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BOOKLET OF ABSTRACTS

DEXiCacao: a new tool to assess the overall sustainability of cocoa-based cropping systems

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ABSTRACT

In the West African cocoa belt, sustainability is a key issue for cocoa cropping systems, which production paradigm needs to be changed as the latter heavily contributed to deforestation and soil degradation. Agroforestry systems are recognized as appropriate cocoa management strategies since they can provide multiple ecosystem services, enhance agronomic productivity and improve the living standard of growers. To promote context-specific agroforestry systems and to increase the potential of adoption of agroforestry practices, it is necessary to assess and compare their overall sustainability. However, the assessment of the sustainability of cocoa-based agroforestry systems is a complex challenge because of the coexistence of conflicting objectives and the multidimensionality of their performances. In such an assessment, the environmental, economic and social aspects need to be simultaneously considered to evaluate potential synergies and trade-offs both in actual (ex-post analysis) and potential systems (ex-ante analysis). In the Cocoa4Future DeSIRA project, an innovative multicriteria model named DEXiCacao based on the DEXi framework is currently developed to assess the overall sustainability of cocoa agroforestry systems in a qualitative and comprehensive way. The DEXi framework consists of building an attribute tree organized to characterize a complex problem. The herein study presents the methodological development of the DEXiCacao model dedicated to cocoa agroforestry systems in Cote d'Ivoire. Its development is based on expert knowledge, literature review and agricultural surveys to (i) identify a set of assessment criteria, (ii) their aggregation modalities and (iii) to define thresholds of classes for each criteria. Different multi-disciplinary groups of scientists were mobilized in botany, agronomy, entomology, forestry, pedology and rural socio-economy. Using this framework, we were able to develop basics indicators and aggregated indicators designed to compare and assess the context-specific suitability of a given cocoa agroforestry system among the three dimensions of sustainability. In the Cocoa4Future European project, DEXiCacao will be used to assess the

sustainability of 150 cocoa cropping systems. This will help selecting the most promising cocoa-based agroforestry in each given context. DEXiCacao will also be used as a dashboard to determine strengths and weaknesses of the evaluated systems and therefore to identify potential improvements.

Keywords: Sustainability, Multicriteria assessment, Cocoa agroforestry