



The Capitalist Solution to 'Save' the Planet: Make it an Asset Class & Sell it

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Lynn Fries (LF): Hello and welcome. I'm Lynn Fries, producer of Global Political Economy or GPEnewsdocs. Today's guest is John Bellamy Foster. He'll be talking about the financialization of the earth as a new ecological regime. A regime where the "rapid financialization of nature is promoting a Great Expropriation of the global commons and the dispossession of humanity on a scale" [quote Foster] that exceeds all previous human history and which is accelerating the destruction of planetary ecosystems and of the earth as a safe home for humanity. All in the name of saving nature by turning it into a market. Our guest's monthly review articles, "The Defence of Nature: Resisting the Financialization of the Earth" and "Nature as a Mode of Accumulation: Capitalism and the Financialization of the Earth", detail this argument. Joining us from Oregon, is John Bellamy Foster, professor of sociology at the University of Oregon and editor of Monthly Review. He's written widely on political economy and is a major scholar on environmental issues. He's the author of numerous books, including "Marx's Ecology; Materialism and Nature", "The Great Financial Crisis; Causes and Consequences", "The Ecological Rift; Capitalism's War on the Earth". A forthcoming book, "Capitalism in the Anthropocene; Ecological Ruin or Ecological Revolution", is coming soon from Monthly Review Press. Welcome, John.

John Bellamy Foster (JBF): Glad to be here.

LF: We'll be talking about your thoughts on how the financialization of nature is capitalism's most catastrophic regime to date, a new ecological regime. And I take it; you think this is at the heart of what came out of the 2021 UN Climate Change Conference negotiations in Glasgow?

JBF: Yeah. Ironically, during COP26 in Glasgow, everybody was watching that, to sort of see, well, would governments and the powers to be take action to protect the earth. And the main thing that came out of Glasgow was actually these plans for the financial takeover of the earth, in the name of saving nature. And the entire conservation sector globally has now bought into these policies of financialization. This was really the main product of the Glasgow meetings, all being done by capital with support of governments. But there is no public discussion anywhere of this. There is no country where this has been subjected to democratic processes or even conversations. There's no dialogue on this. Capital is just proceeding to buy up ecosystem services, to create financial vehicles where they'll be able to control natural capital and to accumulate on the basis of it, and to run natural services on this basis with the idea of accumulating wealth.

LF: Connect the dots from capital's need for a new asset class around 2009, around the peak of the great financial crisis, to the current trajectory of the financialization of nature as a new ecological regime.

JBF: The world went through a global financial crisis in 2007 to 2010. And one of the problems in terms of financial instability, obviously, is that there are not enough underlying assets to support the financial expansion of the system, which is going on at extreme levels. So we're piling up debt in relation to the world economy, but the debt doesn't really have sufficient material foundations, revenue streams underlying it. So capital is searching for new revenue streams. And after the 2007 to 2010 financial crisis, they started looking increasingly at ecosystem services- what we could call nature and nature's services- as a basis, as a material basis for financialization. So there's this very rapid, ongoing financialization of nature that is now occurring. Where natural services, ecosystem services, are being turned into forms of exchange value that can be the basis of financialization, all in the name of saving the global environment. And there was a big change that occurred in the fall of 2021, between September and November, in the context of the UN climate negotiations, where new initiatives were introduced or brought to the forefront. And one is the Global Financial Network for Net Zero [Glasgow Financial Alliance for Net Zero], which brings together all the big financial corporations. All the big banks and hedge funds and so on all came together combining, let's say, \$130 trillion in assets. These are all basically the Western banks and hedge funds. And they claimed that they were going to organise to financialize nature in order to produce a net zero carbon economy globally. And the month before the New York Stock Exchange, together with the Intrinsic Exchange Group, introduced a new asset class on the New York Stock Exchange called Natural Capital Assets. That really had to do with this process of creating structured financial vehicles to create revenue streams from ecosystem services. That could then be financialized and debt built upon them and so on. All in the name of, again, saving nature. And finally, in the climate negotiations itself, they basically agreed on a plan for a world carbon trading mechanism that had been introduced in the 2015 Paris Agreement, but all the details hadn't been worked out. So this established at least the

basis for a global carbon trading mechanism, which would again financialize nature. And this has resulted in a huge expansion just in the last few months of attempts to financialize the earth. To turn ecosystem services, really basic ecosystem services like photosynthesis and the production of oxygen in the environment and things like that into monetary assets exchange value that capital can own. Or at least maybe nation states will own and capital will essentially manage, and this can turn into financial assets. Essentially, corporations would own what nature does, not just owning land. I mean, the governments would still probably own the land, but capital would own the services that nature provides and would manage it for enormous amounts of money. And this is the big accumulation as the Intrinsic Exchange Group said, in their views: if discounted over the century, ecosystem services are worth 4 quadrillion, or \$4,000 trillion, all for the taking.

