental and natural resource issues, we ignore the future needs of the planet and our species. Sustainable development requires an equal treatment of the present and the future, an axiom that I introduced when I defined the formal theory of sustainable development. In a nutshell: both the world's financial crisis and the global environmental crisis stem from a flawed financial mindset and both require a new model of economic growth that is characterized by sustainable development.

This view is shared by the recently created international group G20, the first leading group of nations that includes developing countries. The group met for the first time in Pittsburgh, U.S.A., on September 24-25, 2009. The G20 Leader's Statement (September, 2009) states:

*As we commit to implement a new, sustainable growth model, we should encourage work on measurement methods so as to better take into account the social and environmental dimensions of economic development. Modernizing the international financial institutions and global development architecture is essential to our efforts to promote global financial stability, foster sustainable development, and lift the lives of the poorest. Increasing clean and renewable energy supplies, improving energy efficiency, and promoting conservation are critical steps to protect our environment, promote sustainable growth and address the threat of climate change. Accelerated adoption of economically sound clean and renewable energy technology and energy efficiency measures diversifies our energy supplies and strengthens our energy security. We commit to: - Stimulate investment in clean energy, renewables, and energy efficiency and*

*provide financial and technical support for such projects in developing countries — Take steps to facilitate the diffusion or transfer of clean energy technology including by conducting joint research and building capacity. The reduction or elimination of barriers to trade and investment in this area are being discussed and should be pursued on a voluntary basis and in appropriate fora.*

The G20 statement continues:

*Each of our countries will need, through its own national policies, to strengthen the ability of our workers to adapt to changing market demands and to benefit from innovation and investments in new technologies, clean energy, environment, health, and infrastructure. It is no longer sufficient to train workers to meet their specific current needs; we should ensure access to training programs that support lifelong skills development and focus on future market needs. Developed countries should support developing countries to build and strengthen their capacities in this area. These steps will help to assure that the gains from new inventions and lifting existing impediments to growth are broadly shared.*

And it goes on to say that

*We share the overarching goal to promote a broader prosperity for our people through balanced growth within and across nations; through coherent economic, social, and environmental strategies; and through robust financial systems and effective international collaboration, and that*

*We have a responsibility to secure our future through sustainable consumption, production and use of resources that conserve our environment and address the challenge of climate change.*

The G20 knows the problems that nations face today. What they do not know are the solutions. On April 30th 2016, The Economist run a story on a new measure of economic welfare introduced by James Tobin, a famous economist from Yale. A 2009 report commissioned by the French President Nicolas Sarkozy, chaired by my Columbia colleague Joseph Stiglitz, a prominent economist, called for changes in our measurement of economic progress and growth and for an end to "GDP fetishism" in favor of a "dashboard" of measures that capture human value. These reports offered appropriate criticisms, recognizing the problem at hand. "The report is in part a response to environmentalist concerns that GDP treats the plunder of the planet as something that adds to income" writes The Economist (April 30th 2016, p 22), adding, *The report was much talked about: it was not much acted*". Once again, the problem is identified, but solutions are lacking. We

turn next to the solutions.

### *Human Future: Green Capitalism*

The task in front of us is nothing less than building a human future. In the midst of the sixth largest extinction on planet Earth, we face potentially catastrophic climate change and extinction of life on land and in the world's seas, the basis of Life on Earth. It seems fair to say that there is a global emergency. We have come so close to the brink with the current economic perspectives that it appears right now that only a new, more innovative generation can help. As Albert Einstein said: "the mindset that created the problem is not the mindset that will find a solution."

A green future is about sharing the wealth and saving the planet. Is this an impossible mandate? We need to stave off biodiversity extinction and reduce carbon emissions, while rebuilding the world economy and supporting the needs of developing nations. Is this possible?

It is. To understand the solutions, we need to look closer at the root of the problem so we can change it.

### *The World since WWII*

The Bretton Woods global financial institutions, which were created after WWII, mandated and supported rapid expansion of international markets. They succeeded beyond anybody's expectations. International trade expanded during this period three times faster than the world economy as a whole: this is what globalization is all about. Industrialization is resource intensive. It was fueled in this period by cheap resources exported from developing nations, threatening their forests, minerals, and biodiversity.

Resources were and continue to be exported at very low prices. As a result, poverty grew in resource-exporting regions and provided "competitive advantage" in the form of cheap labor and cheap resources that exacerbated and amplified resource over-consumption in the industrial North. Resources were over-extracted in poor nations desperate for export revenues, and were over-consumed in industrial nations. Globalization after WWII increased together with an increasing global divide between the rich and the poor nations, the North and the South (Graciela Chichilnisky, "North-South Trade and the Global Environment. *American Economic Review*, 84 (4), 1994, pp. 851-874). This is how the global financial system that was created by the Bretton Woods Institutions in



1945 is tied up with the financial crisis of the day, and how it is also tied up with the global environmental crisis we currently face. And this is how the global financial institutions caused an enormous global divide between the North and the South.

