Proceedings of the training workshop on EX-Ante Carbon Balance Tool (EX-ACT)

Bangladesh Forest Department
27-28 March 2018

UN-REDD PROGRAMME
Food and Agriculture Organization of the United Nations
UNDP
UN environment

The UN-REDD Programme, implemented by FAO, UNDP and UNEP, has two components: (i) assisting in developing countries to prepare and implement national REDD strategies and mechanisms; (ii) supporting the development of normative solutions and standardized approaches based on sound science for a REDD instrument linked with the UNFCCC. The programme helps empower countries to manage their REDD processes and will facilitate access to financial and technical assistance tailored to the specific needs of the countries.

The application of UNDP, UNEP and FAO rights-based and participatory approaches will also help ensure the rights of indigenous and forest-dwelling people are protected and the active involvement of local communities and relevant stakeholders and institutions in the design and implementation of REDD plans.

The programme is implemented through the UN Joint Programmes modalities, enabling rapid initiation of programme implementation and channelling of funds for REDD efforts, building on the in-country presence of UN agencies as a crucial support structure for countries. The UN-REDD Programme encourage coordinated and collaborative UN support to countries, thus maximizing efficiencies and effectiveness of the organizations' collective input, consistent with the "One UN" approach advocated by UN members.

The UN-REDD Bangladesh National Program is implemented by the Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

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EXECUTIVE SUMMARY

A two-day training on EX-Ante Carbon Balance Tool for the agriculture, forestry and other land use (AFOLU) sector was held at the Bangladesh Bureau of Statistics from 27-28 April 2018. EX-Ante Carbon-balance Tool (EX-ACT) is a tool developed by the Food and Agriculture Organization of the United Nations (FAO). It is aimed at providing ex-ante estimates of the mitigation potential of agriculture and forestry development projects, and estimating net Carbon (C) balance from greenhouse gas emissions and C-sequestration.

The workshop was organized under the UN-REDD National Programme with the technical support from the FAO. In total, 10 representatives (6- female, 4 male) from academia, Forest Department, Department of Environment participated in the training. It was focused on strengthening the capacity of the participants in understanding the role of the AFOLU sector in greenhouse gas (GHG) emissions and the functionalities of the EX-ACT tool.

During the workshop, participants used EX-ACT for estimating the climate change mitigation impacts of projects related to forest and land management, land use change, crop production and land degradation. A follow up evaluation indicated that 70% of participants were satisfied with the event and reported the content was relevant to their daily work. Also, the evaluation showed that the participants were confident to carry out the tasks described in the training for assessing the mitigation potential of country-specific projects being conducted by the Forest Department and Department of Environment.

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1. INTRODUCTION

EX-Ante Carbon-balance Tool (EX-ACT) is a tool developed by the Food and Agriculture Organization of the United Nations (FAO). It is aimed at providing ex-ante estimates of the mitigation potential of agriculture and forestry development projects, and estimating net Carbon (C) balance from greenhouse gas (GHG) emissions and C-sequestration. EX-ACT is a land-based accounting system, measuring C-stocks, stock changes per unit of land, and CH_4 and N_2O emissions expressed in tCO_{2eq} per hectare and year. The main output of the tool is an estimation of the C-balance that is associated with adoption of alternative land management options, as compared to a 'business as usual' (or baseline scenario).

EX-ACT incorporates primarily the IPCC 2006 Guidelines for National Greenhouse Gas Inventories, complemented by other existing methodologies and reviews of default coefficients where available. Thus, EX-ACT allows the C–balance appraisal of new projects by ensuring an appropriate method available for donors, such as the GEF, and planning officers, project designers and decision makers within agriculture and forestry sectors. The tool can also help users to quantify the mitigation impacts of various intervention options, thus provide an additional criterion for consideration in project selection.

EX-ACT can be applied on a wide range of development projects from all AFOLU sub-sectors, including besides others projects on climate change mitigation, sustainable land management, watershed development, production intensification, food security, livestock, forest management or land use change. Further, it is cost effective, requires a compared small amount of data, and has resources (tables, maps) which can help finding the required information.

