Appendix 1. List of TCA Questions

Appendix 1. Potential and Proposed Materials of Terrestrial Carbon Accounting (TCA) Course

No.	Materials	Scope
1	Climate Change Policies	a. UNFCCC (Nationally Determined Contribution, National GHG Inventory, FREL REDD+, MRV under the Paris Agreement) b. Other guidance (World Bank's carbon scheme standard, voluntary carbon markets, local carbon markets, and other standards, including for verifiers) c. National or provincial forestry policies, and National Greenhouse Gas reporting or policy.
2	GIS/Remote Sensing	a. GIS Software b. GPS use c. Remote sensing and generating activity data d. Software tools (e.g. ERDAS Imagine, ENVI, Google Earth Engine, CLASLite, IMGTools) e. Supervised and unsupervised classifications f. Object Oriented Classification
3	Land classification and IPCC Guidance and Guidelines	a. Applying the 2006 IPCC Guidelines for GHG Inventory b. National forest classification maps, forest types and classes c. National forest inventories d. Time series maps with land classifications e. Data quality and control (QA/QC), and arching of data
4	Data collection, fields methods, and evaluation, generation of emissions factors	a. Forest carbon measurements (determining permanent sample plots, sampling techniques) b. Allometric equations for forest carbon estimation c. Generating emission factors d. Evaluating data quality and methodological appropriateness
5	TCA Statistics	a. Training on basic math and statistics b. Error propagation and uncertainty analysis (bootstrap, Monte Carlo methods), regression c. Use of software (including R code package) d. Statistics/technics applied to forests/forest carbon
6	Communication system of TCA	a. UNFCCC reporting (e.g., NDC, National Communication, Biennial Update Report) b. Registration system and national mitigation actions reporting (PEP-MER, PPV-MRV, SRN) c. REDD+ reporting (e.g. FCPF, FIP, etc.) d. Preparing the data related the implementation of mitigation actions and reporting the progress of emission reductions in accordance with the format specified e. Communication techniques (presentation and writing)

Appendix 2. Questionnaire

Respondent's Identity

Name   : _____

Age   : _____

Organization   : _____

Position   : _____

Tasks related to CC   : GHG Inventory (or others, please specify: _____

                                       _____

A. Scope/Materials of the Course

1. What kind of topics that are important to you? (Please put a "X" in the column based on the rank of priority)

No	Materials	Score*				
		1	2	3	4	5
1	Climate change policies					
2	GIS/Remote Sensing					
3	Forest/land classification and IPCC guidelines					
4	Data collections, field guide, evaluation and FE					
5	TCA statistics					
6	Communication systems of TCA at the national level					

- Number 1 … 5 indicate the rank of priority. Number 1 is the lowest priority and 5 is the highest priority.

2. Which sub-topics do you think most important to be included in the material 1: Climate change policies? (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics of Material 1: Climate Change Policies	Score*				
		1	2	3	4	5
a	UNFCCC (*National Determined Contribution*/NDC, National GHG Inventory, FREL REDD+, MRV under the Paris Agreement)					
b	Other guidance (World Bank's carbon scheme standard, voluntary carbon markets, local carbon markets, and other standards, including for verifiers)					
c	National or provincial forestry policies, and National Greenhouse Gas reporting or policy.					

3. Which sub-topics do you think most important to be included in the material 2: GIS/ Remote Sensing? (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics of Material 2: GIS/Remote Sensing	Score*				
		1	2	3	4	5
a	GIS Software					
b	GPS use					
c	Remote sensing and generating activity data					
d	Software tools (e.g. ERDAS Imagine, ENVI, Google Earth Engine, CLASLite, IMGTools)					
e	Supervised and unsupervised classifications					
f	Object Oriented Classification					
g	Visual interpretation					

4. Which sub-topics do you think most important to be included in the material 3: Land classification and IPCC Guidance and Guidelines (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics Materi 3: Land/Forest classification and IPCC Guidance and Guidelines	Score*				
		1	2	3	4	5
a	Applying the 2006 IPCC Guidelines for GHG Inventory					
b	National forest classification maps, forest types and classes					
c	National forest inventories					
d	Time series maps with land classifications					
e	Data quality and control (QA/QC), and arching of data					

5. Which sub-topics do you think most important to be included in the material 4: Data collection, fields methods, and evaluation, generation of emissions factors? (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics of Material 4: Data collection, fields methods, and evaluation, generation of emissions factors	Score*				
		1	2	3	4	5
a	Forest carbon measurements (determining permanent sample plots, sampling techniques)					
b	Allometric equations for forest carbon estimation					
c	National forest inventory					
d	Generating emission factors					
e	Evaluating data quality and methodological appropriateness					

