How to live the “Laudato Si”

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The **International Resource Panel** – **IRP** was launched in 2007 with the idea of creating a science-policy interface on the sustainable use of natural resources and in particular their environmental impacts over the full life cycle.
IRP Structure

**SCIENTIFIC PANEL**
Internationally recognized experts on sustainable resource management; Scientific assessments and advice, networks

**SCIENCE-POLICY INTERFACE**

**UNE SECRETARIAT**
Direction, procedures, support in development and implementation of assessments, outreach

**STEERING COMMITTEE**
Governments from developing and industrialized countries; Strategic guidance, political support, regional synergies

**Strategic Partners**
OUR WORLD

SOME FACTS ABOUT FUTURE RISKS
THE TASTE OF 21ST CENTURY

- Population growth (2050 – 9.7 billion)
- Per capita consumption growth will increase - consumers moving from low to middle class consumption
- Few people own the same as the poorest half of the world and the richest 1% is more wealthy than the rest of the world
- 800 million people are hungry, over 2 billion suffer from micronutrient deficiencies, over 2 billion people are obese
- We throw away one third of the food we produce
- More than 50% of urban fabric expected to exist by 2050 still needs to be constructed
- 2011-13 China has used more cement than USA in 20th century
Climate change experts warned us that emissions need to be about halved by 2030 to limit warming to 1.5°C
60% of ecosystems already degraded or used unsustainably
Biodiversity: Living Planet Index – 60% fall in just 40 years
85% of the world's fisheries are at (beyond) biological limits
1/3 of soils is degraded or used unsustainably due to various reasons
7 millions premature deaths yearly globally due to air pollution
A million of plastic bottles are bought every minute. 9% of plastic recycled, 12% incinerated, 79% landfills or environment
We are the first generation more likely to die as a result of lifestyle choices than infectious disease
THE TASTE OF 21ST CENTURY

• Nearly half of all the work we do, will be able to be automated by mid of the century

• In 1997, DeepBlue beat Gary Kasparov – world Chess champion - using an algorithm conceived in the 1950s and lots of human data. In 2017, AlphaGo beat Ke Jie - world Go champion – discovering by itself the principles of the game and how to play it - Era of artificial intelligence
For the first time in human history we face the emergence of a single, tightly coupled human social-ecological system of planetary scope.

We are more interconnected and interdependent than ever.

Our individual and collective responsibility has enormously increased.
Empty World and Full World

Source: Club of Rome: Simplified after Herman Daly

Labour and Infrastructure \textit{limiting factors of human wellbeing}

Natural resources and Environmental sinks \textit{limiting factors of human wellbeing}
Safe Operating Space - "doughnut" perspective

Basis human needs
incl. minimum requirements of resource supply

Outer limit by Planetary Boundaries

Adapted from Raworth 2017
Vary across scales & global geographic regions
OUR ECONOMY
Ecological footprint (hectares per person per year)

Source: Global Footprint Network, 2012; UNDP, 2014a
Economic, social and environmental (in)balance

Natural capital not valued
Human capital undervalued
Financial capital overvalued

Producers/Consumers
Rational Behaviour

Market Economy

Economic, social and environmental (in)balance
LIVING WELL WITHIN ECOLOGICAL LIMITS

ECOSYSTEMS

SOCIO-TECHNICAL SYSTEMS
providing social needs and value

Withdrawals from the ecosystems
Ecosystem services

Policy
Industry
Market
Science
Technology
Values

Energy system
Food system
Mobility system

Deposits
Emissions
Pollution

Profits privatized
Environmental externalities
Costs socialized

European Environment Agency
Inclusive Wealth (IW) Index (and its components) evolution - 1992 to 2014

Source: UN, 2018 Inclusive Wealth Report 2018

IW – Inclusive Wealth
PC – Production capital
HC – Human capital
NC – Natural capital

Growth of GDP and social capital in the past decades has been achieved at the cost of depleting natural capital.
Gross Domestic Product

You will not reach the goal by walking faster, if you are walking in the wrong direction!
RESOURCES

THE MISSING LINK
SDGs DIRECTLY DEPENDENT ON NATURAL RESOURCES
Trade-offs among various SDGs are unavoidable. **Sustainable Consumption and Production** is the most efficient strategy to mitigate trade-offs and create synergies to resolve the development and environmental challenges articulated in the SDGs.
FOCUS ON SUSTAINABLE PRODUCTION AND CONSUMPTION
GLOBAL RESOURCES OUTLOOK 2019

NATURAL RESOURCES FOR THE FUTURE WE WANT

Biomass, Fossil Fuels, Metals, Non-metallic Minerals, Land, Water
Relentless demand: Global resource use, Material demand per capita and Material productivity

- Global resource use has more than tripled since 1970
- Global material demand per capita grew from 7.4 tons in 1970 to 12.2 tons per capita in 2017
- Material productivity started to decline around 2000 and has stagnated in the recent years

### Global material extraction and material productivity, 1970 - 2017

- **Non-metallic minerals**
- **Metals**
- **Fossil fuels**
- **Biomass**
In the mid-term, except in specific cases, resource shortage will not be the core limiting factor of our (economic) development ...

