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## **What World is Suitable for Our Grandchildren and How to Create It?**

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## **1. Introduction / The Story of Easter Island**

Let me start with a sad story on an island which lies 2300 miles to the west of Chile and 1300 miles to the east of the Polynesian Islands. It holds a secret, a mystery. Legend says that King Hoto Mat landed his canoe here, thus beginning the occupation of Easter Island 1300 years ago. The first islanders found a lush island filled with giant palms and rich volcanic soil. In 1550 the population was between 7000 and 9000. Rapa Nui, or Easter Island as it was named by the eighteenth-century Dutch explorer Jacob Roggeveen, attracts scientists from around the world who come to study the island's story and its stone statues, called moai. They weighed up to 270 tonnes and were as tall as 70 feet. We still wonder how Stone-Age Polynesians managed to erect such structures without the use of cranes, metal tools, or large animals. This speaks to the existence of a populous, creative and complex society – one that was well-off enough to support an artisan class (see Fig. 1).

But European explorers who visited the island in the eighteenth century found a population of only few thousands, a mere remnant of the statue-building society that came before. Something had significantly altered the life on Easter Island. What had at one time been a subtropical forest was now a completely deforested island, with at least 22 species of trees and plants extinct. Most wild sources of food were gone: overhunting had left the island with almost no wild bird species. The most popular explanation is a scenario in which the population continued to exploit the resources available to them beyond their limits, in an environment the ecological fragility of which made it vulnerable to permanent destruction. The trees were cut to supply wood for rollers and beams to transport the statues. Trees were also burned to obtain charcoal. Easter Islanders made use of their surroundings for their physical and cultural needs in the same way that human societies do, but they most probably did not observe the requirement of keeping their system in balance. When the islanders ran out of resources, they threw their idols down and started killing each other.

The scientists from the Santiago de Chile University invited me to a field study on Easter Island on how to use this experience for the world of today. The question of equilibrium – balancing use with renewal, pollution with its impact on ecosystems – is key to understanding the challenges of our world.



Fig. 1. *The restored stone statues on Easter Island*

The globalisation of business, science, and culture has also opened up our professional choices: following a job far from one's town, working as an expatriate in another country, travelling regularly to offices around the world. On the whole, we are a wealthier, longer-living, more educated, and more mobile population. But can this continue? Will it be true for the future generations and in all parts of the world?

## **2. The Problem of Economic Growth**

*If everyone used energy and resources the same way we do in the Western world, we would need three more earths at least. And we have only one (Mona Sahlin, Sweden)*

History shows that Easter Islanders did not take the necessary steps to prevent the passing the critical threshold, and today our world is also showing signs that we are approaching the same problem to which we need to find solution. We are living on a much larger scale, but could the same happen to us?

Indeed, the so-called developed world has seen average improvements in many areas that are important to 'good life'. Along with these improvements, however, worrying indications that this growth has costs which we cannot continue to ignore have emerged. The tricky part is that it seems we have little choice about this. The free- market system is fundamentally dependent on growth. If an

economy does not grow, it collapses into recession: debts pile up, people lose their jobs and homes, lives shatter. Growth is a structural imperative; it is an iron law. And it has iron-clad ideological support: politician on the left and right may argue about how to distribute the yields of growth, but, when it comes to the pursuit of growth itself, they are united, To the extent that pricing would internalise the costs of production, it would pinch off prospects for growth. It has always needed an 'outside', external to itself, from which to plunder value for free, without an equivalent return. That is what fuels growth. To put a limit on material extraction and waste is to effectively kill the goose that lays the golden eggs.

In spite of unprecedented economic growth, the world has been on a course leading to depletion of resources and serious social crisis, and old ways of problem solving have proven inadequate. If surplus cannot be extracted for free from nature (because of the resource cap), and cannot be extracted for free from humans (because of the wage floor), then where will it come from? Something has to be done to change development – its philosophy, theory and methods – if societies wanted to reverse these negative trends. As Albert Einstein wrote, 'Today's problems cannot be solved if we still think the way we thought when we created them'.

