

XX National Congress of the Italian Society of Ecology, Rome, 27-30 September 2010.



From 27 to 30 September 2010 at Sapienza University in Rome, during the XX National Congress of the Italian Society of Ecology, met more than 400 representatives of the associations:

S.B.I. – Italian Botanical Society

U.Z.I. - Italian Zoological Union

S.I.B.M.- Italian Society of Marine Biology

S.I.S.V. – Italian Society of Plant Science

I.S.D.E. – International Society of Doctors for the Environment.

4 days of hard work of the Congress were divided into Plenary Sessions, where invited distinguished professionals presented their relations:

Stuart Pimm from Duke University, USA, “How much biodiversity will global change destroy?”;

Rob H.G.Jongman, Alterra, Holland, “Biodiversity and Global Change: GEO Bon and EBONE”;

Alan G.Hildrew, Queen Mary University of London, UK, “Environment change: staring at Broadstone Stream for 40 years”;

Robert Costanza, University of Vermont, USA, “Understanding, Modelling and Valuing Ecosystem services”;

Nick Hewitt, Lancaster University, UK, “Trees and urban air quality”;

Vincenzo Naso, Sapienza University of Rome, Italy, “Energy Sustainability: Closed cycles of resources and their application to energy systems”.

The parallel sessions were divided as follows:

Marine, Freshwater, Terrestrial ecosystem processes and biodiversity.

In this section I have presented, together with Professor Mario Cotta Ramusino from the University of Milan, the report on freshwater bryozoans of Belarus

"Fauna of freshwater bryozoans in Belarus and *Plumatella fungosa* ecology in the cooling basin of the Beloozersk hydroelectric power station, Belarus".



Human and ecosystem health
River ecology
Biodiversity in the context of climate change
An integrated approach for habitat conservation
Food webs and food niche
Ecology of macrophytes
A microcosm of biodiversity: in Protists
Ecotoxicology
Ecological indicators and implementation of WFD
Landscape Ecology
Man and Environment in evolutionary perspective
Microbial Ecology
Cooperation for sustainable development
Invasive species and emergent diseases
Ecological Science in the primary and secondary school.

In the Poster section about 200 posters were presented.

The works summarizing the scientific knowledge and create database and monitoring systems and detection are considered of special interest. **Valerio Sbordonì** in the report "The National Network of biodiversity: the aims and progress" points the following projects:

SISPARES – monitoring system in Spain.

LIDAR – tele detection project.

HERMES – monitoring project of the electromagnetic frequencies from different sources.

RE.NA.TO. – Catalogue of the Nature of Tuscany.

LIFEWATCH – European Platform for Biodiversity.

PESI – a Pan-European Species Directories Infrastructure.
SPECIES 2000 – a database of animals.
GBIF – Global Biodiversity Information Facility
ECBOL – European consortium for the Barcode of Life
ERMS – European Register of Marine Species
ENVEUROPE - ecosystems monitoring.
KEY TO NATURE – identification of fauna and flora
TELA BOTANICA – all about flora and herbarium.
EOL – Encyclopedia of Life

Since there is a variety of projects, some of which are repeated, in the future we will come to an unification.

Many speakers raised the problem of global warming and have shown their alarm for the integrity of ecosystems, how we use them, how can we improve the use of natural resources, how can we protect the environment and what we leave to future generations.

Enrico Feoli, Department of Life Sciences, University of Trieste, "The ecological significance of cooperation": *"It 's now a common thought that the man is an integral part of nature and that the terrestrial ecosystem is called geo-biosphere is our global ecosystem. ... This thought is already present in almost all religions ... and is permanently coded into the culture of the whole humanity with the Rio Conference in 1992. "*

"Today we stay in the position of having to evaluate the economic policies not only on the basis of the results in terms of wealth of nations, but also on the basis of the results they have on the ecosystem functioning of the biosphere. Ecology and economy that seemed two parallel sciences now converging towards the solution of a problem that seems insoluble yet: finding a way to sustainable development. Policies that produce environmental degradation and risks are no longer eligible as are inconsistent policies that produce exploitation of man by man and socio-economic inequalities. "

