



Blue  
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**2024**

Professor Robert Costanza

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Interview Summary

THE ASAHI GLASS FOUNDATION

## Prof. Robert COSTANZA (U.S.A./Australia)



**Ecological Economist**

**Born: 14 September, 1950 in U.S.A.**

**Professor of Ecological Economics  
The Institute for Global Prosperity,  
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### <Early Childhood~University>

Professor Robert Costanza was born in September 1950 in the town of Donora, Pennsylvania, U.S.A. Donora was once a steel mill town, but in 1948, two years before Professor Costanza's birth, a combination of toxic gases emitted from the steel mill and climatic conditions formed smog that caused many deaths in the town. This incident led to the creation of the Clean Air Act and eventually the Environmental Protection Agency in the United States. The Donora disaster became a globally significant event in the history of air pollution control. Professor Costanza's parents and their families were Italian immigrants, many of whom lived in or near Donora. He spent the first 8 years of his life surrounded by aunts, uncles and cousins in a loving environment. After the incident, many lawsuits were filed and the steel mill was eventually shut down completely. Many people moved away and the Costanza family moved to South Florida because his father was born in Sicily and wanted to live somewhere warm. South Florida was not as developed as it is today. He lived near a national park and the ocean, and spent his middle and high school years in a rich natural environment. He was interested in a variety of subjects and didn't have one particular interest. However, there was one area that gradually attracted his interest, and that was aerospace engineering. In the 1960s, the Apollo program was being promoted in the USA during which scientific and technological competition with the Soviet Union in space exploration was a matter of

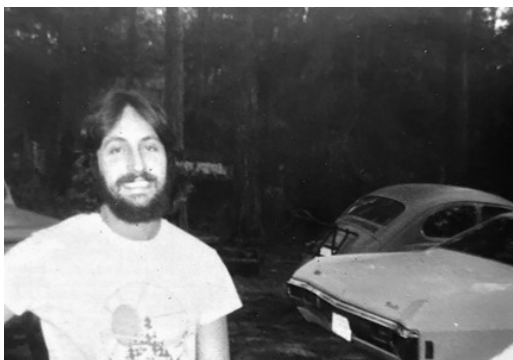


Prof. Costanza (far left) and his two brothers

national interest. Inspired by this spirit of the times, the young Professor Costanza became interested in aerospace engineering and in 1968 he entered the Department of Aerospace Engineering at Purdue University in Indiana, a university with an international reputation in engineering studies. Two years later, however, he switched his major to architecture and transferred to the University of Florida. He found that engineering was not as creative and inspiring as he had expected and he thought that architecture would use engineering disciplines but have more creative aspects. This major shift from space to architecture may have been the initial impetus for Professor Costanza's later career development, which contributed to the development of the new interdisciplinary field of ecological economics.

### <The Broader Perspectives Developed at University>

While he was studying architecture at the University of Florida, he had a chance to participate in a joint research project where his professor at the Department of Architecture was working with Professor Howard Odum, a leading authority on systems ecology. This opportunity prompted him to have Professor Odum as his Ph.D. supervisor and Professor Costanza receiving his Ph.D. in Systems Ecology in 1979. Professor Costanza says that architectural study is more of a synthesizing activity which requires you to think in a more holistic way. While working on land use maps, you have to look at how that land has changed over time. Since a big part of what was driving that change was how the economy was working and how urban development happened, you need to understand how the economy engages with the environment to bring about these changes, which requires a profound understanding of the whole system, synthesis and creativity. Professor Costanza believes that in addition to his experience in architecture, his doctoral studies in various specialized scientific disciplines, such as hydrology and meteorology, as well as economics, have broadened his horizons and allowed him to think from completely different perspectives and combine them. It was not just about understanding these systems, but understanding the underlying dynamics of these systems and how complicated they are then projecting them into the future to make the trajectory of the world move in a better direction. Interdisciplinary approaches are commonly practiced today, but there was much more emphasis on individual disciplines at that time. His way of conducting research and analysis from the perspectives of multiple disciplines was considered a unique and very different approach.



