Asian Development Bank

Greater Mekong Subregion

Capacity Building for Efficient Utilization of Biomass for Bioenergy & Food Security in the GMS

TA7833-REG

PROGRESS REPORT (JULY - SEPT 14)

Landell Mills
DEVELOPMENT CONSULTANTS

In association with

nexus
Carbon For Development

KEY DATA

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CONTENTS

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
APMB	Agricultural Project Management Board
AROS	Asian Regional Organic Standard
ASEAN	Association of Southeast Asian Nations
BEFS	Bioenergy and Food Security
CASP	Core Agricultural Support Program
CDM	Clean Development Mechanism
CEDAC	Centre d'Etude et de Développement Agricole Cambodgien
CER	Certified emissions reduction
CFA	Climate-friendly agriculture
CLV	Cambodia, Lao PDR and Viet Nam
IFOAM	International Federation of Organic Agriculture Movements
DAHP	Department of Animal Health and Production, MAFF Cambodia
DARD	Department of Agriculture and Rural Development (MARD Viet Nam)
DCP	Department of Crop Production (MARD Viet Nam)
DMF	Design and Monitoring Framework
EA	Executing Agency
EOC	Environmental Operations Centre
EoI	Expression of interest
EU	European Union
FAO	Food & Agriculture Organization (United Nations)
GAP	Good Agricultural Practices
GBEP	Global Bioenergy Partnership
GHG	Greenhouse gas
GMS	Great Mekong Subregion
GOMA	Global Organic Market Access
GoV	Government of Viet Nam
IA	Implementing Agency
ICS	Improved cookstoves
ICT	Information and communication technologies
IFOAM	International Federation of Organic Agriculture Movements
LML	Landell Mills Limited
MAF	Ministry of Agriculture and Forestry (Lao PDR)
MAFF	Ministry of Agriculture, Forestry and Fisheries (Cambodia)
MARD	Ministry of Agriculture and Rural Development (Viet Nam)
MEM	Ministry of Energy and Mines
MFI	Microfinance institutions
MIME	Ministry of Industry, Mines and Energy
MOE	Ministry of Education
MoF	Ministry of Finance
MoIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MoST	Ministry of Science & Technology
MPI	Ministry of Planning & Investment
NBP	National Biogas Program
NDF	Nordic Development Fund

NFP	National Focal Point (of the Implementing Agency)
NGO	Non-Governmental Organization
NPI	National Project Implementation
PDR	People's Democratic Republic
PGS	Participatory Guarantee Systems
PPP	Public-private partnerships
PPTA	Project Preparatory Technical Assistance
PSC	Project Steering committee
PSD	Private sector development
RETA	Regional Technical Assistance
RfP	Request for Proposals (RfP)
SME	Small and Medium Sized Enterprise
SNV	Netherlands Development Organisation
SOP	Standard operating procedures
SRI	System of Rice Intensification
TA	Technical Assistance
TFP	Technical Focal Point (of the Implementing Agency)
ToR	Terms of Reference
UK	United Kingdom
US$	United States Dollar
WB	World Bank
WGA	Working Group on Agriculture

1. INTRODUCTION

1.1. SUMMARY

1. The Greater Mekong Subregion (GMS) Working Group on Agriculture (WGA) oversees regional cooperation in agricultural development under a wider GMS regional cooperation program. In 2007, the WGA conducted a regional study on strategic options for biofuel and rural renewable energy development in the GMS. The study developed into a GMS Strategic Framework and Action Plan for Biofuels and Rural Renewable Energy, which was endorsed at the fifth annual WGA meeting in the People's Democratic Republic of Lao (Lao PDR) in 2008. To implement the framework, GMS countries requested Asian Development Bank (ADB) assistance for bioenergy development, including technology transfer from more advanced countries in the GMS to Cambodia, Lao PDR, and Viet Nam, to diversify the region's energy options while ensuring food security.

2. In response, the ADB confirmed the 'Capacity Building for the Efficient Utilization of Biomass for Bioenergy and Food Security in the Greater Mekong Subregion (TA7833)' project financed with a grant from the Nordic Development Fund (NDF). This grant is administered by the ADB alongside the agriculture ministries of Cambodia, Lao PDR and Viet Nam in the form of a project for implementation during a period of 54 months (July 2011 to December 2015). The project concept was presented and endorsed by the GMS countries at the annual meeting of the WGA in Viet Nam in 2010. A fact-finding mission in early 2011 concluded broad agreement on the concept paper. TA7833 primarily focuses on Cambodia, Lao PDR and Viet Nam (CLV). The project intends to lay the foundations for potential investment projects to subsequently scale-up successful outcomes.

3. In December 2011, ADB contracted a consortium of consulting firms led by Landell Mills Ltd (LML) of the United Kingdom to provide technical assistance (TA) to support project implementation by the agriculture ministries. The TA Design and Monitoring Framework is provided in **APPENDIX 1**.

4. By June 2012 the agricultural ministries of CLV, in their respective roles as TA7833 Implementing Agencies (IA), had nominated counterpart government staff and resources to lead implementation of TA7833 with support from the Consultants. During the same period, project start-up was mostly concluded with the CLV governments providing office accommodation, etc.

5. The early TA activities focused on mapping existing implementation structures in CLV for efficient utilization of biomass for bioenergy and food security. The three national workshops were held during February and March 2012 within which key topics for potential studies and pilot projects were prioritized and agreed, along with recommendations on the advantages and disadvantages of both existing and new implementation structures.

6. Potential implementation partners such as national and international non-government organizations (NGOs), enterprises, public and private centers of excellence and public-private partnership (PPP) modalities have been identified. In each country, potential implementation partners for capacity development have been identified and shortlisted. In addition, pre-selection criteria have been drawn up for TA7833 to identify suitable public and private institutions as: i) distance learning partners, and; ii) project implementation partners.

7. This period provided significant input to understanding the current status of priority technologies, policies and standards, in addition to highlighting existing capabilities, priorities and future plans of both Government and key stakeholders. These assessments were built upon the inception workshops and stakeholder meetings in each capital city, initial tri-country missions

involving TA experts and the *1st GMS Regional Forum on Harmonization of Standards in Bioenergy and Food Security* in Nanning, China from 1 to 6 July 2012 (see *Report on Proceedings*)[1].

8. However, the extended inception phase of the TA and lack of progress on pilot project implementation resulted in the replacement of the TA Team Leader in November 2012. There followed an intensive review process covering work completed to date, development of a comprehensive workplan and schedule and extensive restructuring of the consultant TA team / inputs. These were presented in the revised Inception Report submitted in March 2013.

9. The following progress report provides a review of the work up to September 2014, as well as a work plan for the remaining period of the contract, which has been extended up to June 2015.

1.2. PROJECT OVERVIEW

10. TA7833 is a regional capacity development technical assistance project. The project's impact will be to improve the efficient utilization of biomass in Cambodia, Lao PDR and Viet Nam within the wider context of bioenergy and food security. The outcome will be efficiently operating pilot projects in biomass determined by to the following outputs:

i) Output One: Enhanced regional cooperation on bioenergy development to foster and safeguard food security.

11. The output will be achieved through a regional approach to climate-friendly agricultural development through sharing national experiences with institutional processes and mechanisms for introducing and operating regulatory and non-regulatory approaches for biomass related technologies while ensuring their compatibility with international trade obligations. The primary focus of the TA strategy for output 1 shifted during the extended inception phase away from a purely regional harmonization approach to one of building national level awareness, priorities and institutions that are being shared and discussed collectively through regional forums and sharing of outputs. The change responds to a common concern expressed by the government counterparts that harmonization from regional to national level was simply unacceptable and that the process need to build a national position that could then be modified or adapted in response to regional benefits and opportunities.

12. The strategy for this output has therefore been modified which created greater ownership but significantly increases the complexity of what is being delivered through the TA due to the range of priorities and the potential scope for some of these i.e., climate friendly rice standards, as well as the vastly differing institutional contexts that the three countries are required to operate within and the limitations over the process for decision making. The TA offers technical input and the institutional knowledge of what is being developed regionally and internationally along with a process through which priorities are shaped and developed.

13. Using these national programs as a basis for regional learning and sharing is the critical step in achieving the overall output. The overall output as stated has not changed in principle however the indicator targets of the output have been modified.

ii) Output Two: Climate-friendly, gender-responsive biomass investment projects, pilot tested through implementation in Cambodia, Lao PDR, and Viet Nam.

14. Candidate technologies include, but will not be limited to: biogas & bioslurry; improved cook stoves; biochar production and application, and; climate friendly agriculture value chains. Feasibility studies will be completed for priority topics and used to define pilot projects based on technologies successfully tested on a smaller scale. In addition, business model case studies will be completed for successful projects as a means of identifying potential upscaling modalities. The pilot projects will be used to define future investment options for upscaling in terms of technologies and business modalities if they are identified as being feasible and viable.

[1] *https://docs.google.com/open?id=0B1wKP1C0cX-jb1gxbm1zVks3c0U*

15. A significant constraint for piloting business models is the inability of ADB to use TA funds in a manner that is similar to their usual sovereign lending products and as such the provision of TA funds for government expenditures is simply not possible. Further, many of the business models will build around revolving funds or alternative credit systems that cannot be piloted over a 1 or 2 year TA program. The other challenge is to move away from a supply push for technology to one of demand creation for the use of technology outputs which fundamentally changes the manner in which upscaling is organized.

iii) Output Three: Enhanced capacity for the efficient utilization of biomass.

16. The output will raise awareness of the biomass resources and their potential uses amongst officials and policy makers as well as decentralized agencies and supporting civil society groups to enable potential investment options to be fully understood. Gender-sensitive capacity-building will be provided to participating central and local governments, service providers, communities and women's groups. Activities will strengthen institutional and technical capacity to expand biomass investments and ensure sustainable uptake by rural communities. Videos and a blended distance learning approach will be used to reach stakeholders. Capacity building for ADB safeguards, feasibility assessment and project approval due diligence will be provided.

iv) Output Four: Development and dissemination of knowledge products.

17. Using output from the Global Bioenergy Partnership (GBEP), the TA will develop a common methodology for assessing the supply of biomass and prioritizing its use for enhancing energy and food security. Knowledge products will be developed to promote knowledge transfer and cooperation between more advanced GMS countries and CLV. Baseline surveys will be carried out and a monitoring system established.

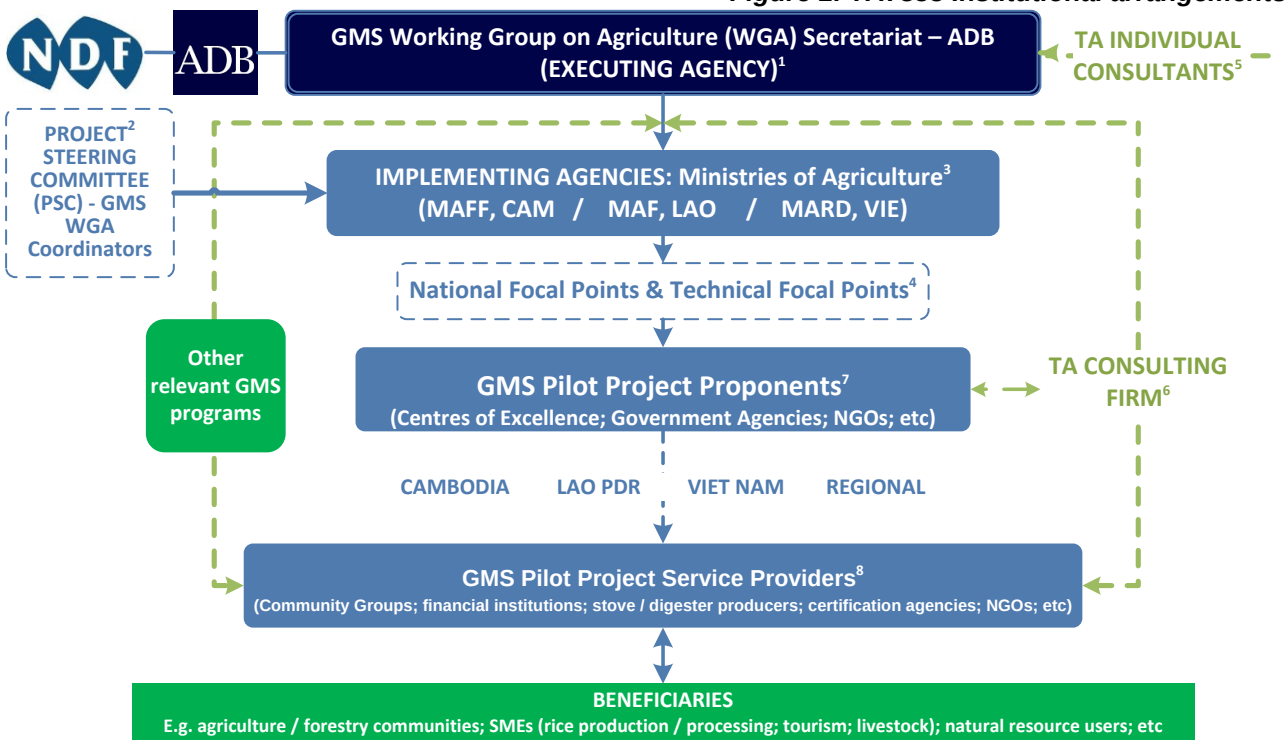
1.3. IMPLEMENTATION ARRANGEMENTS

18. As presented in the figure below, the *Executing Agency (EA)* for this project is the GMS Working Group on Agriculture (WGA) Secretariat, supervised by staff from the ADB's Southeast Asia Department[2]. High-level project supervision function is provided by the National Coordinators of the GMS WGA from Cambodia, Lao PDR and Viet Nam, which together form the TA7833 Project Steering Committee (PSC).

19. The Ministry of Agriculture, Forestry and Fisheries (MAFF), Cambodia; Ministry of Agriculture and Forestry (MAF), Lao PDR; and Ministry of Agriculture and Rural Development (MARD), Viet Nam are the official Implementing Agencies (IA).

[2] *Dr. Sununtar Setboonsarng, TA7833 Project Officer & Principal Natural Resources and Agriculture Economist, Environment, Natural Resources and Agriculture Division, Southeast Asia Department, ADB*

Figure 1: TA7833 Institutional arrangements



20. The GMS Environmental Operations Center (EOC), Bangkok supports administration of the TA and provides access to regional data and information. The EOC seeks to identify synergies and collaboration with other GMS-wide initiatives such as the ADB's Core Environment Program and Biodiversity Corridor Initiatives.

21. As of July 2012, each IA (MAFF / MAF / MARD) had identified and officially nominated *national focal point* (NFP) agencies or individuals to lead implementation of TA7833's project activities on behalf of each country according to the wider arrangements detailed in the figure above. In further discussions with each IA and based on initial lessons learned from TA7833 coordination under project implementation, additional *technical focal point (TFP)* personnel were identified and recommended to take the lead in technical coordination of country-level activities (see the table below).

Table 1: Government counterpart agencies and personnel for TA7833

ROLE	NAME	POSITION
Cambodia		
WGA Coordinator	H.E. SAN Vanty	Under-Secretary of State, Ministry of Agriculture, Forestry & Fisheries (MAFF)
WGA National Secretariat Support Unit (NSSU) National Focal Point	Mr. Prum Somany	Deputy Director, Department of International Cooperation, Ministry of Agriculture, Forestry and Fisheries (MAFF)
GMS-WGA National Secretariat Specialist	*Mr. NAT Chan Tola*	*Individual consultant contracted by ADB, to help co-ordinate all activities under CASP II's TAs including TA7833.*
National Focal Point (NFP)	Dr. Sar Chetra	Department of Animal Health & Production, MAFF
Technical Focal Points (TFP)	Biogas - Mr. Chea Sokhom	Chief of Animal Production Office and Biogas, DAHP, MAFF
	Biochar - Dr. Chan Saruth	Director of Department of Agricultural Engineering of General Directorate of Agriculture, MAFF

ROLE	NAME	POSITION
	Biofuel - Mr. Iv Phirun	Deputy Director of Department of Industry Crop of General Directorate of Agriculture, MAFF
	ICS - Mr. Khorn Saret	Deputy Director of Forestry & Community Forestry of Forestry Administration, MAFF
	Standards - Mr. Chheng Uddara	Director, Standards Development, Training & Consultancy Dep., Institute of Standards, Ministry of Industry, Mines & Energy (MIME)3
Lao PDR		
WGA Coordinator	H.E. Phouang Parisak Pravongviengkham	Vice Minister, Ministry of Agriculture and Forestry (MAF)
WGA National Secretariat Support Unit (NSSU) National Focal Point	Mr. Inthadom AKKHARATH	Director of Economic Integration Division, Department of Planning and Cooperation, MAF
GMS-WGA National Secretariat Specialist	*Sengphet (Anna) Lattanavong*	*Individual consultant contracted by ADB, to help co-ordinate all activities under CASP II's TAs including TA7833.*
National Focal Point (NFP)	Mr. Inthadom AKKHARATH	Director of Economic Integration Division, Department of Planning and Cooperation, MAF
Technical Focal Points (TFP)	Biogas - Mr. Nivat PHANAPHET	Deputy head of Livestock Management Center, Department of Livestock & Fisheries, MAF
	Biochar - Mr. Lattana PHASAYSOMBATH	Director of Technical Agriculture Systems Training Centre, Department of Agriculture Extension and Cooperatives (DAEC), MAF
	Biofuel - Mr. Khamphone MOUNLAMAI	Deputy Director of Research Management Division (NAFRI)
	ICS - Mr. Boualom XAYSANAVONG	Technical staff, Institute of Renewable Energy, Ministry of Energy & Mines (MEM)
	Standards - Ms. Nisith KHAMMOUNHEUANG	Head of Standards Division, Ministry of Science & Technology (MoST)
Viet Nam		
GMS-WGA Coordinator	Mr. Tran Kim Long	Director General, International Cooperation Department, Ministry of Agriculture and Rural Development (MARD)
WGA National Secretariat Support Unit (NSSU) National Focal Point	Mr. Nguyen Thanh Dam	Deputy Head in charge, Multilateral Cooperation Division, International Cooperation Department, Ministry of Agriculture and Rural Development (MARD)
GMS-WGA National Secretariat Specialist	*Ms. Truong Thi Van Anh*	*Individual consultant contracted by ADB, to help co-ordinate all activities under CASP II's TAs including TA7833.*
Coordinator National Focal Point (CNFP)	Mr. Nguyen The Hinh	Agricultural Project Management Board (APMB), MARD
Technical Focal Points (TFP)	Biogas - Ms. Nguyen Quynh Hoa	Official, Livestock Environment Division, Department of Livestock Production, MARD
	Biochar - Mr. Vu Tien Dung	Deputy Director of LCASP project, APMB, MARD
	Biofuel - Mr. Nguyen Tu Hai	Official, Department of Crop Production, MARD

[3] *www.isc.gov.kh*

ROLE	NAME	POSITION
	ICS - Mr. Tran Ngoc Tue	Deputy Head, Biomass Energy Division, Forestry Science Technique Application Centre, MARD
	Standards – TBD	Awaiting approval by MARD

22. In addition to the Consultant firm, ADB contracted a *Regional Cooperation and Trade Facilitation Specialist* and *Regional Knowledge Management Specialist* as individual consultants located in the WGA Secretariat that will work with the Consultants during TA7833 implementation, starting from June 2012. To date the integration of these roles within the TA has been limited.