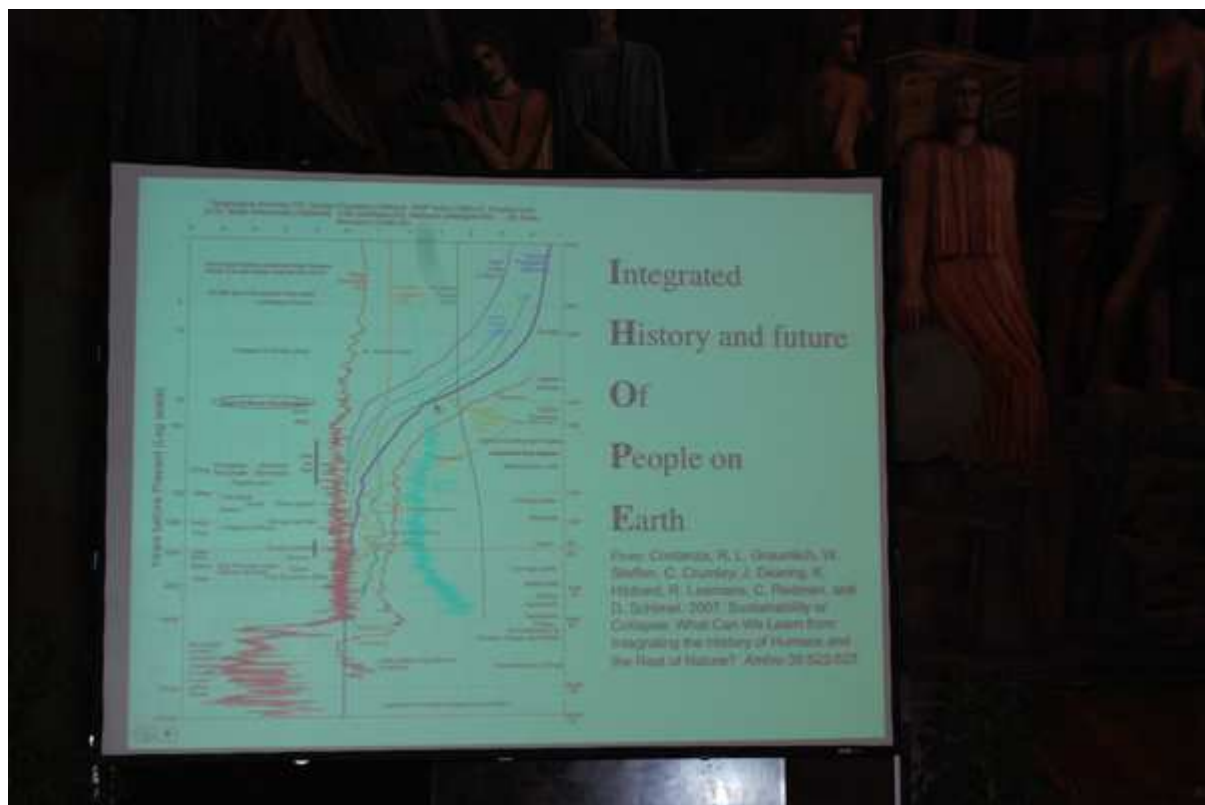
According to data of 2010, world population has 6.85 billion people. In 2050 people living in Asia will constitute about 60% of world population, Africa will reach 20%, 9% Latin America, Europe will decline to 7%. **Marino Gatto**, Department of Electronics and Information, Polytechnic Institute of Milano, "Sustainability of the biosphere and global socio-economic development": "The growth of the material needs of the developed nations ... and those in *developing countries, has increased .. an individual consumption of natural resources and generation of waste. The result was to have affected the functioning .. of the whole earth ecosystem resulting in changes such as global warming, the alteration of biogeochemical cycles, fragmentation and loss of habitat, alteration of soil quality and water, loss of biodiversity. A growing number of economists realize that the scale of human impact on nature that surrounds it has become increasingly large and is no longer reasonable to consider the earth's crust with its biosphere as an inexhaustible source of resources and a repository of waste. "*

Serenella Sala, Research Group on Sustainable Development, University of Milan, "Ecology in the frame work of Sustainability Science":

"In the context of global change, where the sum of an infinitive number of local action make the difference, the study of ecology is crucial to understand vulnerability of ecosystems and of socio-ecological systems reducing negative direct and indirect effects on natural and humankind."