6. Which sub-topics do you think most important to be included in the material 5: TCA Statistics (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics of Material 5: TCA Statistics	Score*				
		1	2	3	4	5
a	Training on basic math and statistics					
b	Error propagation and uncertainty analysis (bootstrap, Monte Carlo methods), regression					
c	Use of software (including R code package)					
d	Statistics/technics applied to forests/forest carbon					

7. Which sub-topics do you think most important to be included in the material 6: Communication system of TCA (Please put a "X" in the column based on the rank of priority)

No	Sub-Topics of Material 6: Communication system of TCA	Score*				
		1	2	3	4	5
a	UNFCCC reporting (e.g., NDC, National Communication, Biennial Update Report)					
b	Registration system and national mitigation actions reporting (PEP-MER, PPV-MRV, SRN)					
c	REDD+ reporting (e.g. FCPF, FIP, etc.)					
d	Preparing the data related the implementation of mitigation actions and reporting the progress of emission reductions in accordance with the format specified in point b above					
e	Communication techniques (presentation and writing)					

8. Please give your reason for choosing those priorities as above?……………………………………………….

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9. Related to question number 1, who is best suited to become trainer or resource to provide the materials?

No	Trainers or Resources	Material*					
		1	2	3	4	5	6
1	Resources from national government (please write down the organization or the name of the person if available) ………………………………………………………………						
2	Resources from local government (please write down the organization or the name of the person if available) ………………………………………………………………						
3	Research institution (please write down the organization or the name of the person if available) ………………………………………………………………						
4	University (please write down the organization or the name of the person if available) ………………………………………………………………						

* Materials 1, …, 6 refer to the materials in the question number 1 to 6.

10. What is the role of government to support the implementation of this training? (Please cross the letter before the answer that you choose, and you may choose more than one answer)
   a. Provide funding to attend training activities
   b. Provide recommendation
   c. Provide materials related to the policies (materials 1 and 6)
   d. Others (others, please specify : ………………………………………………………………………………………..)

11. Of the six course materials, give your view about your level of expertise and depth of knowledge on every aspect of the materials?

No	Aspect	Score*				
		1	2	3	4	5
1	Climate change policies					
2	GIS/Remote Sensing					
3	Land classification and IPCC Guidance and Guidelines					
4	Data collection, fields methods, and evaluation, generation of emissions factors					
5	TCA Statistics					
6	Communication system of TCA					

• Number 1 … 5 indicate the level of your expertise and knowledge. Number 1 shows the weakest and 5 is strongest/deepest.

12. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 1: Climate change policies:
   a. A good understanding of international issues on the problem of global warming and climate change, especially on the Paris Agreement and its relation to national and regional development policies
   b. Understand the link between the development of land-based sector with the national climate change mitigation policies
   c. Understanding various international mechanisms to support the implementation of climate change mitigation actions (voluntary carbon markets, local carbon markets, and other carbon market scheme)
   d. Able to explain the things that need to be prepared by sectors and regions in order to implement climate change mitigation activities that can be measured, reported and verified, and its relationship with national systems that have been developed (such as SRN, PEP dll)

    e.   Other, if available ....……………………………………………………………………

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13. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 2: GIS and Remote Sensing:

    a.   Able to operate SIG and to utilize remote sensing data to create a map of land use changes or develop the land use classification and forest cover in accordance with the classification established by the IPCC

    b.   Able to use GPS to determine the position of a site

    c.   Able to use Google Earth and other applications to verify and improve the accuracy of the forest and land classification data

    d.   Other, if available ....……………………………………………………………………

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14. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 3: Land classification and IPCC Guidance and Guidelines:

    a.   Able to classify the spatial data series of land cover / forest change according to IPCC category

    b.   Able to integrate spatial-based data with statistical observational data to obtain annual series activity data of land cover change with a more detailed categorization

    c.   Able to use IPCC method in analyzing the key categories (main sources of emission)

    d.   Able to use several methods of data quality checking and to perform quality assurance of the key categories data (QA/QC)

    e.   Able to use IPCC 2006 guidelines to develop GHG inventory in land-based sectors

    f.   Other, if available ....……………………………………………………………………

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15. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 4: Data collection, fields methods, and evaluation, generation of emissions factors:

