

United States Department of Energy
DE -FG36-08GO18044.0004-0008
Sustainable Biofuel Crops Project
Final Scientific/Technical Report

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Submitted May 28, 2014

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December 1, 2007 – July 31, 2013

Project Summary, Personnel and Contributors

Project: DE -FG36-08GO18044.0004-0008, project modification for extension awarded to Conservation International's Sustainable Biofuel Crops Project.

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Executive Summary

Over the last six years, the Food and Agriculture Organization of the United Nations (FAO) has developed the Bioenergy and Food Security (BEFS) Approach to help countries design and implement sustainable bioenergy policies and strategies. The BEFS Approach consists of two sets of multidisciplinary and integrated tools and guidance (the BEFS Rapid Appraisal and the BEFS Detailed Analysis) to facilitate better decision on bioenergy development which should foster both food and energy security, and contribute to agricultural and rural development. The development of the BEFS Approach was for the most part funded by the German Federal Ministry of Food and Agriculture.

Recognizing the need to provide support to countries that wanted an initial assessment of their sustainable bioenergy potential, and of the associated opportunities, risks and trade offs, FAO began developing the BEFS-RA (Rapid Appraisal). The BEFS RA is a spreadsheet-based assessment and analysis tool designed to outline the country's basic energy, agriculture and food security context, the natural resources potential, the bioenergy end use options, including initial financial and economic implications, and the identification of issues that might require fuller investigation with the BEFS Detailed Analysis.

While the range of targeted issues in the BEFS-RA is quite comprehensive FAO recognized the importance of incorporating the context of biodiversity conservation, ecosystem services and environmental sustainability into bioenergy considerations more broadly, and into the BEFS assessments more specifically.

FAO expressed the desirability of a supplementary report of key suggestions to accompany the RA spreadsheets. CI provided the report *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production* with generous support from the United States Department of Energy (DOE). The report provides supporting context and suggestions to bioenergy policy makers to identify risky areas to avoid biofuel production and to understand potential impact of biofuels on water resource sustainability for one of the key tools in sustainable biofuels decision-making.

Project Accomplishments and Goals

The original goal of the project as submitted, was to build capacity for spatial planning and biofuels in Mexico. Shortly after this project was approved DOE requested we redirect this project towards a one day GBEP training. Though this was consistent with our original proposal, we were unable to fulfill the request (see project summary) and it took several months to identify a project that would meet the needs of DOE and CI. We were fortunate to have identified this opportunity with FAO and timing of both initiatives were approximately the same timeframe.

One of our original goals in early conversation with FAO was to make this a spatially explicit assessment building on the work that CI had conducted for DOE, including the Responsible Cultivation Areas approach (RCA). The FAO and CI project team ultimately decided against the spatial approach to keep BEFS-RA consistent with its goal of providing an indicative, rapid analysis. FAO opted for a spreadsheet format for BEFS-RA which was somewhat challenging as a platform for our component, i.e., considering the multiple criteria inherent in ecosystem services and biodiversity considerations. We decided it was best to keep the guidance in text format as a supplement to the BEFS-RA.

Despite the changes to our original approach and goals, we achieved the objective of building these considerations into the BEFS-RA approach, a very promising and unique tool for the sustainable bioenergy community and we were grateful for the opportunity to build upon the knowledge gained through the larger DOE/CI relationship and produce a synthesis of recommendations in *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production*.

Project Activities and Results

This project was an extension of the larger DOE grant awarded to CI in December 2007 for the project Sustainable Biofuels Crop Project (DE -FG36-08GO18044.0000).

In December 2011, DOE accepted CI proposed work to develop and conduct spatial planning training in Chiapas, Mexico. This project, designed to be conducted at the national/subnational scale, would be a natural extension of our Sustainable Biofuel Crops Project (DE-FG36-08GO18044), which conducted global and regional spatial assessments of the overlap between biofuel feedstock suitability and areas important for biodiversity, hydrological cycles, carbon storage, and food security.

Shortly after the project was accepted DOE requested that CI amend the project goals. One of the options suggested by DOE was to conduct spatial planning and bioenergy training for GBEP's Promoting Sustainable Modern Bioenergy in West Africa. Though CI felt this was an exciting alternative, CI has limitations on where it can work and the March 2012 deadline was too ambitious to reconfigure training materials that were proposed to take 6 months for development in the Chiapas project. DOE then suggested a similar training lecture format for a

GBEP meeting that was tentatively proposed to place in June 2012 during Rio+20. CI agreed to this amendment but this meeting fell through for reasons beyond DOE's control.