## <Integrating Ecology and Economics>

After receiving his Ph.D. from the University of Florida, he went on to study coastal wetlands at Louisiana State University's Coastal Ecology Laboratory and the Marine Science Department, as it was known at the time. These wetlands were a huge delta plain composed of sediments from the Mississippi River that had accumulated over many years. It was a place where diverse wetlands, salt marshes, and freshwater marshes were part of the system and provided many benefits to people in terms of fisheries and recreation. However, the river was leveed because the area was naturally prone to flooding which interfered with infrastructure. This caused sediments to be carried to the sea and no longer flow into the delta plain created near the mouth of the river. Many wetlands and marshes were at risk of being lost. To make matters worse, local oil and gas development were disrupting hydrological patterns in the area, which has led to a further loss of wetlands. The research he was involved in was concerned with the causes of wetland loss and how to interpret it. However, there was one more important point in that research, that is "the contribution that the wetlands make to the people". What do local people actually lose by losing important wetlands? How do we evaluate the contribution of the wetlands? This was where Professor Costanza began attempting to evaluate ecosystems and the services they provide. This wetland research led him to collaborate on another wetland research project with his colleagues from the Economics Department at Louisiana State University and then-Economist Professor Herman Daly, who later won the Blue Planet Prize in 2014. The two of them conducted a series of studies together and tried to bridge the gap between the two fields through their innovative approach to understanding their interrelationships. They eventually founded the journal *Ecological Economics* to provide a forum for the publication of papers related to ecological economics, contributing significantly to the development of ecological economics, which was still a new discipline at the time.

He also participated in a progressive meeting of ecologists and economists in Stockholm organised by his friend and colleague, Prof. Anne-Marie Jansson, and conducted research at the University of Illinois at Urbana.

Professor Costanza then founded the International Society for Ecological Economics in 1989, to further deepen the understanding of the concept of ecological economics through a series of discussions, to explore ways to combine ecological and economic perspectives, and to show the world, that a broader



perspective is needed that incorporates not only the market economy but also the natural systems that surround it.

### <Evaluation of Ecosystem Services>

He continued conducting research to combine ecology, economics and other disciplines with a broad perspective and viewpoint, and published a paper in 1997 entitled "The Value of the World's Ecosystem Services and Natural Capital", in which he quantified the value of ecosystem services.

Professor Costanza's used his academic background in system ecology to look at economy, society and nature as a whole system, as they are interconnected and interdependent.

This required deep understanding about how interdependent they all are, what their values are and how they can be quantified. He also believed that this understanding of interdependence may address many of the problems and situations the world is actually facing.

In order to maintain a high state of wellbeing and to ensure that this continues in the future, we need to understand how much humanity depends on the natural world and how much nature benefits us. One way to do this was to quantify the value of ecosystem services in monetary units.

To quantify ecosystem services, they first divided the ecosystem services in the world from which humans receive benefits into 17 categories, such as gas regulation, climate regulation, water supply, soil formation, waste treatment, pollination and food production, over 16 global biomes where biological populations with common characteristics exist. These include the open ocean, estuaries, continental shelves, tropical forests, tidal marshes, tundra, deserts and urban areas. They then looked at the extent of each of the 17 ecosystem services in each of the 16 biomes to quantify them.

Their attempt was the first of its kind to use such a synthetic approach to study the whole system of ecosystem services. Since there had already been a number of studies on individual ecosystem services, such as the role of mangroves in protecting coastal infrastructure, they collected different types of existing information, analyzed the data, integrated it and compiled it. At that time, they did not have the internet that we have today, so they worked in teams and looked at each study individually to estimate the value of each



ecosystem service in each category, and finally added it all up to produce a numerical value in monetary units.