    a.   Able to implement the standard method in determining the location and in sampling forest inventory data, which are required for the calculation of the emission and absorption from terrestrial ecosystems

    b.   Able to use the observational data from national forest inventory and other sources to estimate local emission factor

    c.   Able to develop an appropriate allometric equation according to forest types and utilize it to estimate the amount of carbon stocks in various land cover types

    d.   Other, if available ....……………………………………………………………………

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16. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 5: TCA Statistics:

    a.   Able to use some statistical or mathematical techniques to fill in missing data (interpolation technique and data extrapolation)

    b.   Able to use some statistical or mathematical techniques to determine the data outliers

c. Able to perform uncertainty analysis of emission and absorption by using parametric statistical technique (Monte Carlo) and non-parametric technique (bootstrapping)

d. Able to use R programming language to perform spatial uncertainty analysis

e. Other, if available ....……………………………………………………………
………..………
………..………
………..………

17. In your opinion, what knowledge and skills that should be possessed by trainees after attending the course on material 6: Communication of TCA at the national level:

a. Able to use the national guidelines in reporting the results of the GHG emission and absorption calculation (e.g. SIGN) and the achievement of emission reduction (e.g., PEP and SRN)

b. Able to report the results of the emission reduction from other mitigation activity schemes based on carbon market and not 'double counting' with domestic initiatives

c. Able to separate land-based mitigation activities with the REDD+ activities

d. Other, if available ....……………………………………………………………
………..………
………..………
………..………

18. Your expectation after attending the training, the participants will have the following skills and abilities (indicate your answer by crossing the letter):

a. Able to communicate well the development policy of the land sector and forestry and its relation to national and regional mitigation policies (emission reduction) to meet the national commitment to the framework of the United Nations Convention on Climate Change (UNFCCC) and as a form of readiness required and an opportunity to support the implementation of mitigation policies

b. Able to use GIS and remote sensing techniques to obtain activity data related to land use according to the standard classification and able to access and use global, national and local data that is required to estimate the emission and absorption of GHG from terrestrial ecosystems (land and forestry)

c. Able to use IPCC 2006 guidelines to estimate and calculate GHG emission and absorption from land-based activity at some level of accuracy (Tier)

d. Able to develop and use methods to generate emission factors from the observational data and other secondary data (data proxy)

e. Able to conduct measurements of forest carbon stocks in accordance with the standard method

f. Able to use statistical/mathematical techniques for error propagation, assessment of the level of uncertainty of the GHG emission or absorption from terrestrial ecosystems such as bootstrap technique, and Monte Carlo technique

g. Able to prepare reports on the implementation of low carbon development activities, especially from land-based mitigation activities in accordance with a system that has been developed by the national institution

h. Other, if available ....……………………………………………………………
………..………
………..………
………..………

19. Is it possible for participants to carry data that can be used during the training? YES/NO

20. If it is YES, what data that usually the available at the regional level (Circle the letter that corresponds to your opinion):

a. Statistical data series of land use according to administrative region (sub-district level data)

b. Spatial data series of land use and land cover

c. Carbon stock data according to various type of land cover

d. Other, if available ....…….……………………………………………………………

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21. Related to question no. 20, what is the requirement to obtain/carry the data?
    a. With superior permission
    b. How long does it take to obtain such data?
       Is there another way that the data can be obtained more quickly (explain) …….…………

       …….………

       …….………

22. Do you know or understand about the requirements demanded by national governments related to MRV? Yes / No, and if yes please explain what reference do you use?

MRV Aspect	Yes/No	References you use (guidelines, guidance, online-based form, etc.)
Measurement and monitoring		
Reporting format		
Verification needs		

23. Related to MRV:
    a. Has your SKPD/institution done an MRV? Yes/No
    b. What kind of MRV that has been done and who/which part of your organization that has done it?
       …….……
    c. Is there an MRV institution in your region? Yes/No, if yes, which organization/SKPD that is responsible?
       ……………………………………………………………………………………………
    d. How long did it take to form an MRV institution in your organization/SKPD?
       …….………
    e. If there has been no MRV institution, please provide your reason?
       ………………………………………………………….……
    f. In regard to climate change MRV, which part of your SKPD do you think best to perform it?
       …………………………………………………………………………………………….…

B. Logistic Information
1. In your opinion, how many staff the ministry or local government (where you work) that need TCA training annually? (please indicate your answer by circling the letter)
    a. None
    b. 1-2 persons per year
    c. 3-5 persons per year
    d. more than 5 persons per year

2. In your opinion, in order to achieve the objectives of the training activities as you answered in the questions no. 12-17 in Part A above, will it require a long time? Yes/No

3. If yes, how long do you think TCA training will take place ideally?
    a. 1 weeks
    b. 2 weeks
    c. 3 weeks
    d. 4 weeks

e.   Other, please specify: ....