23. The GMS EOC in Bangkok serves as the facility for accessing regional data and information of relevance. In addition, the EOC plays a key role in identifying synergies with and fostering collaboration with other GMS-wide initiatives such as the ADB's Core Environment Program and Biodiversity Corridor Initiatives. Here the role of the public private partnership expert was providing a promising platform on which TA7833 and EOC could develop joint programs. Unfortunately the EOC position is currently concluded.

1.4. PROJECT SCOPE AND DEFINITION

24. Biomass provides a locally available, and renewable, source of energy, particularly in rural areas in CLV, where biomass based energy remains the predominant energy source. In areas endowed with forest and/or agricultural, food processing, agro-industrial and domestic organic residues, bioenergy production is increasingly cost effective and a competitive energy alternative.

25. The TA terms of reference scope includes the need to improve the quality of country-level data on biomass resources and to strengthen national and institutional capacities to collect, analyze and disseminate information related to efficient utilization of biomass for energy and food security, by focusing on key technologies that contribute to both. TA scope is limited to pilot biomass utilization technologies that use small-scale technology operating at the household and the community level. Institutional and regulatory frameworks, capacity development and knowledge management will reflect the wider biomass utilization subsector needs.

26. The TA supports the continued strengthening of cooperation between member countries, acting as a catalyst for building development dividends not always possible at the national level. The TA will support dialogue between regional actors (top-down), as well as support the scaling-up of local community-based initiatives (bottom-up). At the regional level, the project facilitates high-level dialogue on a common approach to bioenergy development for pro-poor climate change mitigation, energy self-sufficiency and food security. The project also works with local governments and stakeholders to put in place the human and institutional capacity to increase adoption of technologies to promote the efficient use of biomass for the benefit of rural poor while enhancing food security.

27. The efficient utilization of biomass requires technologies that transform agricultural and forestry residues, which create environmental problems and pollute waterways when left to decay, to produce bioenergy, biochar and organic fertilizers[4]. Currently, technologies and the required skills for the conversion of agricultural and forestry residues into bioenergy carriers like biogas, wood or straw-based pellets / briquettes and biochar have been promoted by a range of stakeholders and donors with mixed results. Some of the initiatives have entered into upscaling, whilst others remain in various stages of technology readiness and are present only on a limited scale.

28. Bioenergy can be generated from biomass either directly or indirectly converted in either: solid, liquid or gaseous forms. Modern bioenergy relies on efficient conversion technologies which

[4] *ADB's 'Technical Assistance Report 44474-01, Capacity Building for the Efficient Utilization of Biomass for Bioenergy and Food Security in the Greater Mekong Subregion' (ADB, 2011)*

are increasingly available. The project defines bioenergy as: *"…renewable energy from plants and animals. Organic matter containing bioenergy is known as biomass that can produce heat … or be modified to create cellulosic ethanol. Since almost all bioenergy can be traced back to solar energy, bioenergy has the advantage of being a renewable energy source, and should be harnessed in a sustainable manner."*

29. ADB's bioenergy policy states that it can only support bioenergy sourced from non-food crops and 'agro-waste'. The TA scope is defined by this policy which requires: (i) the feedstock is not a food crop; (ii) any land involved in bioenergy development is unsuitable for food crops; (iii) no deforestation is associated with bioenergy development, and; (iv) the net energy balance is positive. The scope of the TA excludes liquid bioenergy for transportation (transport biofuel as bioethanol or biodiesel).

30. The scope of biomass feedstock for bioenergy is further limited by CLV government representatives to include only (i) rice husks, (ii) straw, (iii) bamboo, (iv) nut shells, (v) fruit waste, (vi) non-food oil bearing plants, (vii) animal manure and (viii) other agro-waste wherever these are abundant with the potential to create environmental problems[5].

31. The development of skills required for production of bioenergy carriers like biochar, briquetting and plant oil targets households and small community-based enterprises as the development of a viable bioenergy market is not possible without the involvement of the private sector. Therefore counterparts and key informants sought by the project include public and private sector enterprises, as well as research centers, universities and vocational training centers in the TA stakeholder group.

[5] *WGA meeting, 12 July 2012, Nanning, China*

2. SUMMARY OF PROGRESS AGAINST THE DESIGN AND MONITORING FRAMEWORK

Table 2: Summary of Progress against the DMF

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
IMPACT: IMPROVED USE OF BIOMASS IN CAMBODIA, LAO PDR AND VIET NAM By 2020: - 5% increase in production of clean bioenergy from biomass (2011 baseline: 0.1%) - 5% increase in use of by-products of bioenergy systems (bio-slurry and biochar) (2011 baseline: 0%)	Achievement of the impact (and measuring of performance) is outside the scope of the project. However, it is clear that the impact is still relevant and that the project outcome and outputs will contribute to the impact, particularly increase in the use of by-products of bioenergy systems (bio-slurry and biochar).	
OUTCOME: EFFICIENTLY OPERATING PILOT PROJECTS IN BIOMASS USE By 2014: At least two investment modalities for biogas and bioslurry (Cambodia and the Lao PDR); three for biochar (Cambodia, the Lao PDR, and Viet Nam); two for improved cookstoves (the Lao PDR and Viet Nam); and three for inclusive supply chain of certified biofuel and organic crops in (Cambodia, the Lao PDR, and Viet Nam)	The pilot projects will be assessed and used as a basis for preparing proposals for future investment modalities (to be funded through a future ADB loan or other potential investors). Early discussions with the government and ADB however resulted in the project dropping research into investment modalities for certified biofuel. Pilots, for which investment modalities will be prepared, cover the following: - Biogas and bioslurry (OVI – two in Cambodia and Lao PDR; Pilot Projects – two in Laos PDR and Vietnam) - Biochar (OVI – three in Cambodia, Lao PDR, and Viet Nam; Pilot Projects - three in Cambodia, Lao PDR, and Viet Nam) - Improved cookstoves (OVI – two in Lao PDR and Vietnam; Pilot Projects – three in Laos, Cambodia and Vietnam) - Organic crops (OVI – three in Cambodia, Lao PDR, and Viet Nam; Pilot Projects – four in Cambodia, Laos PDR and Vietnam)	Continue pilot projects and prepare final reports. In terms of timing, the selection, feasibility, procurement and contracting of pilots has taken longer than planned so it is unlikely that investment modalities will be ready by 2014. These will be by approx. March/April 2015.
OUTPUT 1: ENHANCED REGIONAL COOPERATION IN BIOENERGY DEVELOPMENT TO FOSTER AND SAFEGUARD FOOD SECURITY Mechanism tested for harmonizing at least three bioenergy standards[6] and	See below. Work undertaken on four standards.	See below

[6] *Including standards set by such organizations as the Global Alliance on Clean Cookstoves and the Roundtable on Sustainable Biofuels, along with quality assurance from regional quality assurance centers to be established for biogas, improved cookstoves, bio-char, etc.*

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
certification systems, and a common method of assessing greenhouse gases		
1.0 Holding of regional forums to facilitate high-level dialogue within the region on bioenergy and food-security policy issues	Harmonization Roadmap devised and agreed at 1st GMS Forum in Nanning, China, in July 2012, as initial mechanism for facilitating dialogue and ultimate adoption of common standards. See p12 of '***Report on Proceedings'.*** While benefits of harmonization agreed, priority on developing national level regulatory framework. 3 National policy forums (May 2013) - one in each country, which involved a more intensive mechanism for national-level dialogue for wider harmonization. The forums provided a venue for policymakers and public officials to discuss policies and opportunities relevant to their country, and engage with other stakeholders and experts. Reports on the 3 national policy forums submitted Following these forums, TORs prepared and agreed for policy working groups in each country to prepare policy road maps for standards, certification and labeling for biomass related technologies and climate friendly agriculture based on the national forums. WGs formed. 3 WG meetings held in Laos and Cambodia. See 1.1. The following priorities were identified in the first WGs on a demand-led basis: • Cambodia – standards for organic rice and biodigesters; • Laos PDR – standards for organic rice and biofertilizer; Work in Vietnam stopped due to lack of agreement on achievable activities. Regional conference held in Vietnam at end 2013 (see below) Report on 'Introduction to Standards, Certification and Labelling Systems for Sustainability' finalized (Oct 2013) Report on National Legislation and Policy Review under peer review	Meeting between NPIs/TFPs/NFPs from each country on approx. 15th Jan in Cambodia (TBC) in order to discuss standard development progress in each country, prepare a roadmap for the roll-out of each standard (certification, labelling, traceability, inspection), and discuss possibilities for harmonization. Results of discussions to be presented at the final conference in Luang Prabang in Feb/March. Finalise Report on National Legislation and Policy Review
1.1 Testing of mechanisms to facilitate	To date a draft standard for organic rice in Cambodia has been	Finalise biodigester standard in Cambodia.

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
adoption of common set of sustainable indicators, bioenergy and trade standards, certification systems an eco-labeling	developed; while a draft standard for organic rice in Laos is nearing finalisation (using the Cambodia one as a template). A draft standard for biodigesters in Cambodia is under preparation, as well as a draft standard for biofertilisers in Laos. As a result of the work on a standard in Laos, rice husks biochar and mixed biomass converted into biochar adopted in Laos PP; and 4 Formulations of Biochar Organic Fertilizers designed for practicing at LPP testing and demo. To date a draft standard for organic rice in Cambodia has been developed; while a draft standard for organic rice in Laos is nearing finalisation (using the Cambodia one as a template). A draft standard for biodigesters in Cambodia is under preparation, as well as a draft standard for biofertilisers in Laos. As a result of the work on a standard in Laos, rice husks biochar and mixed biomass converted into biochar adopted in Laos PP; and 4 Formulations of Biochar Organic Fertilizers designed for practicing at LPP testing and demo. Draft organic rice standard prepared in Cambodia and Laos.	Meeting planned for 30th October. Finalise Organic Rice Standard in Laos – Laos Organic Agriculture contracted to finalize this. Finalise biofertiliser standard in Laos.
1.2 Holding of annual international workshop on household bioenergy and food security to foster exchange of information, particularly between more advanced Greater Mekong Subregion countries and Cambodia, the Lao PDR, and Viet Nam	Regional Conference held in Hanoi in Dec 2013. Included training on FAO-BEFS.	Regional conference planned in Luang Prabang (Laos) for end Feb/early March
OUTPUT 2: PILOT TESTED CLIMATE FRIENDLY BIOMASS INVESTMENT PROJECTS FOR WIDER IMPLEMENTATION Construction of at least 500 bio-digesters, 600 biochar kilns, 75,000 improved cookstoves; and introduction of at least 300 farmers to sustainable	While climate-friendly biomass investment projects will be pilot-tested for wider implementation, the OVIs will not be achieved as stated. This is because the project is testing business models for future scale-up, not to construct a specific number of bio-digesters, biochar kilns, or improved cookstoves, or to test these particular technologies. Thus the indicators are not realistic, or in line with what the project is trying to achieve. Additional remarks on these indicators is as follows: <u>Bio-digesters:</u>	

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
certification standards	500 biodigesters is optimistic given that the ADB has existing lending products in place for biodigesters in Viet Nam and the assessment of biodigesters in Cambodia and Laos is negative <u>Biochar</u> Biochar and bioslurry technologies are assessed to be too immature and as such the targets for their adoption in the DMF are considered too optimistic. Pilot projects will focus on demonstrating production and management of the more immature technologies and how these products can be integrated into greener value chains. i.e. there is a need for both biochar and bioslurry is to shift the focus from which technology to product development and formulation linked to fertilizer supply chains. 600 biochar kilns is simply unsupportable – there is no local production of kilns that has a commercial basis. Kiln technology and feed stocks are not well known and the benefits of biochar may not warrant the investment of resources. Further, the international experience with biochar is to move away from high volume soil amendments to incorporation of biochar into nutrient products where the biochar changes the characteristics of the biochar through reduced volatilization and provides potential water and nutrient release benefits lowering overall demand for nutrients. The preference for household-level technology, while appropriate for ICS, may be inappropriate for biochar and to a lesser extent bioslurry. The financial viability of such technologies will determine the extent of their adoption. However TA findings and expert opinion currently suggests that the viability of small-scale technology that has adequate safeguards may be insufficient to generate viability and attract investment and adoption. Experience in Thailand and China suggest that the biochar and bioslurry sectors emerge from a demand for biofertilizer from specialist agents that collect from product catchment areas. The focus should maybe move away from technology of production to how to build supply chains – a key finding from the assessment of climate friendly value chains in GMS <u>ICS</u> A program target to upscale 75,000 cook stoves in the three countries far exceeds both the resources available and the likely uptake rate – further it would exceed the ICS stove producer capacity. The ICS sector has a range of players many of whom offer subsidies and grants for the adoption of ICS technologies. The continued investment from the WB, EU and other ADB TAs that offer more concessional investment makes a purely commercial value chain less likely. The TA is focusing its ICS pilots on stove producer risk reduction through skill development, and demand aggregation through women's unions.	

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
	ICS technology in GMS is highly visible, however the gains from the technology are relatively small and with most improved stoves failing to address the durability of stoves it is questionable if significant gains are being achieved. The target of introducing at least 300 farmers to sustainable certification standards is unrealistic since the process of agreeing and ratifying a standard and then setting up the certification systems to support this is beyond the timescale of the TA. Instead the TA will develop standards and then a roadmap for their uptake. See output 1 above.	
2.0 Conduct biomass assessment and development of criteria for selection of pilot project areas by 2012	Regional biomass resource assessment submitted. Options for integrating this within a multi-criteria decision support tool linked to life cycle analysis have been developed and are being reviewed. It is proposed to use these as an integral part of the compendium on biomass under Output 4 Feasibility studies underway.	None. Activity completed.
2.1 Implementation of pilot projects in lower cost biogas technologies as investment options involving use bioslurry for high vale crop production	- Priority topics by country agreed - Terms of reference for feasibility studies prepared and approved by ADB and IAs. - Expression of interest for feasibility studies in Viet Nam and Cambodia received and evaluated. Laos PDR had no national EOI despite a second round of advertisement although an EOI was received from a Viet Namese contractor for Bioslurry and Biochar work but was not approved by government - WB, AUSAID and GERES/EU have completed reviews of ICS sector for the purpose of undertaking pilot upscaling investments – raises the need for FS and or pilot in ICS for Laos - FS in Cambodia and Viet Nam contracted and final reports accepted - Rapid appraisal of options undertaken in Laos - Value chain business models for potential upscaling case studies identified - Business model report finalized and submitted - Procurement using a shopping and RFP modality approved by ADB - TORs approved for proposed pilots - All pilot projects contracted and underway - Baseline data collected	- Continue implementation and monitoring of pilot projects. - Pilot project final reports
2.2 Conduct of reviews to identify appropriate biochar, ICS and biofuel investment modalities by 2012 and	- Summary reviews of ICS, Biochar, the private sector, financing modalities, and the institutional frameworks in CLV completed. - Technology commercialization status assessment based on	- Continue training - Continue preparation of KPs - Once pilot projects finished and

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
implementation of pilot project by 2014	NASA's Technology Readiness Levels (TRL) completed and included in inception report – highlighting the immature nature of biochar and bioslurry technologies for widespread up-scaling. - Biofuel technology has been dropped based on TA team findings and CLV Government skepticism. - ICS review drafted and distributed for review - Biochar testing and analysis report (including risk analysis) submitted - Financing modalities report finalized - Training in Cambodia for participants from CLV on how to develop knowledge and consensus on procedures and ingredients for specifying 4-5 biofertilizer products in terms of their ingredient mixes and formulations to be used in the pilot farm demonstration programs (see also 3.2) - Further dialogue on the design of rice straw kilns for turning surplus straw to biochar in the field immediately after harvesting has proposed alternate designs for inclusion in pilot program - Other KPs produced – see below	assessed, recommendations for future ADB investment for scale-up included in final report
OUTPUT 3: ENHANCED CAPACITY FOR EFFICIENT USE OF BIOMASS Increased capacity for gender-sensitive investment among at least 500 government officials, 400 service providers, and 3,000 lead farmers (i.e., at least 55% of those to be trained will be women and at least 70% of those trained will have increased capacity)	To date, training initiatives have increased the capacity of 2883 trainees (74% of target) including 232 government officials (46% of target), 328 service providers (82% of target), and 2323 lead farmers (77% of target). Of the trainees 1593 have been women (55% which equals the target of 55%). Evaluation sheets show that the majority have been satisfied with the training received and expect it to increase their capacity.	Attempt to reach target through additional training as below.
3.0 Development of gender- sensitive training programs including distant learning activities, use of these for training local and central govt officials, farmers organization and womens groups (30% women by 2013)	Training programs undertaken – see section 3.3 below	- Continue training - Continue dissemination of biobriefs - Finalise DVDs and disseminate
3.1 Conduct training in the implementation of the investment project by 2014	None	Training to be implemented in 2015 as part of the finalization of subprojects for loan projects.

