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A SYSTEM FOR WEIGHTED ENVIRONMENTAL IMPACT ASSESSMENT OF RURAL ACTIVITIES: APOIA-NOVORURAL

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INTRODUCTION

Farmers world around are increasingly committed to the application and demonstration of environmental management practices applied to their farming systems. Whether or not implicated with a variety of best practices arrangements or eco-certification schemes, the impact assessment of rural activities has become a priority for guiding sustainability. Numerous environmental impact assessment (EIA) methods have been developed to meet this demand, both as auditing procedures for third party conformity evaluations and as environmental management systems to aid farmers' decision making.

In the ample majority of cases, EIA methods rely on performance indicators and, according to the scale and required complexity level, the ensuing agricultural performance statements address particular aspects such as pesticide contamination risks and input-output balances, up to the integrated environmental and socio-economic performance of farming systems. Beyond agricultural performance evaluations, the integrated farm sustainability approach offers procedural advantages for environmental management – for it is at the rural establishment scale that production practices and technology adoption decision-making takes place.

Methodological alternatives for integrated farm sustainability assessments have been made available, most often involving specific cropping systems and special market affiliations such as organic farming and integrated production programs. The present paper details the 'system for weighted impact assessment of rural activities' (APOIA-NovoRural; Rodrigues and Campanhola, 2003), devised to promote the environmental management of rural establishments, applicable to a variety of socio-environmental contexts and spatial scales.

Eight case studies carried out with the methodology are briefly reviewed, attesting to the malleability of the approach and its applicability as an integrated environmental management tool for rural establishments and its extension to promoting local agricultural productive arrangements and territorial sustainable development.

DESCRIPTION OF THE APPROACH

The presently proposed method considers the general framework of EIA science, as to observe and integrate the (1) **pressure** premise: be adaptable to imposed impacts, according to local socio-economic contexts, environmental conditions and production scales; (2) the **state** premise: express the effects of changes on the quality of the environment and natural resources, including social, economic and ecological concerns; and (3) the **response** premise: offer the basis for issuing recommendations for decision making on alternative management practices and agricultural technology adoption.

The APOIA-NovoRural system has been developed observing the following objectives: (i) allow practical assessment of the most diverse rural activities with objective, quantitative indicators, applicable in varied environmental settings at the specific scale of the rural establishment; (ii) integrate ecological, sociocultural, economic and management aspects pertaining to local sustainable development; (iii) express results in a simple and direct manner to farmers, rural entrepreneurs, decision-makers, and the general public; (iv) facilitate the detection of critical control points for management correction; (v) provide a user-friendly interface and integrated sustainability index. The system consists of 62 indicators

integrated in five sustainability dimensions: i) landscape ecology, ii) environmental quality, iii) sociocultural values, iv) economic values, and v) management and administration. The indicator level assessment results offer a diagnostic tool for farmers and managers, pointing out specific attributes of the rural activity that may be failing to comply with defined benchmarks. The output integrating indicators by each of the five considered dimensions shows decision-makers the major contributions of the rural activity toward local sustainable development, facilitating the definition of control actions and promotion measures. Finally, the aggregated 'sustainability index' is a yardstick of environmental performance, offering a straightforward eco-certification tool for rural activities.

RESULTS AND DISCUSSION

To date, a total of 139 rural establishments have been studied in formal, fully documented research projects, in addition to numerous evaluations carried out in training programs, graduate courses, and project preparatory trials. These assessments have included from very small (2-5 ha), subsistence family landholdings, to medium size (~100 ha) family farms; and from commercial farms of different scales, to large (600 – 3000 ha), productively diversified and technologically advanced agribusinesses.

Varied rural sectors have been included in these projects, both typically agricultural such as horticulture, grain production and dairy farming; and non-agricultural such as agro-tourism, fee-fishing, carcinoculture, and artisanal mussel / crab fishing. Also, different social arrangements have been adaptively approached, including traditional communities (and indigenous groups), agrarian reform farmers, cooperative groups and farmers involved in special local productive arrangements in governmental programs. Subject to minor adaptations and calibrations, the system has been applied in the most varied socio-economic and physicochemical environmental settings, from the equatorial Amazonian region to the temperate pampas.

Comprising ecological, sociocultural, and economic (including management and administration) dimensions, integrated into an objective measure of rural activities' contributions toward local sustainable development, the APOIA-NovoRural system is straightforwardly applicable by trained researchers and technicians, allows the active participation of farmers / administrators, and facilitates the storage and communication of information concerning environmental impacts. The computational platform is readily available and allows issuance of easy-to-interpret printable graphic outputs. A template is available for the formulation of 'Environmental Management Reports', facilitating recommendation of practices and technologies for correction of faulty indicators and promotion of positive ones.

The results regarding the performance of the studied activities according to particular environmental indicators offer a diagnostic tool for farmers / administrators, pointing out how the activities may comply with defined environmental standards and socioeconomic benchmarks. Additionally, the indicators show a measurement of the relative variation and temporal tendency of impacts imposed by agricultural practices, indicating corrective courses of action for management.

The results combined according to the integrated dimensions provide decision-makers with an overview of the effects, both positive and negative, of rural activities on local sustainable development, facilitating the selection and recommendation of incentive policies or control measures at the local community level. Finally, the 'sustainability index' can function as a measure of the contributions of rural activities to local development, meeting the demands of farmers, administrators, decision-makers and rural organizations, pursuant to defined objectives of integrating ecological integrity, economic vitality and sociocultural equity measures for local sustainable development.

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