### **3. The United Nations and Other Actions on Environment and Sustainable Development. What Is Sustainable Development?**

In her masterful book *Silent Spring*, the US scientist Rachel Carson revealed that human action, for instance DDT, always has unforeseen ecological consequences, and she demonstrated that inorganic compounds could enter a system of 'ecological flows' that later spread across vast distances. Public concern triggered by Carson's book have led to the formation of the US Environmental Protection Agency (EPA) in 1970 – the first of its kind in the world – and in the same year, huge crowds turned out for the celebration of Earth Day in April. Later, a chain of environmental events followed, and the most significant of these was the 1992 Earth Summit held in Rio de Janeiro.

In 1968, an international think-tank – the Club of Rome – was established by the Italian businessman Aurelio Peccei, and they commissioned the study 'Limits to Growth'. The results were published in 1972, in a book with the same title. Immediately, that same year, the United Nations took the leadership, and a chain of environmental events followed.

At this point, there is a need to mention some facts about the United Nations and the UN Charter. According to the Charter, the purposes of the UN are to:

- maintain international peace and security
- develop friendly relations among nations based on respect of the equal rights and self-determination of the peoples
- cooperate in solving international economic, social, cultural and humanitarian problems and in promoting human rights and fundamental freedoms
- be a centre for harmonising the actions of nations in attaining these common ends.

In turn, the UN acts in accordance with principles, among which is the following: **to refrain from threat or use of force against any other state.**

The most significant UN event on sustainable development was the 1992 Earth Summit held in Rio de Janeiro. The summit was based on the Gro Harlem Brundtland Commission Report 'Our Common Future', in which the definition of sustainable development was officially presented: 'Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their needs'.

At the core of sustainable development is the need to consider 'three pillars' together: society, the economy and the environment. **In addition to balancing economic, environmental, and social objectives, a basic tenet of sustainable development is the need to balance the needs of current and future generations.**

At this point, it is very important to stress that expectations of Rio and Rio+20 summits were too high and unrealistic, and their achievements were underrated. Global gatherings undoubtedly have an important role to play, however, the political will to act may only begin to match expectations when **national governments come under more sustained pressure from informed and concerned citizens and from global movements.** Therefore, in September 2015, the UN General Assembly declared the new 2030 Agenda 'The Future We Want' and 17 Sustainable Development Goals (SDGs). The call for SDGs is a potentially historic decision, a powerful way to move to a new global agenda that engages the world community, including not only governments but also businesses, scientists, leaders of civil society, NGOs, and, of course, parents and students everywhere. In addition to the 17 goals, the UN General Assembly also adapted 169 more detailed targets distributed among the 17 goals. The UN

General Assembly emphasized, however, that each nation should choose its own national targets based on its national circumstances and priorities.

However, one year after at the high-level political forum (HLPF) meeting in July 2016, UN Member states expressed very deep and real concern and very serious doubts about the achievement of SDGs and their own goals: communities wearing and weakening down; public spirit disappearing; dysfunctional higher education; governments more responsible to vested interests rather than to actual needs; a culture that distracts us from the central challenges. Among technical obstacles mention was made of the shortage of knowledge, methods, and information, and lack of theoretical framework and explanation.

#### **4. The UN Independent Group of Scientists and the Global Sustainable Development Reporting (GSDR)**

The UN Independent group of scientists was created by the decision of the United Nations Member States at the 2016 High Level Political Forum: ‘...the independent group of scientists is to comprise 15 experts representing a variety of backgrounds, scientific disciplines, and institutions, ensuring geographical and gender balance’ (Fig.2). ‘The group will be appointed by Secretary-General in open, transparent, and inclusive consultations with Member states. The mandate agreed by Member states at HLPF in July 2016’:

- The GSDR is one important component of the **follow-up and review process** for the 2030 Agenda for Sustainable Development.
- The GSDR **will inform the high-level political forum (HLPF)** and shall strengthen the science-policy interface and provide a strong evidence-based instrument to support policymakers in promoting poverty eradication and sustainable development.
- The report **will be available for a wide range of stakeholders**, including business and civil society as well as the wide public.