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
		Training to be provided on: - Innovative financing - ADB project preparation and implementation training
3.2 Conduct of training in the use of biomass to enhance food security and soil carbon sequestration by 2014	Training programs undertaken – see section 3.3 below	- Continue training - Continue dissemination of biobriefs - Finalise DVDs and disseminate
OUTPUT 4: DEVELOPMENT AND DISSEMINATION OF KNOWLEDGE PRODUCTS Methodology for assessing and prioritizing the use of biomass for bioenergy and food security Compendium of good practices in biomass use Booklets on different models of improved cookstove, biochar kiln, and biodigesters	See below	See below
4.0 Development of methodology for assessing and prioritizing the use of biomass for energy and food security by 2012 and dissemination of the methodology through regional forums, training, and capacity building by 2014	Existing resource assessments for CLV have been compiled. international assessment methods identified and a proposed assessment framework is being reviewed Draft high level assessment completed and submitted	To be decided
4.1 Establishment of baseline information and monitoring and evaluation system for pilot projects by 2012	- Baseline requirements specified in the pilot feasibility study ToR - Baseline and on-going monitoring requirements specified in pilot project TORs - Baseline data being collected	Continue monitoring of implementation of pilot projects
4.2 Conduct key studies such as life cycle assessments, least cost options, and eco-labeling by 2013	Options have been outlined for using the pilot projects as case studies for lifecycle and least cost assessments and how these could be combined with the biomass assessment framework within a multi-criterion decision framework.	Undertake life cycle assessment and least cost option study. Preparation to start 5th Nov, field work from 5th Nov till approx., 22nd Dec, report writing by end Jan.
4.3 Publication of compendium of good practices in biomass use and booklets	A number of KPs produced: - Standards and Certification – submitted (See output 1)	Finalise and submit: - Biogas / Bioslurry KP by early Nov

INTERVENTION LOGIC	PROGRESS TO DATE	PLANNED ACTIVITIES (OCT 2014 – MARCH 2015)
containing information on different models of ICS biochar kilns and bio-digesters by 2014	- Climate Change, Food Security & Bioenergy – submitted - Biogas / Bioslurry KP – being reviewed - Biochar KP – being reviewied - Improved Cookstoves KP – ready for review	- Biochar KP by early Nov - ICS KP by end Nov Prepare: - Climate-Friendly Agricultural Value-Chains KP by end Dec - Innovative Financing Mechanisms for Upscaling - Carbon pathways for different technologies (TBC) - Standards for biochars – examine standards and certifications systems for biochar, including constraints inhibiting take-up (KP or biobrief) Work will start in November on ideas for the compendium to be prepared in early 2015. A decision will be made as to whether to produce this as an on-line database of resources or a printed guidebook.
4.4 Analysis of potential climate change scenarios and their likely impact on the availability of different type of biomass and assessment of need for the development of alternative biomass sources by 2013	None	To be decided

3. DETAILS OF PROJECT PROGRESS AND PLANNED ACTIVITIES

32. A work plan for activities and inputs from October 2014 to June 2015 is provided in **APPENDIX 3**. In addition, to ensure that we have adhered to the original TOR, we have done an analysis of progress against TOR statements in **APPENDIX 2**.

3.1. OUTPUT 1: MECHANISMS FOR ENHANCING REGIONAL COOPERATION AND DEVELOPMENT OF BIOENERGY AND FOOD SECURITY HARMONIZED

3.1.1. Project Progress

33. To date a draft standard for organic rice in Cambodia has been developed; while a draft standard for organic rice in Laos is nearing finalisation (using the Cambodia one as a template). A draft standard for biodigesters in Cambodia is under preparation, as well as a draft standard for biofertilisers in Laos.

34. As a result of the work on a standard in Laos, rice husks biochar and mixed biomass converted into biochar adopted in Laos PP; and 4 Formulations of Biochar Organic Fertilizers designed for practicing at LPP testing and demo.

35. Work in Vietnam stopped due to lack of agreement on achievable activities.

3.1.2. Planned Activities

i) October – December 2014

36. Finalise biodigester standard in Cambodia. Meeting planned for 30th October.

37. Finalise Organic Rice Standard in Laos – Laos Organic Agriculture contracted to finalize this.

38. Finalise biofertiliser standard in Laos.

39. Finalise Report on National Legislation and Policy Review (which will be used as a resource for roadmap development mentioned below).

ii) January – June 2015

40. Meeting is planned between NPIs/TFPs/NFPs from each country on approx. 15th Jan in Cambodia (TBC) in order to discuss standard development progress in each country, prepare a roadmap for the roll-out of each standard (certification, labelling, traceability, inspection), and discuss possibilities for harmonization. Results of discussions to be presented at the final conference in Luang Prabang in Feb/March.

3.2. OUTPUT 2: MECHANISMS FOR SCALING-UP BIOMASS INVESTMENT PROJECTS FOR BIOENERGY AND FOOD SECURITY DEMONSTRATED THROUGH PILOT PROJECTS

3.2.1. Project Progress

41. All pilot projects have started and a number of milestones have been met. Details of progress are shown in **APPENDIX 4**. This highlights that most of the activities under each Pilot have now been completed and the field activities are well underway, with most pilots expected to

be completed successfully and on-time. Specific reports (mid-term reports[7]) on each pilot are available on request.

42. Regular monitoring trips have been conducted to the pilots by the National Project Implementation specialists, as well as the international team, in order to verify progress and check on the quality of outputs. So far we have been happy with both the progress and the quality on the majority of pilots, although there remain some concerns on PP#1: Improved Cook Stove Up-scaling in Cambodia, and PP#3: Demonstration of Biofertiliser and Biochar Soil Amendments in Vietnam.

43. The table below provides details of progress against payment deliverables. Almost 60% of the payment deliverables have now been achieved.

44. Linked to this output, additional biochar analysis has been undertaken at the University of Edinburgh as due diligence to identify potential silicosis risk from the production, handling and use of rice husk biochar, and a report submitted.

[7] *Note that we are still waiting for the final mid-term reports for PP#1: Improved Cook Stove Up-scaling in Cambodia (implemented by Mekong TT); PP#2: Bioslurry Management in Vietnam (implemented by CARES) and PP#3: Demonstration of Biofertiliser and Biochar Soil Amendments in Vietnam (implemented by COTDEP)*

Table 3: Pilot Project Output and Payment Tracking Sheet

Contract	Contractor	Start / End Date	Schedule of Payments	Amount (US$)	% of Contract	Amt invoice received	Amt Invoice paid
CAMBODIA							
PP#1: Improved Cook Stove Up-scaling	**Mekong TT** - Mr. PROM NGA [ngaprom@mekongthinktank.com]; +855 12 345 222 (PP#1: Improved Cook Stove Up-scaling)	17.2.2014 / 30.11.2014	Contract signing	8,175	15%	8,175	8,175
			Approval of work plan (5 weeks after contracting) Including disbursement of $28,000 revolving fund to ICS producers and women groups for ICS sale incentives (After contract signed with ICS producers and women group)	16,350	30%	16,350	16,350
			Approval of Mid-Term Report – by end of Month 3 Output 1: Contracts with suppliers and capacity strengthening revolving grants awarded Stove producer linkages to Womens unions established Output 2: Womens Unions letter of agreement completed Capacity strengthening and awareness raising undertaken	13,625	25%		
			Submission of Draft Final Report including training summary and pilot evaluation report	10,900	20%		
			Approval of Final Report	5,450	10%		
				54,500		**24,525**	**24,525**
PP#2: Farm Demonstration of Biofertilizers for Upscaling Investment	**CelAgrid** - Mr. KHIEU BORIN [khieu_borin@celagrid.org; +85512828942; +85523223640]. (PP#2: Farm Demonstration of Biofertilizers for Upscaling Investment)	07.02.2014 / 30.12.2014	Contract signing	10,754	15%	10,754	10,754
			Approval of work plan (5 weeks after contracting)	17,924	25%	17,924	17,924
			(i) Approval of Mid-Term Report (ii) TULD Kilns operating (iii) Farm Demonstrations established and Training program tested and being implemented (iv) Farm demo monitoring framework agreed and operating	17,924	25%	17,924	17,924
			Submission of Draft Final Report including product testing findings, and training evaluation report	14,339	20%		
			Approval of Final Report	10,755	15%		
				71,696		**46,602**	**46,602**
PP#3: Production and	**Mekong Carbon** - Mr. Sar Samnang	06.02.2014 /	Contract signing	10,338	15%	10,338	10,338
			Approval of work plan (5 weeks after contracting)	17,230	25%	17,230	17,230

Testing of Biofertilizers	[sarsamnang7@gmail.com ; +85512481169]. (PP#3: Production and Testing of Biofertilizers)	30.11.2104	Approval of Mid-Term Report – App product formulations and supporting lab tests	17,230	25%	17,230	17,230
			Submission of Draft Final Report including product testing findings, and training evaluation report	13,784	20%		
			Approval of Final Report	10,339	15%		
				68,921		**44,798**	**44,798**
VIET NAM							
PP#1: Improved Cook Stove Use	**EPRO Consulting JSC (EPRO)** and Centre for Social Initiatives Promotion (CSIP) Ms. Tang Thi Hong Loan Email: loan.tth@eprovn.com Tel: +84913211299 (PP#1: Improved Cook Stove Use)	15.12.2013 / 15.10.2014	Contract signing	9,977	15%	9,070	9,070
			Approval of work plan	23,280	35%	24,187	24,187
			Approval of Mid-Term Report (Mth 6)	19,954	30%	19,954	19,954
			Submission of Draft Final Report	6,652	10%		
			Approval of Final Report	6,652	10%		
				66,515		**53,211**	**53,211**
PP#2: Bioslurry Management	Associate of Center for Agricultural and Ecological Studies ("**CARES**") and Sustainable Energy Development Consultancy Joint Stock Company ("**SEDCC**") Ms. Nguyen Thi Bich Yen Email: ntbyen@hua.edu.vn; Tel: 84-438768046 (PP#2: Bioslurry Management)	28.2.2014 / 30.10.2014	Contract signing	11,407	15%	11,407	11,407
			Approval of work plan (5 weeks after contracting)	22,814	30%	22,814	22,814
			Approval of Mid-Term Report – and delivery of knowledge product, production of bioslurry compost products and the design of crop demonstration program	19,011	25%		
			Submission of Draft Final Report including crop demonstration findings, and training evaluation report	11,407	15%		
			Approval of Final Report	11,407	15%		
				76,046		**34,221**	**34,221**
PP#3: Demonstration of Biofertiliser and Biochar Soil Amendments	Centre for Technology Development and Environmental Protection (**COTDEP**) Dr. Nguyen Dinh Manh, Vice Director and Dr Nguyen Cong Vinh Vinhsfri@gmail.com (PP#3: Biochar based soil amendments)	1.3.2014 / 30.12.2014	Contract signing	12,898	15%	12,898	12,898
			Approval of work plan (5 weeks after contracting)	21,496	25%	21,496	21,496
			Approval of Mid-Term Report – App product formulations and supporting lab tests	25,795	30%		
			Submission of Draft Final Report including product testing findings, and training evaluation report	17,197	20%		
			Approval of Final Report	8,599	10%		
				85,985		**34,394**	**34,394**
LAO PDR							
#PP1: Cluster	**National Consulting**	10.02.2014	Contract signing	34,855	15%	34,855	34,855

Biomass Technology and Biofertilisers	**Group (NCG)** Mr. Videth Visounnarath General Director National Consulting Group (visounnarath@yahoo.com) (PP#1: Biomass Utilization Cluster Pilot Upscaling)	/ 31.03.2015	Approval of work plan (5 weeks after contracting)	69,709	30%	69,709	69,709
			Approval of Mid-Term Report – App product formulations and supporting lab tests	46,473	20%	46,473	46,473
			Submission of Draft Final Report including product testing findings, and training evaluation report	58,091	25%		
			Approval of Final Report	23,237	10%		
				232,365		**151,037**	**151,037**
Total				**656,028**		**388,788**	**388,788**
%						**59%**	**59%**

3.2.2. Planned Activities

45. Planned activities are as follows:
- Continue pilot project implementation
- Continue monitoring implementation
- Analyze results

3.3. OUTPUT 3: STRENGTHENED CAPACITY OF PROJECT STAKEHOLDERS FOR THE EFFICIENT USE OF BIOMASS

3.3.1. Project Progress

i) Stand-alone training and study-tours

46. See tables below.

ii) Training under the pilot projects

47. See table below.

iii) Bio-Briefs

A series of two-page *Bio-Briefs* are being developed and disseminated in hard- and e-copy, with the purpose of raising the awareness levels of select groups within GMS government and civil society stakeholders and to build their familiarity with a number of interrelated subjects covering climate change, climate-friendly agriculture, food security, biomass and bioenergy. The following biobriefs have been completed and disseminated to date.

Topic	Date	Main Source Doc (Author Initials)	Links
1. Overview of TA7833-REG	Dec 2013	N/A	***ENG VIE CAM LAO***
2. Climate change in the GMS (overview)			
Climate change in the GMS (CAM)	Dec 2013	KP#1 (GM)	***ENG CAM***
Climate change in the GMS (LAOS)	Dec 2013	KP#1 (GM)	***ENG LAO***
Climate change in the GMS (VIE)	Dec 2013	KP#1 (GM)	***ENG VIE***
3. Climate Change & Agriculture in the GMS	Dec 2013	KP#1 (GM)	***ENG VIE CAM LAO***
4. Food Security in the GMS	April 2014	KP#1 (GM)	***ENG VIE CAM LAO***
5. Biomass resource availability in the GMS	Dec 2013	Agri Biomass Resource Assessment in CLV (SS)	***ENG VIE CAM LAO***
6. Soils and Biomass Amendments a	Aug 2014	Soils and Biomass Amendments KP (SS)	***ENG CAM VIE LAO***

iv) Videos

48. A *Training Video Series* has been started which aims to address the following two principle capacity development requirements:

- Enhancing target farmers' understanding of the true value of biomass resources, knowledge of various resource use options and confidence in applying this knowledge within biomass use;

- Enhancing target stakeholders' understanding of successful approaches for scaling-up the dissemination of improved cookstoves (ICS).

49. Production is underway on a practical *Training Video Series* focused on the '*Biomass for Healthy Soils, Crop Production and Bioenergy'*.

50. The video series aims to strengthen the practical knowledge of target beneficiaries in the GMS in managing agricultural biomass resources and bioenergy technology in a more efficient and sustainable manner. The videos are designed to address key capacity development requirements by enhancing target farmers': i) Understanding of the true value of biomass resources, ii) Knowledge of various options for efficient utilization of biomass, and; iii) Confidence in applying this knowledge in crop / bioenergy production.

51. The four-part video covers: a) Healthy Soils; b) Biomass for Energy; c) Biomass for Crop Production; d) Biofertilizers.

52. The intended use of the videos is as visual training resources within facilitated government (e.g. extension staff) and non-government training initiatives (external to TA7833). The series is intended to be interspersed with hands-on field training and demonstrations.

53. A subcontractor has been engaged and detailed scripts developed in partnership with the IAs, TA team, pilot project service providers and key stakeholders. Field shooting is planned for October to December 2014 ahead of editing and delivery of the final product in March 2015.

54. A full terms of reference, copies of the scripts, and details on the videos planned are available on request.

v) Blended Learning

55. A blended learning programme, using distance learning and other tools, has been prepared, following extensive consultations with stakeholders in CLV. This has been sent to ADB but put on hold.

3.3.2. Planned Activities

i) Stand-alone training and study-tours

56. Continue the gender-based training in Cambodia linking biochar to home garden systems

57. Undertake training (by Stephen Joseph) on how to enhance biochar through best practise at end November in Laos and Cambodia and in December in Vietnam. Notes will feed into the compendium.