... but the environmental and health consequences caused by this excessive and irresponsible use of resources will be!
Environmental impacts in the value chain

Resource extraction and processing phase

- 90% of global biodiversity loss and water stress
- 50% of global climate change impacts
- 1/3 of air pollution health impacts
Unequal consumption: per capita material footprint from high-income countries is 60% higher than the upper-middle-income group, 13x the level of the low-income groups.

• Measured in Domestic Material Consumption (DMC), upper-middle income countries are the largest per-capita material consumers

• Measured in Material Footprints (MF), high-income countries are by far the largest consumers per capita and are increasing their resource import dependence by 1.6% per year

• Two Key Drivers: New infrastructure buildup in developing countries, outsourcing of material & resource intensive production from high-income countries
“Historical Trends”

“Towards Sustainability” scenario assumptions

**Resource Efficiency**

- Reduction in materials use in manufacturing and construction through innovation, increased demand and recycling
- Assumed policies: regulations, technical standards, public procurement, shifts in taxation

**Climate Mitigation and Removal**

- Bio-sequestration and carbon dioxide removal technologies
- Assumed policies: Support of innovations through public investments, carbon levy for the financing of carbon sinks

**Landscape and Life-on-land protection**

- Bio-diversity in bio-sequestration solutions, reducing crop-based biofuels and limiting agricultural land
- Assumed policies: biodiversity conditions on GHG sequestration sinks, and policies to conserve native vegetation and key biodiversity areas

**Shifts in Societal Behaviour: Healthy Diets and Reduced Food Waste**

- Halving the current meat consumption (less in regions of low-meat diets) and halving food waste by 2050
- Assumed policies: Including public education
Achieve the SDGs through concerted SCP measures: Boost the economy by 8%, converge incomes, and reduce environmental impacts

The GRO provides new scenarios

- Continuing past economic trends would more than double global material use to 190 billion tonnes by 2060
- This would quickly exceed the planetary boundaries and prevent achieving the SDGs

- Resource efficiency and innovation are key tools to achieve economic development while reducing climate change, biodiversity and health dangers

Note: Greater gains are possible – large potential e.g. in the circular economy (not fully modelled in the scenario yet)
CIRCULAR ECONOMY

Should be seen as an instrument to deliver decoupling and as a part of the bigger picture of societal and cultural transformation needed to sustain the humanity and its prosperity central to SDG delivery.
All nature is organized based on the principles of the circular economy. Nothing is lost and everything has its purpose. That is why it would make common sense to embrace it and finally start to behave accordingly.

In essence there is only question we have to answer: Do we agree that we humans are part of the nature too?
To answer this question we probably do not need the help of the most famous Belgium detective, but his advise is always useful.

HERCULE POIROT

When asked why he is speaking about himself always in a third person he replied something like that:

If one is such a genius like myself, it is very important to establish a healthy distance to himself.
OUTLINE OF A CIRCULAR ECONOMY SYSTEM

**Principles**

1. **Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows**
   - Stock management
   - Technical materials
   - Renewable materials
   - Finite materials
   - Regenerate
   - Renewables
   - Substitute materials
   - Virtualise
   - Restore

2. **Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles**
   - Biological materials
   - Farming/collection
   - Soil restauration
   - Biochemical feedstock
   - Biogas
   - Extraction of biochemical feedstock
   - Cascades
   - Bioproduction
   - Parts manufacturer
   - Product manufacturer
   - Service provider
   - Consumer
   - Collection
   - Substitution
   - Physical value
   - Biological materials
   - Renewable materials
   - Finite materials
   - Soil restauration
   - Waste to resource
   - Reverse engineering
   - Make whole new
   - User
   - Maintain
   - Reuse/redistribute
   - Recycle
   - Refurbish/remanufacture

3. **Foster system effectiveness by revealing and designing out negative externalities**
   - Source: Ellen MacArthur Foundation; McKinsey Center for Business and EnvironmentStiftungsfonds für Umweltökonomie und Nachhaltigkeit;
CIRCULAR ECONOMY AS AN ESSENTIAL INGREDIENT IN A FIGHT AGAINST CLIMATE CHANGE
PILLARS FOR EFFICIENT CLIMATE CHANGE POLICY