LF: We should also know these initiatives target the Global South. As you say, basically because the Global South is where financial gains from the expropriation of the earth in the name of management of natural capital and offsets are the greatest. Your articles details ways this targeting is done. For example, the 2021 Glasgow Alliance for Net Zero initiative declared upfront that carbon mitigation financing to be made available for developing countries comes with strings attached. So financing will depend on developing countries' willingness to fully open their economies to global capital. And in the case of the agreed plan for carbon trading and in the designs to promote a world market and offsets, the \$100 billion developed countries promised to direct to the Global South is subject to debt leverage by a multinational monopoly finance capital. Just to clarify what we're talking about here with the financialization of nature and accumulation of nature, are you saying that in general that involves the creation of financial claims; so titles over natural assets and ecosystems, environmental services of various kinds that can then be traded and leveraged? Is that basically what you mean by the financialization and accumulation of nature?

JBF: Finance is really based on the promotion of debt. And from one perspective, money itself is a debt. But finance is based on the promotion of debt, and that means liens on the future revenue streams from underlying assets. What the debts represent or what the creditors get is revenue streams into the future. So essentially it means you're selling whatever nature provides or revenue streams well into the future. In a lot of these proposals, it's selling off what nature would produce or the revenue it would generate if it's reduced to exchange value over the next century or two. And this is very dangerous. We'll look back to 2007- 2010, the great financial crisis, the whole financial system was really in danger of collapsing. And the structural changes that occurred at that time, in a sense related to economic stagnation, are really still there. The financialization, the growth of the debt economy, is in many ways at a much more extreme level than it was in 2007. And we're looking at other financial crises that could occur, another conceivable grave financial crisis. This is because when we create these debt bubbles which span the economy, but eventually the bubble bursts. And the consequences are there. And our economies are growing slowly, but we're also expanding the debt bubble at the same time. And so we're in a sort of stagnation/ financialisation trap. Well,

then if you try to financialize the whole of nature and try to run ecosystem services under capitalist principles regulated by structural investment vehicles, you're basically bringing nature into this financial bubble. But it's absurd because the laws of nature- we can talk about the laws of nature as the scientific world does, meaning the biogeochemical processes of the earth's system- do not operate like capitalist markets and actually attempts to monetise nature and treat it as a financial asset, as an economic asset, a stream of income in which we can impose debts, and this will create revenue according to the power of capital and at the same time save nature, it's really a fairy tale. I mean, it's worse than a fairy tale. It's a complete fetish of capital and nature. John Maynard Keynes once said that we're in trouble when the underlying productive economy becomes a bubble on the financial system. But we're now creating a situation where the earth itself is going to be turned into a bubble on the financial system, which itself is a speculative enterprise. There's a famous statement by a 19th century chartists, Dunning, in his book on the trade unions that Marx quotes in Volume One of "Capital". Where Dunning says that capital will do such and such for a 12% rate of return. And it'll do even more, it will transgress laws for, say, a 50% rate of return. But for a 300% rate of return, it will lie and destroy and it's willing to sell off humanity and the earth itself. And he points to the slave trade. And I think that's what we're in the situation of. The returns are so great that capital is really mesmerised by this notion that ecosystem services discounted and projected over this whole century are worth \$4 quadrillion. And then they can go in and have a piece of this. And the fact that this is so destructive is ignored. And also what they're doing is taking ecosystem services not from the population of the earth as whole even, but more immediately they're taking nature away from Indigenous populations. In Africa, for example, it's claimed that 90% of the land is essentially untitled, which capital can take over and reap the natural capital ecosystem services. Reason for this is it's a legacy of colonialism. So that after the colonial period and the post-colonial period, it was sort of recognised that Indigenous communities had common rights to the land that they lived on throughout history, but they didn't have any actual title. They just had sort of vague common rights. While the governments were given, like every government was seen as actually having the final right to all of the land in a country. And what's happening is that the Indigenous claims to the land are being kind of removed. They are not treated as having the same basis as private property. And so these lands can be expropriated in land grabs. And a lot of this is now in order to gain hold of natural capital and ecosystem services. And it is ripe for corruption. My article starts out with a massive case of corruption over natural capital in Malaysia's Borneo state of Sabah. So we're seeing struggles of Indigenous people over this financialization of the earth as well.