CI then pursued other options over the next couple of months. In the process of researching standards and guidelines in sustainable biofuels planning, we determined that FAO's Bioenergy and Food Security (BEFS) framework represented current best practice for assessing biofuel potential and one that was embraced by GBEP. Coincidentally, FAO was about to begin BEFS Rapid Appraisal and given our similar objectives CI proposed the option to work with FAO on the biodiversity and ecosystem services context of the BEFS RA. DOE agreed that this was satisfactory use of the grant extension and CI submitted Modification 6 in May 2012. CI began work in late June 2012 pending approval of Modification 6 since this project was tied to FAO's timeframe. On July 16, 2012 CI and FAO met in Rome to begin planning out the details of the project.

During this meeting CI and FAO discussed the objective of BEFS RA, i.e., the development of a tool to assist decision makers in assessing whether bioenergy can be a sustainable option by defining the conditions, main tradeoffs/risks, and main benefits/opportunities. We further agreed that the tool should distinguish itself from BEFS Detailed Analysis; it should be implementable in a relatively short time (six months) and as a first step assessment, give an indication of biofuel potential with the assumption of limited data availability. The tool was aimed primarily at countries associated with the Global Bioenergy Partnership (GBEP) targeting technical government officials as primary users, but understanding that other potential users would include FAO country offices, universities, private sector, and NGOs.

The output of tool was to give an indication on the viable and sustainable potentials of feedstock production, conversion technologies and possible energy uses; potential risks and benefits and identification of thematic areas where more in depth analysis is needed e.g. application of more in-depth BEFS Detailed Analysis. At the end of the meeting, FAO divided the overall BEFS-RA assessment into component parts, first determining physical feasibility of biofuels, then determining a country's techno-economic, environmental and socioeconomic viability.

CI was tasked to develop information on the ecosystem considerations. The broad steps include the development of initial indicators of risk and opportunity as it relates to biodiversity and ecosystem services, given the goals of biofuel development for a given country; crop suitability, constraints and opportunities, including food security, important ecological areas and their considerations depending on their protection status; and the identification of opportunities where for biofuels might improve ecosystem services. These indicators would in part, draw from what we have learned during the development of RCA and the original DOE project where applicable.

During the course of discussion in Rome it became clear that BEFS-RA would not adopt a rapid country-level spatially explicit analysis approach. FAO felt that a lack of data and the limited technical capacity in bioenergy producing regions, especially in developing countries, would be an impediment to this approach. The suggested approach was to establish a non-spatial decision logic using global and regional datasets which are readily available.

Our initial intention was to (much like our original Chiapas proposal) contribute methods for RCA-like rapid spatial planning and assessment of natural ecosystems and land use that would include spatially explicit criteria to characterize biodiversity, ecosystem services (e.g. carbon sequestration and storage, hydrological cycles) and food production as important dimensions of the planning process.

With BEFS-RA reconfiguring its lens towards a non spatial framework that understands the risks, trade-offs, and alternatives (including conservation) to biofuels development, it was decided that CI would then produce a supporting document to support the conservation elements and biodiversity and ecosystem services considerations.

We did not conduct primary research. We gained a much better understanding of the sustainable biofuels material during this trip and community and with the BEFS-RA goals in mind we synthesized and tailored key biodiversity and ecosystem considerations developed during the initial DOE grant and from best practice from the conservation community to inform the BEFS-RA. We began work in the fall of 2012 but delayed full development due to complications in the signing of Modification 6 in order to ensure full compliance with the DOE approved work plan and budget.

The Modification was approved by DOE in April 2013 (and signed by CI on July 2013) and CI ramped up work again. During this period, FAO had advanced BEFS-RA methods and CI completed its first draft of the *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production* in May 2013 and submitted it to FAO for review and comments. An extensive period of further comments and revisions resulted in a second draft in December 2013.

FAO shared the BEFS-RA with CI in March 2014 which enabled CI to review, revise and complete the *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production* for the third and final draft which was review and approved by FAO in May 2014

The web publication of the BEFS-RA and the accompanying supplement, *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production*, is anticipated at the beginning of June 2014, thus closing out the project and CI's duties. The BEFS Rapid Appraisal (RA) and the more comprehensive BEFS Detailed Analysis (DA) are state of the art assessments for sustainable biofuels assessment and decision-making. We hope that the information will provide guidance on how areas important to nature conservation can be avoided when identifying potential areas for biofuels production as countries design and implement sustainable bioenergy policies and strategies.

We submit the attached document *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production* as our final deliverable for this grant extension, effectively closing out the suite of products delivered under the Sustainable Biofuel Crops Project. We would like to take the opportunity to thank the DOE for its generous support to this project and for its guidance, leadership and enormous contribution to the sustainable biofuels community.

Publication and Websites Reflecting Project Results:

- Web publication *Avoiding Important Areas for Nature Conservation in the Assessment of Biofuels Production* as a supplemental part of [BEFS- RA](#). Full release anticipated at the end of May 2014.
- Fostered links and research collaboration with FAO, GBEP.