Under the UN-REDD Bangladesh National Programme, a number of training workshops on GHG accounting for the agriculture, forest and other land use sector have been conducted at the Bangladesh Forest Department involving representatives from various government agencies and academia. Based on the request made by participants of the Forest Department and MRV working group, a training on Ex-ACT has been organized with the aim to build the capacity of the participants to estimate GHG mitigation and to build their capacity in Ex-ACT application.

2. OBJECTIVES

This interactive training workshop aimed to enhance the capacity of participants:

- to understand the role of AFOLU sector in the GHG emissions;
- to understand the functionalities of the EX-ACT tool; and
- to use the EX-ACT tool for estimating the climate change mitigation impacts of land management, watershed development, forest management or land use change project, and Monitoring and Evaluation (M&E) purposes.

3. SUMMARY OF THE WORKSHOP

3.1 Summary of the theoretical part of the workshop

Agriculture, Forestry and Land Use Change (AFOLU) are major sources of green-house gases (GHG), contributing 24% of global emissions or about 10-12 Gt of CO_2 equivalents per year. The climate change

mitigation potential for the sector is high. Many of the technical options are readily available and could be deployed immediately, like:

a) Decreasing the rate of deforestation and forest degradation, adoption of improved cropland management practices (reduced tillage, integrated nutrient and water management);

b) Reducing emissions of methane and nitrous oxide through improved animal production, improved management of livestock waste, more efficient management of irrigation water on rice paddies, improved nutrient management; and

c) Sequestering carbon through conservation farming practices, improved forest management practices, afforestation and reforestation, agro forestry, improved grasslands management, restoration of degraded land.

In order to show the mitigation potential of the above mentioned option The EX-ACT (EX-Ante Carbon Balance Tool) is a tool developed by the FAO, and is aimed at providing ex-ante estimations of the impact of agriculture and forestry development projects on GHG emissions and Carbon (C) sequestration, indicating the effects on the C balance. EX-ACT has been developed based on the 2006 Guidelines for National Green-house Gas Inventories, and the default values (tier 1) of emission factors are mostly from IPCC 2006 Guidelines.

Figure 1 presents the basic user interface of the EX-ACT tools. EX-ACT consists of a set of linked Microsoft Excel sheets in which project designers insert basic data on land use and management practices foreseen under projects' activities. EX-ACT adopts a modular approach-each "module" describes a specific land use – and following a three-step logical framework:

1) A general description of the project (geographic area, climate and soil characteristics, duration of the project);

2) Identification of changes in land use and technologies foreseen by project components using specific "modules" (deforestation, forestation, forest degradation, annual/perennial crops, rice cultivation, grasslands, livestock, inputs, energy); and

3) Computation of C-balance with and without the project using IPCC default values and-when available project or country specific coefficients (tier 2). The main output of the tool consists of the C-balance resulting from project activities.