LF: John, I'll quickly round off for viewers on points you just made about the struggle of Indigenous peoples and the innate power of capital. First, on the fairy tale of the innate power of capital, and so liens on the future production of the economy, as ecological economist, Herman Daly, has put it to cite a few lines from your Defence of Nature article, quote, "the capitalist growth economy, while continuing to profit in the course of its creative destruction, is ultimately faced with physical limits of an Earth System, which does not, like compound

interest increase exponentially". "Real physical wealth emanating from nature and ultimately derived from solar energy is subject to the entropy law and cannot generate endless rapid growth as in the case of 'symbolic monetary debt'! The conflict between finance-based economic expansion and the ecological basis of society is thus inevitable". In the context of struggles of Indigenous peoples to cite the same article, quote, "This struggle is occurring on all three continents of the Global South and in regions of the Global North an indication of how close the ties are between neocolonialism and the natural capital juggernaut". And as you say in these articles, the financialization of the earth is promoting a Great Expropriation of the global commons and the dispossession of humanity on an unprecedented scale. Give us now some big picture context and also historical context on your ecological critique of how financialization is also an expropriation.

JBF: Well, Karl Marx once said, and this is a paraphrase, but it's very close to what he said. He said, nobody owns the earth. Not even all the people on the planet own the earth. We hold it in trust as good heads of the household for future generations, for the entire chain of human generations. You know, in terms of humanity, if anyone has a right to the earth, to the planet, it's all of us together. Or certainly, we hold it in trust for the future. To sell it off to private services is another matter altogether. Karl Polanyi, the great economic anthropologist, once said that converting nature into real estate was the most extreme invention of our ancestors. But now we're going a step further. It's not about ownership of land, but it's the selling off and integration into the financial world of all that nature does, all of its ecosystem services across the planet. And parcelled out and turned into debts and derivatives and revenue streams which will be owned by capital. Things that were previously considered the free gifts of nature will now be owned by financial interests and private financial interests. That means a few will own ecosystem services and the rest of the population of the earth will be dispossessed.

LF: Speaking now in the context of a system of production, explain more about the term expropriate. So what exactly does that mean?

JBF: Expropriate basically means taking without return. We have to take from nature in our production. And there's nothing wrong with the free appropriation of nature on behalf of humanity as a whole. There is a problem when nature is treated as a free gift to capital, as nothing but a means to capital accumulation. And there's a problem when the appropriation of nature doesn't occur in a sustainable way. That is, there's no reciprocity, there's no giving back in any way. So that it becomes a form of robbery. You're taking without replacing and that always results in destruction. And our system basically does that. Now there are resources that are irreplaceable; that they can't be replaced. Herman Daly set out how we can use all resources sustainably. And we have to conform to those rules or we're really destroying the ecological basis of our own existence. Ecologists talk about the tap and the sink. The tap refers to what we extract from nature. We also have the problem of the sink. That is, where do we dispose of the waste from production. And carbon dioxide emissions are

basically a waste from production. Which on a small scale wouldn't really be very important there. I mean, carbon dioxide is part of our own respiratory system. But on the scale in which emissions are occurring today and concentrating carbon in the atmosphere, we're producing climate change which is threatening civilization and the very existence of humanity. When we think about production, we have to think about not only the tap, that is the extraction; we also have to think about the sink, where the waste goes. And there are rules in terms of sustainability and how we can live on the planet with these limitations. But capitalism is not geared to anything like that. It has one goal, and that's the profit motive or the accumulation of capital or the increase in stockholders equity, however you want to look at it. That's what drives capital. It really doesn't see anything else. And in the process of growing, even as our economy grows, we're destroying the natural system around us, which is the very basis of our existence.

LF: You point out that in Marx's view, it was necessary in any critique of capitalism to understand not only the enormous productive forces generated by capital, but also the negative, destructive side of capitalism's interaction with the environment. And for this, Marx placed an emphasis on natural science. And this emphasis can be seen in his treatment of capitalist agriculture, where Marx was the first major economist, as you say, to incorporate concepts like metabolism and the laws of thermodynamics into the analysis of production. Your argument being ecological thought has deep roots in the 19th century and the influence of Karl Marx. Talk about those deep roots of present day ecological thinking.