Energy is at the center because its use goes hand-in-hand with economic progress, and most of the energy used in the world today is fossil (87%). GDP growth is closely tied with carbon emissions today. Industrial nations consume about 70% of the world's energy. The North-South divide is therefore inexorably connected to the carbon emissions that are undermining the stability of the global climate. The North-South divide has been a stumbling block in every United Nations negotiation on climate issues, for example in the 2009 Copenhagen Convention of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) (COP15) and then in 2010 in Cancun Mexico COP16. The same issue surfaced in the Paris COP21 in December 2015. The problem is: who should use the world's resources: the rich or the poor? Or, otherwise put, who should abate carbon emissions? (Graciela Chichilnisky and George Heal, "Who Should Abate Carbon Emissions: An International Perspective. *Economic Letters*, Spring 1994, pp. 443-449).

It can be said that we are reliving last century's Cold War conflict, but this time as a conflict between China and the U.S.A. (Graciela Chichilnisky, "Forward Trading Between the U.S. and China, *Time Magazine*, October 5, 2009). Each party could destroy the world as they are the largest emitters and alone can change the world's climate. Each wants the other to reduce carbon emissions (to "disarm") first. But this time the conflict is between the rich nations represented by the US and the poor nations represented by China. The solution requires that we overcome the North-South Divide, and the use and trade of the world's resources between the rich and the poor nations. One could say that global justice and the environment are two sides of the same coin. Poverty is caused by cheap resources in a world where developing nations are the main sellers of natural resources into the international market, resources which are over-consumed by the rich nations and lead to environmental havoc. Perverse economic dynamics are destroying the stability of the atmosphere, undermining climate patterns and causing the sixth largest extinction in the history of the planet.

How long will it take until this situation reaches its logical limits and victimizes our own species? How to avoid extinction?

The Gordian knot that we must sever is the link between natural resources, fossil energy, and economic progress. Only clean energy can achieve this. But this requires changing a \$45-55 trillion power plant infrastructure, the power plants that produce electrical power around the world (see IEA), because 87% of world's energy is driven by fossil fuels and power plants produce about 45% of the global carbon emissions.

How to make a swift transition to renewable energy?

*Who Needs a Carbon Market?*

Energy is the mother of all markets. Everything is made with energy: our food, our homes and our cars, the toothpaste and the roads we use, the clothes we wear, the heating of our homes and offices, our medicines: everything. Changing the cost of energy, making dirty energy more expensive and undesirable and making clean energy more profitable and desirable, changes everything. It makes the transition to clean energy possible. We have the technologies, we just have to get the prices right. Is it possible to thus change the price of energy?

Yes, it is. In fact it has already been done, although it requires more input at present to continue this process, as is discussed below.

Here is the background and a summary of the current situation. In 1997, the Carbon Market of the United Nations Kyoto Protocol was signed by 160 nations. In it, and after a long period of lobbying and designing the carbon market, I was able to write the structure of the carbon market (see Graciela Chichilnisky and Kristen A. Sheeran, *Saving Kyoto*, New Holland Publishers, 2009). The Kyoto Protocol (KP) became international law in 2005, when the protocol was ratified by nations representing 55% of the world's emissions. The KP and its carbon market were adopted as law by 195 nations. The U.S. is excluded. The carbon market helped change the value of all goods and services in the world economy because it changes the cost of energy the world over: it makes clean energy more profitable and desirable and dirty energy unprofitable. This changes the prices of all products and services in the world, since everything is made with energy, and drives the economy to use cleaner rather than dirty energy sources. It is more profitable and less costly to use clean energy that reduces emissions of carbon now; this is precisely the role of the carbon market in the United Nations Kyoto Protocol in Kyoto, December 1997.

The carbon market started trading carbon credits at the EU Emissions Trading System (EU ETS) in 2005 since it became international law. The World Bank reported on its progress in its report "Status and Trends of the Carbon Market" which was published annually since 2005. The carbon market requires support for the carbon emission limits to continue working. Sadly enough, the Paris Agreement supported no carbon emission limits – none at all – which is what is needed to avert catastrophic climate change. The World Bank documents that by 2010–2011 the EU ETS was trading about \$175Bn billion/year, and succeeded in decreasing the equivalent of over 20% of EU's emissions of carbon. Through the carbon market, those nations who over-emit compensate those who under-emit, and throughout the entire process the world's emissions remains always under a fixed total emissions limit. These limits are for Annex I nations, and they are documented nation by nation in the Appendix to the Kyoto Protocol. Annex 1 nations are essentially OECD nations. A "carbon price" emerges from trading "carbon credits" or rights to emit, which represent the monetary value of the damage caused by each ton of CO<sub>2</sub>. The carbon market therefore introduces a "carbon price" that corrects the negative impact that the emissions of CO<sub>2</sub> have on climate, which has been called "the biggest externality in the history of humankind" according to Nicholas Stern (Nicholas Stern, Review: The Economics of Climate Change, Cambridge University Press, 2006).

