

SIMPATICA: software to register and analyse crop management

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Introduction

Intensification of production of food and other agricultural products is much needed in order to sustain an ever growing global population. However, farmers and food industry are put under pressure to achieve this intensification without affecting the environment or increase the emissions of green house gasses (GHG). More and more, both farmers and food industry are challenged to demonstrate the results of their efforts with hard data. In fact, being able to do so may become a requirement for getting a ‘license to produce or sell’.

Tools like LCA and the Cool Farm Tool are used to provide ‘footprints’ (e.g. for water, energy, GHG) for specific products. These tools require data on input use during the whole production and processing chain. For transport and industrial processing and packaging these data often exist or can be estimated within a reasonable margin of error. For many agricultural products however, data on input use for the production stage are almost completely lacking, especially when these are produced by (small holder) farmers in developing countries. Examples are green coffee, cocoa, tea, bioenergy, potato.

Part of that lack of data derives from the fact that many farmers do not keep track of their input use, or only in financial terms. Using questionnaires or interviewing farmers once a year (or even less often) on their input use generally results in unreliable data, because most people do not correctly recall the required information.

In the recent CLM/SAI Platform report ‘Towards a simple set of farm-level sustainability indicators’, the authors suggest in section 4.2 ‘Data Collection and reporting’: ‘Help farmers to be efficient in data collection’ that SAI Platform members who have an interest, may join forces in developing a sophisticated reporting mechanism. The ideal is that farmers keep track of basic data of their own farm: kg and type of pesticides used, fertilisers, soil characteristics etc. Farmers feed such basic data into a single computerised system which calculates all environmental impacts’.

The DE Foundation (related to Sara Lee), the Hanns R. Neumann Stiftung (related to the Neumann Kafe Grupe) and Kuit Consultancy (private) are jointly developing the SIMPATICA software, which could be(come) such computerised system.

SIMPATICA Axiomas

1. One time entry of data
2. Data-owners determine who can use their data for what purposes
 - a. Different types of users with different levels of access and use of data
3. Data-owners to profit from providing data
 - a. Receive and/or be able to produce performance analysis
 - b. Compare own performance with that of (anonymized) peers and/or benchmarks
 - c. Comply with certification requirements of data registration
4. Users enabled to define quantitative performance indicators and reporting
 - a. How to calculate customized indicators in addition to standard indicators

- b. Create and use customized templates for reporting of performance results
- 5. Sharing of data and other information between users where feasible
 - a. Background data (e.g. embedded GHG emissions per fertilizer type)
 - b. Definitions of variables defined by other users
 - c. Templates for reporting
- 6. Universal Use
 - a. Inclusion of additional languages and translation between languages
 - b. Inclusion of additional units (systems) and conversion between unit systems
 - c. Inclusion of additional currencies and time specific conversion between currencies
 - d. Users to define objects (e.g. crops, products, product qualities, activities)
- 7. Customizable Data Quality Assurance integrated
 - a. 'Science Board' to approve on use of entered data (specifically background data) and new objects

SIMPATICA Setup

1. Modular approach
 - a. E.g. modules for recording activities, setup of variables, objects (crops etc), analysis & reporting, certification check
2. Hierarchical domain objects
 - a. World, region, project, area, farm, field, crop, planting date
 - b. Background data can be defined per object (e.g. currency and language to region)
3. Definitions for crops and depending items
 - a. Crop (e.g. Coffee), type (Arabica), variety (Catimor)
 - b. Produce (e.g. Coffee bean), stage (fresh cherry), quality (ripe)
 - c. Process (e.g. Production), activity (fertilizing)
4. Activities grouped in activity types related to input use / output
 - a. E.g. fertilizing (uses fertilizers), fertigation (uses water and fertilizers), harvesting (gives certain produce)
5. Various types of resources and materials, each with specific attributes and assigned to specific activity group(s)
 - a. Fertilizers: attributes: N, P, K content, embedded CO2 emissions; assigned to activity type fertilizing
 - b. Others: biocides, energy, water, planting material, other material, equipment, labor, other resources

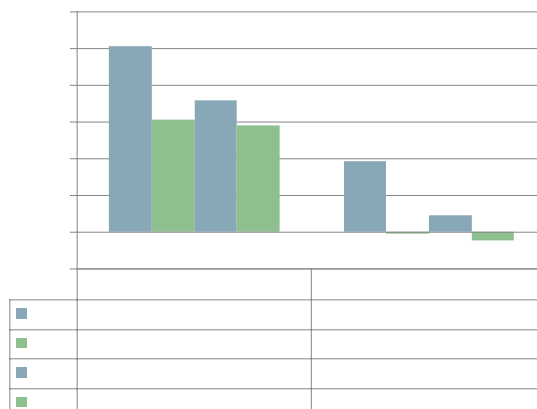
SIMPATICA examples of results

1. Financial analysis

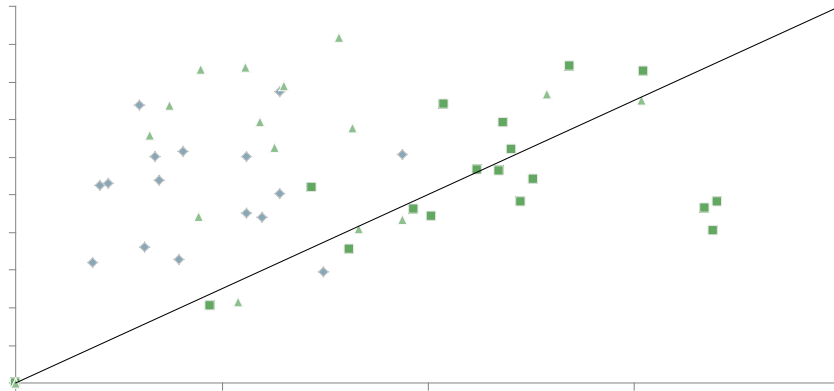
Costs and revenues for smallholder coffee production in USD Mt ⁻¹ green bean			
Costs	Baseline	2007	2008
Irrigation inputs	-	104.27	64.55
Fertilizer inputs	-	447.37	354.42
Total labor	-	211.08	134.25
Other	-	-	-
Total costs	833.00	763.44	553.22
Gross income	1,562.50	1,562.50	1,562.50
Net revenue	729.50	799.06	1,009.28

2. Environmental analysis

Use of irrigation water



3. Group comparison



SIMPATICA status

1. Currently in beta stage of development; first official version expected March 2011
2. Open source software, free to be used under a Non-Profit Open Software License (www.opensource.org/licenses/NOSL3.0.html), which allows also future developments in SIMPATICA to remain open source
3. Not-for-profit, independent SIMPATICA Foundation to be established to provide users with support and facilitate further software development (including fund-raising)