Fig. 2. Members of the UN Independent Group of Scientists

The title of the Report **'The Future is Now – Science for Achieving Sustainable Development'** (GSDR) expresses the central message:

in order to secure the future of humanity and the planet we cannot wait for crisis with potentially irreversible and unmanageable consequences to trigger change. Rather, we need to act now based on our current knowledge and understanding.

The main Statement of GSDR:

Achieving a sustainable, equitable and healthy world requires an **integrated transformations** approach, which addresses the Sustainable Development Goals (SDGs) in a **comprehensive, systemic way, rather than as a collection of discrete goals and associated targets and indicators**. With **just ten years to go**, countries and regions urgently need to design and implement **integrated, context-sensitive and achievable pathways towards achieving transformation at all levels and scales**. Adding to the concern is the fact that recent trends along several main dimensions with cross-cutting impacts across the entire 2030 Agenda are even moving in the wrong direction. **Four in particular fall into that category: rising inequalities, climate change, biodiversity loss, and increasing amount of waste and pollution from human activity (irresponsible consumption and unsustainable production)**.

Assessments show that those negative trends presage a move towards the crossing the tipping points, which lead to dramatic changes in the conditions of the Earth system in ways that are irreversible on time scales meaningful for society, i.e., that the world's social and natural biophysical systems cannot support the aspirations for universal human well-being.

The UN Independent group of scientists in a Report on Global Sustainable Development explicitly states that the actions by a range of stakeholders that can accelerate progress towards achieving the SDGs should

derive from knowledge about interconnections across individual Goals and targets, recognizing that the true transformative potential of the 2030 Agenda can be realized only through a systemic approach that helps identify and manage trade-offs while maximizing co-benefits (IGS. 2019).

## 5. How to achieve sustainable development?

The main existing methods for unsustainability reduction implementation are:

- Resource efficient and cleaner production
- Pollution prevention and preventive innovations
- Product eco-design (LCA assessment)
- Environmental management and EMA
- Circular economy



- Integrated waste management
- Responsible consumption (product-service systems;)
- Sustainable development indicators and reporting
- Environmental labelling, EPD
- Industrial ecology
- Dematerialisation
- Biomimicry
- Corporate social responsibility
- Natural capitalism
- Sharing economy
- Stakeholder economy (Klaus Schwab)
- 'Basic income guaranty' economy
- Creative capitalism (Bill Gates).

Unsustainability reduction achieved by **incremental changes does not lead to sustainability**. The move towards sustainable development **requires to effect transformations in all spheres of our life**. Nonetheless, it is a fact that the state remains the most powerful organisational instrument that humankind has invented, and thus big economic, environmental, and social transformations are very difficult to achieve without it. In the book *Transformation of Business Organization Towards Sustainability: Systems Approach* (J.K. Staniškis *et al.* Springer Nature, 2022), three types of management/control systems are developed based on the systems theory and facilitating sustainable development:

1. systems for unsustainability reduction at the level of organization
2. systems for transformations management/control of socio-economic systems
3. decision-making support system.

We argue that for achieving sustainability, two conditions should be applied: **necessary and sufficient**. The methods and systems for unsustainability reduction are treated as the necessary condition, whereas the model and the system for structural transformations of socio-economic system as the sufficient condition (Fig.3.)

