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## **IDENTIFYING AND IMPLEMENTING CIRCULAR APPLICATIONS OF AGRI-RESIDUES. A practical tool for assessing circular agricultural projects**

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Agricultural residues originating in the field, during processing or collected later as waste are generally underutilized. Scarce elements are lost (K, P) and the potential value of the organic material is underutilized. In addition disposal of residues may have negative environmental impact. For example burning of residues leading to considerable air pollution, discharging residues may lead to pollution (i.e. eutrophication) of waterways or disposal leads to odor nuisance and hygiene problems. Alternatives to the current disposal or application of residues need to be identified and assessed. A method was developed to identify the best and preferably most circular applications of agricultural wastes. The aim was to have a method to compare the best applications for agri-residues for use by agricultural counselors and other stakeholders and to also identify the bottlenecks for implementation and how to address them. The method compares applications of a residue on the basis of 4 domains: circularity, socio-economic impact, ecological impact, and implementability. Each domain is subdivided into four categories, i.e. for circularity the applications are compared with respect to: Use of the functionality of the biomass components – this is a modified ladder van Moerman that also considers components of the biomass (i.e. fiber, protein, sugars, starch minerals, etc.), efficiency, re-use potential, sparing of land or other input. Socio-economic and ecological impact show the direct effects of strategy implementation, while implementability highlights barriers that challenge adoption of a new strategy.

Each category is scored in relevance to a base-case (generally the scenario as it is before change is implemented). Based on the scores, opportunities and bottle necks can be identified and scenarios compared. Stakeholders are enabled to focus on key aspects that promote the circular use of agri-residues while directly comparing all aspects of proposed scenarios. In case-examples studied it was shown that to adopt change, challenges need to be identified and addressed as early as possible. Each case has its own specific challenges, which often do not require unique solutions. Through the use of this practical tool, an early and thorough assessment of proposed strategies becomes possible, guiding the decision making process.

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