58. Undertake additional training in Vietnam on biofertilisers, tentatively planned for December.

ii) Training under the pilot projects

59. Continue as planned

iii) Biobriefs

60. Prepare and disseminate additional biobriefs.

Topic	Main Source Doc (Author Initials)
7. Soils and Biomass Amendments b	Soils and Biomass Amendments KP (SS)
8. Biochar: Overview	Biochar KP (SS)
9. Biochar: Technology options & readiness levels	Biochar KP (SS)

10. Biochar: Applications	Biochar KP (SS)
11. Biochar: TA7833 test results & OHS*	Analysis of GMS Biochar Samples (SS)
12. Biogas: Overview	Biogas KP (JY)
13. Biogas: Technology options & readiness levels	Biogas KP (JY)
14. Biogas: Efficient bioslurry management	Biogas KP (JY)
15. Improved Cookstoves: Overview	ICS KP (EB updated by Nexus)
16. Improved Cookstoves: Impact on public health	ICS KP (EB updated by Nexus)
17. Improved Cookstoves: Technology options & readiness	ICS KP (EB updated by Nexus)
18. Climate-friendly value chains	CFA value chains KP (LS)
19. Standards & Certification#1	An overview of sustainable standards and certification systems (DPB), national policies and legislation KP (DPB) and using the draft standards prepared under output 1 as examples
20. Standards & Certification#2	An overview of sustainable standards and certification systems (DPB), national policies and legislation KP (DPB) and using the draft standards prepared under output 1 as examples
Any other topics (e.g. Climate-friendly soil amendments)	

* The biobrief on biochar analysis findings may be split into two with a focus on findings (especially related to Occupational Health and Safety) and the quality of rice husk biochars.

iv) Videos

61. Continue to supervise video production

v) Annual conference

62. Organise the second annual regional conference on household bioenergy and food security in Luang Prabang at the end Feb/early March 2015.

Table 4: Stand-alone training and study-tours to date

Event	Location	Dates	No. of Trainees by type (farmers, government or service providers) (and no. of women)	Evaluation feedback
Awareness-raising activities were initiated through inception workshops (Cambodia and Lao PDR) and a stakeholder meeting in Viet Nam.	CLV	February 2012	Government and service providers (not disaggregated - approximately 50:50) 121 total • 60 government • 61 service providers • (39 women)	Report available
Support for attendance of the TFP-Biochar from CLV at the International Biochar Initiative (IBI) Congress	Beijing, China	Sept 2012	3 Government (0 women)	Report available
Regional Workshop & Study Tour on Efficient Utilization of Biomass for Biochar Production & Application Biochar. See *Report on Proceedings*.	Siem Reap, Cambodia	04-07 March 2013	Government and service providers (not disaggregated – approximately 50:50) 33 total • 16 government • 17 service providers • (6 women)	Report available
Study-tour and training on biochar	China	Oct 2013 (x days)	6 Government (0 women)	Report available
1st regional conference on Efficient Utilization of Biomass for Bioenergy & Food Security in the Greater Mekong Subregion. Copies of presentations are available at: *https://drive.google.com/folderview?id=0B1wKP1C0cX-jLWJTNU54SXFKbUk&usp=sharing*	Hanoi, Vietnam	16th-18th Dec 2013	Government and service providers (approximately 50:50) 122 total • 61 government • 61 service providers • (34 women)	Report available
Training session on the application of the FAO's Bioenergy and Food Security (BEFS) Analytical Framework and Tool Box[8]. Held at the regional conference	Hanoi, Vietnam	18th Dec 2013	Government and service providers (approximately 50:50) 27 total • 13 government • 14 service providers	Not available

[8] *www.fao.org/bioenergy/foodsecurity/befs*

			(5 women)	
Training in Cambodia for participants from CLV on how to develop knowledge and consensus on procedures and ingredients for specifying 4-5 biofertilizer products in terms of their ingredient mixes and formulations to be used in the pilot farm demonstration programs.	Cambodia	March 2014 (4 days)	11 Government (2 women)	Laos has applied biochar organic fertilizers (4 formulas) following the training
Training on Vegetable – Nutrient Planning and Management Using Biochar in Takeo	Takeo, Cambodia	23 – 26 June 2014	59 Farmers (53 women)	- SATISFIED: 39 participants - GOOD: 20 participants - UNSATISFIED: 0 participants
Training on Vegetable – Nutrient Planning and Management Using Biochar in Battambang	Battambang, Cambodia	2 – 5 July 2014	60 Farmers (including 54 women)	- SATISFIED: 39 participants - GOOD: 21 participants - UNSATISFIED: 0 participants
Total			442 trainees of which: • 170 government • 153 service providers • 119 farmers • 193 women (44%)	

Table 5: Pilot Project Training Events to date

Pilot Project	Training	Dates	No. of Trainees by type (farmers, government or service providers) (and no. of women)	Evaluation feedback
Cambodia				
PP#1: Improved Cook Stove Up-scaling (Mekong TT)	ICS technical training for ICS enhancement (Coaching monthly quality control by GERES)	May – Sep 2014	18 ICS producers (Service providers) (9 women - wives)	
	ICS user training on different kinds of ICS and different biomass use (Contracted training by GERES)	04 15 August 2014	44 people (Women groups) (farmers) (all women)	
	Women Groups to open bank account (coaching)	Sep 2014	44 people (Women groups) (farmers) (all women)	

	Training on financial bookkeeping for women groups (coaching)	Sep 2014	44 people (Women groups) (farmers) (all women)	
PP#2: Farm Demonstration of Biofertilizers for Upscaling Investment (CelAgrid)	Orientation staff and training on farmer field school on methodologies and techniques, facilitation and communication skills, vegetable and rice production, fertilization and fertilizer rates and biochar	19 – 23 May 2014	12 Farmers (4 women)	
	15 Farmer field school on vegetable in 15 villages.	2nd week of June 2014	271 Farmers (214 women)	Pretest: 23-59% of participants had good scores, 26-47% passed the test and 15-30% failed the test Post-test: 100% of participants had good scores
	13 Farmer field school on rice	1st week of September	275 farmers (193 women)	Pre-test: 40-100% of participants got good scores, 4-31% passed the test and 4-40% failed the test
	Biochar Making and Application in Agricultural Crops (2days training at DAE where participants can visit the workshop where kilns are produced and 3days practice in Samroung village – production of biochar.)	7 – 11 September 2013	30 mainly government although some farmers (2 women) (GDA Officers, DAEng, NEDO, ADB project staff, Farmers)	
	Operation and maintenance of TLUD kilns for farmers' groups in Takeo province (3 days training of which participants had 1day visit to Samroung village that received 3kilns already and 2days theory plus practice	2nd week of June	30 Farmers (11 women)	

PP#3: Production and Testing of Biofertilizers (Mekong Carbon)	No training			
Vietnam				
PP#1: Improved Cook Stove Use (EPRO)	Training in marketing, communication skills and efficient biomass use for union reps, showrooms and stove producers	?	28 service providers (including 15 women)	
PP#2: Bioslurry Management (CARES)	2 Training courses on biogas technology and its benefits	March 2014	30 people/each (8 women) i.e. 60 farmers (16 women)	- SATISFIED: 48 participants - GOOD: 12 participants - UNSATISFIED: 0
	2 Training courses O&M biogas digester	June 2014	30 people/each (8 women) i.e. 60 farmers (16 women)	- SATISFIED: 50 participants - GOOD: 10 participants - UNSATISFIED: 0
	2 Training courses on Bioslurry utilization	August and September 2014	30 people/each (7 women) i.e. 60 farmers (14 women)	- SATISFIED: 46 participants - GOOD: 14 participants - UNSATISFIED: 0
	2 Training courses on composting and business skills	July and August 2014	31 people/each (7 women) i.e. 62 farmers (14 women)	- SATISFIED: 54 participants - GOOD: 8 participants - UNSATISFIED: 0
PP#3: Biochar based soil amendments (COTDEP)	4 TOT on kiln design (DK-TR1) and operation to produce biochar	May and June 2014	200 Farmers (50 person/each and totally 107 women)	- SATISFIED: 148 participants - GOOD: 52 participants - UNSATISFIED: 0

	4 Training courses on operation of biochar kiln and application in An Giang	July 2014	37 Farmers (5 women) 34 Farmers (2 women) 47 Farmers (5 women) 40 Farmers (4 women)	- SATISFIED: 102 participants - GOOD: 56 participants - UNSATISFIED: 0
	4 Training courses on operation of biochar kiln and application in Hanoi	August 2014	200 Farmers (50 person/each and totally 107 women)	- SATISFIED: 130 participants - GOOD: 70 participants - UNSATISFIED: 0
Lao PDR				
PP#1: Biomass Utilization Cluster Pilot Upscaling				
Output#1 ICS program: scaling up ICS use in project clusters				
A#1.1 Scaling up ICS use and Education Campaign	Hands-on/OJT ICS production focus on Super Stoves and Work Bank Stoves Hands-on/OJT rice husks stove production and small wood residue Hands-on/OJT biomass stove production	July	1 local producer and 4 labors, 0 women (Service providers) 1 local producer and 6 labors (Service providers) 1 local producer and 3 labor (Service providers)	Difficult to produce with high standards Price still high Price still high
A#1. 2 ICS use and education program	ICS demonstration and efficient use of biomass for bioenergy	July	18 people including 8 women (Service providers)	Agreed on 4 types of ICSs
A#1.3 ICS Business planning	ICS Sale projection and Incentive –Based Systems	July	7 women (LWU) (Service providers)	Business plan
A#1.4 ICS Inventory	ICS Shop design and Promotion Campaign	July	7 women (LWU, service providers) and 3 ARMI/NCG staff	Good fashion Good start
A#1.5 Practical knowledge transfer	ICS practical training and marketing /after sale	Aug	49 people, including 46 women (cost sharing workshop) (LWU) (service	Sale techniques applied

	services		providers)	
A#1.6 ICS sale recording	Monitoring and ICS users survey	Aug	7 women (LWU) (service providers)	Sale recording and monitoring
A#1.7 Biomass stoves (metal)	Rice husks stoves and other biomass stoves promotion	Aug	1 local producer / inventor and 6 labors, 0 women (service providers)	Good quality Price still high
Output#2: Biomass for bio- fertilizers and soil amendments				
A#2.1 Biochar and Biochar Organic Fertilizers	How to make biochar and effective use for soil improvement Organic farming by using biomass for BOF	Aug	19 people, including 3 women (farmers)	Learning by doing and applied
A#2.2 Biomass feedstock and soil conditions	Biomass feedstock and soil samples collection and analysis - Healthy Soil Requirements	July	35 Veggies growers (farmers) (28 women) 7 rice farmers (4 women)	Test results have been used
A#2.3 Cross-study tour	GAP practices and Organic Vegetables and Market Places	Aug	20 veggies and rice farmers, including 12 women	Lessons learnt and applied
A2.4. BOF – Volunteer Soil Doctor	BOF/BCF and Use Theory on good soil and Biomass/BOF for healthy soil	Aug	22 farmers, including 10 women (plus two women trainers)	Learning by doing at farm levels
A2.5 Biochar Organic Fertilizers	How to produce BOFs and Processing and Application	Aug	31 farmers, including 16 women	Want to apply
A#2.5 MEKSAVAN Enterprise	On the job-training /learning by doing: BOF Formulation 1	Aug	22 farmers (compost makers), including 15 women	Want to apply
A#2.6 KONGKHAM Enterprise	On the job-training/learning by doing – kilns and machines tested to produce BOF Formulations 2	Aug	14 farmers, including 7 women	Eager to use BOF
A#2.7 Compost at fields	How to make compost in the fields / practices at KM 52	Aug	18 people (farmers), including 12 women	6 families applied
A#2.8 Biogas composite digesters	Installation, Use, Operation and Maintenance	Aug	12 families 72 persons (farmers) (34 women)	Good performance
A#2.9 Veggies demo	28 green houses installation	Aug	28 women and family members (farmers)	Good performance
A#2.10 Rice fields demo	7 plots preparedness	Aug	7 women and family members (farmers)	Good performance
A#2.11 Application and follow up	Routine and periodical learning by practicing /	Started from July onwards	Demo. plots (44 locations) owners and their family members, more are women (say	Case-on-case basis applied

	hands-on advice		80% i.e. 35) (farmers))	
A#2.12 TVD series review meeting	Disseminate and review TVD synopses Parts A, B, C and D at central level	3 July	14 government officials (4 women)	Consensus on proceedings
A#2.13 Hands-on Biogas Composite Digesters	OJT learning by doing with farmers participation and contribution – BCD O&M	26-28 July	24 farmers (6 women)	Active participants Want to use biogas
A#2 14 TVD series review meeting	Disseminate and review contents of TVD series production at pilot clusters	22 Aug.	29 mainly farmers (14 women)	Understandings and consensus to proceed
A2# 15 OJT Pest-Control Techniques	Organic / Botanical Pest-Control Approaches and Methodologies	4-7 Sept.	18 families in 3 villages of pilot cluster (mainly farmers)s (18 women)	Learning by doing applied
A#2 16 Mid-Term Performance Review	Lao Pilot Interim Performance Review Meeting	16 Sept.	33 persons (mixture – say 11 gov, 11 service providers and 11 farmers) (14 women)	Satisfaction
A2#17ICS Education/ demonstration program	Sale promotion and demonstration of ICS, with Organic Vegetables Produce and Sale, BOF use and replication / introduction	Sept.	At clusters level: 21 persons (estimate at 7 government, 7 service providers and 7 farmers) (20 women) At district level on spec. events: 250 farmers(165 women)	Good satisfaction
A2#18 OJT Soil Test	OJT on soil test (NPK and PH) after first cycle of veg. production	Sept.	At farm levels (6 farmers (3 women) (and two local staff)	Being applied at other farms
Total			2441 trainees of which: • 62 government • 175 service providers • 2204 farmers • 1400 women (57%)	

63. Thus in total there has been 2883 trainees approximately 232 of which have been government staff, 328 service providers, and 2323 farmers. 1593 have been women (55%).

3.4. OUTPUT 4: KNOWLEDGE PRODUCTS DEVELOPED AND DISSEMINATED

3.4.1. Project Progress

64. Knowledge products are being prepared which will eventually feed into a compendium to be developed at the end of the project. So far the following have been disseminated:

- An Overview of Sustainable Standards and Certification Systems (linked to output 1)
- Business Models for the Scaling-Up of Climate-Friendly Agricultural Value Chains in the GMS (linked to output 2)
- Agricultural Biomass Resource Assessment in CAM, LAO and VIE
- Agriculture, Food Security and Climate Change in the GMS
- Soil and Biomass Amendments

65. These can be accessed, together with other project reports, at:
https://drive.google.com/folderview?id=0B1wKP1C0cX-jdUhvMDNvcmEyZHc&usp=sharing

66. The following KPs are under preparation:

- Biochar (under peer review)
- Biogas and bioslurry (under peer review)
- Improved cook stoves - partly drafted

3.4.2. Planned Activities

67. Finalise and submit the following KPs:

- Biochar
- Biogas and Bioslurry
- Improved Cookstoves

68. Prepare the following

- Climate friendly value chains
- Carbon pathways for different technologies (TBC)
- Standards for biochars – examine standards and certifications systems for biochar, including constraints inhibiting take-up (KP or biobrief)
- Innovative Financing Mechanisms for Upscaling

69. In addition, the pilot projects will be used as case studies for lifecycle and least cost assessments. Timelines are as follows:

- 5th – 14th November: Prepare for field work including getting baseline data on use of straw/biomass from feasibility studies and pilot contractors)
- 15th November – 22nd December: Approx. 2 weeks in each country for field work
- January: 2 weeks for report writing

70. This could then be combined with a biomass assessment framework within a multi-criterion decision framework. This would then feed into the compendium.

71. Unfortunately our expert who was to conduct the lifecycle and least cost assessments is unable to travel for medical reasons. We therefore propose a PhD student, with whom he has worked in China on a similar study, to undertake the field work. We will submit a contract variation request to ADB for this change.

72. Work will start in November on ideas for the compendium to be prepared in early 2015. A decision will be made as to whether to produce this as an on-line database of resources or a printed guidebook. The current thinking is to have this as an on-line collection/ resource library, with appropriate indexing. Needs thought on the scope and the structure. Could be hosted on the WGA website.

4. PROJECT MANAGEMENT

4.1. SUMMARY OF CONSULTANT TA TEAM

73. Only those experts (the core team) with inputs remaining, and who will continue to work on the project, are included below.

