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## **A transaction-based approach for defining and measuring ecosystem services**

**Key words:** ecosystem accounting, economic, transactions

### **Abstract:**

There has been a significant amount of work in the past 4-5 years focusing on measuring ecosystem services and the related issue of classification for use in the System of Environmental-Economic Accounting (SEEA) Central Framework and Experimental Ecosystem Accounting (SEEA EEA). The description and definition of ecosystem services tends to come from one of two different angles: i) an ecosystem approach (e.g. Convention on Biological Diversity) focused on levels of biological organization, encompassing the essential structure, processes, functions and interactions among organisms and their environment, and; ii) consideration of the benefits obtained by people and society (including private sector) from ecosystems (e.g. Millennium Ecosystem Assessment). Both the ecosystem and benefit based approaches leave several issues unresolved from an accounting perspective. The challenge is how to deal with intermediate or supporting services which commonly underpin the supply of final ecosystem services but also how to interpret the role of ecosystem assets in a comprehensive accounting framework. In this paper we describe a transaction-based approach to defining ecosystem services for accounting purposes. We propose an approach to defining and identifying ecosystem services based on spatially distinct ecosystem assets. We do so through application of accounting principles contained in the System of National Accounts (SNA) and the SEEA Central Framework (CF), particularly those relating to the definition of production. Each ecosystem asset can be spatially delineated and SEEA CF based recording can be used to account for physical transfers between the ecosystem assets and the economy. By recording the various physical transfers, a bridge is established between the accounting approaches in the SEEA CF and the spatial accounting of ecosystem services and economic values. We illustrate our approach by presenting a hypothetical example of soil-water-economy transactions in an agro-ecosystem.