

# ANALYSIS OF THE FUNDAMENTAL CONCEPTS OF RESOURCE MANAGEMENT

Contractor



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## 0 EXECUTIVE SUMMARY

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Resource management has a long history. Various schools cover a broad field of different approaches and have created several, even contradicting concepts. Therefore, an analysis of the fundamental concepts of resource management is needed: Which concepts have been developed? How can resource management be effectively structured? Above all, before developing a consistent EU policy on resource management, the following questions have to be answered: Is there a need for policies on resource management? Which problems should a policy focus on first?

Classical resource economics takes scarcity – one of the problems connected with resource use – up. However, scarcity of specific resources cannot be easily identified. The static range (proved reserves of a resource divided by its annual consumption gives the remaining range) provides wrong results due to neglecting technological progress and discoveries of new raw material deposits. In contrast to pessimistic reports of approaching depletion of resource stocks, the prices of almost all environmental resources have been declining in the course of history. Therefore, from an empiric point of view scarcity cannot be observed. On the other hand, environmental problems (pollution, waste generation,...) are vital for society. These issues currently build up the more significant part of the problems concerned and have to be addressed first by new policies on resource management.

In order to structure resource management several levels have to be distinguished:

- 1) The overarching goal is to make the use of natural capital sustainable.
- 2) On the macro level, measures are used to assess the health of the natural capital. The methods can be divided either by the two main orientations of sustainability: Weak sustainability, which means that the value of all capital is constant, and strong sustainability, which means that the natural capital is constant and cannot be substituted by other capital. On the other hand, the methods can be based on the assessment either of the natural capital (stock assessment) or of the natural interests (flow assessment).
- 3) Resource economics deals with models and mechanisms of the economy's resource use. It helps to explain behavior of society or economy as far as resource use is concerned.
- 4) Process and policy strategies as well as management measures are used for interventions.

The concept of dematerialization can be used as a general strategy to decouple the environmental problems from the economic growth. Methods developed are Factor 4 and Factor 10 as well as Eco-Efficiency. Physical measures can be subdivided according to thermodynamic laws. Firstly, in the field of mass flow analyses the concepts of MIPS & rucksacks, Mass Flows – Life Cycle Assessment Approach, Environmental Space and the Ecological Footprint (Carrying Capacity) are identified. Secondly, thermodynamic analyses can be based on the measurement of entropy and exergy.

Despite of the fact that there is a lot of critics on the strictly economic approach in resource management, economics can contribute to an effective concept by addressing the more urgent environmental problems: Prices have to reflect the total value of a good or service including economic, ecological and social costs which arise in the life of a good or service. The externalities have to be assessed "from cradle to grave" and valued. By integrating the methods developed in resource management, Welfare Cost-Benefit Analysis can determine the total advantages and disadvantages of certain projects providing an objective basis for decision making in resource management policies.



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At the Earth Summit on Environment and Development in Rio de Janeiro in 1992, the United Nations agreed that the concept of sustainable development is the global strategy for further human development. A major part of the follow-up program – the Agenda 21 – deals with resource management: The implementation of new concepts to stop non-sustainable patterns of production and consumption is demanded on local, national and supra-national level. The conclusion is that an effective EU resource management policy based on a coherent concept is definitely needed.