Bioethanol Science and Technology Center

Research Program on Sustainability of Bioethanol: Direct and indirect impacts of land use change

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The main goals – direct impacts

- The specific aim of this project is the evaluation of direct and indirect impacts of land use change. Results will be used within the assessment of GHG emissions.

The main goals – direct impacts

- The objectives are related to the identification of the land uses displaced by the expansion of the sugarcane cultivation (in the first years of the project, the impacts on food security won't be prioritized by CTBE).
- General objectives: are related to the understanding of the sugarcane expansion dynamics, with the identification/ estimation of the growth rates, the regions where the expansion is taking place, and what land uses have been replaced.
- On the other side, another objective is the validation of economy-based models that will be used in the research on assessment of the indirect impacts of land use change (ILUC).

Direct impacts: actions

- The expansion of sugarcane cropping will be determined based on studies of the sugarcane industry, on the scenarios of National Energy Plan and, eventually, on specific studies that will be performed by CTBE group.
- Data from surveys have important limitations; such data permit the identification of tendencies, but for more accurate evaluation of the GHG emissions better data are required.
- Therefore, CTBE wants to work with data based on satellite images and for that a partnership must be established in the short term.

Direct impacts: results within one year

- Data consolidation of direct impacts of land use change due to sugarcane expansion along the last 10 years. Definition of tendencies for the next 10 years.

The main goals – indirect impacts

- General objectives: (1) consolidation of the knowledge on the techniques of impact evaluation, and (2) consolidation of a database that can be assessed by the general public, that will allow for consistent analyses.
- Specific objectives: consistent evaluations of what has happened and of what will happen in Brazil, as a consequence of the growth of sugarcane cultivation for ethanol production.

Indirect impacts: first approach

- One of the lines of the project is the partnership between CTBE and ICONE to improve the partial equilibrium economic model developed by ICONE - BLUM (Brazilian Land Use Model).
- ICONE will present the details of their research proposal.

Indirect impacts: second approach

- An alternative modeling based on general equilibrium economic models. At this moment it has been considered the use of existing models, such as the GTAP (Global Trade Analysis Project), for the evaluation of the ILUC effects due to the increase in biofuels production.
- Advantage: the objective comparison of the results obtained in Brazil and abroad. Drawback: in GTAP Brazil is not dealt as a single case, but it is part of one region.
- Alternatively, a specific model for Brazil (general equilibrium on regional basis) could be developed, and in this case it is necessary to evaluate time and resources required.

Indirect impacts: complementary action

- A partnership is being analyzed between CTBE and a research group abroad with proved experience in the ILUC evaluation due to the expansion of biofuels production.
- Such a partnership would accelerate the research as well as the dissemination of the knowledge. The negotiations are underway.

Indirect impacts: results within one year

- LUC analysis for sugarcane expansion using improved BLUM model.
- Preliminary comparison of results based on the use of BLUM and GTAP models.

Thanks for attending!
Thanks for your attention!!
Questions?