

# **Zero Waste and Sustainability Interactive Workshop**

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**New Paltz Town Hall**

Between 8,000 and 10,000 years ago the use of fire and desire for the cultivation of specific foods altered the lifestyles of the human, plant and animal communities forever.

Agricultural societies developed in various parts of the world and depended largely on the environment. Around 3000 BCE agrarian societies arose in Egypt and Sumer in southern Mesopotamia (now Iraq). By 1000 BCE civilizations also arose in India, China, Mexico, Peru, and parts of Europe (1).

The circumstances that took place, in what was then Sumer, illustrates issues central to the sustainability of human civilization. Sumerians learned the art of irrigation and began practicing intense year round agriculture (2).

The surplus of storable food produced by this community allowed the people to settle in one place instead of migrating in search of wild foods and grazing land. The development of agriculture demanded many laborers to build and maintain the irrigation systems. This, in turn, leads to a political hierarchy, bureaucracy, and religious sanction along with standing armies to protect the emergent civilization (1,3).

The Sumerians intensified agricultural practices eventually lead to deforestation in the upstream areas with resultant flooding and over irrigation which raised the soil salinity. Even after the Sumerians made a switch to a more salt tolerant barley they could not recover from the effects of their over irrigation and the yields diminished causing a decline in their society (1). It is estimated that the population decreased nearly sixty percent from 2100 BC to 1700 BC. The Mayans, Anasazi, and the Eastern Islanders were among some of the populations that had fallen do to poor resources (4, 5).

In contrast, large agrarian communities in China, New Guinea, South America, and India were stable and farmed their land for centuries. Some Polynesian cultures have

maintained sustainable communities for up to 3,000 years on small islands with minimal resources using Rahui (policies for protection of land and water) to control human pressure on the environment. In Sri Lanka nature reserves established during the reign of king Tissa, dating back to 307BC, were devoted to sustainability and harmonious living with the plants and animals in nature (4).

The western Industrial Revolution of the 17<sup>th</sup> and 19<sup>th</sup> centuries tapped into the vast growth potential of the energy in fossil fuels. Coal was used to power more efficient engines and later used for electricity. There was an explosion of the population due to advances in medicine and more efficient sanitation systems. From 1650 to 1850 the global population doubled from around 500 million to 1 billion (6). This population growth led to unprecedented industrial, technological and scientific growth that has continued until this day. This period of human influence is known as the Anthropocene: a new global term to describe the epoch defined by massive human impact on the world.

By the 20<sup>th</sup> century human consumption of our world's resources had increased greatly. The increase of health, wealth, technology and population was considered a simple path of progress (7). However in the 1930's economists began developing models for non-renewable resources and the impact they have on the welfare of the economy that utilizes non-renewable resources (8). Since the 19<sup>th</sup> century when Eugenius Warming introduced the discipline of ecology, many concepts vital to sustainability have been explored. These concepts include the biosphere, the importance of natural cycles, and the passage of energy through trophic levels of the living system.

Following the deprivations of the Great Depression and World War II the developed world entered a new period of escalating growth, a post 1950's surge in the enterprise that emphatically stamped humanity as a global geological force (9).

Society was rapidly being transformed through technological innovations and the use of fossil fuels. The development of synthetic fertilizers, herbicides and pesticides led to modern industrialized agriculture, also known as the "Green Revolution". This revolution had devastating consequences for wildlife. These consequences were documented by American marine biologist, naturalist and environmentalist Rachel Carson in the book *Silent Spring* (1962) (10).

The energy crises in the 1970's demonstrated the extent to which the global community had become dependent on non-renewable resources. President Carter in his State of the Union Address called on Americans to "conserve energy, eliminate waste, and make 1980 a year of energy conservation" (11). While the developing countries were considering the issues of unchecked development the developing countries were dealing with continued poverty and deprivation and regarded development as essential to raise the standard of living for their peoples (12).

In the 1980's the International Union for Conservation of Nature had published its influential World Conservation Strategy followed in 1982 by its World Charter for Nature, which drew attention to the decline of the world's ecosystem (13). The population growth and increased individual consumption has caused humanities demand on the planet to double over the past 45 years (14).

In 1961 almost all countries in the world had more than enough to meet their own demand; unfortunately by 2009 the situation had rapidly changed with many countries able to meet their needs only by importing resources from other nations (14).

Some of the first sustainable alternatives to fossil fuels and nuclear energy were developed in the 1970's and 80's. These alternatives were wind turbines, photovoltaics, and the increased use of hydroelectricity. The first large scale and the first large scale solar and wind power plants were created in the 1980's and 90's. Small scale sustainable policies were also being implemented in the developed countries.

Through the work of Climate scientists in the Intergovernmental Panel on Climate Change there was increasing global awareness of the threat posed by the human-induced enhanced greenhouse effects produced largely by the burning of fossil fuels and the clearing of forests (15).

In March 2009 the Copenhagen Climate Council, an international team of leading climate scientists, released a powerful statement "The climate system is already moving beyond the patterns of natural variability within which our society and economy have developed and thrived. These parameters include global mean surface, temperature, sea level rise, ocean and ice sheet dynamics, ocean acidification, and extreme climate events. There is a significant risk that most of the trends will accelerate leading to an increasing risk of abrupt climate change or irreversible climate shifts" (16).

Ecological economics provides an inclusive and ethical economic model for society. Professionals in this field work on bridging the gap between ecology and the traditional neoclassic economics (17). There is a plethora of new concepts to help implement and measure sustainability including the car free movement, smart growth, ecological footprint management, green building, composting, de- carbonization, and many more (18). In 2009 the Environmental Protection Agency of the United States determined that “the greenhouse gases endanger public health and welfare of the American people by contributing to climate change and causing more heat waves, droughts, and flooding” (18).

We now have the means to achieve a transition of our economics, forms of energy, water, waste management, and food protection methods (19). The most important question for today is: how can our society continue our growth in human population, consumption, and technology while exercising preservation for our generations to come???

As always it starts and ends with people like us who are eager to dedicate themselves to this cause.