The carbon market cuts the Gordian knot and makes change possible. It does so because it makes clean energy more profitable and dirty energy less profitable, and therefore encourages economic growth without environmental destruction: it fosters green development. The carbon market itself costs nothing to run, and requires no subsidies except for minimal logistics costs. In net terms, the world economy is exactly in the same position before and after the carbon market: there are no additional costs from running the carbon market, nor are there from its extremely important global services. The over-emitter nations are worse off, since they have to pay. But every payment they make goes to an under-emitter, so some nations pay and some receive. In net terms the world economy is exactly in the same position before and after the carbon market is introduced. There are no costs to the world economy from introducing a carbon market, nor are there from the limits on carbon emissions and environmental improvement that it produces. It is all gain.

As of 2010, the carbon market had been ratified by 195 nations, and this included all the industrial nations except the U.S. It is an international law since 2005. Its

nation-by-nation carbon limits expired originally in 2012 and were extended to 2015 and in a second period to 2020. But the KP itself — its overall structure and the structure of the carbon market do not expire: they are and continue to be an international law. All we have to do to keep the carbon market's benefits is to define new emissions limits nation by nation for the OECD nations, something that we should be doing in any case as they are major emitters and without limiting their emissions there is no solution to the global climate issue.

What is the current status of the carbon market in the U.S., which is the single industrial nation that has not yet ratified the KP? There are cross currents in U.S., since it is a politically divided nation. But the U.S. has already a carbon market for 10 Northeastern U.S. States, called Regional Greenhouse Gas Initiative (RGGI), which is operating, but timidly: the limits on emissions are small and so are the prices for carbon credits therefore. The economic incentives of KP's carbon market are enormous. China, for example, created a reported one million new jobs and became the world's main exporter of clean technology, wind and solar equipment, since 2005 after signing on and ratifying the KP in 2005 and benefiting from about \$75Bn from its carbon market's Clean Development Mechanism (CDM). China has introduced its own national carbon markets: however useful they may be, national or regional markets do not have the same status nor positive effect in controlling climate change as the global carbon market does, because they are not based on global emissions reductions. Reducing global emissions of CO is required in order to avert catastrophic climate change.

Many in the U.S. want part of the UN carbon market advantages. President Obama said he wished to ratify the KP, and by now 22 States are planning to create a Carbon Market of their own, including California, which already has a carbon market in operation. Hundreds of cities and towns support the carbon market in the U.S. In the Fall 2007, the U.S. Supreme Court agreed that Federal government and the Environmental Protection Agency (EPA) could enforce carbon emissions limits without requiring Congressional approval. Every effort to deem this regulation illegal by Republican representatives has failed so far. It is generally accepted that global businesses (for example, the automobile industry) would benefit from KP's guidelines, and could suffer economic losses without the benefit of KP's economic incentives at home. This is because the automobile industry is global, and cars that do not sell in other OECD nations create huge

losses. Since all OECD nations are buying carbon- efficient cars, because they ratified the KP, the U.S. car industry could be commercially isolated. In part for these reasons, in 2010 the EPA imposed automobile emission limits of 36.7 m per gallon, an efficiency requirement that has been increased further by the Obama administration in 2011 and since then. The automobile industry voluntarily supported a rise to 54 MPH in 2011.

Furthermore, in December 2011, EPA announced that it would impose limits on stationery sources like power plants, which is the beginning of a U.S. carbon market, and the breakthrough Clean Power Act (COA) imposed 30% reductions on power plants, a law created by President Obama and the EPA in 2014<sup>15</sup>. Several states are contesting this law and in 2016, in an unprecedented move, the US Supreme Court froze its implementation pending the states' decisions. The issue is still hotly contested by the Republican Party, which typically freezes decision making since the U.S. is in a presidential election year. A former Republican candidate for president, Mitt Romney who was formerly a Governor of Massachusetts, endorsed the creation of a "cap and trade" system or a carbon market. A similar sequence of events took place when the SO<sub>2</sub> market was created at the Chicago Board of Trade (CBOT) 20 years ago: first it was quite controversial, but SO<sub>2</sub> emission limits were eventually passed for U.S. power plants and then traded efficiently in an SO<sub>2</sub> market at the CBOT, which is now widely considered to have been very successful in eradicating acid rain in U.S.A.

