

Ecosystems

Ecosystem approach to management of renewable resources

First the comment on the above phrase:

We have seen the above phrase, for some time already. What we have not seen are tangible results. So the phrase is as good as new, with regard to what needs to be done. It is even better because it is familiar to people.

Why ?

Example from fisheries

Management of renewable resources, for example fisheries, has been advocated as sustainable but in reality the term "sustainable" has been used only as a convenient attribute. Nowhere in EU has fisheries been sustainable. Based on the concept of maximum sustainable yield which originated from treatment of an isolated fish population (not to be found in the sea) it is in fact a recipe for exterminating great many species of fish in the sea and freshwaters. As such, not only that the concept is not in line with Declaration of Biological Diversity, it runs directly against the declaration. The reason is simple: the concept has not considered the ecosystem of which the targeted species of fish are just one part. The result is that even some targeted species have been pushed to the brink of existence while others have gone extinct. In the Adriatic Sea alone, 5 out of 12 species of rays (the third most abundant fish in 1948) are extinct today. All other predatory fish comprise at most 10 % of what they used to be in 1948. We have recently computed that even the anchovies, which reproduce the fastest, have been overfished. So we wonder where has that sustainable management gone? Of course, the answer is: it has never been put into place. And this is because it has never been created. To create it we need a whole ecosystem approach, not species by species approach.

1. Ecosystem based approach

An integrated ecosystem-based approach focused on protection issues of immediate and long-term concerns, exploiting synergy of in situ integrated monitoring, mathematical modelling and remote sensing. New methodology for sustainable management of ecosystems (freshwaters, marine and terrestrial).

Identification of reference sites and detection of hot spots like soil, surface and ground water contamination, overfishing as well as air pollution in most endangered areas.

For example in forest ecosystems:

1) mapping spatial distributions of forest types and dominant tree species diversity on the entire area of Dinarides, 2) estimating spatial distributions of naturalness and stability of these forests and 3) explaining these distributions as a function of environmental factors. This research will be methodologically based on: 1) remote sensing (e.g. aerophotogrametric images with high spatial resolution, time-series of satellite images

with high temporal resolution) which will be used for recognition of spatial patterns, 2) optimized field sampling (e.g. tree species populations, parameters of forest health status) which will be used as ground truth informations, 3) raster-GIS techniques (e.g. DEM-based modelling) which will be used for processing of spatial data and 4) environmental modelling techniques (e.g. multivariate statistics, neural networks) which will be used for data analysis and building of prediction models. Beside the understanding of dominant spatial patterns in distribution of forests over entire area of Dinarides, comprehensive results of proposed research will enable involved countries to develop and optimize common strategies for the forest management, especially in the fields of environmental risk assessment and sustainable use.