Table 6: International staff engaged on TA7833 (as of end Sept 2014) (contract variation#3)

NAME	SPECIALIST POSITION	TOTAL INPUTS (MONTHS)	INPUTS UTILIZED (MONTHS)	INPUTS REMAINING (MONTHS)
INTERNATIONAL				
Lindsay SAUNDERS*	Team Leader	13.52	8.03	5.49
Greg MUNFORD	Capacity Building & Distance Learning Specialist	6.7	3.58	3.12
Simon SHACKLEY	Biomass / Biochar Technology Specialist	8.03	4.05	3.98
Stephen JOSEPH	Biofertiliser Specialist	2.5	1.05	1.45
NATIONAL				
Mao Moni RATANA	Cambodia National Project Implementation Specialist (NPI)	19.7	15.91	3.79
Bounthavy CHALEUNPHONH	Laos National Project Implementation Specialist (NPI)	21	15	6
Li Thi THOA	Vietnam National Project Implementation Specialist (NPI)	19	16.41	2.59

4.2. PROJECT REIMBURSABLE EXPENDITURE

Table 7: Summary of TA7833-REG Project Reimbursable Expenditure (US$)

Category	Budget (VO#3)	Disbursed	Balance
1200 Equipment	32,391	27,390.93	5,000.07
1300 Seminars, Workshops & Training	443,709	184,024.50	259,684.5
1400 Studies, Surveys & Reports	925,000	598,051.27	326,948.73
TOTAL		**809,466.7**	**591,633.3**

74. Note the above table shows expenditure to date, not amounts invoiced to or paid by ADB.

5. IMPLEMENTATION ISSUES, LESSONS LEARNT AND RECOMMENDATIONS

75. The major lessons learned during the implementation of the TA are presented in the following table.

Table 8: Issues Encountered, Recommendations and Remedial Actions

ISSUES ENCOUNTERED	RECOMMENDATIONS & REMEDIAL ACTIONS
Regional cooperation Lack of operational procedures for ADB implementation and procurement in Regional Technical Assistance Projects	WGA standard operating procedures (SOPs) covering the role of the public sector in Regional TA projects and the basis for their engagement for services supported by an ADB OSFMD agreement for the procurement systems and documentation is required. SOPs have been under preparation by the ADB TA7833 Regional Cooperation Specialist, but despite repeated requests the TA team has not yet received these. Significant delays were experienced with respect to clarifying ADBs procurement options for supporting public sector participation. The inability to pay for participation and the lack of government funding for participation will slow and minimize the value of policy work and counterpart participation
Implementing Agency engagement Official IA counterpart staff nomination and resource allocation process was only completed on 08 June 2012, resulting in delays in completing the inception phase and commencing implementation. The ADB and Consultant have raised concerns about these initial delays in TA inception and implementation and their knock-on effect on the project performance – e.g. the DMF references milestones in 2011, even though the contract was not signed until December 2011.	Such constraints are to be expected due to the complex regional nature and innovative, pioneering approach of TA7833. All parties continue to work hard to recover the lost time. Enhancing opportunities for communication and collaboration are considered prime approaches for enhancing engagement.
TA Team leadership TA7833 complexity (different perspectives on immature technologies; difficult regional cooperation and varying IA priorities; specification to use innovative financing mechanisms; etc.) led to a loss of direction by the TA Team Leader and a lack of project progress.	Team leader replaced and TA team and approach streamlined. Revised work plan elaborated and distributed to project partners. Extra backstopping resources provided through a Landell Mills Director.
Intermittent inputs do not work effectively	The TA team was resourced with a large number of experts in each country but most of these were part time. Part time work may appear to be attractive but for most nationals it is in fact extremely difficult to organize and then manage time inputs to enable a genuine team participation and approach. The team has operated far more smoothly since the reduction in the number of experts and the increased duration of inputs. A key lesson for future TAs is the need for a national coordinator to be full time to ensure that programs and processes are being sustained.
Immature technologies The ToR specify up-scaling of a wide range of	Liquid biofuels such as jatropha-derived biodiesel

technologies, however many of these are not sufficiently mature for up-scaling.	will not be included in TA activities due to key concerns about the feasibility of jatropha, lack of farmer / government commitment and interest and the broad-based questions regarding the potentially negative correlation between jatropha production and food security. Biochar and bioslurry technologies are also assessed to be too immature and as such the targets for their adoption in the DMF are considered too optimistic. Pilot projects will focus on demonstrating production and management of the more immature technologies and how these products can be integrated into greener value chains. The immaturity of technology has been highlighted in biochar and bioslurry. The need for both is to shift the focus from which technology to product development and formulation linked to fertilizer supply chains.
Technology adoption indicators are not realistic For example, the DMF indicates the following: Construction of at least 500 bio-digesters, 600 biochar kilns, and 75,000 improved cookstoves	A program target to upscale 75,000 cook stoves in the three countries far exceeds both the resources available and the likely uptake rate – further it would exceed the ICS stove producer capacity 500 biodigesters is optimistic given that the ADB has existing lending products in place for biodigesters in Viet Nam and the assessment of biodigesters in Cambodia and Laos is negative 600 biochar kilns is simply unsupportable – there is no local production of kilns that has a commercial basis. Kiln technology and feed stocks are not well known and the benefits of biochar may not warrant the investment of resources. Further, the international experience with biochar is to move away from high volume soil amendments to incorporation of biochar into nutrient products where the biochar changes the characteristics of the biochar through reduced volatilization and provides potential water and nutrient release benefits lowering overall demand for nutrients.
Scale of technology	The preference for household-level technology, while appropriate for ICS, may be inappropriate for biochar and to a lesser extent bioslurry. The financial viability of such technologies will determine the extent of their adoption. However TA findings and expert opinion currently suggests that the viability of small-scale technology that has adequate safeguards may be insufficient to generate viability and attract investment and adoption. Experience in Thailand and China suggest that the biochar and bioslurry sectors emerge from a

	demand for biofertilizer from specialist agents that collect from product catchment areas. The focus should maybe move away from technology of production to how to build supply chains – a key finding from the assessment of climate friendly value chains in GMS
Donor crowding within the ICS sector	The ICS sector has a range of players many of whom offer subsidies and grants for the adoption of ICS technologies. The continued investment from the WB, EU and other ADB TAs that offer more concessional investment makes a purely commercial value chain less likely. The TA is focusing its ICS pilots on stove producer risk reduction through skill development, and demand aggregation through women's unions. ICS technology in GMS is highly visible, however the gains from the technology are relatively small and with most improved stoves failing to address the durability of stoves it is questionable if significant gains are being achieved.
Innovative financing mechanisms The purpose of the TA is to pilot implementation mechanisms. The assumption being that innovative implementation mechanisms will support up-scaling initiatives more effectively. Numerous innovative financing mechanisms were identified by the TA in 2012 and provisionally endorsed by the ADB and team leadership in relation to proposed potential pilot implementation modalities. However, rigorous internal review has revealed that: (i) the nature of the modalities is not fully understood by all project parties; (ii) the complex institutional requirements for options including revolving funds and social merchant banking are not in place; (iii) the constraint of timelines for outcome-based funding would ensure that the TA would be closed prior to outcomes being achieved, making financing impossible; (iv) the TA resources are too limited to adequately finance the required investment funds including development bonds and social merchant banks at sufficient scale; (v) the risk averse nature and novelty factor of national and regional private sector stakeholders for engaging in such innovative modalities, and; (vi) the questionable performance of some of the proposed mechanisms, across a range of scenarios (e.g. Nepal), and the degree to which critical success factors are represented within the GMS – e.g. social merchant banking is a mix of financing modalities that individually are used in other ADB loan projects, many of which require 1-2 years to establish.	The TA has modified its position on innovative financing and will limit its modalities to a focus on the use of output-based financing to offset the business and market risk of stove producers. The financing modality for biogas and biochar will continue to emerge throughout the pilot projects and their implementation. Private-sector stakeholders and financing institutions will continue to be targeted for relevant awareness-raising and capacity building activities so as to raise the profile and confidence levels of potential future investors re. TA7833-relevant themes. One option of output based funding is for new product formulation for biochar supply chain development. An important question to be asked is can an ADB TA operating for 2-3 years be expected to pilot innovative financing arrangements that require new or reformed institutions to operate them, and can a TA flow funds into such institutions in a cost effective and transparent manner
Focus on standards and certification	The TA team has adapted its approach and has focused on areas where the government has requested assistance i.e. demand-led. This has led to improved engagement, ownership and results, particularly in Laos and Cambodia. In Vietnam the scope of work could not be agreed due to concerns that the request for project assistance (for an SRI standard) may be outside the scope of the project

	given the complexities.
ADB procurement	A critical, if not unique, experience of the TA7833 is the ability to use ADB procurement modalities in a manner that enables implementation of a pilot program. Many contracts for services are small, target local service providers and are as such unattractive to these firms due to the cost of competing compared to the potential benefits. The TA ToR indicated the use of innovative PPP modalities. Achieving these through a TA financing modality is remarkably difficult, time consuming and uncertain. Differing interpretation of rules and processes has resulted in repeat actions and time delays.

APPENDIX 1: DESIGN & MONITORING FRAMEWORK

Design Summary	Performance Targets & Indicators with Baselines	Data Sources & Reporting Mechanisms	Assumptions and Risks
Impact Improved use of biomass in Cambodia, the Lao PDR, and Viet Nam	By 2020: 5% increase in production of clean bioenergy from biomass (2011 baseline: 0.1%) 5% increase in use of by-products of bioenergy systems (bio-slurry and biochar) (2011 baseline: 0%)	Project baseline and benchmark surveys Periodic surveys and annual reports of agriculture and energy ministries of Cambodia, the Lao PDR, and Viet Nam[9]	**Assumptions** The governments of Cambodia, the Lao PDR, and Viet Nam remain committed to regional cooperation in clean bioenergy and food security. **Risk** Private sector investment is constrained by over-regulation.
Outcome Efficiently operating pilot projects in biomass use	By 2014: At least two investment modalities for biogas and bioslurry (Cambodia and the Lao PDR); three for biochar (Cambodia, the Lao PDR, and Viet Nam); two for improved cookstoves (the Lao PDR and Viet Nam); and three for inclusive supply chain of certified biofuel and organic crops in (Cambodia, the Lao PDR, and Viet Nam)	Project completion report Annual reports from agriculture ministries of Cambodia, the Lao PDR, and Viet Nam	**Assumptions** The central and provincial governments remain committed to working with the poor in remote areas. **Risk** Pilot projects are not successfully implemented.

[9] *a Ministry of Agriculture, Forestry and Fisheries (Cambodia); Ministry of Agriculture and Forestry (Lao PDR); and Ministry of Agriculture and Rural Development (Viet Nam)*

Outputs *1. Enhanced regional cooperation in bioenergy development to foster and safeguard food security*	By 2014: Mechanism tested for harmonizing at least three bioenergy standards[10] and certification systems, and a common method of assessing greenhouse gases	Consultants' reports and document records of agriculture ministries of Cambodia, the Lao PDR, and Viet Nam Agricultural household survey reports of Cambodia, the Lao PDR, and Viet Nam	**Assumptions** The consulting team is given timely access to records, information, personnel, and relevant geographic sites.
2. Pilot-tested climate-friendly biomass investment projects for wider implementation	Construction of at least 500 bio-digesters, 600 biochar kilns, 75,000 improved cookstoves; and introduction of at least 300 farmers to sustainable certification standards	Benefit and impact monitoring reports Project review missions	Local officials, technicians, and lead farmers are available to participate in training Development partners and the private sector are keen to participate in the TA activities.
3. Enhanced capacity for efficient use of biomass	Increased capacity for gender-sensitive investment among at least 500 government officials, 400 service providers, and 3,000 lead farmers (i.e., at least 55% of those to be trained will be women and at least 70% of those trained will have increased capacity)		**Risks** Cambodia, the Lao PDR, and Viet Nam cannot agree on harmonized standards and certification systems
4. Development and dissemination of knowledge products	Methodology for assessing and prioritizing the use of biomass for bioenergy and food security Compendium of good practices in biomass use Booklets on different models of improved cookstove, biochar kiln, and biodigesters		

[10] b *Including standards set by such organizations as the Global Alliance on Clean Cookstoves and the Roundtable on Sustainable Biofuels, along with quality assurance from regional quality assurance centers to be established for biogas, improved cookstoves, bio-char, etc.*

Activities with Milestones	Input
1.0 Holding of regional forums to facilitate high-level dialogue within the region on bioenergy and food-security policy issues, by 2011 1.1 Testing of mechanisms to facilitate adoption of common sets of sustainable indicators, bioenergy and trade standards, certification systems, and eco-labeling systems, by 2012 1.2 Holding of annual international workshop on household bioenergy and food security to foster exchange of information, particularly between more advanced Greater Mekong Subregion countries and Cambodia, the Lao PDR, and Viet Nam 2.0 Conduct of biomass assessment and development of criteria for the selection of pilot project areas, by early 2012 2.1 Implementation of pilot projects in lower-cost biogas technologies as investment project with a component involving the use of bio-slurry for high-value crop production, by 2012 2.2 Conduct of reviews to identify appropriate biochar, improved cookstove, and biofuel investment modalities, and implementation of pilot project, by 2013 3.0 Development of gender-sensitive training programs, including distant learning modalities, and use of these programs in the training of central and local government officials, farmers' organizations, women's groups, and service providers (of which at least 30% are women), by 2012 3.1 Conduct of training in the implementation of the investment project, by 2013 3.2 Conduct of training in the use of biomass to enhance food security and soil carbon sequestration, by 2013 4.0 Development of methodology for assessing and prioritizing the use of biomass for energy and food security, by 2011, and dissemination of the methodology through regional forums, training, and capacity building by 2012 4.1. Establishment of baseline information and monitoring and evaluation system for pilot projects, by 2012; 4.2 Conduct of key studies, such as studies on life-cycle assessments, least-cost options, and eco-labeling, by 2013 4.3 Publication of compendium of good practices in biomass use and booklets containing information on different models of improved cookstoves, biochar kilns, and bio-digesters, by 2014 4.4 Analysis of potential climate change scenarios and their likely impact on the availability of different types of biomass, and assessment of need for the development of alternative biomass sources, by 2013	Total cost: $4.6 million equivalent

APPENDIX 2: PROGRESS AGAINST THE TOR

TOR Statement	Addressed by the TA?
Background	
The subject regional capacity development technical assistance (R-CDTA) aims to improve utilization of biomass in Cambodia, Laos PDR and Viet Nam (CLV). This will be achieved through: (i) harmonization of sustainable standards, certification systems, and other mechanisms to enhance regional cooperation on bioenergy development with food security ensured; (ii) implementation of pilot projects to demonstrate mechanisms for scaling up biomass investment projects for bioenergy or food security; (iii) capacity-building support for project stakeholders; and (iv) knowledge products and awareness campaign.	**Partially.** Standards are being developed but at a national level, although these are shared so that some harmonisation is achieved. Regional dialogue has helped to further potential harmonization in the future. **Yes.** 7 pilot projects are on-going, demonstrating a variety of mechanisms for scaling up **Yes.** A variety of capacity-building events have been undertaken. **Yes.** Knowledge products and biobriefs have been prepared, and videos and a compendium are being planned.
The mechanisms for scaling up demonstrated under the R-CDTA are expected to lead to ensuing ADB investment projects in Cambodia, Laos, and Viet Nam.	**Yes.** The final report will provide ADB with recommendations for investment projects which can then be subject to PPTAs
ADB will engage an international consulting firm …. to: (i) strengthen institutional linkages and mechanisms for regional cooperation on bioenergy and food security; (ii) provide technical support for designing and implementing pilot studies, undertaking studies and building capacity; and (iii) monitor and report on the R-CDTA activities and outputs.	**Partially.** Forums have been organized to promote regional co-operation. Government stakeholders have preferred to concentrate at the national level however. **Yes.** Feasibility studies for pilots were undertaken to aid design. Support is now being provided in implementation. **Yes.** Quarterly reporting, plus specific progress reports on pilot activities.
Expected Outputs and Activities (to be undertaken by the R-CDTA firm)	
i. **Inception phase:** a. Map existing implementation structures for efficient utilization of biomass for bioenergy and food security. Where none exist, map potential partners/NGOs/centers of excellence and provide recommendations on organizations with the requisite expertise to carry out specific work packages under the TA. Provide recommendations on the advantages and disadvantages of both existing and new implementations structures, outlining challenges, capacity issues, etc. and how can they be addressed or mitigated.	**Yes.** See inception report.