Are the new EPA carbon limits the beginning of the U.S. 10 carbon market as were the SO<sub>2</sub> limits 20 years ago? History is being written right now.

### *Green Markets are the Answer □ They will Transform Capitalism in the 21st Century*

What is a green market and why does it matter? A shining example of a green market was just discussed: it is the Kyoto Protocol Carbon Market, which became international law in 2005. By 2011 the EU ETS was trading \$175Bn annually and had transferred about \$130Bn in total to developing nations for clean technology private projects that promote sustainable development. Most importantly it succeeded in its mission as it decreased over 20% of the EU emissions since becoming a law in 2005. This happened while all other nations outside the Kyoto Protocol, such as the U.S., increased their emissions.

Another successful example of a green market is the SO<sub>2</sub> Market in CBOT that

was created about 20 years ago, as mentioned above. This market is quite different from the carbon market because SO<sub>2</sub> concentration is not a "global commons," because it varies city by city while CO<sub>2</sub> is the same uniformly all over the planet. This changes fundamentally the structure and functioning of the market. There are more green markets in the works. Today the UN is exploring markets mechanisms for biodiversity and for watersheds. As in the case of the KP carbon market, these are markets that would trade rights to use the global commons "the world's atmosphere, its bodies of water, its biodiversity" and therefore have a deep built-in link between efficiency and equity. In the carbon market of the KP, by design, the poor nations are preferentially treated, having in practical terms more access and more user rights to the global commons (in that case the planet's atmosphere). This is not the case with SO<sub>2</sub> which is a simple "cap and trade" approach as SO<sub>2</sub> is not a public good, as was mentioned above.

Efficiency with equity is what green markets are all about. They are really two sides of the coin: One is equity and the other is efficiency. Both matter. The carbon market provides efficiency with equity. How? Through its CDM the KP provides a link between rich and poor nations, indeed the only such link within the Kyoto Protocol, since poor nations do not have emissions limits under the Kyoto Protocol and therefore cannot trade in the carbon market. Nevertheless developing nations have strong incentives for emission reductions through the Clean Development Mechanism (CDM) of the carbon market "how does this work?"

The CDM works as follows. Private clean technology projects in the soil of a developing nation "for example in China, Brazil or India" that are proven to decrease the emissions of carbon from this nation below a "UN agreed baseline," are awarded "carbon credits" for the amount of carbon that is reduced. These "carbon credits" are themselves tradable for cash in the carbon market, in recognition for the amount of carbon avoided in those projects. The carbon credits are a monetary compensation for clean technologies, and therefore shift prices in favor of clean technologies as the carbon market does. By law, the CDM carbon credits can be traded for cash within the carbon market. This is the role of the carbon market in the CDM. This is how the CDM has provided about \$130Bn in funding to developing nations since 2005 (The World Bank, State and Trends of the Carbon Market (Annual Report 2006-2014)).

The North-South conflict, namely, who should abate first, puts all this at risk. To

move forward in the global climate negotiations we must overcome the China-U.S. impasse, which is in an intense form of the same conflict that prevails between rich nations and poor nations as a whole, the conflict between the rich North and the poor South (see Graciela Chichilnisky, *Beyond the Global Divide: From Basic Needs to the Knowledge Revolution*, 2009).

Is it possible to overcome the North-South divide? Yes, it is. But the interests of the industrial and developing nations are so opposed that once again, we need a two-sided coin. This is the same dual role that the carbon market played in the UNFCCC 1997 global negotiations, allowing it to save the negotiations from which the Kyoto Protocol was born. The carbon market was acceptable to the rich nations because it provided market efficiency that the U.S. and the OECD wanted; at the same time the carbon market placed mandatory emission limits solely on Annex 1 (OECD) nations' emissions, which is what poor nations wanted. This was what I saw then: how, by introducing the carbon market into the wording of the Protocol, it was possible to save the negotiations. This is how the Protocol was voted by 160 nations in December 1997. Equity and efficiency are the two sides of the same coin. Together they win. We need both.

The G20 and the rest of the world seem to recognize the need for sustainable development, both in terms of financial practices and the environment. In a nutshell Sustainable Development means giving the future a fair treatment in our policies. The concept of Basic Needs created in the Bariloche Model in 1974 (see Graciela Chichilnisky, 'Economic Development and Efficiency Criteria in the Satisfaction of Basic Needs.' *Applied Mathematical Modeling*, 1 (6), 1977, pp. 290-297; Chichilnisky, "Development Patterns and the International Order." *Journal of International Affairs*, 1 (2), 1977, pp. 274-304; and A. Herrera et al., *Catastrophe or New Society: A Latin American World Model*. International Development Research Centre, Ottawa Canada, 1976) is its backbone since sustainable development is defined as the right of the present to satisfy needs without depriving the future from satisfying its own needs. A formal theory of Sustainable Development was created in 1993 (Graciela Chichilnisky, 'What is Sustainable Development?' Paper presented at the 1993 workshop of the Stanford Institute for Theoretical Economics, 1993).

