

**Training Report on
Bioenergy and Food Security
Rapid Appraisals (BEFS RA): ASIA Training
27-31 October 2014,
Novotel Hotel, Bangkok, Thailand**

Introduction

FAO has developed the Bioenergy and Food security Rapid Appraisal (BEFS RA). The BEFS RA consists of a set of easily applicable methodologies and user-friendly tools which allow countries to get an initial indication of their sustainable bioenergy potential and of the associated opportunities, risks and trade-offs. The BEFS RA covers the whole biofuel supply chain from feedstock production to the processing plant gate. The tools are globally applicable and are tailored for country level or area level assessment depending on country size and data availability. The tools are implementable in a relatively short time and can be used with limited data. The user has the option to rely on default values, provided throughout the tools where possible, or enter more reliable data they may have. The more accurate the data used, the more accurate the results. The analysis can be tailored to address specific needs of countries by selection of specific modules or components of the BEFS RA; nonetheless users are encouraged to run the whole BEFS RA to get an initial overview of the options based on country validated evidence.

The BEFS RA tools assist policy-makers/technical officers in:

- Outlining the country energy, agriculture and food security context;
- Obtaining initial estimates of which sustainable bioenergy supply chains are viable in the country, based on economic profitability, financial viability, investment requirements, labour implications and smallholder inclusion; and
- Identifying options of interest that require more in-depth analysis and planning e.g. more detailed BEFS analysis, local level analysis, and/or detailed spatial level planning, etc.

Training Objective

The overarching objective of the training was to deliver a 5-day technical introduction of the Bioenergy and Food Security Rapid Appraisal (BEFS RA) tools in Asia. The training aimed to instruct participants on how to operate the BEFS RA tools through a combination of conceptual discussions and practical exercises. The training targeted primarily participants from academic institution and government representatives from the participating countries. The event was organized by FAO in collaboration with the Asian Institute of Technology (AIT). A courtesy invitation to the German Development Cooperation was also extended in recognition funding support provided by Germany for this activity. A side meeting with GIZ was conducted to seek future collaboration between FAO and GIZ-Thailand Programme (see annex 3 for details).

Training Conduction

The training was opened by Mr Vili Fuavao, Deputy Regional Representative of FAO Regional Office for Asia the Pacific (RAP) and Professor Kanchana Kanchanasut, Vice President of the Asian Institute of Technology (AIT).

The training was attended by 23 participants coming from academia and government institutions in Cambodia, Indonesia, Japan, the Philippines and Thailand. A GIZ representative in Thailand also participated in the training. The list of participants is presented in Annex 1. The training took place over the span of five-days. The training covered most of the BEFS RA tools in detailed and when not possible due to time constraints demonstration of some of the other tools were carried out. The training programme is attached (Annex 2). The training format comprised of combination of lectures and practical sessions. The lecture sessions focused primarily on providing detailed explanations on the methodological aspects related to the tools, the data requirements and explanation of the results generated by the tools. Each of the lectures was then followed by practical exercises aimed at helping participants become familiar with the operation of the tool. For the exercises, the participants were divided into groups of two to ensure participants had the opportunity to practice with the tools.

On the third day of the training, Professor Abdul Salam from the Asian Institute of Technology (AIT) firstly delivered a general presentation of AIT's work on Bioenergy in the region. This presentation helped contextualize bioenergy development to the situation faced by Asian countries. Furthermore, Professor Salam delivered a second presentation related to Biomass Gasification which complemented the presentation of the BEFS RA tools on gasification. A very valuable discussion on the status of gasification development in the region was then followed. The discussion identified some key barriers for the deployment of gasification including environmental impacts from the tar by-products, lack of gasification manufacturing equipment in the region among others. This discussion also provided a good opportunity for the participants to share their experience in gasification among themselves.

On the last day of the training, the participants were divided into three groups. Each group was given a comprehensive exercise which included the assessment of a specific bioenergy production pathway. The exercise required the participants to operate the natural resources tools and use specific energy end use transformation technologies to evaluate the viability of the supply chain. At the end of the exercise, each group presented their results to the plenary. This final exercise helped assess the level of comprehension of the students. Overall the assessment given the level of discussions throughout the course and in particular on during the last session indicated that the participants had a very good understanding of the BEFS RA tools. Compare to other trainings, one can recognized that this group was very knowledgeable which greatly benefited the level of interaction between participants and trainers and to successfully meet the goals.

On the last day of the training Mr Vili Fuavao closed the training by thanking the trainees for their active participation in the training and group work. He also thanked FAO staff members for the smooth arrangements to make the training successful (both technical and logistic aspects). He concluded the meeting with the hand-over of certificates to the participants.