ii. **Component 1: Enhanced regional cooperation on bioenergy development that safeguards and fosters food security.** Activities to be conducted include but are not limited to:	
a. Organize and convene annual regional forums to facilitate regional high-level policy dialogue on bioenergy and food-security issues with the objective of enhancing regional approach to development through activities such as harmonizing regulatory frameworks and developing common standards, certification systems, methodologies, monitoring and evaluation systems, etc.	**Yes.** Forums have been organized to promote regional co-operation. Government stakeholders have preferred to concentrate at the national level however.
b. Review and evaluate existing laws, regulations, indicators, standards, certification and accreditation systems, IT traceability and eco-labeling systems with the purpose of developing and testing appropriate mechanisms to facilitate adoption of common sets of sustainable indicators, bioenergy and trade standards, certification systems and eco-labeling systems among GMS countries, in particularly CLV countries by 2012. Constraints and interventions required for collection of critical mass of eco-products for export from the region.	**Partially.** Regulatory framework has been reviewed. Policy working groups set-up to determine priorities for action in each country. Based on this 4 standards (2 in Cambodia and 2 in Laos) have been developed, and a roadmap is being created for ensuring their take-up (i.e. systems for certification, labelling, traceability and inspection).
c. Organize and convene annual international workshops on household bioenergy and food security to foster exchange of information, particularly from advanced GMS countries to CLV. The first forum will be conducted in 2011 to gather knowledge and assemble best practices related to standards, technologies, and business models, which will inform the design and implementation of pilot projects and knowledge products under the R-CDTA. Subsequent forums will disseminate findings from R-CDTA experience, research and analysis and strengthen the network of practitioners developed under the R-CDTA.	**Yes.** Forums organized in China, Vietnam, and in 2015 in Laos. Separate national forums in CLV also organised.
iii. **Component 2: Pilot testing of scaling up climate-friendly biomass investment projects.** The consulting firm will oversee the design and implementation of at least 10 pilot gender-responsive investment models in CLV countries. Pilot projects will test investment modalities for scaling up successful small-scale project and should include private sector participation. For mature technologies with ongoing government programs, the firm will build upon existing implementation structures which may involve subcontracting of NGOs to dry run the activities as an ADB investment project. For technologies that require further study, Centers of Excellence may be engaged to conduct research and evaluate technologies and identify institutional arrangement under the government system to scale-up as pilot investment project. The firm will represent ADB in calling for proposals on studies and pilot programs, develop criteria for selection of new technologies and organize stakeholder consultation to prioritize and agree on the priorities and appropriate parties to be subcontracted. Where activities are sub-contracted, the firm will manage this process and	**Yes**. Although at least 10 investment modalities will still be assessed, the type of investment modality differs slightly in terms of numbers per country and technology. This is because they have been prepared in a participatory manner and based on feasibility and need in each country, following discussions, and feasibility studies (plus a rapid appraisal) in each country. • Cambodia: - PP#1: Improved Cook Stove Up-scaling - PP#2: Farm Demonstration of Biofertilizers for Upscaling Investment - PP#3: Production and Testing of Biofertilizers • Vietnam:

oversee the deliverables of subcontracted entities in accordance with ADB Guidelines on the Use of Consultants. The firm will build upon the works of the GBEP in the monitoring and evaluation, including utilizing indicators developed by GBEP and other regional institutions. At the minimal, the following pilot projects and related activities will be pursued:	- PP#1: Improved Cook Stove Use - PP#2: Bioslurry Management - PP#3: Demonstration of Biofertiliser and Biochar Soil Amendments • Laos: - #PP1: Cluster Biomass Technology and Biofertilisers
a. Household biogas with bioslurry extension. All CLV countries have existing national programs to promote domestic biogas, but biogas installations remain costly and continue to rely on substantial subsidies. R-CDTA consultants will identify less costly biogas technologies and will support development of standards on domestic biogas. An implementation model will be developed to pilot test at least 500 low cost biogas plants in each country, with linkages to micro-finance or local financial institutions and carbon revenue. Pilot activities will also support extension programs in each country to test an appropriate investment modality for using bioslurry from biogas digesters in lieu of chemical fertilizers to produce higher value organic and bio-intensive agriculture products. It is envisioned that SNV Netherlands Development Organization, which presently provides technical assistance to the ongoing national biogas programs in Cambodia and Lao PDR, would be subcontracted to implement the biogas with bioslurry extension projects.	**Yes**, although not in Cambodia, and the mechanisms used are different to that stated in the TOR. E.g. SNV has not been subcontracted. In terms of the target indicator, while climate-friendly biomass investment projects will be pilot-tested for wider implementation, the target will not be achieved as stated. This is because the project is testing business models for future scale-up, not to construct a specific number of bio-digesters, biochar kilns, or improved cookstoves, or to test these particular technologies. Thus the indicator of 500 biodigesters is not realistic, or in line with what the project is trying to achieve. In addition, the target of 500 biodigesters is optimistic in any case given that the ADB has existing lending products in place for biodigesters in Viet Nam and the assessment of biodigesters in Cambodia and Laos is negative.
b. Biochar. Existing methods for producing and utilizing biochar at the household level, such as biochar kilns and improved biochar cookstoves, will be reviewed, appropriate technologies identified for larger scale dissemination in CLV, and investment models, which include private sector service providers for kiln and stove production, pilot tested in each country. Since biochar as a soil amendment can also displace fertilizer to produce high-value organic crops, biochar pilot activities should also link to inclusive supply chains for higher value organic crops (see below). In addition, carbon sequestration impacts of biochar will be evaluated and possibility of carbon financing will be explored.	**Yes**. Biochar pilots are being implemented in each country. On carbon financing – see below.
c. Improved cookstoves (ICS). Various ICS models will be reviewed to identify models appropriate for large-scale dissemination in CLV countries. If pre-feasibility analysis suggests a need for public financing for ICS dissemination in Lao PDR and Cambodia, pilot projects will be developed to test a model for national ICS programs involving the public and private sectors and to prepare for larger scale investment. Output-based contract to private	**Yes**. ICS pilots are being implemented in each country.

sector will be explored. Through pilot projects, link with ongoing regional programs to support ICS dissemination, such as sending project developers to attend the GERES Stove Academy in Cambodia. Evaluation will be also conducted on best strategy to establish stove testing facility at regional, national or local level. If regional level will be best option, the possibility of establishing a regional stove testing facility at the Asian Institute of Technology or another appropriate regional institution will be established.	
d. Biofuels. Based on a review of best practices for intercropping jatropha on marginal lands in integrated farming systems, develop pilot project for smallholder farmers to test use of jatropha seed for local consumption as biodiesel and oil cake residue as organic fertilizer. Support certifying farmers using the Roundtable for Sustainable Biofuel standard and link to activities to strengthen inclusive supply chains (below).	**No**. Liquid biofuels such as jatropha-derived biodiesel will not be included in TA activities due to key concerns about the feasibility of jatropha, lack of farmer / government commitment and interest and the broad-based questions regarding the potentially negative correlation between jatropha production and food security.
e. Inclusive supply chains. Conduct a value chain analysis to identify appropriate interventions along the supply chain from farmer to consumer to support development of more inclusive supply chains for high value organic products and sustainably grown biofuels in CLV linked to cross-border trade. Integrate inclusive supply chains into pilot projects for biogas with bioslurry extension, biochar, and biofuels and link to activities related to harmonization of standards under Output 1. It is envisaged that the TA activities will build upon works done by certification related agencies (e.g. CEDAC in Cambodia, Profile in Lao PDR, ADDA in Viet Nam) or other social enterprises.	**Yes**. Pilot projects will focus on demonstrating production and management of the more immature technologies and how these products can be integrated into greener value chains. The immaturity of technology has been highlighted in biochar and bioslurry. The need for both is to shift the focus from which technology to product development and formulation linked to fertilizer supply chains. Preparation of standards under Output 1 is linked to the ork undertaken in Output 2.
f. Carbon financing. Biogas, biochar, ICS, and sustainably grown biofuels can be eligible for carbon financing if the applications displace or sequester greenhouse gas emissions. Carbon revenue can be used to bring down the cost of the technology, improve quality, displace donor-funded subsidies, or contribute to long-term sustainability of large-scale dissemination programs. For all projects, the costs and benefits of obtaining carbon financing should be assessed, and, where appropriate, carbon finance should be pursued.	**No**. Carbon financing options will not be explored due to the time needed. The TA is limiting its financing modalities to a focus on the use of output-based financing to offset the business and market risk of stove producers. Private-sector stakeholders and financing institutions will continue to be targeted for relevant awareness-raising and capacity building activities so as to raise the profile and confidence levels of potential future investors. An important question to be asked is can an ADB TA operating for 2-3 years be expected to pilot innovative financing arrangements that require new or reformed institutions to operate them, and can a TA flow funds into such institutions in a cost effective and transparent manner .

iv. **Component 3: Capacity for efficient utilization of biomass enhanced.** The consulting firm, on its own or through entities sub-contracted and managed by the firm, will assess the needs of and provide gender-sensitive capacity building support to participating central and local governments, service providers, communities and women's groups, to strengthen institutional and technical manpower to scale up biomass investment and to ensure sustainable uptake by rural communities following the withdrawal of external support. Specific activities include but are not limited to:	
a. Through a participatory process including women, assess target groups' needs and design and implement gender-sensitive training programs, including distant learning modalities, to train at least 500 government officials at central and local levels, 400 service providers, and 3000 farmers on various applications for efficient use of biomass. Training may be conducted as part of the pilots implemented through the TA (as described above). At least 30% of individuals trained should be women.	**Yes**, although distance learning activities have been put on hold, except for the production of DVDs through a filming programme. Training has been conducted as part of the pilots, through in-country training events, and through overseas study-tours. Specific training events have specifically targeted women.
b. Assess the needs of various stakeholders involved in the implementation of pilot projects and provide necessary support to build capacity for implementing ensuing investment projects.	**Yes**. On-going training has been provided to pilot project stakeholders. Training will be provided on investment implementation modalities at the end of the project.
v. **Component 4: Knowledge products developed and disseminated.** The consulting firm will undertake a variety of activities to develop a body of knowledge on the efficient utilization of biomass for bioenergy and food security and disseminate findings. Linkages with regional centers of excellence will be created to promote knowledge transfer and cooperation between more advanced GMS countries and CLV. Distant learning materials such as self-learning CD or DVD will be developed and disseminated for each target group of stakeholders and distant learning modalities will be implemented to provide mentoring where feasible. Specific activities include but are not limited to:	
a. Develop a common methodology for assessing the supply and prioritizing the use of biomass for energy and food security, building upon the work done by international agencies such as the Global Bioenergy Partnership (GBEP).	To be decided
b. Establish a monitoring and evaluation framework for pilot projects implemented under the TA, including baseline and follow up surveys, including post training evaluation assessment.	**Yes**. M&E system in place for each pilot.
c. Compile research and prepare knowledge products on various topics including life-cycle assessments and least cost options for various biomass technologies, and eco-labeling.	**Yes**. Various KPs produced.
d. Conduct awareness campaigns for pilot activities targeting key stakeholders, including women's groups, service providers, and end users.	**Yes**. Through training events and dissemination of 'bio-briefs'
e. Gather and publish a compendium of good practices on biomass utilization, highlighting elements necessary for effective gender mainstreaming, and publish booklets evaluating	**Yes**. To be produced in 2015. Decision pending as whether to produce as an on-line database of resources.

different models of ICS, biochar kilns, and biodigesters.	
f. Conduct analysis of potential climate change scenarios and their likely impacts on the availability of different types of biomass and assess if development of alternative biomass sources will be required.	To be decided
g. Develop distant learning materials for capacity building and awareness campaign of different targeted stakeholders, including translating materials into local language where appropriate. Engage farmers in training material development for extension, including DVD making by farmers.	**Partially**. Biobriefs and KPs translated and disseminated. DVDs being produced for farmers in the local language.

APPENDIX 3: WORK PLAN (OCTOBER 2014 – JUNE 2015)

	Tasks and Activities	2014/2015																																			
		Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				June			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2		
Output 1: Enhanced regional cooperation in bioenergy development to foster and safeguard food security																																					
1.1 Identify & recommend policy, standards and indicators for bioenergy technologies & climate-friendly agriculture																																					
	i	***Facilitation of national forums on policy and standards for bioenergy technology and climate-friendly agriculture***																																			
		Cambodia																																			
		Preparation of draft organic rice standard (through policy working groups)	Done																																		
		Preparation of draft biodigester standard (through policy working groups)																																			
		Laos																																			
		Preparation of draft organic rice standard (through policy working groups)	Done																																		
		Finalisation of draft organic rice standard (through policy working groups)																																			
		Preparation of draft biofertiliser standard (through policy working groups)																																			
	ii	***Facilitation of regional dialogue on policy and standards for climate-friendly agriculture, bioenergy & food security***																																			
		GMS Forum on Policy, Standards & Indicators for Bioenergy, Food Security & Climate-Friendly Agriculture	Done																																		
		National roadmap elaboration (15th Jan meeting to prepare PPTs for final conference) with regional dialogue																																			
1.2 Establish systems to support eco-product development & cross border trade																																					
		Proposals developed as part of (ii) above (e.g. for certification, inspection, traceability, labelling)																																			
1.3 Inform & enhance biomass, bioenergy & food security policy dialogues relating to standards operationalization & quality control																																					
	i	***Review of international standards and certification systems on bioenergy and climate-friendly agriculture***	Done																																		
	ii	***Review of relevant national laws, regulations, policies and plans***																																			
		Study implementation (take from inception report and updates/extras from NPIs)	Done																																		
		Draft Report	Done																																		
		Review and completion																																			
		Delivery of knowledge product (feeds into gaps for roadmap for 15th Jan meeting)																																			

	Tasks and Activities	2014/2015																													
		Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				June	
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
Output 2: Pilot-Tested Climate Friendly Investments for wider Implementation																															
2.1 Selection of Priority Technologies																															
2.2 Pilot Feasibility studies and due diligence																															
2.3 Pilot implementation and monitoring																															
i	***Definition of terms of reference***	Done																													
ii	***Procure/approve/contract implementation service providers (CQS/SSS)***	Done																													
iv	***Pilot implementation (will include a training element for farmers/communities/gov)***																														
v	***Analysis of Biochar Samples (incl H&S risks from crystalline silica)***																														
vi	***Final Report Review and Consultation***																														
2.4 Regional investment subproject model formulation																															
i	***Stakeholder Meeting to review each subproject***																														
	- lessons learned proposed outputs																														
	- draft DMF																														
	- subproject model specification, implementation arrangements																														
ii	***Regional meeting to share lessons and approaches***																														
iii	***Final preparation of core subprojects for follow-on investment programs***																														
2.5 Development of a social baseline for the proposed investment project																															
i	***Incorporation in Feasibility Terms of Reference***	Done																													
ii	***Social survey completed by FS service providers***	Done																													
iii	***Baseline completed for each pilot project***	Done																													
iv	***Draft SPRSS report for each investment loan (TBD)***																														

	Tasks and Activities	2014/2015
		Oct: 1 2 3 4 | Nov: 1 2 3 4 | Dec: 1 2 3 4 | Jan: 1 2 3 4 | Feb: 1 2 3 4 | Mar: 1 2 3 4 | Apr: 1 2 3 4 | May: 1 2 3 4 | June: 1 2
Output 3: Enhanced Capacity for Efficient Use of Biomass		
3.1 Develop and deliver awareness-raising program		
i	***Develop & deliver awareness-raising material on efficient use of biomass for bioenergy & food security***	
	Collation and consolidation of existing resources	Done
	Finalise list of target agencies and individuals	Done
	Plan awareness-raising program strategy and plan	Done
	Prepare and disseminate bio-briefs/spotlight on….(taken from KPs - see 4.3)	
	Prepare training video plan	Done
	Contract video production companies and link implementation to pilots	
	Collate feedback, evaluation findings and experiences	
	Incorporate lessons learned & key resources into compendium (4.2)	
3.2 Develop and deliver capacity building program		
i	***Training, Workshops and Study Tours***	
	Biochar - IBI Congress, Beijing	Done
	Biochar study tour - Siem Reap	Done
	ICS - GACC Forum, Phnom Penh	Done
	Biochar study tour - PRC (and follow-on events in each country led by study-tour participants)	Done
	BEFS Approach - w. conference 2013, Viet Nam	Done
	Biofertiliser training, Cambodia	Done
	Biochar training and field practise (gender), Cambodia	On-going
	How to enhance biochar through best practise (by S Joseph)	18th-30th
	Training in Vietnam on biofertilisers (by S Joseph)	12th-20th
	Innovative financing mechanisms / Private sector engagement	
	ADB investment project readiness & implementation	
	Incorporate lessons learned & key resources into compendium (Output 4)	
	Other possible trainings, budget permitting, for 2015:	
	Training/Demonstration on Improved Cook Stove Use, Cambodia	To be decided
	Biochar training and field practise (gender), Laos and Vietnam	To be decided
	Training/Demonstration on Improved Cook Stove Use, Laos and Vietnam	To be decided
	AROS/Organic agricultural value chains, Lao PDR	To be decided
	Biogas, bioslurry & CFA (SRI) - Viet Nam	To be decided
	Biomass resource assessment - e.g. through Land Development Dept, Kasetsart Uni, Thailand	To be decided
	Sustainability indicators - w. conference in Luang Prabang	To be decided
ii	***Distance learning for Provincial Officers***	
	Prepare pilot blended DL programme (based on KPs and 3.1 materials)	Done
	Implement blended DL programme	To be decided based on ADB feedback
	Evaluate and provide (project/GMS) certification	
	Package-up and offer to AIT, ADBI…etc. as future hosts	
3.4 Organize annual international conference on household bioenergy and food security		

	Tasks & Activities	2014/2015																													
		Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				June	
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
OUTPUT 4: DEVELOPMENT & DISSEMINATION OF KNOWLEDGE PRODUCTS																															
4.1 Studies and Assessments for Development and Dissemination of Knowledge																															
i	***Agricultural Biomass Resource Assessment in CLV***	Done																													
ii	***Complete a least costs assessment or Net Present Value/Cost-Benefit Analysis of available biomass***	Prep				Field work (15th Nov-)								Report writing																	
iv	***Conduct a lifecycle assessment for alternative biomass resources and technologies (feeds into 4.2 a***	Prep				Field work (15th Nov-)								Report writing																	
4.2 Compile compendium of best practice in efficient utilization of biomass*																															
	Develop a proposed scope and outline of compendium (look at other examples)																														
	Update scope based on comment																														
	Identify international, regional and national best practices (examples) for inclusion																														
	Review examples and select for inclusion write up																														
	Distribute for reviews and include comments																														
	Peer review draft																														
	External peer review																														
	Finalise and distribute																														
4.3 Develop & disseminate knowledge products to support efficient biomass utilization technology *(Knowledge products feed into awareness raising (biobriefs/videos/distance learning))*																															
	Devise knowledge product development and dissemination plan	Done																													
	#1 Climate Change, Food Security & Bioenergy - Greg	Done																													
	#2 Soils and Biomass Amendments - Simon Shackley	Done																													
	#3 Biogas / Bioslurry - Jason Yapp/Thoa	Under review																													
	#4 Biochar (and biofertiliser) - Simon Shackley	Under review																													
	#5 CFA value chains - Lindsay																														
	#6 ICS - Ewan	Update																													
	#7 Certification / standards	Done																													
	#8 • Carbon pathways for different technologies - Sam	Timing to be decided																													
	#9 Innovative Financing Mechanisms for Upscaling - Lindsay																														
	Possible KP or biobrief on biochar standards	To be decided																													

*Possibly to include 'Development of national guidelines on sustainability indicators' to include (i) Review national sustainability requirements for public sector investment (social/economic/environment) (ii) Comparative analysis with GBEP with recommendations/guidelines for strengthening national guidelines (feeds into 2.2 (vi))

	2014/2015																																			
Input Schedule	**Oct**				**Nov**				**Dec**				**Jan**				**Feb**				**Mar**				**Apr**				**May**				**June**	
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**
Nationals																																		
Bounthavy (NPI Laos)																																		
Ratana (NPI Cambodia)																																		
Le Thoa (NPI Vietnam)																																		
Internationals																																		
Lindsay Saunders (Team Leader)																																		
Simon Shackley (Biochar Specialist)			Least Cost & Lifecycle Analysis																Conf															
Greg Munford (Capacity Building Specialist)																			Conf															
Stephen Joseph (Biofertiliser Specialist)	Prep training						Training						***Additional inputs to be decided***																					
	KEY:																																	
	Full-time/Intensive inputs																																	
	Intermittent inputs																																	

APPENDIX 4: PILOT PROJECT IMPLEMENTATION PROGRESS

1. CAMBODIA

1.1 PP#1: Improved Cook Stove Up-scaling (Mekong Think Tank Co. Ltd (MTT))

i) Introduction

The pilot will seek to increase ICS uptake and supply in two districts: S'Ang district in Kandal province and Sandan district in Kompong Thom province. The pilot will support existing ICS stove producers located close to the pilot sites to increase production through the use of a revolving grant. The pilot will work with 4 existing ICS producers to produce the stoves for the pilot project. Stoves to be distributed in each pilot location will be supplied by 2 ICS producers that are located near the pilot places and each will receive a revolving grant to expand their production of up to $5,000 per ICS producer. The grant will be revolved back to the ICS producer association to ensure production capacity is improved and it is available only if stove Quality Control systems of the stove producers association are applied – this would again be an output based payment but advancement is 50% up front and 50% based on increased production level.