JBF: In the beginning of the 19th century, around 1815, I think, the natural scientists working mainly in physiology started to develop analysis of cell metabolism. And so this was very important in the development of biology and physiology. And Marx had a friend, Roland Daniels, who was a physician scientist. Many of the scientists in those days came out of being physicians. And Daniels wrote a book called "Mikrokosmos", which had only one reader. And that was Karl Marx. It wasn't actually published until the 1980s in Germany, I think. But Marx read it, and Daniels had used the concept of metabolism in a broader ecological sense to look at the systemic relations between plants and animals and the earth. So he was using metabolism as a systems ecology concept; beginning to do that. At the same time, the concept of metabolism was also being used in the development of thermodynamics. Especially the first law of thermodynamics on the conservation of energy. So metabolism was being used in that sense. And Justus von Liebig, who was the leading German chemist and very influential agricultural chemist, introduced the notion of metabolism in looking at the disruptions that were occurring in agriculture at the time, as a result of industrialised agriculture. At any rate in the 1850s, really under the influence of Daniels, Marx began to use the concept of metabolism as a systemic concept. And he introduced the notion of social metabolism. And he developed this analysis in his "Critique of Political Economy" and in "Capital". So he was the one who introduced the notion of social metabolism. And social metabolism was really related to the labour and production process. So that in engaging in the labour process and in production, human beings were transforming their relation to the earth. They were taking

what nature provided and transforming it. And in the production, of course, transforming themselves and society. But Marx made this powerful social ecological connection unlike any other thinker in his time, or maybe even in our own, where the understanding of production with his whole class analysis and so on, his so-called social analysis, was unified with ecological analysis through the concept of social metabolism. And not only that, he introduced a concept called the universal metabolism of nature. Marx didn't talk just about nature. He talked about natural processes in terms of metabolism, and he talked about the universal metabolism of nature, basically what we would call earth system processes today. Under capitalism, he argued that the social metabolism was alienated, so we had a destructive relation to nature. The social metabolism came in conflict with the universal metabolism of nature. And in those cases what happened was a rift between human beings and nature. And Marx wrote of the irreparable rift in the interdependent social metabolism between humanity and nature. And we call this the metabolic rift. And his theory of ecological crisis, which was very pronounced and connected to his whole critique of the social system, is really defined by this analysis of the metabolic rift. Marx's usage of metabolism actually influenced other thinkers in his time and afterwards. For example, the leading British natural scientists, the leading British biologist, really a zoologist E. Ray Lancaster- Darwin and Huxley's protégé- was also a close friend of Marx. Lancaster was the leading developer of an ecological crisis analysis in the late 19th and early 20th century. And this same ecological systems approach, which was rooted in metabolism, gave rise to the concept of ecosystem, which is our main ecological concept. And that was developed by Lancaster's student, the botanist, Arthur Tansley. And working in conjunction with systems theory developed by Marxist mathematician, Hyman Levy, but building on this conception of metabolism. And this all goes forward from there so that we now speak of the earth system of metabolism. So Marx's approach is completely integrated with science. And ecological science down to the present day operates with these same conceptions.

LF: I'll have another stab at some of your essential arguments on how financialization is also an expropriation and related to the robbing of nature you referred to earlier. So take us through the 19th century concept of robbing this soil into the present, where as you write in the "Defence of Nature" article that, quote, "The Original Expropriation has metamorphosed into a planetary juggernaut, a robbery system encompassing the entire earth, leading to a more universal dispossession and destruction". And with respect to the Original Expropriation, to cite the "Nature as Mode of Accumulation" article, quote, "The expropriation of the commons, its simplification division, violent seizure and transformation into private property constituted the fundamental precondition for the historical origin of capitalism". "What Karl Marx referred to is the original expropriation of the Commons in England and in much of the world generated the concentrations of wealth and power that propelled the late 18th and early 19th century's Industrial Revolution". And as written in parenthesis, this original "expropriation often involved various forms of slavery and forced labour". So in a nutshell, from the Original Expropriation to the Great Expropriation, explain this reference to the robbery of nature.

