The Seychelles: Seismograph of Climate Change

Presentation at the Nelson Mandela African Institute of Science and Technology, Arusha by Prof. em. Dr. Karl Fleischmann, The Federal Institute of Technology Zurich, Switzerland / University of Seychelles

PART ONE: Dream Islands Seychelles – Biogeography and Uniqueness – **as a Model for the many Impacts of Climate Change**

PART TWO: The Reality of Climate Change – an Update

ASPECT A: The Economic Impacts of Climate Change
i.e., *Tourism in the Seychelles as a Case Study*

ASPECT B: Climate Impacts on Important Biodiversity Hotspots & Unique Island Phenomena

Island Phenomenon 1: Island gigantism (Flora & fauna)
Island Phenomenon 2: Reduction of dispersal mechanisms (Flora & fauna)
Island Phenomenon 3: Islands exhibit a higher degree of species endemism (Endangered, rare relic flora and the impact of climate change)
Island Phenomenon 4: The effects of global change are more pronounced on islands than on the mainland

ASPECT C: Climate Change Promotes Invasion of Non-native Plant & Animal Species with catastrophic Effects (i.e. Competition with-, or even elimination of native species = loss of biodiversity)

ASPECT D: Climate Impacts on Biodiversity
i.e., Biological diversity leads to higher productivity and stability of an ecosystem and thus includes a tangible economic value.

ASPECT E: Devastating Climate Impacts on Ecosystem Services
Example mangroves: Ecosystem service = 6,112 USD/ha/year and 82 billion USD solely for coastal & flood protection (The Nature Conservancy 2021); Coral reefs: 36 billion/year (Journal Marine Policy 2017).

ASPECT F: Our Climate close to a Tipping Point
(The Amazon rainforest is losing its enormous significance as a global CO_2 sink.)

ASPECT G: Climate Impacts on Planetary Self-Regulation
(How marine plankton has helped stabilize CO_2 levels & climate over millions of years. What if global CO_2-induced ocean acidification nullifies the prosperity of marine plankton?)

ASPECT H: Increased CO_2 Load and Ocean Acidification

ASPECT I: Climate Impacts on Sea Level Rise
The farewell to paradise has already begun: sea level rise in the Seychelles ... the majority of the Seychelles islands are affected.

ASPECT J: Seychelles in the Midst of the Global Plastic Crisis

Concern No. 1: Plasticizers in plastics are hormonally active and negatively affect cell activity.
Concern No. 2: Micro-/Nanoplastics can cause cell death (=apoptosis) and insulin resistance.
Concern No. 3: Micro- and Nanoplastics have the potential to alter DNA structure and are thus a risk in cancer development.
Concern No. 4: Micro- and Nanoplastics can change the blueprint of a chromosome (i.e., chromosome structure) and thus impair gene expression.
Concern No. 5: Micro- & Nanoplastics can cause chronic inflammation, e.g., in the intestine, lungs, skin, etc., which can lead to a precursor of cancer.

PART THREE
The "Silent Makers" of Climate- & Global Change (... why is sustainable development so difficult to achieve ?): **Characteristics of popular ways of thinking and acting that have a direct impact on a meaningful climate policy.**

Thesis No.1: We are incapable or insufficiently determined to take the necessary steps against resource waste and climate change.
Thesis No. 2: Populism & conspiracy theories are political business models.
Thesis No. 3: The industry of doubt is an important instrument to challenge meaningful climate policy: Quote: "…DOUBT is our PRODUCT, because it is the best way to devalue facts that have taken hold in people's convictions!
The goal is achieved when the average American understands that climate science is associated with uncertainties, and these uncertainties become generally accepted viewpoints".
Thesis No. 4: The global consumer craze is increasingly becoming its own lifestyle and an economic constant.
Thesis No. 5: Hidden (... external) costs are major drivers for "successful" policies and "profitable" market mechanisms. Current concepts in technology and economics are anything but sustainable.

A final statement: Despite everything, we must hope!

- Interview with Prof. Anton Gunzinger, SRF Context. Sustainable energy policy in Switzerland.

- News from the sustainable energy industry, e.g., THE POWER TO X: Climate-neutral synthesis of hydrocarbons (i.e., fuel or fertilizer) from CO_2, water & solar energy.