The Pilot will also promote ICS use through increased awareness and education through demonstration of new ICS by the local women's union or other women's group. The women's group will form direct agreement with the stove producers and are expected to build demand for ICS and also provide additional competition within the supply chain to ensure lower prices to consumers. The unions will receive a grant to purchase their initial sales stock on which they will also receive commission. The combination of grant and commission will enable subsequent orders and continued activities.

The women saving group or female group of forest community members are both potential partners and will require training and education on ICS – with demonstration. It is proposed that the group receive commission as an output based incentive for each ICS sale amounting 7% – 10 % of retail price – effectively lowering local retail prices and adding competitive forces with existing resellers. To help for their investment, the group will receive advance cash flow of $5,000 per each to order ICS stoves. Through purchase direct of producers the groups will also make their commission on each stove.

Another distribution channel is the existing retailers in each pilot location. They can be found in village market or commune or district downtown. They use their own capital to order stoves and sell them for their income. They will receive benefit from the pilot project on support on the awareness and education in the market place on ICS advantages. The Womens group could choose to work through local retailers.

Two distribution models in each location will be arranged using (i) women's group and (ii) existing retailers. The performance from these two groups will be compared as part of the pilot monitoring.

Outputs will be as follows:

- Output 1: Reliable ICS supply Chain Established – Output Indicators: ICS producer contracts and ICS availability in pilot districts
- Output 2: Increased Uptake of ICS in two districts – Output indicators: Two women's Groups contracted to ICS suppliers, a minimum of 500 ICS stoves purchased in each district with at least 70% of all capacity building and awareness raising participants are female
- Output 3: Pilot Assessment and Reporting - Output Indicator – Monthly reports, Project completion report

ii) Progress

See table below. Further information is available from the monthly pilot progress report and mid-term report. As can be seen MTT have already completed most activities.

Table 9: Cambodia PP#1 Progress

Output/Activity	Completed
Output 1: Reliable ICS supply Chain Established	
1. Identified existing ICS producers nearest to the pilot location	
Activity 1.1: Identify existing ICS producers nearest to the pilot location	Yes, completed in March with 3 ICS producers were selected
Activity 1.2: Select the existing producers for production capacity that meet demand in pilot project	Yes, completed in April with 6 ICS producers
Activity 1.3: Sign LOA for specific location in pilot location	Yes, completed
2: Enhanced quality of ICS with agreed price point	
Activity 2.1: Review the new specification desired by ICS users and provide ICS technical training for ICS enhancement	Yes, completed with GERES in April
Activity 2.2: Review on profitable production and producer price	Yes, completed with GERES and producers together in April
Activity 2.3: Sign LOA and Desired ICS production and revolving fund disbursement (50% by October and 50% by —to be determined)	Yes, completed in September with 6 ICS producers
Output 2: Increased Uptake of ICS	
A: ICS Awareness in the Community	
Activity 2.1 Identify key ICS promoter groups in each pilot location	Yes, completed as 4 targeted communes
Activity 2.2 Design promotion message and materials	Completed in late June
Activity 2.3 Distribute the message and materials	Completed in September
Activity 2.4 Set up demo ICS for different kinds of ICS and different biomass use and conduct ICS user training	Completed in August
B: Reliable distribution channels and outlet of ICS	
Activity 1: Identify existing ICS distributors and retailers in each pilot location and establishing women groups for ICS distribution with incentive policy and cash flow arrangement	Completed in late July
Activity 2: Make agreement on delivery location for price point with ICS distributors;	Completed in late July
Activity 3: Make agreement on retail price with ICS retailers	Completed in late July

A village representative read ICS Poster

Improved Cook Stoves

A participant asking question during ICS training Demo

Group work by women group during ICS training demo at Kraing Yov Commune

ICS Introduction to Women group and Commne Councilors by Kraing Yov Commune Chief

ICS quality briefing to women groups at Prek Koy by MTT Director

MTT Director meeting with ICoProDac Representative at Kampong Chhnang

ICS transportation by bike cart

ICS transportation by truck

1.2 PP#2: Farm Demonstration of Biofertilizers for Upscaling Investment (CelAgrid)

i) Introduction

The pilot seeks to demonstrate the range of products formulated under the pilot: Biochar/bioslurry/other biomass/ and inorganic materials (clays, etc.) - value added product development and testing. The products formulated and produced will be demonstrated in farmer demonstration plots that have agronomic support in their design monitoring and measurement. Further the pilot will work closely with the Department of Agricultural Engineering (DAE) of General Directorate of Agriculture (GDA) of MAFF to introduce, train and monitor the production of biochar using mobile low cost TLUD kilns. The biochar produced will then be mixed with manure or NPK for application to vegetables or rice within the Farm Demo plots.

The outputs will be:

- A detailed design of farm demonstration programs within 1 month of contracting that completes all pilot activities within 10 months and is approved by TA 7833 for Inception milestone.
- Identify farmer groups and communes in Takeo for trialling of 10 pyrolysis drum kilns for biochar production from a range of available agri-residues, with supporting composting infrastructure for the incorporation of bioslurry with 10 farm demo plots established
- Ingredient supply chains confirmed within 10 weeks of contracting with supporting germination tests
- Farm Demonstration plots identified within 12 weeks of contracting
- Farm demonstration plot used for (i) collecting data on the impact of the differing products and existing farm practice (control plots) – including physical input – output levels, financial data for inputs and outputs, gender disaggregated labor inputs, and soil nutrient level changes
- Monitoring and Evaluation systems established and included in the work plan

ii) Progress

See table below. Further information is available from the monthly pilot progress report and mid-term report. As can be seen most activities have been completed or are on-going.

Table 10: Cambodia PP#2 Progress

Activity	Progress

Project development	Done
Staff recruitment and contract	Done
Products development	Done
Preparation of demo inputs	Done
Project staff orientation and training	Done
Selection of demo sites, and initial soil sampling	Done
Farmer groups formation and used TLUD kilns for producing biochar	Done
Conduct training for operation and maintenance of TLUD kilns to farmer group members	Done
Conduct 35 farmer field school trainings	Done
Conduct vegetable demos	Done
Organize 3 Field Days on vegetable demos at the end of the FFS training	Done
Farmer field school training on rice (early monsoon crop) to demonstration farmer and interested farmer.	On-going
Conduct rice demos	Done
Organize at least 2 Field Days on rice at the end of the FFS trainings	To be done
Monitoring demo progress	On-going
Final soil and plant sampling, and sample preparation	On-going
Soil and plant analysis	On-going
Data entry, processing, analysis, and presentation	On-going
Complete 1st draft report	To be done

Farmer Demonstrations on Vegetable Crops

Visit to see vegetable farm demo in Takeo province with Prof. Stephen Joseph

Rice husk kiln has been distributed to a farmer group in Takeo province

A farmer demo in Takeo province

A farmer demo in Takeo province

Farmer Field Day in Takeo province – Certificates awards

Farmer Field Day in Takeo province – awards for the top 3 farmers

Farmer Field Day in Takeo province – A farmer demo – Chinese kale before harvest

Farmer Field Day in Takeo province – A farmer demo – Chinese kale before harvest

Farmers mixing fertilizer in Battambang province

Showing vegetable plant after pulled out in Battambang province

Treatment #1, before harvest time

Treatment #2, before harvest time

Treatment #3, before harvest time

Treatment #4, before harvest time

A farmer demo in Battambang province

Farmer demonstrations on rice crops

General view of rice farmer demonstration

Treatment no. 1

Treatment no. 2

Treatment no. 3

Treatment no. 4 ***Control (based on farmer practice)***

1.3 PP#3: Production and Testing of Biofertilizers (Mekong Carbon Co., Ltd (MECAR))

i) Introduction

The pilot seeks to supply finance as a product development grant to create added value to compost based products through the inclusion of rice husk biochar, manures, bioslurry and possible NPK to reduce environmental pollution and increase the value of compost derived fertilizer products.

The scope of the project is limited to biochar and bioslurry related fertilizer and soil amendment products and their testing in Battambang and Kampong Chhnang provinces. Compost and bio-slurry products will be sourced from COMPED and NBP, respectively, and rice husk char from rice mill stockpiles. The fertilizer products will be demonstrated in vegetable and rice production field trials and will include an agreed set of product formulations based on crop nutrient demands and international experience in biochar, bioslurry and product pelletising.

The outputs will be:

- A detailed design of product formulations and field tests within 1 month of contracting that completes all pilot activities within 10 months.
- Compost supply chains agreed within 6 weeks of contracting
- Establish an agreement for accessing pelleting machine at Green Mountain Ltd formed with NPI (TA7833) within 4 weeks of contracting
- Formulations produced and germination tests completed within 12 weeks of contracting
- Conduct trial production runs for pelletized and non-pelletized products and evaluate product quality – adjust formulation as required to meet nutrient targets
- Establish, manage and monitor a Product Field Trial site (using 4 replicates of 4 or more treatments in a block design) identified within 12 weeks of contracting
- Monitoring and Evaluation systems established and included in the work plan

ii) Progress

See table below. Further information is available from the monthly pilot progress report or mid-term report. As can be seen most activities are completed or on-going.

Table 11: Cambodia PP#3 Progress

Activity	Progress
Project development	Done
Submit Draft work plan	Done
Approved work plan	Done
Products development - Associate with MGM for biofertilizer production - Associate with COMPED for biofertilizer production	Done
Preparation of trial inputs	Done
Selection of trial sites, and initial soil sampling	Done
Conduct vegetable trials	Done
Conduct rice trials	Done
Monitoring trial progress	On-going
Conduct field monitoring	On-going
Submit draft mid-term report	Done
Approved Mid-Term report	Done
Final soil and plant sampling, and sample preparation	On-going

Soil and plant analysis	On-going
Data entry, processing, analysis, and presentation	On-going
Overall management and coordination	On-going
Complete 1st draft report	To be done
Submit draft final report	To be done
Comments on draft report	To be done
Submit final report	To be done

Drying to keeping moisture down 20% or less

Packing in bags for keeping the pellet dry

Field plot layout for vegetable

Vegetable trial at CARDI-V site (45 days after sowing)

There are many missing plants in T0

Vegetable trial at BB-V2 site

Rice field plot layout

Rice trial at CARDI-R site

Rice trial at BB-R2 site, 30 days after transplanting (Battambang)

Kampong Chhnang site KC-R1: 15 days after transplanting

2. VIETNAM

2.1 PP#1: Improved Cook Stove Use (EPRO)

i) Introduction

The pilot seeks to test a business model for increasing the use of ICS in two districts through supporting marketing and promotion of selected stoves and by developing a local sales network using existing farmer and women's unions as commissioned sales agents effectively extending the ICS supply chain into two districts. For the business model to replicate an upscaling program the pilot would be managed and implemented through a single service provider that is to be contracted by TA7833.

The pilot investment will achieve the following outcome: A business model tested for future upscaling of ICS using market based incentives. The outcome will be supported by the following pilot outputs:

- Output 1: Market based stove supply chain from producers to consumers established using local farmer and women unions

- Output 2: Stove producers operating a sustainable business
- Output 3: Number of households using ICS increased by 15% per commune by Pilot completion

ii) Progress

A summary of progress, as outlined in the pilot mid-term report, is as follows. As can be seen most activities are completed or on-going.

Table 12: Overview of Vietnam PP#1 progress

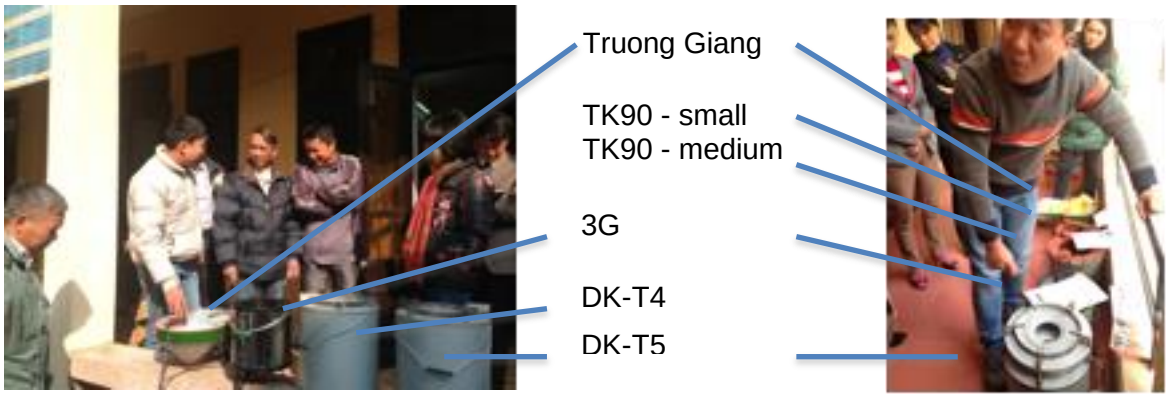
	No	ACTIVITIES	Status by 30 June 2014
1	ESTABLISHMENT OF STOVE SUPPLY CHAIN FRAMEWORK		
	1	Kick-off introductory meetings in Ung Hoa, Hanoi	Completed
	2	Kick-of Introductory meetings in Ha Hoa, Phu Tho	Completed
	3	Development of three party commercial contracts between producers, union and TA 8377	Completed
2	STOVE PRODUCER SUPPORTS		
	1	Laboratory test	Completed
	2	Show-room set up in Ung Hoa	Completed
	3	Show-room set up in Ha Hoa	Completed
	4	Development of simple ICS user manual	Completed
	5	Peer-to-peer support in business and marketing plan	Completed
	6	Per-to-peer support in quality control	Completed
3	COMMUNICATION AWARENESS & DEMAND AGREGATION		
	1	Monthly awareness/demonstration event	Completed
	2	Training in marketing, communication skills and efficient biomass use	Completed
	3	Developing communication strategy for 10 communes	Completed
	4	Follow-up with implementation of marketing and awareness strategy	Completed
	5	Development of voucher and warrantee scheme for unions	Completed
	6	Providing support in voucher and warrantee scheme of unions	Completed
4	PILOT MANAGEMENT		
	1	Quarterly monitoring and reporting	Completed
	2	Efficiency comparison between traditional and ICS	On-going
	3	Logistic (administrative support, translation)	On-going

Table 13: Vietnam PP#1 Achievements vs. performance indicator

	Indicator	Performance to date	%	Note
1	The stove supply chain from producers to unions is set up and tested on market based mechanism			
1.1	6 commercial contracts for pilot period are signed between producers, district unions and TA7833 within first quarter of pilot	5/6 contracts signed	100%	• Ung Hoa: 2 (Truong Giang, DK-T5) • Ha Hoa: 3 (Truong Giang, TK90, DK-T5) • Contracts for TK90 small and medium are merged in one contract (same producer) • One model was not selected after seeing at kick-off meeting (the FS selected 3 models of DK-T5, TK-90 and Truong Giang to be implemented at 2 pilots. During kick-off meeting and seeing the