One of the main problems is energy currently based on the current use of non-renewable fossil fuels that cause environmental degradation and possible risks to the integrity of natural systems. **Vincenzo Naso**, Mechanical and Aeronautics Department, Sapienza University of Rome, "Energy sustainability:" Closed cycles of resources and their application to Energy Systems ":

*"Human activities are still based on "open cycles" of energy resources, starting from a condition of environmental balance and reaching an environmental imbalance, this cycle consumes resources and produces waste. **THE ERA OF OPEN CYCLES CANNOT CONTINUES.** What yesterday seemed impossible, today is our stated objective: to realize energy systems that not consume resources and do not produce waste. The solution to move towards a new sustainable energy paradigm is the realization of Closed cycles of resources, which can be achieved in the energy sector by exploiting renewable resources and integrating energy vectors. The inclusion of energy vectors in the energy system chain becomes a key concept far a new sustainable society with low carbon emissions, with equal opportunities of development for all countries and poverty eliminated, aiming to zero waste and zero consumptions and that continuously re-use its resources."*



How show an integrated analysis of past and future of the Planet, in 1956 began the Great Acceleration characterized by: growth in world population, the decrease of the village green, the growth in the GWP (Global Warming Potential), the consumption of 'water, rising CO2 (**Robert Costanza et al**, 2007, University of Vermont, USA). It is no longer unthinkable to use natural resources as if they were infinite and for replace *Homo economius* and *Homo comunicus* must come *Homo naturalis* the goal of which is the principle of sustainability. Ecology as a science should be major science who will accumulate the knowledge of all other sciences in a systemic vision of our Planet. The world ruled by the Economy have to "sign a contract" with the Ecology and give value to the services offered by the Earth. The Economy have to operate with **4 types of capital**:

Built capital - all the structures of human activity - infrastructures, buildings, roads, houses, etc.;

Human capital - human individuals, their health, education and information collected in their brains;

Social capital - the web of interpersonal connections, institutional organizations, rules and laws;

Natural capital - land and resources, ecological systems and services (**R. Costanza**, "Understanding, Modelling and Valuing Ecosystem services").

As many ecological services are public, its can not be privatized.

Ecosystem services and benefits represented on the picture:

The transition to sustainable quality of life must be based on four concepts:

- **Large-scale conversion of capital built** with use of sustainable renewable energy with massive investments in wind and solar energy, use of energetic networks fast and efficient, effective mass transit, use of buildings and machines of high efficiency;

- **Total use of human capital** through the full-time employment, universal access to high quality education in colleges and distance education, universal access to preventive medical care of high efficiency, the limitation of the population;

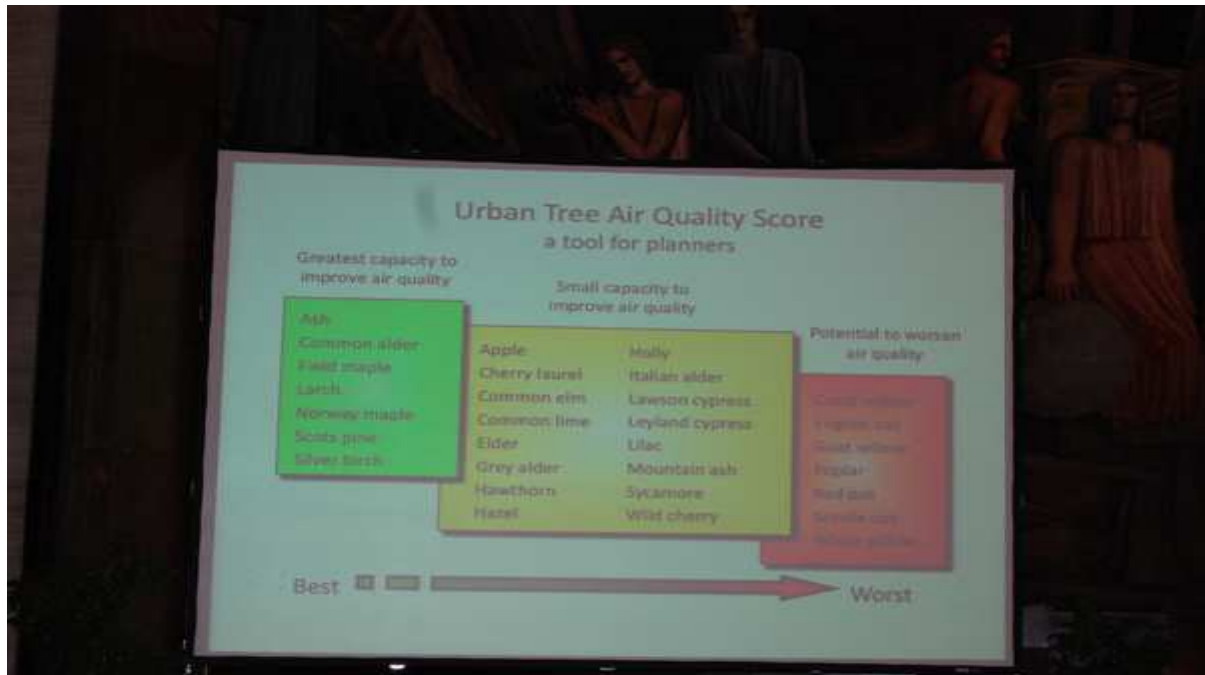
- **Reconstruction of social capital** through the gratification of the communities involved, reducing the difference in earnings between rich and poor, by providing work that allows you to have more free time to spend with family and friends;