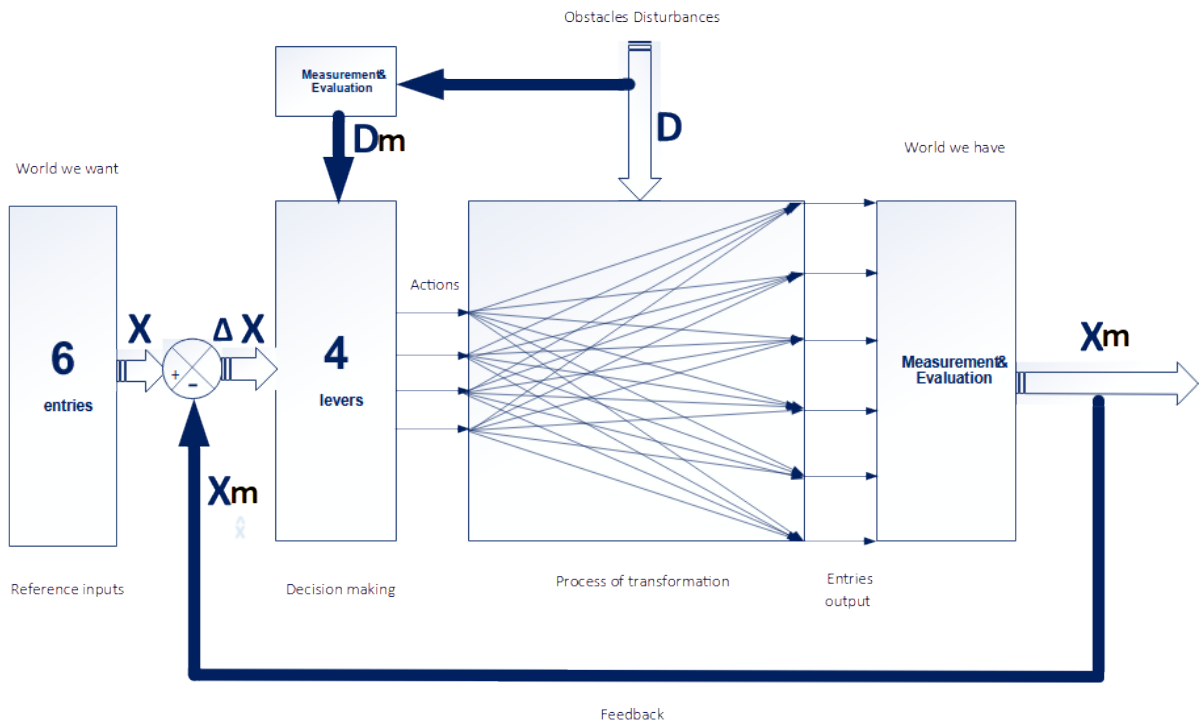


Fig. 3. *The management system for socio-economic transformations*

The system for transformations towards sustainable development (Fig. 3) represents the most important closed loop feedback-feedforward control system that is most widely used in current practice. The feedback-feedforward method allows for detecting serious deviations prior to their effect on the system, and feedback can counteract any imperfections in the feedforward scheme and the effects of other (unmeasured or measurable) disturbances. Therefore, the feedback-feedforward system for transformations towards sustainability control was developed, where two actions were considered: the vector of uncontrolled inputs  $D$  and the vector of controlled actions  $U$ . The actions vector represents a set of actions/levers that can be manipulated by the decision-maker to influence the system of transformations in order to approach the entries output more closely to reference settings. Feedforward loop forecasts are of the greatest utility, for example, for environmental and social objects, with long lag, reaction and relaxation times and where there are significant delays in the provision of information on transformation system behaviour and performance. Without forecast by feedforward loop, the transformation system can act only as a feedback control system, which is capable of counteracting deviations from goal only after they have occurred. The model for the process of transformations was elaborated by the UN Independent Group of Scientists and consists of the state vector  $X$  comprising six variables  $X (x_1, x_2, x_3, x_4, x_5, x_6)$ , where:  $x_1$  – human well-being and

capabilities;  $x_2$  – sustainable and just economies;  $x_3$  – food systems and nutrition pattern;  $x_4$  – energy decarbonisation with universal access;  $x_5$  – urban and peri-urban development;  $x_6$  – global environmental commons, and the vector of actions/levers  $U$  comprising four types of levers/actions identified:  $u_1$  – governance;  $u_2$  – economy (incl. consumption and production) and finance;  $u_3$  – individual and collective action;  $u_4$  – science and technology.