So how were various ecosystem services converted into monetary values? There is a range of techniques depending on the service itself and one of the methods is called 'avoided costs'. For example, the value of coastal wetlands for storm protection would be first assessed based on elements such as where a particular storm occurred, how much damage it caused, how big the storm was, and how many wetlands exist in the storm affected area, and so on. After collecting as much as data as possible, they estimate what the scale of damage would have been if the wetland had not existed there at all. Another method is called 'replacement cost'. For example, freshwater is provided by forests and uplands that filter water. But if there were no such natural filtration systems, then water treatment facilities would have to be built to achieve the same effect. So, the value is calculated based on how much it would cost to replace that service. Another technique is called 'contingent valuation'. For example, in the case of forest recreational services, people are asked how much they would be willing to pay to enjoy it. This is also a way of converting the intrinsic value into a monetary value. Other research has involved computer modelling to determine the extent and nature of ecosystem contributions to human wellbeing.

The total economic value of ecosystem services worldwide, derived through a number of work processes and the analysis and synthesis of a large amount of different data, was estimated to be approximately \$33 trillion per year. A significant portion of this value was not reflected in market prices. This figure was considerably higher than the world's entire GDP at the time, underscoring the extent to which humanity depends on ecosystem services. This outcome had a profound impact, raising global awareness of the vital role of ecosystem services.

The paper also addressed the limitations and caveats in estimating the value of natural capital, including the fact that it was the first attempt to integrate different kinds of research data on individual ecosystem services into one, and that there was much less research material on ecosystem services than there is today. Nevertheless, it was determined that even if these challenges had been resolved, the estimated figures would still result in a higher value. The paper generated a considerable interest and prompted efforts by international organisations to assess the value of ecosystem services. Furthermore, it facilitated the integration of ecosystem services into the decision-making process, which resulted in the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Millennium Ecosystem Assessment by the UN. The paper also inspired a number of studies on the value and valuation of ecosystem services around the world, which helped to keep various data in ecosystem services updated all the



time. Using the latest information accumulated through new studies, Professor Costanza's team conducted a reassessment to see how the value of natural capital has changed between 1997 and 2011, and published a paper in 2014 entitled *Changing the Global Value of Ecosystem Services*, in which they estimated that \$20 trillion worth of ecosystem services are



lost every year. Since the publication of the first paper by Professor Costanza in 1997, the value of ecosystem services has been presented to the world in various ways, and facilitated the regulation by the US federal agencies and the EU that the impact on the ecosystem services needs to be considered for policy decisions. His research has provided invaluable contributions that have enabled the development of new foundations for our future.

#### **<Limitation of GDP and the New Indicator>**

Professor Costanza's paper demonstrated that the value of ecosystem services exceeds GDP, and most of these values are provided outside the market and not included in the GDP value. GDP is a calculation of economic activity in the market and does not factor in, for example, climate regulating services which are provided by natural systems and have a significant value for our wellbeing. Professor Costanza also pointed out that GDP also counts economic activities unfavourable for our social life, such as increased security equipment and police deployment resulting from elevated criminal activities. For these reasons, he stresses that GDP cannot accurately measure social wellbeing and should not be used as an indicator.

The global policy goal after World War II mainly focused on maximizing GDP growth, with the underlying assumption that maintaining growth was of paramount importance. Nevertheless, there is a growing consensus that our future policy should also place a greater focus on improving our wellbeing. Until recently, humans did not have such a significant impact on the environment as we do today. The current era is often referred to as the Anthropocene, reflecting the magnitude of human impact on the environment such as climate, on nitrogen cycling, and on biodiversity. There is a growing need for alternative indicators to GDP in order to achieve a more sustainable future. One of the alternative measures is called 'the Genuine Progress Indicator (GPI)'. It was developed by Professor Herman Daly, who has collaborated with Professor Costanza on numerous research projects over an extended period of time. This indicator incorporates important components such as income distribution and equality,

