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Emternalities - The Case of Agro-ecosystems

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Abstract

This paper deals with the role of ecosystem services prior to crop production and uses this example to introduce emternalities in agro-ecosystems. Emternalities are best viewed as the quasi counterpart of established economic externalities, except that they designate unassessed inflowing environmental contributions instead of unpriced, outflowing impacts of economic processes on the environment. In agro-ecosystems, classic externalities cover effects of soil loss as unpriced outputs, but the environmental services prior to crop production are not typically considered. Consequently, much of the environmental work performed in processing wastes produced by industries supporting food production is not included in assessing its cost, even when economic externalities are accounted for. Emternalities are useful in filling this conceptual gap. They also measure the contribution of the environment to the sustainability of local and/or national agro-ecosystems. This paper focuses on ecosystem services to agro-production, and specifically those associated with fertilizer production used in production of food crops. For instance, calculations for phosphate fertilizer use in Florida and Algeria show emternalities being essentially non-renewable in both cases, and therefore a deficit. For the U.S., this deficit is valued at over a hundred billion GDP\$-value terms in lost equivalent ecosystem services.