JB: In the book, "The Robbery of Nature" that Brad Clark and I wrote together, we connected the issue of the rift, the metabolic rift, to the issue of the robbery of nature. Going back to Marx and his discussions in "Capital" and elsewhere, and to Justus von Liebig and others we argued that the rift, the metabolic rift, or the rift in the metabolism between human beings and nature was a product of the robbery of nature. Not addressing the need for reciprocity and sustainability in the relation to nature. So taking from nature and not giving back is a form of theft or robbery; expropriation, in fact. So expropriation is a form of robbery, stealing. But not just nature, it's some expropriation of human bodies in many cases. We look at slavery. We look at the oppression of women, problems of social reproduction. And these kinds of issues, the oppression of women, slavery, the super-exploitation of people in the Global South, are all issues of robbery. And the seizure, of course, of the financialization of nature, land grabs, these are all forms of expropriation that then create the basis of private property, capital accumulation. And capitalism constantly seeks to expropriate people, resources, land, nature in order to expand its system. So the robbery of nature is integral to the problem of the metabolic rift. The metabolic rift, Marx explained originally in terms of the soil crisis in England and elsewhere in the 19th century, where industrial capitalist agriculture was intensively removing nutrients such as nitrogen, phosphorus and potassium from the soil in the food and fibre that was being exported to the urban centre with the concentrated industrial population. And the nutrients which were being shipped in the food and fibre, hundreds, maybe thousands of miles to the cities did not return to the soil again. So they had to try and get bones from the Napoleonic battlefields in the catacombs of Europe to have natural fertiliser for the soil and guano from Peru establishing the whole massive guano trade where they use Chinese labour, basically expropriating their bodies and killing them off very rapidly in order to get the guano, the bird droppings to fertilise soil in England, which was being depleted by industrial agriculture. And this kind of robbery of the soil is a model of how capitalism robs resources and land everywhere. Taking without putting back, not following ecological principles, ignoring permaculture, building monocultures and basically destroying the earth. So the robbery is the source of really the metabolic rift itself. And that rift between human beings and nature is how we can understand ecological crisis. It's all rooted in the system of production, the capitalist system of production, which has now been globalised and financialized and is really driving the world to the wall.

LF: The capitalist system of production, as we all know, is based on commodity production for exchange value and endless capital accumulation. So a treadmill of exchange, profit and accumulation. Your Monthly Review articles clarify how the concept of natural capital originally arose as a defence against the capitalist system of production for exchange value. Briefly explain that and then the related concept of the Lauderdale Paradox.

JB: You have to go back really to the 19th century and the concept of natural capital was introduced by socialists and radicals in opposition to the expropriation of nature in their time,

the turning of nature into exchange value. Which in our terms was at a fairly crude level, but land was being taken over and turned into exchange, value being turned into capital. The concept of natural capital was opposed to the turning of all of nature- in those days they were thinking simply of land and raw materials- into cash, into exchange value, into the cash nexus. They argued that we had a natural capital stock that we had to protect. And they saw it in use value terms. That is, natural materials use value terms. We had to protect this stock of nature. They argued that if nature, which was the essential basis of human existence, the material nature and the land and the resources, the forests and so on, were brought into the system of exchange value under capital- which they were seeing happening in their day and then land turned into real estate markets and so on, private real estate markets- then this would destroy the basis of natural existence on which we depend. You see figures like Ebenezer Jones and his famous book on the land in England and figures like Karl Marx, arguing for a conception of natural capital that's based on use value and not exchange value. Marx later abandoned the notion of natural capital because he thought that it led to the notion of the naturalisation of capitalism. And so he adopted a different vocabulary distinguishing between earth matter for nature and earth capital, that is when capital takes over nature and turns it into exchange value. And there's a notion known as the Lauderdale Paradox, named after the Earl of Lauderdale in the beginning of the 20th century. And he developed this notion that capitalism, he didn't use the term capitalism but it was implicit. He was talking about natural material use values constituting public wealth, like the water, the forests, crops. He argued that capitalism or the system of private exchange, since it depended on exchange it depended on scarcity. That things only really had value or could be marketed if they had a price. And price depended on scarcity. So that water that was freely available and abundant did not have a price, had no exchange value,. And the air had no exchange value because it was abundant, freely available. You could apply this to other aspects of nature and they were actually kind of free gifts. And capitalism came in and one of the things that it does in order to make an exchange value economy and profit off it, they want to make these resources scarce. One way you make them scarce is just by creating private ownership and private monopolies, which then can restrict the access of others to the resources. If there are wells for water, if somebody comes in and takes it over and it becomes a private monopoly, they can charge money for water. And so the private economy worked at destroying public wealth in various ways. And systematically works at that in order to create private markets. And Ebenezer Jones in "The Land Monopoly" talked about what would happen if the air in the vicinity of London were turned into a private market?! He was writing in the early 19th century, so this wasn't really the case but we can understand now. And all of these thinkers argued that nature had to be seen as a natural material use value, the basis of our existence. And it could not be reduced to exchange value, to the cash in excess of the market, without destroying the basis of our existence. And that was how the concept of natural capital arose. The emphasis was on natural. That this was a stock within nature and a permanent stock on which we depended.