We now turn to the principles and the practice of a new economic system that can achieve what is needed in the context of the global environment, avoiding extinction.

## *Blueprint for Sustainable Development*

In its creation, the G-20 stated as its top priority to achieve Sustainable Development for the world economy. This requires

*(1) Economic growth in developing and rich nations to satisfy the Basic Needs of the present and the future*

*(2) Smooth and accelerating transition to renewable energy and a harmonious use of the earth's resources*

*(3) Clean and abundant energy available worldwide;*

Nobody knows the economic systems that will prevail in a long-term future. However, In the immediate future, sustainable development can be achieved by

Green Capitalism: below we discuss what this means and how it works.

## *Organizing Principles for Green Capitalism*

Green capitalism is a new economic system that values the natural resources on which human survival depends. It fosters a harmonious relationship with our planet, its resources and the many species it harbors. It is a new type of market economics that addresses both equity and efficiency (the basis for Green capitalism was explained in Time Magazine (Chichilnisky, 2009 (op. cit.)). Using carbon negative technology™ it helps reduce carbon in the atmosphere while fostering economic development in rich and developing nations, for example in the U S., EU, China and India. How does this work?

In a nutshell Green Capitalism requires the creation of global limits or property rights nation by nation for the use of the atmosphere, the bodies of water and the planet's biodiversity, and the creation of new markets to trade these rights from which new economic values and a new concept of economic progress emerges updating GDP as is now generally agreed is needed (see The Economist issue on "The Prosperity Puzzle", April 30 2016, p. 10, and "The Modern Economy", p. 7).

Green Capitalism is needed now to help avert climate change and achieve the goals of the 2015 UN Paris Agreement, which are very ambitious and universally supported but have no way to be realized within the Agreement itself. The Carbon Market and its CDM play critical roles in the foundation of Green Capitalism, creating values to redefine GDP. These are needed to remain within the world's "CO2 budget" and avoid catastrophic climate change.

Below are the building blocks for Green Capitalism and practical examples of how



these organizing principles can be put in practice right now. They illustrate how new carbon negative technology can help achieve the climate negotiations goals, averting climate change.

### *Building Blocks for Green Capitalism*

Here are three building blocks for Green Capitalism:

- (1) Global limits nation by nation in the use of the planet's atmosphere, its water bodies and biodiversity - these are global public goods.
- (2) New global markets to trade these limits, based on equity and efficiency. These markets are relatives of the Carbon Market and the SO<sub>2</sub> market. The new market create new measures of economic values and update the concept of GDP.
- (3) Efficient use of Carbon Negative Technologies to avert catastrophic climate change by providing a smooth transition to clean energy and ensuring economic prosperity in rich and poor nations.

These building blocks have immediate practical implications in resolving key goals of global policy, such as:

- (4) Create a \$200Bn/year Green Power Fund from existing funding sources, including the CDM, to ensure a smooth and accelerated transition to clean energy, achieve the goals of the UN Paris Agreement and of the UN Green Climate Fund.

In terms of global policy, the three building blocks offer practical ways to assist the ambitious goals of the COP21 Paris Agreement, which cannot be achieved within the Agreement terms itself.

Indeed, according to the 2014 5th Assessment Report of the IPCC (IPCC, 5th Assessment Report, Bonn 2014, p. 191) carbon negative technologies, also known as "carbon removals," are now needed in our century in most scenarios and in massive scale in order to avert catastrophic climate change. Here is a practical example of how the three building blocks can help achieve the goals of the UNFCCC, using carbon negative technologies while fostering growth in developing nations and overcoming poverty, all of which requires more energy:

#### *1. Carbon negative power plants for developing nations*

New generation technologies can capture CO<sub>2</sub> from air at low cost (<http://www.globalthermostat.com>). These technologies build carbon negative power plants that clean the atmosphere of CO<sub>2</sub> while producing electricity