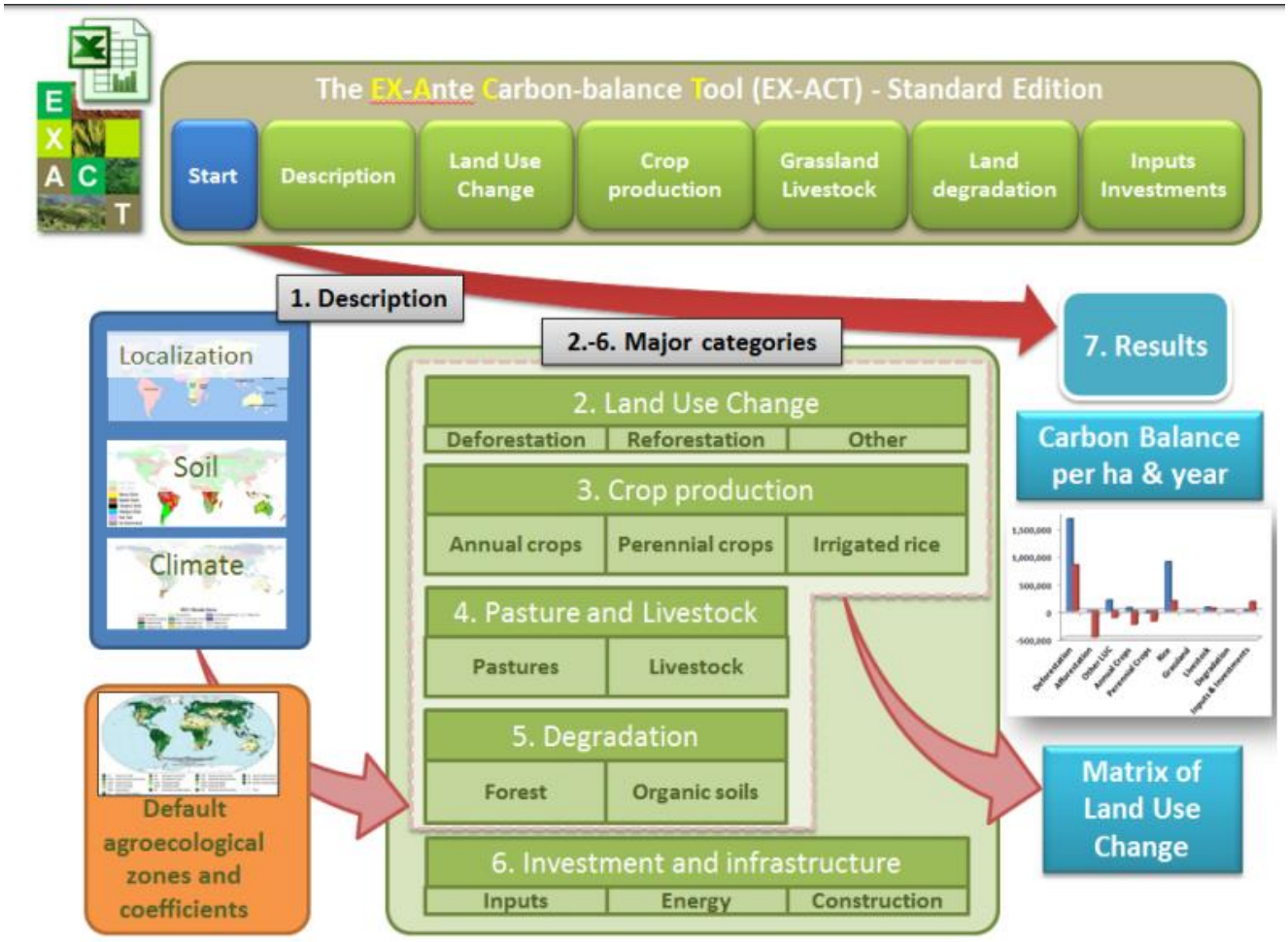

FIGURE 1 THE BASIC USER INTERFACE OF THE EX-ACT TOOLS.

3.2 Summary of the practical part of the workshop

Practical Exercise 1: Agricultural project in Benin

This simulated situation aims at providing a good understanding of the “Land Use Change”, “Crop Production” and “Inputs and Investment” modules. It focuses on the aspects of annual & perennial crop cultivation as well as on the utilization of fertilizers. This exercise indicates that, climate change mitigation can be carried out in synergy with food security and poverty reduction. The sole reliance on cotton cultivation will be replaced by a diversification into rice production, which should contribute to household food security and risk management. Further, perennial crops are established on a selected area that will store carbon and serve as a further income source to smallholders.

Practical Exercise 2: Palm Trees in Indonesia

This simulated exercise guides EX-ACT users to analyse deforestation and perennial crop systems as part of the “Land Use Change” and “Crop Production” modules. This exercise indicates that, in terms of climate change mitigation, the plantation of palm trees is not a suitable action. The induced deforestation severely worsens the final carbon balance, which is not compensated by the positive aspects of planting palm trees. The results will be even worse once also accounting for the emission impacts for utilized inputs like fertilizers.

Practical Exercise 3: Forestry Reserve in Brazil

This simulated situation aims at providing a good understanding of how to use EX-ACT for deforestation and afforestation activities as part of the "Land Use Change" module. This exercise indicates that, how conservation of natural resources and encouraging sustainable forest management by controlling and monitoring reduced deforestation will positively impact the climate change mitigation.