LF: So as you write in your "Nature as a Mode of Accumulation" article, this concept of natural capital rooted in use value, quote, "was reintroduced into the economic discussion in the 1970s and 1980s beginning with Schumacher's 'Small Is Beautiful', to highlight the 'liquidation' of 'natural capital' stock as a failure of the first order of the modern economic system. This representing the view of ecological economics. And you also explain in a thermodynamic based tradition, ecological economists initially inspired by Nicholas Georgescu- Roegen's 1971 publication, "The Entropy Law and the Economic Process", also embraced this notion of natural capital. And wedded it, as you say, to the notion of "critical natural capital in conformity with what's known as the strong sustainability postulate". An approach which established limits to growth and determined sustainability in biophysical/ use value terms. And critical to this were the three principles of sustainability, introduced by Herman Daly, that you referred to earlier. The first principle was for renewable sources, the second a non-renewable source, and the third for a pollutant. You go on to write in the same article that quote, "The basic elements of Nicholas Georgescu- Roegen's thermodynamic critique of neoclassical economics were accepted from the start by Marxist economists and viewed as consistent with Marxian tradition, though lacking a social critique". So talk now about the neoclassical response to all this and other approaches inspired by other prominent like-minded figures like Howard Odum, for example. In other words, talk now about the neoclassical response to an ecological economics tradition in which the concept of natural capital was rooted in use value terms.

JBF: Neoclassical economists worked on turning this into an exchange value concept. In the beginning of this century, neoclassical economics sort of took over ecological economics to a large extent, which had been a distant tradition and reduced the natural capital concept to a concept of exchange value. And that is to be measured as capital in monetary terms, to be monetised assets. The notion of use value of nature as constituting use value, really isn't present at all in neoclassical economics, which doesn't use the concept of use value. So basically, there was this switch and part of the switch was associated with the calculations they made of ecosystem services and of natural wealth. And once those calculations were made on largely bogus grounds, because they were turning into hypothetical markets things that weren't markets at all, but once the price tag on it then capital started to see, well, how can we actually make these into markets that we can then capitalise on.

LF: Talk about how these calculations had put a price tag on nature, we're arrived at.

JBF: If you look at how this happened, there was actually a big debate about this in ecological economics. But those who wanted to reduce nature to exchange value, or at least to calculate this one out and the primary figure in this was Constanza, who was also editor of "Ecological Economics". And in 1997, they came out with the first calculation of what the world ecosystem services were worth in monetary value. Now you have to understand that these are not actual markets. So they did all sorts of fancy manoeuvring to convert what nature does into markets. So they divided what nature does globally into 17 ecosystem

services occurring all over the planet. And they came up with values for each of these ecosystem services based on methods like hedonic pricing, which is basically a way of just attributing a value to nature based on comparisons with current practices. So they use these kinds of techniques and they use what they call contingent valuation, where they draw a hypothetical market and then survey consumers on what they're willing to pay. They use these kinds of techniques to value some particular ecosystem, and then they extrapolate the studies to that ecosystem globally and come up with values. And they did this for like 17 different ecosystem services globally. And that becomes then the value of ecosystem services throughout the planet. They ostensibly did this in order to put a value on nature so that people would protect it. But the moment this started to happen- and it was predictable- capital began to see that these ecosystem services could be turned into markets- value didn't turn it into markets- and financed through debt and purchased, and a basis for financial accumulation. And the same group under Constanza came out with another estimate of the world ecosystem services, which was even higher. And you had all of these massive meetings of corporations and the establishment of natural capital protocols and various ways of organising and studying and figuring out how to create markets out of these ecosystem services that emerged, in which all of the giant corporations were directly involved.

LF: Give us more of a picture of the ramifications of this switch in ecological economics.

JBF: In the 21st century nature is now treated as capital, as exchange value, as a source of exchange value. And if you look at the concept of natural capital that is seen in this new kind of neoclass- the dominant economic perspective- natural capital is used for the underlying natural asset, which is now seen as ecological capital. But all of the estimates and projections and all the financialization is based on the concept of ecosystem services, which is seen as the revenue stream provided by nature. When nature does things like photosynthesis, it's providing a service supposedly to the world economy. Nature doesn't know it's doing that, as we might say. But in their theory that nature is providing ecosystem service to the world economy, which, like any revenue stream, can be capitalised on. Basically, once they figure that there is a revenue stream here of ecosystem services derived from the underlying asset of natural capital, they can then take that revenue stream and divide it by the discount rate and multiply it by 100% to get an expected stream of revenue. A way into the future, say, into a century in the future. And then they can impose a debt on the basis of their revenue stream and financialize nature and make huge profits.