The transformation process requires rethinking of all concepts and ways of socio-environmental-economic life. Therefore, the discussions and some conclusions on socio-economic models, responsible consumption and sustainable production, role of markets, role of state, transformations in society, corporate social responsibility, nations' health, globalisation and localisation for each case are extremely important.

## **6. Practical Pathways Towards Unsustainability Reduction (a Necessary Condition)**

There are many possible ways to fulfil the necessary conditions. For instance, based on the sustainability reduction methods presented above, the so-called five-step pathway to post-free market world could be implemented:

*Step 1.* Planned obsolescence. how we might address these inefficiencies:

- Extending warranties on products
- Introduce a 'right to repair' possibility to repair by ordinary users
- To switch to a lease model for large appliances and devices (product- service system)
- Chemicals leasing.

*Step 2.* Cut advertising:

- It is impossible to fundamentally grasp the social, political, economic and cultural developments of the past 100 years without some understanding of Edward Louis Bernays and his professional heirs in the public relations industry. PR is a twentieth-century phenomenon, and Bernays, widely eulogized as the 'father of public relations' at the time of his death in 1995, played a major role in defining the industry's philosophy and methods.

- A survey conducted in 1990s of American CEOs believed it would be impossible to sell new product without an advertising campaign: 85% admitted that advertising often persuaded people to buy things they did not need and 51% said that advertising persuaded people to buy things they did not actually want.
- And right now, the global advertising spending is rising fast: from \$400 billion in 2010 to \$560 billion in 2019, making it one of the biggest industries in the world.
- Cutting ads has a direct positive impact on people's well-being: in addition to slowing down needless consumption, these measures would also free our media, so we can follow our thoughts, our imagination, our creativity without being constantly interrupted.
- Edward Louis Bernays' (1891-1995) mother was Sigmund Freud's sister, his father – Freud's wife's brother. A Jewish family in Vienna. Cigarettes Lucky Strike for women and bacon and eggs as the true all-American breakfast, only disposable cups were sanitary, the choice of cigarettes over sweets. To promote the special beauty of thin women, Bernays linked bananas to good health and to American interests and placed them strategically in the hands of celebrities, in hotels, and other conspicuous places.

*Step 3. Shift from ownership to usership:*

- Communities should establish neighbourhood workshops, where equipment can be stored and used on an as-used basis and enabled by apps for easy access. This is particularly true for cars. We need to switch to electric cars, but ultimately need to dramatically scale down the total number of cars (free public transport, bicycles, publicly owned app-based platforms for sharing cars between us without the rentier intermediation).

*Step 4. End food waste:*

- Up to 50% of all the food produced in the world – equivalent to 2 billion tones – ends up wasted each year. Ending food waste would allow us to cut global emissions by up to 13%, while regenerating up to 2.4 billion hectares of land for wildlife habitat and carbon sequestration. Composting, donating unsold food to charities, etc.

*Step 5. Scale down ecologically destructive industries:*

- Beef industry. Nearly 60% of global agriculture land is used for beef – either directly for cattle pasture or indirectly for growing feed. Beef accounts for only 25 calories humans consume. Switching from beef could liberate almost 11 million square miles of land – the size of the USA, Canada, and China combined. This simple shift would cut net emissions by up 8 gigatons of CO<sub>2</sub> (20% of annual emissions).
- Artificial intelligence, arms industry, private jets industry, single-use plastic, SUVs (sport utility vehicle), McMansions, commercial airline industry. The only way is hard limits on resource and energy use, all sorts of limits on capital exploitation of people and nature.

## 7. Education and Research

We, EDUCATORS, have equipped our graduates with the tools and technology necessary to enlarge the human empire, but not the wisdom to understand the consequences of doing so.

We have taught how to manipulate, make, conjure, communicate worldwide, and sell everything under the sun but not how to think about the effects on themselves and others of doing such things.

We have trained armies of lawyers and lobbyists with the skills to defend their right to plunder but taught them nothing about enlarging the empire of justice across the generational and species line.