Practical Exercise 4: Rice project in Ghana

This simulated situation aims at providing a good understanding of how to use EX-ACT for irrigated rice and other annual crop production as well as concerning fertilizer use. It involves the modules "Crop Production" as well as "Inputs and Investments". This exercise indicates that, how traditional rice cultivation and improved rice cultivation can influence the climate change mitigation contribution of a country.

Practical Exercise 6: Agro-forestry project in the Cross-river region, Nigeria

The exercise familiarize the users how to utilize the pre-defined Tier 1 options in EX-ACT, and also the region or site specific Tier 2 data as part of the forestry and agricultural sector.

4. RECOMMENDATIONS FOR NEXT STEPS

- Some of the exercise on Livestock project, Sugar project and Forest Rehabilitation have not been discussed during the training workshop because of time constraint. The next follow-up workshop should discuss this exercise to familiarize the participant with the climate change mitigation implication of fossil fuel electricity avoidance, efficient management of livestock and forest rehabilitation.
- The next follow-up workshop should discuss some of the relevant project on AFOLU sector of Bangladesh. The participant of different national entities can provide the project data on the AFOLU sector of Bangladesh. Subsequently those project data can be utilized to estimate the C balance of the project.

APPENDIX 1. AGENDA

Venue	BBS ICT Lab room	
Tuesday 27 March 2018		
09.00 – 09.15	1) Opening remarks 2) Introduction to Program and Participants.	Rakibul Hassan Mukul UN-REDD PD
09.15 – 09.45	Presentation on the Objectives GHG mitigation in the AFOLU sector Introduction of the EX-ANTE Carbon Balance tool	Anatoli Poultouchidou FREL consultant, FAO Bangladesh
09.45 - 10.00	**Tea Break**	
10.00 – 10.30	IPCC Tier Definition	K M Nazmul Islam GHG inventory and FREL consultant, FAO Bangladesh
10.30 – 12.30	Practical Exercise 1: Agricultural project in Benin Presentation by Participants and discussions	Anatoli Poultouchidou FREL consultant, FAO Bangladesh
12.30 – 13.30	**Lunch**	
13.30 – 15.30	Practical Exercise 2: Palm Trees in Indonesia Presentation by Participants and discussions	K M Nazmul Islam GHG inventory and FREL consultant, FAO Bangladesh
15.30 – 15.45	**Tea Break**	
15.45 – 17.00	Practical Exercise 3: Forestry Reserve in Brazil Presentation by Participants and discussions	Anatoli Poultouchidou FREL consultant, FAO Bangladesh
Wednesday 28 March 2018		
09.00- 10.00	Practical Exercise 4: Rice project in Ghana Presentation by Participants and discussions	Anatoli Poultouchidou FREL consultant, FAO Bangladesh
10.00-11.00	Practical Exercise 5: Livestock project in Mongolia Presentation by Participants and discussions	K M Nazmul Islam GHG inventory and FREL consultant, FAO Bangladesh
11.00 – 11.15	**Tea break**	
11.15 – 12.30	Practical Exercise 6: Agro-forestry project in the Cross-river region, Nigeria Presentation by Participants and discussions	Anatoli Poultouchidou FREL consultant, FAO Bangladesh
12.30 -13.30	**Lunch**	
13.30 – 15.00	Practical Exercise 7: Markala Sugar project in Mali	K M Nazmul Islam GHG inventory and FREL consultant, FAO Bangladesh
15.00 – 15.15	**Tea break**	
15.15 – 16.15	Practical Exercise 8: Forest Rehabilitation in Kazakhstan	K M Nazmul Islam GHG inventory and FREL consultant, FAO Bangladesh
16.15 – 16.30	Presentation of the training outcome / Questions and answer on case studies	