	Indicator	Performance to date	%	Note
				stoves, the farmer union did not want to sell TK-90 due to “simple design” and left 5 of 6 contracts signed).
1.2	There is continuation of at least one commercial contract between producer and union at the end of pilot phase	2	200%	• Ha Hoa woman union continues business with TK-90 and Truogn Giang • Ung Hoa farmer union expressed no interest in further business at district level (two commune’s unions want to continue)
2	The stove producers are supported in sustainable business			
2.1	All stove producers are able to identify and provide warrantee scheme to users within first quarter of pilot	3/3	100%	• All 3 producers provided warrantee scheme in 3 party contracts • All 3 producers approved warrantee schemes in user manual, which are distributed by unions and as a part of warrantee system • Late completion of warrantee system (May 2014 instead of March as expected)
2.2.	All stove producers have developed ICS user manual within first quarter of pilot	3/3	67%	• Simple user manuals are finalized in ready-to-print form
2.3.	At least one producer is successful with marketing and business plan	1	100%	• Targets and actions for producers of Truong Giang and TK-90 are identified in business and marketing plan • Targets of Truong Giang may be too ambitious, but as the wish of producer • TK-90 producer entered market in Phu Tho through woman union successfully. Truong Giang re-structured business in July-August and did not maintain the market as business plan
3	Increasing demand on efficient biomass use			
3.1	Number of approved ICS in pilot districts increased by 15%, ie. 300 approved ICS in pilot district	1054	351%	• Positive sales every month in both pilot district • No more sales of DK-T5 • Sales of Truong Giang in Ha Hoa is reducing, in which no sales in June was observed. TK-90 was more preferred due to wood savings advantages after using for a while • Less demand or low sales in July-August due to hot weather. Best months with sale volumes were around lunar new year in combination with promotion campaigns
3.2	Number of households with traditional cook stoves reduced by the end of pilot	Reduced in both pilot provinces	N/A	End-of-pilot evaluation was conducted with the same households, who participated in FS: • Ung Hoa: Among 79 HHs under FS study, there were 69 HHs with traditional cook stoves before pilot and this number of HHs is 69 after pilot, ie. Reduction from 87% to 75% HHs with traditional cook stoves. ICSs are in used instead of traditional cook stoves • Ha Hoa: Among 77 HHs under FS study,

	Indicator	Performance to date	%	Note
				there were 72 HHs with traditional cook-stoves before pilot and this number of HHs now is 17, i.e. reduction from 94% to 22% HHs with traditional cook stoves. ICSs are in used instead of traditional cookstoves. • Thanh Oai (controlled district of Ung Hoa): number of HHs with traditional cookstoves reduced from 48% to 46% • Tan Son (controlled district of Ha Hoa): number of HHs with traditional cookstoves reduced from 100% to 96%)



ICS introduction to Ung Hoa Farmer Union

ICS introduction to Ha Hoa Woman Union

Showrooms in Ha Hoa

Showrooms in Ung Hoa

Practice by participant in Ung Hoa at demonstration event

Discussion on ICSs and sufficient biomass use in Ha Hoa

ICS selling campaign

2.2 PP#2: Bioslurry Management (CARES)

i) Introduction

The pilot will demonstrate means of using bioslurry that are environmentally sound. The bio-slurry, when treated as an additional nutrient input to compost and properly managed, can be transformed into a valuable fertilizer – either liquid or solid - instead of a potentially hazardous pollutant. The large volume of liquid bioslurry and solid bioslurry (scum) that is currently discharged to the environment will be the feedstock of the Pilot. This practice not only saves organic resources but

contributes to the environmental improvement through the improvement of soil, ground water and air.

The expense of the household for inorganic fertilizer and organic compost accounts for 60 percent of investment for crop establishment. The pilot aims to reduce this expense to 40 percent by replacing inorganic fertilizer with bioslurry integrated with composted biomass.

For the pilot it is expected that awareness improvement for environment, community is strengthened. Through capacity building and training stakeholders will be provided information and knowledge on biogas technology, its benefits and impacts as well as knowledge on composting and properly fertilizer utilization.

The implementation of pilot fits the current Vietnamese Good Agricultural Practices (VietGAP) program. According to VietGAP, soil should be managed, e.g. soil is analyzed to control and evaluate the quality and potential risks. Fertilizers and organic fertilizers that are used for crops should be documented in order to avoid contamination on agricultural products. Organic fertilizer has to be treated and managed to ensure the quality of the fertilizer.

The pilot impact will be reduced agricultural pollution and investment while increased revenue of households, knowledge on cultivation, biogas technology and composting process; improved the community relation; be a good example for duplication.

The outcome of the pilot will be an assessment of the model for the use of bioslurry for up-scaling.

The outputs will be:

- Knowledge products on biogas technology, bioslurry and composting bioslurry fertilizer
- Production and use of bioslurry-enhanced compost;
- Demonstration of compost-bioslurry on vegetable crops;
- Capacity building and training for enhanced knowledge and technology development and transfer systems

ii) Progress

See table below. Further information is available from the monthly pilot progress report or mid-term report. As can be seen most activities are completed or on-going.

Table 14: Vietnam PP#2 Progress

Activity	Progress
Kick off activities	
Kick off introductory with Tam Xa commune	Done
Set up questionnaire to collect information from biogas households	Done
Development working method with commune	Done
Select 25 biogas households	Done
Organize meeting with selected households and representative of Tam Xa commune	Done
Development contract with selected households and union	Done
Component 1: knowledge products on biogas technology, bioslurry and composting bioslurry fertilizer	
Collect relevant documents	Done
Overview relevant documents	Done
Prepare summary report	Done
Component 2: Support for a compost/bioslurry production enterprise	
Construction 25 bioslurry pits	Done
Construction 80m3 for storing bioslurry at field	Done

Construction of a 10 m2 of house for composting	Done
Monitoring during construction bioslurry pits and composting house	Done
Support farmer set up business plan	On-going
Take bioslurry sample (before and after correctly operation)	On-going
Support farmer union doing composting	Done
Promote composting organic fertilizer in public media	On-going
Component 3: Demonstrate the use of bioslurry compost for crops	
Develop guideline for using bioslurry for crops	Done
Sep up plot trial's design for vegetable and maize	On-going
Monitoring selected household using bioslurry	On-going
Component 4: Capacity building and training for enhanced knowledge and technology development and transfer systems	
Develop training documents	Done
Organization training courses on biogas technology and its benefit	Done
Organization training courses on O&M biogas plants	Done
Organization training courses on bioslurry utilization	Done
Organization training courses on marketing and sale for farmer union	On-going
Project management	
Prepare work plan	Done
Monthly monitoring	On-going
Prepare mid-term report	Done
Prepare final report	On-going

Producing composting from bioslurry

2.3 PP#3: Demonstration of Biofertiliser and Biochar Soil Amendments (COTDEP)

i) Introduction

The pilot seeks to test if biochar biofertilizer product development is able to create viable fertilizer products to substitute (in full or at least in part) for inorganic fertilizer and to support a future supply chain that is able to reduce environmental pollution and increase the value of biofertilizer products, including NPK – biochar fertilizer pellets where c. 25% of the NPK is replaced, with the aim of yields remaining the same and even increasing.

The scope of the project is limited to Hanoi and An Giang Provinces.

The pilot will:

- Implement at 2 communes, one in each province – a static biochar production kiln from rice straw to assess viability
- In Hanoi implement a biochar, biofertiliser and pelleting demonstration program
- In each Province implement a farmer group TLUD biochar production capability

Outputs include:

- A final work plan agreed within 1 month of contracting that completes all pilot activities within 10 months.
- Modify existing TLUD kilns
- Fabricate a replicate rice straw kiln
- Produce sufficient biochar to demonstrate production technology and to produce sufficient biochar for the demonstrations and trial areas plus for training and capacity building purposes
- Incorporate biochar filters into 10 biogas plants in Dong An District Hanoi and conduct NPK testing to ascertain the effectiveness of the filters to extract NPK from bioslurry
- Provide agronomic input to defining biochar related products for inclusion in the demonstrations
- Ingredient supply chains confirmed within 10 weeks of contracting
- Formulations defined, produced and tested within 12 weeks of contracting
- Establish, manage and monitor a Product Field Trial site (using 2 replicates of selected treatments in a block design) identified within 10 weeks of contracting
- Farm Demonstration plots identified within 12 weeks of contracting
- Monitoring and Evaluation systems established and included in the work plan

ii) Progress

See table below. Further information is available from the monthly pilot progress report. As can be seen most activities are completed or on-going.

Table 15: Vietnam PP#3 Progress

Activity	Progress
Kick off introductory meetings in Hanoi and An Giang	Done
Conduct survey and select site in Hanoi and An Giang	Done
Activity 1: Modify TLUD and brick kilns to product biochar	
Design and TLUD drums in Hanoi	Done
Testing the TLUD and modify	Done
Design and construct fixed biochar kiln in An Giang	Done
Testing fixed biochar kiln in An Giang	Done
Activity 2: Pilot production of fertilized, non - fertilized product, biochar and compost	
Purchase pellet machine	Done
Prepare material for product biochar, compost	Done
Product biochar for pellet	Done
Prepare material for product NPK- biochar pelleted fertilizer	Done
Analyzing biochar samples	Done
Product NPK-biochar pelleted fertilizer	Done
Activity 3: Pilot production of biogas filter and quality monitoring	
Selected households	Done
Design filter systems to treat the waste water of biogas in the laboratory	Done
Design 2-3 filter systems to treat the waste water from biogas on the field	Done
Setting up, operating and monitoring the filters	On-going

Sampling and analyzing waste water before and after filteration	On-going
Activity 4: Field experiments for evaluation of biochar and formulated fertilizers	
Design experiment on rice and vegetable	On-going
Analyzing rice and vegetable sample after experiment	On-going
Setting up the field trail, crop management and observation in the field on rice and vegetable	On-going
Activity 5: Farm demonstration	
Design experiment on rice and vegetable	On-going
Analyzing rice and vegetable sample after experiment	On-going
Setting up the field trail, crop management and observation in the field on rice and vegetable	On-going
Activity 6: Training, workshop and public awareness	
Training on biochar production and kilns use	Done
Workshop on biochar application on rice and vegetable	Done
Workshop on application of biochar as water filter for biogas digester	On-going
Exhibition for biochar and safe vegetable	On-going
Video clip for local television broadcasting	On-going
Subsidiary for Television broadcasting	On-going
Preparing report	
Mid-term report	On-going
Final report	

Testing TLUD stoves


Rice and vegetable experiment and demonstration

3. LAOS PDR

3.1 PP#1: Cluster Biomass Technology and Biofertilisers (NCG)

i) Introduction

The pilot will support 2 outputs including: (i) to increase the number of households using ICS stoves within the two clusters of 6 villages by offering an output based incentive to the Lao Women's Union, and (ii) the production of enhanced soil fertilizers and soil amendments from rice husk, bioslurry and compost formulations and their demonstration through farm demonstrations in two development clusters. The location of the villages and clusters are as follows: Nalao – Lak 52 Clusters: Ban Nalao, Ban PhonNgarm Tai and Ban Lak 52, and Saka – Napho Clusters: Ban Saka Tai, Ban Noi and Ban Nabone, Phone Hong District, Vientiane Province.

The ICS program will be offered in both clusters within the 3 villages within each cluster and within the cluster development centers. The purpose of the pilot is to test the use of a supply chain output based incentive program to stimulate the adoption of improved ICS. In doing so, the pilot does not seek to create technology; it seeks to increase the use of best available technologies currently available.

The pilot will conduct testing of selected ICS stoves, train and resource village women's unions to conduct awareness, demonstration and education programs that lead to sale of approved ICS products, and oversee feedback and evaluation by the user. The village level Women's Unions will be linked to stove producers who will be eligible for a production support grant.

Outputs will include:

- 4 ICS stoves tested within 6 weeks of contracting
- Women union engagement confirmed within 5 weeks of contracting
- Output incentive payment agreed with each women's union within 5 weeks of contracting
- Awareness and Education Program developed within 8 weeks of contracting
- Undertake Women's Union training and evaluate effectiveness within 10 weeks of contracting
- Complete a stove producer business planning program for the producers with supply agreements to the Women's Unions within 12 weeks
- Define the Inventory stocking requirements for each Union
- Village demonstration programs starting from week 12 after contracting
- Monitoring and reporting confirming that 40% of households have adopted ICS within 10 months.
- A final work plan agreed within 1 month of contracting

- Enterprise participation agreement completed within 6 weeks of contracting:
- Biochar kilns procured within 5 weeks of contracting and rice husk produced within 8 weeks of contracting
- Compost and dung supply chains formed within 6 weeks of contracting
- New composite digester procured, installed and user training, slurry tested for nutrient content within 8 week of contracting
- Pelletisers procured and training provided within 10 weeks of contracting
- Formulations defined, produced and tested within 12 weeks of contracting
- Demonstration sites identified within 10 weeks of contracting
- Farm Demonstration plots identified within 12 weeks of contracting
- Monitoring and Evaluation systems established and included in the work plan

ii) Progress

See table below. We are awaiting a formal progress report from the service provider so that this table can be updated.

Table 16: Laos PP#1 Progress

Activity	Progress
ICS Program	
1 ICS awareness program	Done, on-going
1.1 Prepare promotion material (leaflets, label, plate for ICS shop, Video making)	Done, on-going
1.2 Meet with LWU in cluster brain storming on promotion materials	Done
1.3 Submit draft materials to NPI for review	Done
1.4 Produce materials for each LWU	Done
2 Training of LWU business planning	Done
2.1 ICS awareness and use training	Done, on-going refresh
2.2 ICS product promotion training	Done, OJT
2.3 Agreement of ICS supply agreement	Done (MOU)
3 Complete a stove producer business planning program for the producers with supply agreement to LWUs	Done (MOU)
3.1 Conduct a business planning	Done
3.2 Identify existing production capacity and sales and marketing strategies	Done, on-going promotion campaign
3.3 Identify the need for stove producer capacity development and prepare a proposed plan for this strengthening	Done
3.4 Submit to TA7833 for review and comment	Done
3.5 stove producer agreement between the service provider, TA7833 and the stove producer	Done (MOU)
4 Define the Inventory stocking requirements for each Union	Done in collaboration with SNV/ARMI
Develop a work plan with each union	Done
Define inventory stocking needs	Done
women union – producer agreement	Done (MOU)
Stove purchase for LWU	Done in collaboration with ARMI/SNV
5 Village demonstration programs	Done
Thermometer purchase	Being done

Village meeting with the use and alternative stove test to demonstrate to audience	Done, on-going scaling up
6 Monitoring and reporting	On regular basis
Monthly group discussion	On-going
Monthly report	On-going
Conduct a quarterly check ICS use	Done
Quarterly evaluation report	On-going
Bio-fertilizer Program	
1 Agreement with enterprises including their roles and responsibility	Done (MOU)
1.1 Prepare enterprise roles and responsibility	Done
1.2 Meet with enterprises and agreement sign off	Done (MOU)
2 Bio char kiln procurement	(two kilns from DAE CAM)
2.1 Identify bio char kiln owners and agreement	Done (MOU)
2.2 Biochar distribution	Done
2.3 Biochar use training	Done
2.4 Biochar production	Done
2.5 biochar transportation	Done, IN SITU
3 Identify compost suppliers and agreement	Done
3.1 Meet with Participants and interested persons in 6 villages	Done
3.2 Materials purchase for compost production	Done
3.3 Hut for compost production	Done
3.4 Construct compost lots	Done
3.5 Training of compost making	Done (6 families applied at farms)
3.6 Raw materials lab test for COF	Done, 14 items
3.7 Different formula Compost production	Done, 4 formulas designed
3.8 Compost quality lab test	Done, 4 BOF formulas
4 Biomass digester(BD) procurement	Done (12 units from Vietnam)
4.1 Identify Bio slurry suppliers	Done
4.2 BD distribution and installation	Done
4.3 Training of BD use and maintenance	Done
4.4 Bio slurry production	On-going
4.5 Bio slurry quality lab test	Done (pig and cattle)
5 Materials and equipment procurement for Bio fertilizer	Done
6 Pellet machine procurement	Done (two units from Vietnam)
6.1 Pellet machine installation	Done
6.2 Training of Pelletizer use and maintenance	Done, on-going
6.3 Pellet bio fertilizer production	On-going
6.4 Pellet bio fertilizer lab test	On-going
6.5 Adjust the production components to standard quality	On-going modification

6.6 Prepare operation guideline	Done, on-going
6.7 Production protocol	Done (MOU – 3 formulas tested)
7 Conduct to product Demonstration plot (Organic Vegetables)	Done, now second veg. cycle on-going with new 5 veg. varieties
7.1 Soil lab test (Ref. Monthly Report of Sept. 2014)	Done (from 30 sites prior to implementation) and (135 plots for PH, and 20 plots for NPK soil particles lab. Tests are on-going after first production cycle)
7.2 Participants Identification	Done
7.3 Procurement materials for demo plot (demo plot hut, water system, sign plates.)	Done
7.4 Provide Materials	Done
7.5 Water system and Hut installation	Done
7.6 Technical training for staff and farmers	Done, different topics
7.7 Land preparation	Done
7.8 Chinese cabbage germination	Done
7.9 Chinese cabbage transplantation (Ref. Monthly Report of Sept. production cost vs sale price at market place and high market demand)	Done, good growing, produce sold out at good price
7.10 Following up with recording data	Done, regular follow up
7.11 harvest and evaluate	On-going
8 Conduct to farm Demonstration plot (Organic Rice Production)	Done
8.1 Soil lab test	Done (with Pos. 7.1 above)
8.2 Farmer technical training	Done
8.3 Agreement with farmers including their roles and responsibility	Done (MOU)
8.4 Material provision (plastic sheet, seeds, bio-fertilizer, botanic pesticide)	Done
8.5 Demo plot hut installation	Done
8.6 Land preparation	Done
8.7 Seeds germination	Done
8.8 Sampling transplantation	Done
8.9 Following up and on job training	Done, on regular manner
9 Monitoring and Evaluation	On-going
9.1 Monthly report	On-going, on regular manner
Key Report Deliverables	
Inception report	Done
Interim Report	Done

Draft final report	
Final Report	

Photos of ICS Activities in the Laos Pilot Project