LF: Talk more specifically on how natural capital defined in exchange value terms came to stand for and represent the view of ecological economics.

JBF: If you look at "Ecological Economics", the Journal, which was associated with the International Association for Ecological Economics, they actually had a battle between Howard Odum, one of the chief developers of systems ecology in the world, and Robert Constanza over whether the Journal was going to go the route of seeing nature as exchange

value or whether ecological economic was going to have a deep conception of ecology based on use value. And Howard Odum and the other scientists that he was associated with, that have been part of the founding of "Ecological Economics", the journal, were basically thrown out. And that's sort of the beginning of ecological economics becoming something different, captured by or recaptured by neoclassical economics. And you have people like Robert Solow, the most prestigious neoclassical growth theorist, who said that if natural resources could be substituted for, then effectively they don't matter and can be left out altogether. And that actually is what was done with the neoclassical production function. Labour and capital are the only factors of production in nature. Land is excluded altogether. The whole notion of use value in nature is excluded altogether. Everything, absolutely everything is reduced to exchange value. And then that provided the kind of theoretical basis for weak substitutability, which is the notion that nature doesn't really matter. That markets can substitute for natural resources in whatever nature does. And that connected up with the development of the estimates by Constanze and others of world ecosystem services. And pretty soon we have these notions of the financialization of the earth. Not simply in an academic sense, now transferred from the academic world into the world of capital where corporations and governments begin to put into plans the policies, calculations, methods, structures for actually turning ecosystem services everywhere on the planet into economic markets, which capital can finance and accumulate on the basis of.

LF: We've been talking about the argument you put forward that this financialization of the earth as a new ecological regime is accelerating the destruction of planetary ecosystems and of the earth as a safe home for humanity. Talk for a moment about how, even before this new ecological regime, you warned of an accelerating pace of devastation compared to earlier periods of capitalism. Amongst examples of this, you write about how Darwin and his time had been struck by how European colonisation turned the ecology of the island of Saint Helena into a desert, in just three centuries. The island of Saint Helena, having been made famous by the voyage of the Beagle. Yet in the current stage of capitalism, the biogeochemical processes of the entire Earth system were altered in just two generations.

JBF: I wrote about this in my book, "The Vulnerable Planet" in 1994, where I was explaining how we were crossing the thresholds of the biogeochemical processes of the planet and threatening the whole earth system. But what struck me and what I wrote about then is the speed with which it's occurring. The speed in terms of climate change. We've seen massive geological changes in the history of the earth, but we haven't seen anything that occurs with this speed. This is one of the reasons why we can point to the anthropogenic causes and the anthropogenic rift in the earth's system, which is how we define the coming of the Anthropocene epic in earth system history. And it's really the speed of the change and the scientific reports, although they've, you know, the IPCC [International Plant Protection Convention], they've tried to keep up with this, but all of their reports, I think, all the way along have underestimated the speed with which we are transforming nature. And this is under the pressure of a system of capital accumulation geared to exponential growth. At this

point, we generate vast, vast amounts of economic and ecological waste, things that people neither need nor really want. And we have a marketing system, a massive multitrillion dollar marketing system geared to getting people to buy more and more. And our system is geared to the fastest growth possible. And in order to accomplish that, even in periods of economic expansion, we draw more and more on extracting from natural systems. And this is a high energy intensive system. It doesn't take care of people's needs. The wealth created is not going to the populations. And in the dominant ideology, they don't even talk about trickle down anymore, which they talked about in my youth, because everyone knows that that's false. So we are creating a system that doesn't benefit the human population economically, while we're actually destroying the entire Earth. And the motor of this is a capital accumulation process that is now highly financialized and globalised and has become the enemy of humanity and the planet. We put profits before people on the planet in all cases in this society. You can't solve things that way. The capital wants to say, well, technology will solve the problem, because they don't want social transformation. They want to say, well, we can do it with technology. And the population falls for that because they have cell phones in their pockets and they think, oh, technology is absolutely wonderful. But no matter how wonderful cell phones are, that communication technology and other technologies we have do not allow us to transcend the laws of physics. And we're right up against that today. And it spells an unimaginable crisis, really, for the population of the earth.