4.   In your opinion, how long it takes to complete each TCA training materials so that the goal can be achieved? (Fill in the column)

No.	Materials	Duration (Days)
1	Climate Change Policies	
2	GIS/Remote Sensing	
3	Land classification and IPCC Guidance and Guidelines	
4	Data collection, fields methods, and evaluation, generation of emissions factors	
5	TCA Statistics	
6	Communication system of TCA at national level	

5.   When is the time that you think is most appropriate for the implementation of that training? (Put a cross under the months that you think appropriate - consider your holiday or busy time)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

6.   Do you think TCA training needs to be done more than once a year? Yes/No, if yes please provide the reasons
....………………………………………………………………………………
……..……
……..……

7.   Do you think the competence obtained by participants after the training is needed by local government? Yes/No, if yes please provide the reasons ....…………………
……..……
……..……

8.   To be able to describe the competences of the participants after the training, what things need to be mentioned in the certificate?
        a.   Certificate stating 'Pass', accompanied the training curriculum and the grade for each TCA material
        b.   Certificate stating that the TCA training par with international-scale training program
        c.   Other, please specify ....……..…………………………………………………………………
        ……..………
        ……..………

C. Ideal Candidate and Training Costs
    1.   What educational/knowledge background of the participants to enter TCA training? (Please indicate your answer by circling the letter, you may choose more than one)
        a.   Forestry
        b.   Agriculture/Soil science/Biology/Natural Science
        c.   Statistic
        d.   Other (please specify) ……..………………………………………………………………………………………
    2.   What level of echelon do you think is appropriate to attend the TCA training?
        a.   Echelon 3 or less
        b.   Technical or functional personnel/staff
        c.   Academic staff or related graduates
        d.   Above echelon 3, depends on the materials and the depth of the training

e. Other (please specify) ……...…………………………………………………………………………………..

3. Do you think the candidates need to be grouped into several categories depending on the position of the participants in the structural, time availability, and educational background? Yes/No

4. If yes, what categories of participants proposed and materials that need to be included according to the categories of participants? (Please put a "X" in the appropriate column)

No.	Category of Participants	Materials*					
		1	2	3	4	5	6
1	Policymakers at all backgrounds						
2	Technical or functional personnel/staff at all backgrounds						
3	Academic personnel/researcher with backgrounds related to TCA materials						
4	Other (please specify)						

5. In your opinion, with TCA training materials provided, do you think the prospective trainee must have a specific background/knowledge/prerequisites? Yes/No. If yes what background (prerequisites)?
    a. Have knowledge of basic statistics
    b. Have an experience in using GIS/remote sensing
    c. Other, please specify ……..…………………………………………………….......................

6. Do you think the training participants are willing to pay for their own training? Yes/No

7. If No, do you think the government should provide funds for the TCA training? Yes/No

8. Do you think there should be other parties outside the government, such as international agencies, to provide funds for TCA training? Yes/No. If yes which institutions do you think the potential? (please specify)
    ....

9. In your opinion, how much is the maximum cost of the training that is still feasible and affordable?[1]
    a. Less than 5 million IDR
    b. Between 5 – 10 million IDR per person
    c. More than 10 million IDR per person
    d. ……

10. What kind of support needs to be given to participants before and after TCA training? (Circle the letter that corresponds to your opinion)

Time	Support
Before the training	a. Reading material or references that need to be studied before the training b. Instructions for prospective participants about the form of data that needs to be taken at the time of training d. Other (please specify) …………………………………………………………………….. ……
After the training	a. Providing consulting services to alumni regarding the problems associated with TCA

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[1] As an information, the course fee of TCA training that previously held at the international level is USD 2,000 per person

	b. Facilitate alumni meetings to exchange experiences and lessons learned c. Provide information about the latest developments TCA guidelines and methodologies to the alumni via the website e. Other (please specify) …………………………………………………………………….. ………………………………………………………………………………………………..

D. Developing Network

1. How do you think the best way to involve your institution in developing the curriculum of TCA?

   ……………………………………………………………...

   ……..……

   ……..……

2. Is your organization interested in obtaining TCA curriculum that was prepared prior to COP23? Yes/No