We have taught the future leaders of mighty corporations how to grow their companies beyond imagination, but given them no guidance regarding the physical, ecological, and moral limits to the scale of human estate or the concepts of enough and sufficiency.

We ourselves have to continue to learn how the ecosphere works as a physical system and to become more responsible within that system. **More than any other institution, schools, colleges and universities have an obligation to preserve the habitability of the planet that their graduates will inherit.**

**Trans-disciplinarity** should become mainstream in education, research and professional practice, and positioned in a broad philosophical and societal context that influences the interconnections between research, public policies and professional activities. This requires rethinking the contribution of science to respond efficiently to unexpected situations and persistent problems in our complex world. The university of the future will be inclusive of broad swaths of the population, actively engaged in

issues that concern them, relatively open to commercial influence, and fundamentally interdisciplinary in its approach to both teaching and research.

## 8. Conclusions and Discussions

- The world suitable **for our grandchildren** is the socioeconomic system based on sustainable development principles which are essentially a response to perceived deficiencies within modernity and industrialism, where 'progress' is defined as consumption, environmental degradation, economic growth at the expense of ecosystems, the extinction of species, extreme social inequality, unstable economic systems, pollution, a throwaway society, and so on.
- After decades of incremental progress, it is now clear that achieving a sustainable relationship between people and planet will require a transformative response. Transformations towards sustainability involve profound, systemic changes that reach across **social, cultural, political, economic and technological** domains. The goal of sustainability transformations is to find ways for humanity to live within planetary boundaries while delivering **social justice for present and future generations**. This strategy ensures **intergenerational** equity.
- Sustainable development should now be understood as the best possible way forward that can emerge over time and space to manage our complex socio-ecological systems as a whole. Decisions in one country or one specific territory may affect many others, and sometimes leave negative footprints across the whole planet while apparently small changes can lead to major events with unforeseeable consequences. Therefore, **transformations toward sustainable development will be successful only if they holistically integrate all goals, and if they are backed by an appropriate understanding of the complex causal chains which affect socio-economic and ecological systems and of the interlinkages across goals and targets.**
- First of all, we have to transform our economics, i.e. the way, how people produce and consume. One large obstacle to transformation towards sustainability began with a

bargain made long ago with the giant companies that promised to make our lives affluent, convenient, easy and fun. But they also made our world fragile, polluted, violent, undemocratic, insecure, and unsustainable. Moreover, they corrupted our very thoughts and words (David W. Orr). Many people assume, wrongly, that a company exists simply to make money. While this is an important result of a company's existence, we have to go deeper and find the real reasons for our being... People get together and exist as... a company so that they are able to accomplish something collectively that they could not accomplish separately – they make a contribution to society (Dave Packard, 1960).

- It is not just our economics that needs to change. **We need to change the way we see the world, and our place within it.** Now we have a choice before us: will we ignore science in order to maintain our world view, or will we change our world view? This time we do not have luxury of pretending the science do not exist. This time, it is a matter of life and death. **We have to change values:**
  - (1) More cooperation - less competition
  - (2) More empathy - less greed
  - (3) More global awareness - less provincialism
  - (4) More local action - less globalization
  - **And in general, more ethics and morality in all areas of life and activity.**

I think, we have to be open in stating that future problems cannot be solved within a traditional paradigm of economic growth and reliance on technology and by specific policies to attenuate the most unethical behaviour and nudge consumers, firms, and workers in the 'correct' direction, i.e., only by calling upon people to behave 'right' within 'wrong' structures.

#### **Some quotations on the future:**

- Will we have the sense to reconcile our lifestyles with the well-being of our environment or is the human personality always the same – as that of the person who felled the last tree.

- Only when the last tree has been cut down, the last fish been caught, and the last stream poisoned, will we realize we cannot eat money (Cree Indian prophesy)
- Only two things are infinite: the universe and human stupidity, but I'm not sure about the former (Albert Einstein)
- There is no future without the past (with the condition that people will learn something from the past).

### **History knocked on your door, did you answer?**

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