as well as factors such as household labour and volunteer work, which are not included in GDP. In this indicator, the costs of negative impacts such as crime, family breakdown, air and water pollution, and climate change are subtracted. A comprehensive global assessment, considering all such relevant components indicated a transition from “a period of true economic growth”, as defined by Professor Daly, up to approximately 1980, to the current state of “uneconomic growth”. This signifies a transition towards an era where GDP continues to grow, while GPI reaches a plateau and exhibits a slight decline. This indicates that GDP, the measure of economic growth and national strength, continues to expand, while our wellbeing, which is a key factor in our ability to survive, has not improved. Professor Costanza highlighted the significance of this finding during the interview, noting that the current approach may be misguided if GDP remains the primary objective. While acknowledging the potential of GDP as a contributor to wellbeing, he also emphasized that it should not be regarded as the goal itself. He is currently engaged in a new project to develop an alternative indicator to replace GDP, working on how to create a new and better indicator of wellbeing, as well as on building consensus around such an indicator. These are the challenges he is addressing in his research today.



### <How to Overcome Our Addiction to Growth>

What are the underlying reasons that our societies are stuck in the paradigm of economic growth indexed by GDP? Professor Costanza argues that it is because our societies are addicted to growth. For example, individuals who are addicted to something such as smoking, drugs, or alcohol, are mostly well aware of the negative effects of these addictions have on their health and their surroundings. Nevertheless, they are unable to cease their addiction due to the positive reinforcement these substances provide in the short term. It is possible that our societies are facing a similar situation. It has been well understood for decades that there are significant issues in need of attention, including environmental destruction and inequality. Furthermore, there is a growing awareness that GDP may not be the most effective indicator for measuring social wellbeing. However, there has been no change in the way people behave. Why do people persist in pursuing the same course of action when they are fully aware that it will lead to adverse consequences in the future? One way to think about improving this is to view this situation as a kind of “addiction,” but we also need to recognize



that simply pointing out the problem does not change our behavior. A therapy called Motivational Interviewing is believed to be an effective treatment method for addiction on an individual scale. It is a method that does not confront the individual with their addiction, but facilitates discussions about the individual's life goals in a non-confrontational manner. This approach involves asking the individual about their desired outcomes, how they envisage themselves from the present to the future, and what that vision looks like. When this method is applied on a social scale, it is essential to establish a shared vision that will motivate people to depart from traditional societal behavior and embrace a new set of values. Professor Costanza observed that our societies continue to focus on GDP growth, despite recognizing the potential challenges this may cause in the future. It is therefore essential that we establish a shared vision for an alternative future in order to overcome our current challenges. During the COVID pandemic, severe restriction of global economic activities resulted in a drastic reduction in greenhouse gas emissions. It presented a valuable opportunity to reassess the economic model based on GDP growth. However, Professor Costanza believes that the necessary treatment was not administered during the pandemic. The fact that we reverted back to our previous form of thinking once the pandemic subsided suggests, in his analysis, that either the event did not provide sufficient impact to facilitate the transition to a better vision, or that the vision itself was not sufficiently compelling to convince people that it is possible to achieve. Nevertheless, the COVID-19 pandemic has demonstrated that people have a great concern about their health and wellbeing, and that they are capable of overcoming their addictions and reducing their current level of consumption and production, even if only temporarily.

Professor Costanza views the Sustainable Development Goals (SDGs) as an example of a shared vision that can drive societal change. He considers the SDGs a significant and unique accomplishment in human history that resulted in an agreement to achieve a more stable, sustainable, and wellbeing-oriented future, shifting the focus away from GDP growth. There are still a few areas that require further development in order to fully realize the potential of the SDGs, such as a need to apply a more sophisticated ecological-economic approach in order to address the goals in a more comprehensive manner. This is because the 17 goals were stated individually, but in fact are highly interdependent. National and regional adjustments also need to be considered due to extremely varied circumstances. Professor Costanza believes that it was nonetheless a truly



important step towards establishing the societal goals that people should pursue.