(Graciela Chichilnisky and Peter Eisenberger, "Carbon Negative Power Plants." Cryogas International, 2011). Global Thermostat LLC is an award winning firm that can be used as an example. The firm is commercializing a technology that takes CO<sub>2</sub> out of air and uses mostly low cost residual heat rather than electricity to drive the capture process, making the entire process of capturing CO<sub>2</sub> from the atmosphere very inexpensive. There is enough residual heat in a coal power plant that it can be used to capture twice as much CO<sub>2</sub> as the plant emits, thus transforming the power plant into a "carbon sink." For example, a 400 MW coal plant that emits 1 million tons of CO<sub>2</sub> per year can become a carbon sink absorbing a net amount of 1 million tons of CO<sub>2</sub> instead (e.g. Chichilnisky and Eisenberger, 2011). Carbon capture from air can be done anywhere and at any time, and so inexpensively that the CO<sub>2</sub> can be sold for industrial or commercial uses such as plastics, food and beverages, greenhouses, bio-fertilizers, building materials and even enhanced oil recovery, all examples of large global markets and profitable opportunities. Carbon capture is powered mostly by low (85°C) residual heat that is inexpensive, and any source will do. In particular, renewable (solar) technology can power the process of carbon capture. This can help advance solar technology and make it more cost-efficient. This means more energy, more jobs, and it also means economic growth in developing nations, all of this while cleaning the CO<sub>2</sub> in the atmosphere.

Carbon negative technologies can transform the world economy. In recognition of this fact Global Thermostat received three prominent awards recently, including "World's Top Ten Most Innovative Company" in energy (Fast Company Magazine 2016) and in April 22 2016, "World's Top 50 Innovator in Renewable Energy," and IAIR (International Alternative Investment Review) "2015 CEO of the Year" at the NY Yale Club, June 2015.

## *2.The Role of the KP carbon market*

The role of the Kyoto Protocol Carbon Market and its Clean Development Mechanism (CDM) is critical as it can provide needed funding and financial incentives for investment to build carbon negative power plants that were described above in developing nations. To provide access to all nations to the carbon market, the KP carbon limits must be generalized to all nations, since no Carbon Market can operate without carbon emission limits. The CDM can be used to provide "offsets," namely contracts that promise to buy the electricity that is provided by carbon negative power plants for a number of years. Using these

offsets as validation of future revenue, unlocks banking resources for the investment required to build carbon negative power plants. The plants themselves are profitable, since their costs are low and their electricity is sold. The scheme covers fixed costs and greatly amplifies private profits from clean technologies. The private green capital markets recognize this enormous business potential, having achieved now a record scope of about \$260 Bn/year in today's markets.

### *3. The green power fund and global capital markets*

To accelerate and enhance the impact of the UN Carbon Market and its CDM, we have to create a \$200 billion a year Private/Public Fund called the Green Power Fund that was proposed. The funding can be used to build carbon negative power plants in developing nations, particularly in Latin America and Africa, therefore enhancing their economic development while cleaning the planet's atmosphere. The Green Power Fund was named and proposed by the author in writing to the U.S. Department of State in Copenhagen COP15 December 2009, and was also published by the author at the time in the Financial Times in 2009. It was accepted by the US State Department, and two days later was publicly offered by U.S. Secretary of State Hillary Clinton as the United States' contribution in the global negotiations in COP15. Part of the proposal, now called the Green Climate Fund (one word was changed), became international law and received substantial financial support. Most of the financial promises to The Green Power Fund unfortunately have not yet been delivered. The Green Climate Fund lacks the funding which the KP and its carbon market could provide if the link was made between the two. But the US has not ratified the Kyoto Protocol and therefore has severed this natural and desirable source of funding. This connection can still be worked out while reinstating nation-by-nation carbon limits after 2020, and thereby the US carbon market based on those limits. The complete scheme as was proposed by the author in COP15 2009 is a private-public Green Power Fund with funding raised from global capital markets to invest in investment grade firms that build carbon negative power plants in developing nations, and with access to CDM funding to provide off-takes to buy the ensuing electricity.

The background and financial feasibility of the Green Power Fund can be seen as follows. Existing technologies ([www.globalthermostat.com](http://www.globalthermostat.com)) can efficiently and profitably transform coal power plants and solar thermal sources of energy into carbon sinks that reduce atmospheric carbon concentration while producing electricity. The more electricity is produced, the more residual heat is released,

which drives the new generation carbon capture technologies.

The Green Power Fund provides the project finance that is needed to build carbon negative power plants in developing nations and elsewhere. This can accelerate the renovation of the \$45-55 trillion power plant industry infrastructure worldwide (IEA) which is 87% fossil today, to transform it into a powerful “carbon sink” that cleans the atmosphere of CO<sub>2</sub>. Financially what is required is about \$200 billion/year for 15 years. By 2011 the UN Carbon Market was already trading \$175 billion/year, which almost suffices to cover these costs.

The funding will go to investment-grade power plant builders and new ones (including General Electric, SSE, Siemens, Linde, as well as new and smaller firms) to build carbon negative power plants in developing nations. \$200Bn is what the carbon market can trade per year (or more), thus providing the funding required (see The World Bank’s “Status and Trends of the Carbon Market” 2010 and 2011). Therefore the financial target proposed here seems eminently achievable.