Training Evaluation

During the five day training period, the participants provided valuable feedbacks and at the end of the training, a training evaluation by participants was conducted. In general, the evaluation indicated that the training met the expectations of the participants, the format and content of the training was adequate and that the tools were appropriate and easy to follow.

Overall, participants agreed that the training was good and that they would be able to apply the knowledge obtained. The participants also expressed interest to contextualize the tools i.e. default values and technology options to the Asia context. Other important aspects highlighted were the need to include life cycle assessment, policy aspects, additional financial parameters such as payback period, additional tree species for evaluation and a pretreatment tool for residues.

Conclusions

- The training directly responded to participants' interest and expectations.
- The BEFS RA tools are very useful for conducting research corresponding to food and agriculture and could be introduced to participants' universities and institutions.
- The BEFS RA tools could be modified/utilized based on each country context.
- The tools could also be used with GBEP tool to gain more insight on bioenergy sustainability.
- The BEFS RA tools need credible scientific information from trusted sources to influence policy making process.
- The tools were developed for an initial level of assessment; there still have some limitations to implement the tools.
- The BEFS RA tools could be used to support policy decision making as well to test government policy on bioenergy.
- Countries commit to make use of BEFS tools to support policy implementation.
- Countries request supports from FAO and partner organizations to assist them in data collection.
- Participants from Indonesia plan to introduce the BEFS RA tools to GBEP and AGLINK-COSIMO groups and discuss the possibility of harmonizing these tools.
- Participants from Cambodia plan to write a funding proposal to implement BEFA tools in order to establish database systems for policy makers and investors. They requested FAO and partner organizations to facilitate a meeting and/group discussion for this collaboration.
- Trainees commit to share the knowledge and experience gained from the training with their colleagues and students.
- Countries requested FAO to provide any updates on BEFS RA tools and continue to provide technical supports.

Recommendations

- FAO should assist countries to integrate the tools into academic institutions and relevant government departments

- FAO should provide training to other countries in the region which has potential in biomass such as Myanmar, Laos and Viet Nam.
- Promote Training of Trainer (ToT) training of BEFS RA Tools in the country.
- There should be an M&E follow-up for each country to assess the implementation of BEFS RA tools.
- There should be an online group discussion forum for countries that employed the tools. This will help to evaluate the application of the tools and make continuous improvement based on countries input.
- Establish a taskforce group in each country/region with regularly meeting to discuss country/regional insight on bioenergy and food security both at national and regional levels.
- Minimize the limitation of BEFA RA tools for advanced application as some tools are not working properly.
- Countries requested FAO and partner organizations to provide small-grants for research on specific BEFS tools.
- Countries requested FAO and partners organization to provide capacity building to government officers from all related technical institutions.
- Seminar and workshop on bioenergy and food security in the region should be organized.
- FAO and partner organizations should support a joint-case study project on bio-energy and food security in Cambodia by using BEFS RA tools (activity to be jointly implemented by Institute of Technology of Cambodia, Ministry of Mine and Energy and Royal University of Agriculture).

Annex 1: List of Participants

No.	Name	Title	Institution	Country
1	Mr Vili A. Fuavao	Deputy Regional Representative for Asia and the Pacific	FAO Regional Office for Asia and the Pacific	Thailand
2	Mr Simmathiri Appanah	Regional Climate Change and Bioenergy Officer (Acting)	FAO Regional Office for Asia and the Pacific	Thailand
3	Ms Wirya Khim	Junior Professional Officer (Natural Resources Management)	FAO Regional Office for Asia and the Pacific	Thailand
4	Ms Erika Felix	Natural Resources Officer	Food and Agriculture Organization	Italy
5	Ms Ana Kojakovic	Natural Resources Officer	Food and Agriculture Organization	Italy
6	Mr Luis Rincon	Consultant	Food and Agriculture Organization	Italy
7	Mr Kim Soben	Director of Centre for Agricultural and Environmental Studies, and Lecturer of Graduate School	Royal University of Agriculture	Cambodia
8	Dr Houn Thavrak	Dean of Graduate School	Royal University of Agriculture	Cambodia
9	Dr Sopheak Rey	Researcher	Institute of Technology of Cambodia	Cambodia
10	Mr Leang Khemarith	Vice Chief of Renewable Energy Office	Ministry of Ministries and Energy	Cambodia
11	Mr Ari Imam Sutanto	Researcher	Surfactant and Bioenergy Research Center Bogor Agricultural University	Indonesia
12	Mr Dhani Satria Wibawa	Researcher	Surfactant and Bioenergy Research Center Bogor Agricultural University	Indonesia
13	Ms Fifin Nashirotn Nisya	Researcher	Surfactant and Bioenergy Research Center Bogor Agricultural University	Indonesia