- **Restoration of natural capital** through the protection and renewal of ecological services which depend on the quality of life of all mankind. These aspects include the limitation of carbon emission to maintain the concentration in the atmosphere under 350 ppm, a vast expansion of marine protected areas, restoration of degraded ecosystems etc". (**R. Costanza**).

As so many people in the world live in urban areas (only 75% in Italy), the air pollution levels are now high and cause respiratory and other diseases, this has already been well documented. Many speakers at the conference spoke of the ability of green space to remove air pollutants. They are commonly known roles played by trees - create shade and moisture, increase biodiversity, the appearance of urban greenery, to absorb the CO2 and other greenhouse

gases. The function of the absorption of pollutants with the leaves of trees, is considered one of the most important.

According to **Nick Hewitt**, Lancaster Environment Centre, Lancaster University, "Trees and urban air quality", *Pinus sylvestris*, *Alnus*, *Larix*, *Acer platanoides*, *Fraxinus*, *Betula* that are best removed. The trees in the area of 900 km² reduced the concentration of fine particles by 25%.



Professor F. Manes, Department of Environmental Biology, Sapienza University of Rome, has estimated that in 2004, hardwoods and conifers have removed a value equal to 1254 tonnes of PM₁₀. Many researchers continue to associate air pollution in urban areas to increased morbidity and mortality of man. Then becomes essential to protect, rehabilitate and increase the "urban forests", the parks and wooded areas.

The ecosystems are undergoing significant transformations of their characteristics with a speed that far exceeds that of adaptation of organisms to new conditions. These changes have caused important losses of biodiversity. Undoubtedly, the responsibility of the human species is considerable, and environmental science is expanding its systemic vision of the environment in more detail highlighting the presence of humans in environmental issues. The current defense of ecosystems, based on the interests of economy, is clearly unbalanced. In the era of globalization, the possible solutions have to include both in-depth knowledge of the structure and functioning of the processes of nature, ethical commitments to the needs of companies that invest in different areas of the world. These objectives require different knowledge, in order to initiate the studies based on the principle of eco-development aimed at improving the quality of life and a proper use of natural resources.

The XX Congress of the Italian Society of Ecology showed the anxiety of scientists for the state and protection of ecosystems, for further study. As always

during the conference did not miss the humor and already at the first drink in the foyer of the University someone put "the trees of the future" decorated with bottles of beer.



...

Academician **Vladimir Vernadsky**, the eminent Russian chemist, geologist, founder of radiobiology, science system, and founder of the theory of **Biosphere** and **Noosphere**, world intellectual network of human beings who think positively and believe in the progress of science and reason, in 1945, during the 2nd World War, wrote from his exile in the village Borovoe in Kazakhstan:

"In the geological history of the Biosphere, before the man will open a huge future if he will be able to understand it and will not use his intellect and his work for self-destruction. For the Humanity remains to study the laws of the functioning of the Biosphere and learn to respect them. "



31.10.2010

Tatiana Mikhaevitch