### *Green Capitalism and Traffic Lights for Human Survival*

The three building blocks just described include new types of markets that are needed to transform capitalism into Green Capitalism. This transforms the economic values and prices of the new economy providing market incentives that make green economic projects more profitable than their alternatives and fostering conservation of biodiversity, clean water, and a safe atmosphere. Some of these new markets already exist and are described above. Green markets change GDP by valuing the Global Commons (the atmosphere, biodiversity, clean water), which in turns changes the measure of economic progress that is defined as the sum of all goods services produced by an economy at market prices. In a nutshell, as pointed out by The Economist (“The Trouble with GDP”, April 30, 2016) the well- known economists James Tobin and Bill Nordhaus gave examples of environmental concerns stating that at present “GDP treats the plunder of the planet as something that adds to income, rather than a cost” (p. 22). For example, cutting down all trees in the US national parks and making toilet paper from their wood, increases US GDP and counts as economic progress. This is because GDP uses market prices in its computations. Toilet paper has a market price, since there is a market for toilet paper, while there is no market for standing trees in national parks.

*How green markets change the measure of economic progress and redefine GDP*

The creation of new markets that trade the use of the global commons, such as rights to emit CO<sub>2</sub>, drinkable water and biodiversity, changes the measure of economic progress. The Carbon Market for example changes the GDP of a nation, which is a number defined as the sum of all goods and services produced at market prices. Indeed, if two nations that we can call Solar Nation and Coal Nation, produce exactly the same goods and services both produced at the same cost, the first using solar energy and the second coal, then the GDP of Solar Nation will be significantly higher than the GDP of Coal Nation on any given year. This is because if Coal Nation emits too much CO<sub>2</sub> and has to pay Solar Nation that emits none. The difference makes Solar Nation's GDP higher and Coal Nation's GDP smaller. In reality, the purchase and sale of carbon credits now enters the computation of GDP, giving a positive edge to Solar Nation and a negative one to Coal Nation. This is exactly what we wish to achieve, providing information about the negative effects on GDP that should measure the damages that Coal Nation is causing to the environment, the nation, and indeed the entire world.

In addition, Green Markets that trade global public goods link equity with efficiency as was explained, and this is different from standard markets for private goods in which equity and efficiency are unrelated.

Examples of global green markets are:

The UN Carbon Market, which has been international law since 2005.

The SO<sub>2</sub> Market in U.S., which started trading at the CBOT (Chicago Board of Trade) in 1991.

Markets for Water and Markets for Biodiversity: these are in embryonic stages and still to emerge. They have been proposed by the author and are under UN consideration.

These markets provide the missing signal of scarcity that is normally provided by market prices when a good or service becomes very scarce. Such signals are tantamount to Traffic Lights for Human Survival.

Here are sign posts to implement the above strategies going forward. Within the UNFCCC Global Climate Negotiations, the annual COP meetings, the next of which is COP22 in Marrakesh December 2016, we have been able to insert the Carbon Market in December 1997 COP3 in Kyoto; in Copenhagen 2009 COP15 we

inserted wording allowing carbon negative technologies to be compensated as part of the CDM, namely, that the CDM may fund negative carbon technologies, and in CO221 we were able to insert four articles about carbon removals or carbon negative technologies.

### *Economic Incentives for the Short and the Long Run: Why Negative Carbon?*

Long-run strategies can be quite different from strategies for the short-run. Often long-run strategies do not work in the short run and different policies and economic incentives are needed.

In the long run the best climate change policy is to replace fossil fuel sources of energy that by themselves cause 45% of the global emissions, and to plant trees to restore if possible the natural sources and sinks of CO<sub>2</sub>. But the fossil fuel power plant infrastructure is about 87% of the power plant infrastructure and about \$45-55 trillion globally. This infrastructure cannot be replaced quickly, certainly not in the short time period in which we need to take action to avert catastrophic climate change. The issue is that CO<sub>2</sub> once emitted remains hundreds of years in the atmosphere and we have emitted so much that unless we actually remove the CO<sub>2</sub> that is already there, we cannot remain long within the carbon budget, which is the concentration of CO<sub>2</sub> beyond which we fear catastrophic climate change (Graciela Chichilnisky and Peter Eisenberger, "Carbon Negative Power Plants," Cryogas International 2011). In the short run, therefore, we face significant time pressure. The IPCC indicates in its 2014 5th Assessment Report that we must actually remove the carbon that is already in the atmosphere and do so in massive quantities, this century (p. 191 of 5th Assessment Report). This is what I called a carbon negative approach, which works for the short run. Renewable energy is the long run solution.

Renewable energy is too slow for a short run resolution. since replacing a \$45-55 trillion power plant infrastructure with renewable plants could take decades. We already saw that planting trees is not feasible either, for similar reasons. We need action sooner than that. For the short run we need carbon negative technologies that capture more carbon than what is emitted. Trees do that □ and they must be conserved to help preserve biodiversity. Biochar does that. But as seen above trees and other natural sinks are too slow for what we need today.