14	Mr Dipo Bariguna Choerul Biladi	Soil and GIS Researcher	Surfactant and Bioenergy Research Center Bogor Agricultural University	Indonesia
15	Ms Ira Ayuthia Herdiani	Staff of Bioenergy Technical and Environmental Subdirector	Ministry of Energy and Mineral Resources	Indonesia
16	Mr Masami Ueno	Professor	Faculty of Agriculture, University of the Ryukyus, Agricultural machinery and renewable energy	Japan
17	Dr Eizo Taira	Assistant Professor	Faculty of Agriculture, University of the Ryukyus, Agricultural Engineering	Japan
18	Prof Rex Bacaling Demafelis	Professor 4 & Convenor and Chair UPLB Alternative Energy and Energy Systems RDE	Chemical Engineering Department, CEAT University of the Philippines Los Banos College	Philippines
19	Mr Nelson Manguiat Pampolina	Associate Professor	Department of Forest Biological Sciences University of the Philippines Los Banos	Philippines
20	Dr Emmanuel Gavilan Samson	University Researcher	UPLBCA La Granja Research and Training Station	Philippines
21	Dr Maliwan Haruthaithanasan	Researcher	Agricultural and Agro- Industrial Product Improvement Institute, Kasetsart University	Thailand
22	Dr P. Abdul Salam	Associate Professor	Energy Field of Study School of Environment, Resources and Development Asian Institute of Technology	Thailand
23	Dr Rajendra Shrestha	Associate Professor and Coordinator of Natural Resources Management program school of Environment, Resources and Development Chair of Academic Senate	Asian Institute of Technology	Thailand
24	Dr Datta Avishek	Assistant Professor	Asian Institute of Technology	Thailand

25	Ms Piyanon Kaenchan	Researcher	Life Cycle Sustainability Assessment Lab The Joint Graduate School of Energy and Environment King Mongkut's University of Technology Thonburi, Bangkok	Thailand
26	Ms Laksamee Suttiwilairatana	Forestry Technical Officer/ Senior Professional Level	Royal Forest Department Ministry of Natural Resources and Environment	Thailand
27	Ms Jariya Budnard	Engineer	Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy	Thailand
28	Mr Henrick Beermann	Research Assistant	The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	Thailand

Annex 2: Training Agenda

27 October 2014 (Day 1)

Time	Session content and speakers
9:00-9:15	<p>Opening session</p> <p><i>Welcome remarks by:</i></p> <ul style="list-style-type: none"> • Mr. Hiroyuki Konuma, Assistant Director-General and Regional Representative FAO Regional Office for Asia and the Pacific –TBC- •
9:30-10:00	<p><i>Moderator and Presenter: Ana Kojakovic, FAO</i></p> <ul style="list-style-type: none"> • Introduction of the Participants • Objectives and Structure of the Training
10:00-10:45	<p>Introduction to FAO’s Bioenergy and Food Security Approach and the Bioenergy and Food Security Rapid Appraisal</p> <p><i>Presenter: Erika Felix, FAO</i></p>
10:30-10:45	<i>Coffee break</i>
10:45-11:45	<p>Session 1 Bioenergy and Food Rapid Appraisal: Country status Module</p> <ul style="list-style-type: none"> • Introduction to the Country Status Module • Exercise and Discussion <p><i>Presenter: Ana Kojakovic/Luis or Erika, FAO</i></p>
11:45-13:00	<p>Bioenergy and Food Rapid Appraisal: Natural Resources Module</p> <ul style="list-style-type: none"> • Introduction to the Natural Resources Module • The Crop Production tool <p><i>Presenter: Ana Kojakovic FAO</i></p>
13:00-14:00	<i>Lunch</i>
14:00-15:15	<p>Bioenergy and Food Rapid Appraisal: Natural Resources Module</p> <ul style="list-style-type: none"> • Crop Production tool-Exercise and Discussion <p><i>Moderator: Ana Kojakovic FAO</i></p>
15:15-15:30	<i>Coffee break</i>
15:30-17:30	<p>Bioenergy and Food Rapid Appraisal: Natural Resources Module</p> <ul style="list-style-type: none"> • The Crop Budget tool <p><i>Presenter: Ana Kojakovic FAO</i></p>

28 October 2014 (Day 2)

Time	Session content and speakers
9:00-10:30	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none">• The Crop Budget tool- Exercise and Discussion <i>Moderator: Ana Kojakovic FAO</i>
10:30-10:45	<i>Coffee break</i>
10:45-12:00	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none">• Introduction to the Techno-economic Module• The Transport tool-Ethanol <i>Presenter: Luis Rincon, FAO</i>
13:00-14:00	<i>Lunch</i>
14:00-15:15	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none">• The Transport tool-Exercise and Discussion <i>Moderator: Luis Rincon, FAO</i>
15:15-15:30	<i>Coffee break</i>
15:30-17:30	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none">• The Transport tool-Biodiesel <i>Presenter: Luis Rincon, FAO</i>