SUPPLY SIDE SOLUTIONS
- Energy, Carbon management

DEMAND SIDE SOLUTIONS
- Circular Economy, Land, Water, Materials Management

NATURE BASED SOLUTIONS
- Eco-system services Environmental sinks
A **SHARED MOBILITY SCENARIO** IS A HIGHLY ATTRACTIVE VISION FOR PASSENGER CARS

**CO₂ impact of materials**
Mt CO₂ per year, Europe

- **Steel**
  - Baseline scenario, 2050: 60 Mt
  - Circular scenario, 2050: 18 Mt (-70%)
- **Aluminium**
  - Baseline scenario, 2050: 18 Mt
  - Circular scenario, 2050: 6 Mt (-60%)
- **Plastics**
  - Baseline scenario, 2050: 16 Mt
  - Circular scenario, 2050: 4 Mt (-75%)
- **Other**
  - Baseline scenario, 2050: 8 Mt
  - Circular scenario, 2050: 2 Mt (-75%)

**Total cost of ownership**
EUR per 1000 pkm

- **Current**
  - Baseline scenario, 2050: 155 EUR
  - Circular scenario, 2050: 35 EUR (-77%)

**Externalities and cost to society**
EUR per 1000 pkm

- **Current**
  - Baseline scenario, 2050: 264 EUR
  - Circular scenario, 2050: 68 EUR (-74%)

*pkm = passenger kilometre*
MORE OR LESS REGULATION?

We should continue working actively to bringing together the leading business actors. Many businesses express that they are not afraid of more regulation but of unfairness, free riders and uncertain risk. If we make policies fair, consistent and reliable – we can work together across policy and business actors for a real transition.
• The challenge seems to not be one of not inadequate scientific evidence anymore; rather it is one of cooperation and implementation.

• Complexity and scale of these challenges requires a space that allows actors with responsibility for those environmental governance mechanisms to be able to consider and experiment with both new forms of collaboration and more „systemic“ approaches ... through promoting multi stakeholder cooperation, more agile governance (including sub-state actors, such as cities, states and provinces), the use of new technologies, and enhanced accountability and transparency.
We need more “Circularity” even in the **GLOBAL GOVERNANCE**

Sharing sovereignty instead of owing sovereignty
TO CONCLUDE
WHY AND HOW?
• Those that will be best able to cope with these limits (i.e. those that will create most value with least virgin or finite resources) should/will also be most competitive

• We need more creative destruction rather than destructive creation
Main points to remember

• We need a new dialogue about how we are shaping the future of our planet. We need a conversation that includes everyone, since the environmental challenge we are undergoing, and its human roots, concern and effect us all.
• Degree of human intervention, often in the service of business interests and consumerism, is actually making our earth less rich and beautiful.
• The effects of imposing this model on reality as a whole, human and social, are seen in deterioration of the environment, but this is just one sign of reductionism which effects every aspect of human and social life.
• Interdependence obliges us to think of one world with a common plan.
• We urgently need a humanism capable of bringing together the different fields of knowledge, including economics, in the service of a more integral and integrating vision.
• I suggest that we now consider some elements of an integral ecology, one which clearly respects its human and social dimensions.
Why the changes are so difficult in practice?

• Political cycles, public and financial institutions, have inbuilt short term focus and logic. The challenges we face require a real deep system change and rethinking of the way how we govern our society.

• Production and consumption systems are based on the logic of consumerism and GDP and quantities fuelled growth. There is a lack of clear identification of future risks and of an appropriate effective risk management and there is a clear lack of understanding what really matters for our safe future.

• Transition to a more sustainable economy and society will be only possible if it is just, fair and inclusive. We are currently failing to deliver. We need to make our societies more equitable and do more in the fight against poverty. Social unrest is growing even in the high-income countries and it is high time to hear the echo of the streets and the voice of frustrated young generation.
We have to fix a broken compass!
In essence this means the development of new economic model based on sustainable consumption and production integrating all pillars of sustainability. Changes are unavoidable and humans are supposed to be intelligent. It is high time to prove it.

SDGs
northern star guiding our policies and behaviour
INTER-GENERATIONAL AGREEMENT
A Program for the Future Generations
“Sustainability First”
When asked why it is that mankind has stretched so far as to discover the structure of the atom, but we have not been able to devise the political means to keep the atom from destroying us he replied:

“That is simple, my friend. It is because politics is more difficult than physics”
Advise of Prof. Guy McPherson:
"If you think the economy is more important than the environment (and health), try holding your breath while counting your money".
THANK YOU

For more information
Contact IRP Secretariat at resourcepanel@un.org
Visit our website at http://resourcepanel.org/