Negative Carbon as part of the world's economic transformation

Negative Carbon is needed now as part of a blueprint for transformation, as

already explained. It must be part of the blueprint for Sustainable Development and its short term manifestation that I call Green Capitalism, while in the long run renewable sources of energy suffice, including Wind, Biofuels, Nuclear, Geothermal, and Hydroelectric energy. These are in limited supply and cannot replace fossil fuels. Global energy today is roughly divided as follows: 87% is fossil, namely natural gas, coal, oil; 10% is nuclear, geothermal, and hydroelectric, and less than 1% is solar power □ photovoltaic and solar thermal. Nuclear fuel is scarce and nuclear technology is generally considered dangerous as tragically experienced by the Fukushima Daichi nuclear disaster in Japan, and it seems unrealistic to seek a solution in the nuclear direction. Only solar energy can be a long term solution: Less than 1% of the solar energy we receive on earth can be transformed into 10 times the fossil fuel energy used in the world today.

Yet we need a short-term strategy that accelerates long run renewable energy, or we will defeat long-term goals. In the short term as the IPCC validates, we need carbon negative technology, carbon removals. The short run is the next 20 or 30 years. As we saw there is no time in this period of time to transform the entire fossil infrastructure □ it costs \$45-55 trillion (IEA) to replace and it is slow to build. We need to directly reduce carbon in the atmosphere now. We cannot use traditional methods to remove CO<sub>2</sub> from smokestacks (called often Carbon Capture and Sequestration, CSS) because they are not carbon negative as is required. CSS works but does not suffice because it only captures what power plants currently emit. Any level of emissions adds to the stable and high concentration we have today and CO<sub>2</sub> remains in the atmosphere for years. We need to remove the CO<sub>2</sub> that is already in the atmosphere, namely air capture of CO<sub>2</sub> also called carbon removals.

The solution is to combine air capture of CO<sub>2</sub> with storage of CO<sub>2</sub> into stable materials such as biochar, cement, polymers, and carbon fibers that replace a number of other construction materials such as metals. The most recent BMW automobile model uses only carbon fibers rather than metals. It is also possible to combine CO<sub>2</sub> to produce renewable gasoline, namely gasoline produced from air and water. CO<sub>2</sub> can be separated from air and hydrogen separated from water, and their combination is a well-known industrial process to produce gasoline. Is this therefore too expensive? There are new technologies using algae that make synthetic fuel commercially feasible at competitive rates.

Other policies would involve combining air capture with solar thermal electricity

using the residual solar thermal heat to drive the carbon capture process. This can make a solar plant more productive and efficient so it can outcompete coal as a source of energy.

In summary, the blueprint offered here is a private/public approach, based on new industrial technology and financial markets, self-funded and using profitable greenmarkets, with securities that utilize carbon credits as the "underlying" asset, based on the KP CDM, as well as new markets for biodiversity and water providing abundant clean energy to stave off impending and actual energy crisis in developing nations, fostering mutually beneficial cooperation for industrial and developing nations. The blueprint proposed provides the two sides of the coin, equity and efficiency, and can assign a critical role for women as stewards for human survival and sustainable development.

My vision is a carbon negative economy that represents green capitalism in resolving the Global Climate negotiations and the North-South Divide. In the examples provided above, carbon negative power plants and capture of CO<sub>2</sub> from air and ensure a clean atmosphere together innovation and more jobs and exports: the more you produce and create jobs the cleaner becomes the atmosphere.

In practice, Green Capitalism means economic growth that is harmonious with the Earth resources.

#### *A Vision for Sustainable Development*

Avoiding extinction is about the survival of the human species. Survival is not about violent competition and struggle. Survival is about life not death. Carbon Negative Solutions are the future of energy, and green markets lead the way to Green Capitalism, resolving the global climate negotiations and the Global Divide, providing clean energy and economic growth for the North and the South that is harmonious with the Earth's resources, creating and nurturing life. Building a sustainable future.

#### *About the author:*

Graciela Chichilnisky is Professor of Economics and of Statistics at Columbia University, Visiting Professor of Economics at Stanford University, and co-founder and CEO of Global Thermostat. Professor Chichilnisky has worked extensively on the Kyoto Protocol, creating and designing the carbon market that became



international law in 2005 and wrote the wording for the carbon market into the Kyoto Protocol at the COP in Kyoto in December 1997. She is the creator of the formal theory of Sustainable Development and acted as Lead US author of the Intergovernmental Panel on Climate Change, which received the Nobel Prize in 2007. Her pioneering work uses innovative market mechanisms to create Green Capitalism.

<http://www.chichilnisky.com/>