29 October 2014 (Day 3)

Time	Session content and speakers
9:00-10:30	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none">• Agricultural Residues Tool<ul style="list-style-type: none">○ Crops Residues <i>Presenter: Ana Kojakovic FAO</i>
10:30-10:45	<i>Coffee break</i>
10:45-11:30	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none">○ Crops Residues tool-Exercise and Discussion <i>Moderator: Ana Kojakovic FAO</i>
11:30-13:00	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none">• Gasification Tool <i>Presenter: Luis Rincon, FAO</i>

13:00-14:00	<i>Lunch</i>
14:00-15:15	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none"> • Gasification tool-Exercise and Discussion <i>Moderator: Luis Rincon, FAO</i>
15:15-15:30	<i>Coffee break</i>
15:30-17:30	AIT's experience in Bioenergy <p><i>Presenter: Dr. P. Abdul Salam, Associate Professor - Energy Field of Study, AIT</i></p>

30 October 2014 (Day 4)

Time	Session content and speakers
9:00-10:30	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none"> • Demonstration Straight Vegetable Oil (SVO) and Combustion tool <i>Presenter: Luis Rincon, FAO</i>
10:30-10:45	<i>Coffee break</i>
10:45-11:45	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none"> • Woodfuel, Forest harvesting, wood processing residues tool <i>Presenter: Ana Kojakovic, FAO</i>
11:45-13:00	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none"> • Woody residues tool- Exercise and Discussion • Plantation Budget tool <i>Moderator: Ana Kojakovic, FAO</i>
13:00-14:00	<i>Lunch</i>
14:00-15:15	Bioenergy and Food Rapid Appraisal: Natural Resources Module <ul style="list-style-type: none"> • Plantation Budget tool- Exercise and Discussion <i>Moderator: Ana Kojakovic, FAO</i>
15:15-15:30	<i>Coffee break</i>
15:30-17:30	Bioenergy and Food Rapid Appraisal: Techno-economic Module <ul style="list-style-type: none"> • Briquettes tool <i>Presenter: Luis Rincon, FAO</i>

31 October 2014 (Day 5)

Time	Session content and speakers
9:00-10:30	<p>Bioenergy and Food Rapid Appraisal: Techno-economic Module</p> <ul style="list-style-type: none"> • Charcoal tool <p><i>Presenter: Luis Rincon, FAO</i></p>
10:30-10:45	<i>Coffee break</i>
10:45-13:00	<p>Bioenergy and Food Rapid Appraisal: Techno-economic Module</p> <ul style="list-style-type: none"> • Charcoal tool-Exercise and Discussion <p><i>Moderator: Luis Rincon, FAO</i></p>
13:00-14:00	<i>Lunch</i>
14:00-14:30	<p>Bioenergy and Food Rapid Appraisal: Natural Resources Module</p> <ul style="list-style-type: none"> • Demonstration of Agricultural Residues tool for livestock Residues <p><i>Presenter: Ana Kojakovic, FAO</i></p>
14:30-15:15	<p>Bioenergy and Food Rapid Appraisal: Techno-economic Module</p> <ul style="list-style-type: none"> • Charcoal tool-Exercise and Discussion <p><i>Presenter: Luis Rincon, FAO</i></p>
15:15-15:30	<i>Coffee break</i>
15:30-16:10	<p>Bioenergy and Food Rapid Appraisal</p> <ul style="list-style-type: none"> • What do the BEFS RA results tell us? How can these results be used to inform policy? • Training Evaluations <p><i>Moderator: Erika Felix, FAO</i></p>
16:10-16:40	<p>Awarding Ceremony</p> <p><i>Closing remarks by:</i></p> <ul style="list-style-type: none"> • Mr. Hiroyuki Konuma, Assistant Director-General and Regional Representative FAO Regional Office for Asia and the Pacific – TBC- • TBD, AIT person

Annex 3: Side-meeting with GIZ

A side meeting with Mr. Thomas Chrometzka, Director for Renewable Energy and Mr. Henrik Beermann, Energy Consultant from GIZ-Thailand Programme was held. The meeting was organized to discuss in particular the possibility of using the BEFS RA in the context of GIZ work on energy conservation and development in Thailand and at the regional level.

It was agreed that the BEFS approach and BEFS RA tools could be very beneficial to their work programme, particularly one added value can be the use of the BEFS approach to convince key stakeholders including the private sectors.

Some possible areas of collaboration identified during the discussion were the possibility for a 2-3 day workshop within the framework of GIZ Energy in Asia Programme, linkage to the Better Rice Initiative and Power Agriculture initiative. It was agreed to continue communicating to further explore these areas of future collaboration between the two organizations.