APPENDIX 2. PARTICIPANT LIST

Sl	Name	Gender	Designations	Email
1.	Mahmudah Roksana Sultana	F	Assistant Conservator of Forest (BFD)	Sultana_rakhi@yahoo.com
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3.	Md. Harun or Rashid	M	Assistant Director (DoE)	Harun.rs83@yahoo.com
4.	Md. Mozahidur Rahman	M	Assistant Director (DoE)	Rozu.fwto3@gmail.com
5.	Rafiqua Sultana	F	Assistant Conservator of Forest (BFD)	Fariqua_3@yahoo.com
6.	Rokeya Begum	F	Assistant Conservator of Forest (BFD)	Nupu_zaman@yahoo.com
7.	DR. Md. Golam Rakkibu	M	Prof. Khulna University	golamrakkibu@yahoo.co.uk
8.	Farida Nusrat	F	Consultant	fishimul@gmail.com
9.	Anindita Chakma	F	Project Preparation Assistant (FAO)	Anindita.chakma@fao.org
10.	Marufa Akhter	F	CF-BFD	marufaakhter@gmail.com

APPENDIX 3. EVALUATION

L1_	1	Male	6	86%
L1_	2	Female	1	14%
		How often do you participate in training related to forest monitoring?		
Q1_	1	First time	6	86%
Q1_	2	1-3 every year	1	14%
Q1_	3	More than 3 per year	0	0%
Q1_	4	Regularly (approximately one per month)	0	0%
		I would describe myself as?		
Q2_	1	A professor/academic	2	29%
Q2_	2	A student	0	0%
Q2_	3	Forest Department staff	3	43%
Q2_	4	Government staff (outside Forest Department)	2	29%
Q2_	5	NGO staff	0	0%
Q2_	6	Private consultant	0	0%
Q2_	99	Other	0	0%
				0%
		My professional background relates most closely to:		
			TRUE	
Q3_1	1	Forester	5	71%
Q3_2	2	GIS/RS	0	0%
Q3_3	3	Statistics	0	0%
Q3_4	4	Social survey/assessment	0	0%
Q3_5	5	Economics	0	0%
Q3_6	6	Natural Resource Management	1	14%
Q3_7	7	Ecology	0	0%
Q3_99	99	other	1	14%
		My years of relevant experience is:		
Q4_	1	1-2 years	1	14%
Q4_	2	3-5 years	1	14%
Q4_	3	5-7 years	0	0%
Q4_	4	8-10 years	2	29%
Q4_	5	More than 10 years	3	43%
		The training was relevant to my daily work		
Q5_	1	Strongly agree	1	14%
Q5_	2	Agree	5	71%
Q5_	3	Neutral	0	0%
Q5_	4	Disagree	1	14%
Q5_	5	Strongly disagree	0	0%

		I had enough previous knowledge to understand the content of the event		
Q6_	1	Strongly agree	2	29%
Q6_	2	Agree	3	43%
Q6_	3	Neutral	1	14%
Q6_	4	Disagree	1	14%
Q6_	5	Strongly disagree	0	0%
		The training met my expectations in terms of the content and learning outcomes		
Q7_	1	Strongly agree	3	43%
Q7_	2	Agree	4	57%
Q7_	3	Neutral	0	0%
Q7_	4	Disagree	0	0%
Q7_	5	Strongly disagree	0	0%
		The learning resources provided were adequate and useful		
Q8_	1	Strongly agree	5	71%
Q8_	2	Agree	2	29%
Q8_	3	Neutral	0	0%
Q8_	4	Disagree	0	0%
Q8_	5	Strongly disagree	0	0%
		The resource person presented information in a way that i could understand and was easy to follow		
Q9_	1	Strongly agree	4	57%
Q9_	2	Agree	3	43%
Q9_	3	Neutral	0	0%
Q9_	4	Disagree	0	0%
Q9_	5	Strongly disagree	0	0%
		I feel confident to be able to carry out the tasks described in the training without supervision.		
Q10_	1	Strongly agree	0	0%
Q10_	2	Agree	5	71%
Q10_	3	Neutral	0	0%
Q10_	4	Disagree	2	29%
Q10_	5	Strongly disagree	0	0%
		I was pleased with the venue/meeting room/snacks etc		
Q11_	1	Strongly agree	1	14%
Q11_	2	Agree	6	86%
Q11_	3	Neutral	0	0%
Q11_	4	Disagree	0	0%
Q11_	5	Strongly disagree	0	0%
Q12		Are there other people/agencies/organisations that you think should have been included in the training?		

Q13		Any other comments?		
		Duration of the Training may be increased		