### <Professor Costanza's Stance Towards Work and Research>

Professor Costanza's research career encompasses a wide range of subjects. After studying aerospace engineering and architecture and obtaining a PhD in Systems Ecology, he has conducted a series of research studies at a number of universities and institutes, including Louisiana State University, University of Illinois, The University of Maryland, The University of Vermont, Stockholm Resilience Centre, Beijer Institute of Ecological Economics, Portland State University, The Australian National University and University College London. His research activities have primarily focus on systems ecology, environmental science and ecological economics. He has conducted a number of research projects in a variety of locations, driven by a strong motivation to seize new opportunities as they arise. He believes that researching in different places has greatly benefitted his career by broadening his horizons through exposure to a variety of issues, as well as diverse people and their opinions. It also allowed him to build a wide network across different academic disciplines. However, regardless of his location or the nature of his research, Professor Costanza has always been committed to "making a better world". The questions of what a better world would look like, whether it is possible to create one, and how to move towards a sustainable and wellbeing-focused world have been significant driving forces throughout his extensive research career. Over the course of his dedicated career spanning more than four decades, Professor Costanza has enjoyed his leisure time by participating in several sports, including horse riding, racquetball, and badminton. Due to the location of his current residence, he now enjoys hiking, walking, and taking his dog for a walk as ways to refresh and relax his mind.



With his family and relatives



## <Messages from Professor Costanza to Business Community, Policymakers and General Public>

Following are the messages from Professor Costanza to business community, policymakers and general public.

*Initially corporations were structured to perform social good, providing something positive for society. However, for some reason we come to believe the only thing that corporations are mandated to do is make a profit in the shortest possible time. Under these conditions, anything they do that doesn't contribute to their short-term bottom line has been regarded as a negative element that might affect their stock price negatively. However, there is a whole new approach to corporations known as B Corporation or Benefit Corporation. It is a type of corporation whose mission is to provide social and environmental benefits as well as the benefits for the company itself. Corporations that demonstrate a commitment to enhancing their social impact through environmentally and socially responsible practices are likely to gain a positive reputation, which could subsequently positively affect their share price. In order to ensure the future success of business, it is essential that corporate mandates are more comprehensive and incorporate environmental and social values alongside financial considerations.*

*It is unlikely that policymakers would change their decision-making process without some form of public support or pressure. In modern 'democracies', policymakers are heavily influenced by special interests who are locked into and addicted to the conventional system. Therefore, in order to overcome the influence of those special interests on politicians and policymakers, it is essential to have that appropriate pressure and input from the general public.*

*I think what people need to realize is, that there are viable alternatives to achieve a better world. Previous research indicates that the general public is seeking a future that is more sustainable, more equitable and more environmentally aware. The level of life satisfaction is dependent much more on people's relationships with others, their social capital and their dependence on the environment for a range of ecosystem services, than on mere production and consumption. All of these factors are important to their quality of life and to greater sustainability. What we need is to build that critical mass that shares the vision based on our wellbeing, which should also influence policymakers and businesses. We must all contribute to building this shared vision and adapting it as we move forward. In order to share our vision for the future, it is essential that we establish a genuine democracy where people fully participate in decision-making.*

## **<What We Need To Protect Our Blue Planet>**

*We have to remain hopeful that humans are clever enough in the end to understand these problems and find solutions for them. But this is not a foregone conclusion because there are many examples of civilizations that have collapsed in the past. I am still hopeful that there is a possibility because I know that the majority of people around the world would like to see greater wellbeing in the world. Moving that desire into reality, I think is the challenge, but may be possible as many hundreds, if not thousands, of people around the world are working on this. To achieve these kinds of goals it is necessary to build movements, not just one. The social justice movement, the environmental movement and the new economy movement are headed in the same direction, however, they are not coordinated or integrated. They are not forming an alliance that could really move things forward. There are a few governments that have signed on to the idea of wellbeing economy, in the form of government initiatives for economic activity created from the perspective of human and ecological wellbeing, instead of mere economic growth. Iceland, Scotland, Finland, New Zealand, Wales, and Canada are part of this government initiative. These countries have established that wellbeing is the goal for their countries, instead of simply GDP growth. This kind of movement is starting to happen, and much larger movements will have to be formed to protect our Blue Planet.*