the average carbon footprint of banana farming was reduced by 15% when applying these optimization measures. The application of the CF+DEA method was found to be a valuable tool for farming optimization, allowing an easy estimation of the environmental improvements that would result of the application of given target values to inefficient units. DEA constitutes, however, a complex model, leading to the conclusion that results should be carefully analized to ensure target viability before implementing any optimization measure.

TU305

Environmental footprint of the company in consideration of the whole supply chain

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In late years, the attention for the environmental evaluation of the organizations in the LCA. For example, I include "Organization Environmental Footprint" which introduction is considered for in Europe, "PUMA's Environmental Profit and Loss Account for the year ended 31 December" by PUMA company. In this study, I performed examination for the development of the environmental footprint technique of the company for the whole supply chain. For end-point, I aim at covering all influence domains advocating with Organization Environmental Footprint in Europe.I evaluate it using a Japanese Input-Output table analysis in this study, and the input data used the disclosure data of the company.

TU306

Eco-efficiency indicators for decision-making support in the Urban Water Sector

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The recently released standard for eco-efficiency assessment (ISO 14045:2012) is proposed to support decision-making when dealing with urban water cycle management.The lack of such an integrated assessment may lead to non-eco-efficient performances both from the economic and the environmental point of view. The most appropriate environmental, economic and eco-efficiency indicators were selected after the application of both LCA and LCC to the urban water cycle activities of two small-medium cities in Spain. Nevertheless, with respect to LCA results, midpoint and endpoint indicators have been compared in order to select which were the most understandable ones for end-users. The midpoint indicators selected were Global Warming (GWP), Ozone Layer Depletion (ODP), Eutrophication (EU) and Commulative Energy Demand (CED) as those were the common relevant indicators in the four stages of urban water cycle (drinking water treatment, supply network, sewer network and wastewater treatment and discharge). Both construction and operation and maintenance impacts were included as for treatment plants the most important stage is Operation and for networks it is more relevant the construction stage. Regarding the economic assessment, besides LCC, cost functions were developed in order to estimate costs for water facility and monetisation of externalities was also carried out in order to have a single economic indicator including, costs, monetised environmental impacts and monetised environmental benefits that can be understood by itself. With respect to the eco-efficiency assessment, many previous works from academia and companies showed that there are many different ways to assess the “value” of a product or activity while the standard clearly identifies LCA results as the most appropriate indicators for the environmental assessment. In the case of urban water activities, LCA midpoint and endpoint indicators have been used to correlate them with economic indicators (CAPEX, OPEX and externalities) and also with quality indicators (e.g. BOD reduction or GHG emissions). The most preferred results were the ones that have a graphical interpretation that best supports decision-making. A user friendly web tool for eco-efficiency assessment in the urban water cycle devoted to non-lifecycle experts has been developed gathering all this knowledge and as a collaborative work within academics, water utilities and public institutions.

TU307

Carbon footprint of plant derived surfactant use in leather industry

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In leather production degreasing is an important processing step where the excess of natural fat substances are removed from animal skin. The conventional degreasing methods used for degreasing of skins generally involve using polluting products such as organic solvents and/or synthetic surfactants, or their mixture in the form of aqueous emulsions. The industrial application of these methods has been questioned and raises the question of sustainability because of non-biodegradable structure of synthetic chemicals. Surfactants are shown to be toxic to aquatic organism and their presence generate severe environmental burdens due to use of large amounts of water and cause significant problems in the conventional wastewater treatment processes. The possibility of using plant derived biosurfactant in the degreasing of sheep skins have been investigated and biosurfactant based degreasing process has been described as a viable and promising ecological degreasing option for leather industry. This study analyzes the environmental performance of the biosurfactant based degreasing process in leather industry in comparison to conventional process where syntetic surfactants are used. Life Cycle Assessment (LCA) methodology is applied and biosurfactant use was evaluated by analyzing the global warming potential impact category defined by CML 2001 (measured in kg of CO_2 equivalent emissions), water and energy consumptions.

TU308

Benchmarking carbon footprint of wine industry: comparing data from 20 wineries in Spain and France.

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Inventory data were obtained from 20 wineries with varying production volumes participating in two projects coordinated by Cyclus: 8 within the *CO_2 Vino* project (financed by the *European Social Fund through* the *Program empleaverde from Biodiversity Foundation*) and 12 within the *VINECO* project (financed by the *Euroregion Pyrenees-Mediterranean*). The wineries were distributed in 12 designations of origin from 5 regions in Spain (Galicia, Castilla La Mancha, Murcia, Catalonia and Balearic Islands) and 2 in France (Midi Pyrenees and Langedoc-Rousillon). Both projects had as a goal the fight against climate change, together with increasing competitiveness by delivering environmental information to sensitized markets. In addition to CO2 emissions, the VINECO project aimed at evaluating and reducing water and energy consumption as well. A comparative analysis of the inventory data collected to calculate the carbon footprint of the 20 mentioned wineries is presented. Specifically, a comparative statistical study of consumptions of chemicals and energy per hectare of vineyards, per kg of grapes and per liter of wine produced has been performed. Different variables have been identified as relevant to the results, such as fuel consumption, use of phytosanitary products and weight and type of packaging. The comparative results obtained in this study can be used by wineries as a benchmark to compare their impacts to the average and identify what variables are causing their deviation from the average. This may help and encourage wineries to adopt measures to reduce their carbon footprint.

Assessment of risks posed by systemic insecticides to hymenopteran pollinators: from lab via (semi-)field to landscape scale testing (P)

TU309

Spatial representativeness of field studies on neonicotinoids used for the EU risk assessment to bees

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In view of the various studies and research activities carried out in recent years, in 2012 the EU Commission requested EFSA to revise the risk to bees of neonicotinoid active substances by focussing on clothianidin, imidacloprid, and thiamethoxam applied as seed treatments and granules. In particular EFSA was tasked to consider the acute and chronic effects on colony survival and development, effects on bee larvae and bee behaviour, including effects of sublethal doses. The mandate recommended to perform the risk assessment on the basis of the EFSA PR Panel Opinion, 2012. The risk assessment for honey bees concentrated on three main routes of exposure: via intake of residues in nectar and pollen collected in the flowers of treated plants; from dust produced during the sowing or the application of the granules and drifting on to nearby vegetation; via intake of residues in guttation fluid produced by the treated plants. To this purpose, a number of semi-field and field studies were submitted for the approval of the active substance at EU level and in support of the product authorisations at Member State level. These studies were conducted under certain environmental conditions (e.g. specific crop, landscape, and climate) and therefore their representativeness for different regions and environmental conditions in Europe was questionable. In the present work, the aforementioned studies will be geographically characterised using maps. Their spatial relationship with the distribution of bee-attractive crops and biogeographic regions across Europe will be shown. Uncertainties in extrapolating results from field studies to a pan-European scale will also be discussed. To enhance the interpretation of the results, a short meta-analysis will briefly highlight the main issues undermining the reliability of some studies.

TU310

Calculators developed for the EFSA Guidance Document on Risk Assessment of Plant protection products on bees (Apis mellifera, Bombus spp. and solitary bees)

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