LF: The Anthropocene epic you refer to is, of course, a reference to geological time. To cite the flyer from your forthcoming book, *The Anthropocene Epic*, quote, marks "a changed reality in which human activities are now the main geological force impacting the earth as a whole, generating at the same time an existential crisis for the world's population". Talk more about the issue of the capitalists argument that technology can save humanity from ecological ruin; so things like geoengineering.

JBF: Well, it is not just geoengineering, but things like carbon sequestration methods and direct air capture. But it's interesting, in the sixth assessment report, AR6 of the IPCC- the mitigation part of the report, part three by Working Group three- was published in April of this year. But the actual scientific consensus report, the report as written by the scientists themselves, was completed in August 2021. And governments in the IPCC process have the right to come in and rewrite the scientific report; the summary for policymakers. And they rewrote the science report entirely. Practically every line in the scientific consensus report was censored by governments and in some places turned into the direct opposite. And we know this because Scientific Rebellion in August 2021 leaked the Scientific Consensus Report on mitigation, which we posted on the Monthly Review website. So you can compare what the scientists decided to the published summaries from policymakers, from governments. And we find that in the scientific consensus report, they said these technologies are not available, won't work, and cannot play a major role in keeping us below 1.5 degrees Celsius or even below two degrees Celsius. And they said other things like coal fired plants had to be eliminated globally this decade. And what we need is basically low energy

solutions which can improve societies. Conditions, as that report said, prove the conditions of everybody on earth, but also using less energy in the process.

LF: Back in 2019, in writing on how capitalism had failed and asking what's next, you argued that, quote, "Once sustainable human development, rooted not in exchange values, but in youth values and genuine human needs, comes to define historical advance, the future, which now seems closed, will open up in a myriad ways, allowing for entirely new, more qualitative, and collective forms of development." And so what's coming across loud and clear in all this is how the way you see it, the underlying structure of capital accumulation itself, is what is standing in the way of real solutions to the ecological crisis.

JB: The irony is that capitalism has created this ecological crisis and is generating it. And the answer of capital- and this is typical of the system- is that we just need a more intensive, more extreme form of capital accumulation. The answer to the ecological crisis created by capital is to turn all of the world ecology into capital, to make the entirety of nature conform to economic laws, essentially. And the economists and the capitalists say, well, this is the answer. The reason why that sells, despite the illogical nature of it, is that for capital, that's always the answer. If there is a crisis, the crisis is because there's too little capital, not too much. From capital standpoint, the answer to every crisis, let's say an economic crisis, is to redistribute income from the poor to the rich. That is, increase the power of capital. If there's a problem, an ecological crisis, the answer is to increase the power of capital markets and expand it into nature. Paul Hawken and others with him in his book "Natural Capitalism", argues: we don't really have capitalism until all of nature is part of capital, as part of capitalism. But that's absurd. We live within a planet. Capitalism exists within the planet. Human society exists within the planet. Human beings live within the planet. We can't turn the entire planet Earth into some kind of attribute of the capitalist market system without destroying the world. But that's exactly what we're doing. The solution to the ecological crisis that they're advocating doesn't involve taking energy efficiency and turning it into conservation. Like you see in Cuba; they take energy efficiency and turn it into a greater expansion of the economic system. And that doesn't help. That's what we call the Jevons Paradox, that the more efficient we are in the use of resources, the more resources we use because the object is not to conserve, but it's to expand the economy and the accumulation of capital. Well, in such a system, you're headed towards destruction. Now the destruction is very close upon us. We're very close now to the 1.5 degrees increase in global average temperature. In the latest IPCC report, AR6, the physical science basis, they say in their most optimistic scenario we will hit 1.5 degrees Celsius in 2040. That would require a kind of revolutionary scale social transformation to accomplish. More likely, we're going to hit 1.5 degrees Celsius in this decade in just a few years. We're headed over the edge of the cliff in terms of the tipping point for the climate where we will reach irreversible climate change. And even in the most optimistic scenario, we're facing major catastrophes in the next few decades. But if we don't take the action that prevents irreversible change, we will be threatening civilization itself in the broadest sense and the human species and billions of

people on earth. We have to have a different method. 60 years we've known about climate change, accelerated climate change or accelerated global warming, and all we've done is promote capitalist solutions that have gotten us closer to the edge of the cliff. And we're now on a runaway train. It's time to pull the emergency brake.

LF: There's a lot more behind this and a lot more to come in your forthcoming book on "Capitalism in the Anthropocene; Ecological Ruin or Ecological Revolution". But for today, we're going to have to leave it there. John Bellamy Foster, thank you.

JBF: Thank you.

LF: And from GPENewsdocs in Geneva, Switzerland, thank you for joining us.

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