Implementing guide for planting, replanting and tree diversification in cocoa systems

Asare, Richard; David, Sonii

Publication date:
2010

Document version
Early version, also known as pre-print

Citation for published version (APA):
Asare, R., & David, S. (2010). *Implementing guide for planting, replanting and tree diversification in cocoa systems*. Forest & Landscape, University of Copenhagen.

FOREST & LANDSCAPE

Implementing guide for planting, replanting and tree diversification in cocoa systems

FOREST & LANDSACPE WORKING PAPER - REVISION 2011 46 / 2010

by Richard Asare and Sonii David

FACULTY OF LIFE SCIENCES
UNIVERSITY OF COPENHAGEN

FOREST & LANDSCAPE

Implementing guide for planting, replanting and tree diversification in cocoa systems -

Revision 2011

by Richard Asare and Sonii David

Contributions from:

IITA
Research to Nourish Africa
The International Institute of Tropical Agriculture

WCF
WORLD COCOA FOUNDATION

USAID
FROM THE AMERICAN PEOPLE

FACULTY OF LIFE SCIENCES
UNIVERSITY OF COPENHAGEN

Title
Implementing guide for planting, replanting and tree diversification in cocoa systems - Revision 2011

Authors
Richard Asare and Sonii David

Collaborating Partner
Sustainable Tree Crops Program
Regional Office
P.O. Box 135, Accra, Ghana
International mailing: c/o IITA Ltd.
Carolyn House, 26 Dingwall Road
Croydon, CR9 3EE, U.K
http://www.treecrops.org
http://www.iita.org
Email: stcp-wca@cgiar.org

Cover Photo
Cocoa Bush. Photo: Richard Asare

Publisher
Forest & Landscape Denmark
University of Copenhagen
Hørsholm Kongevej 11
DK-2970 Hørsholm

Series - title and no.
Forest & Landscape Working Paper No. 46-2010

ISBN
ISBN 978-87-7903-476-1 (internet)

DTP
Melita Jørgensen

Citation
Asare, R. and David, S. 2010. Implementing guide for planting, replanting and tree diversification in cocoa systems. International Institute of Tropical Agriculture, Ghana. Forest & Landscape Working Paper No. 46-2010.

The report is available electronically from
www.sl.life.ku.dk

About the Sustainable Tree Crops Program (STCP)

STCP is a public-private partnership and innovation platform that seeks to generate growth in rural income among tree crop farmers in an environmentally and socially responsible manner in West/Central Africa. This is achieved by introducing innovations to enhance productivity, increase marketing efficiency, diversify farmer income, and strengthen the institutional and policy environment. STCP, which is managed by the International Institute of Tropical Agriculture (IITA), provides a framework for collaboration between farmers, the global cocoa industry, local private sector, national governments, NGOs, research institutes, and development investors.

About International Institute of Tropical Agriculture (IITA)

Africa has complex problems that plague agriculture and people's lives. We develop agricultural solutions with our partners to tackle hunger and poverty. Our award winning research-for-development (R4D) is based on focused, authoritative thinking anchored on the development needs of sub-Saharan Africa. We work with partners in Africa and beyond to reduce producer and consumer risks, enhance crop quality and productivity, and generate wealth from agriculture. IITA is an international non-profit R4D organization since 1967, governed by a Board of Trustees, and supported primarily by the CGIAR.

Acronyms

CGIAR	Consultative Group on International Agricultural Research
FFFS	Farmer Field School
FLG	Farmer Learning Group
FP	Farmer Plantation
ICPM	Integrated Crop and Pest Management
IITA	The International Institute of Tropical Africa
PRD	Planting, Replanting and Diversification
STCP	Sustainable Tree Crops Programme
T&V	Training and Visit

Content

Cocoa intensification

Introduction

Cocoa intensification is a term used to describe a new vision of the cocoa investment whereby the crop is grown with the objective of increasing productivity while at the same time ensuring sustainability by protecting the environment. To intensify cocoa production farmers will need to change in the following ways:

- See cocoa farming as a business, an activity that must be profitable
- Stop growing cocoa if they cannot do so profitably and sustainably
- Plant improved materials (hybrids cocoa)
- Use approved inputs (fertilizer, fungicide, insecticide) at recommended dosages
- Follow best management practices (for example, land preparation, planting requirements, pruning, weeding, fermentation etc.)

To intensify their farms, farmers need to make conscious efforts to rehabilitate old and non-producing farms and/or establish new cocoa farms using best practices. The planting, replanting and diversification curriculum helps to improve farmers' knowledge and skills in order to carry out the necessary best practices in revamping old farms and/or starting new ones. The curriculum helps to train farmers on 24 field exercises in 20 sessions over a 10 month period from March to December.

The FLG approach

The PRD curriculum uses the farmer learning group (FLG) approach to train farmers. In the past 2 decades, various group-based training methods and tools have been developed to improve farmers' productivity. Methods such as farmer participatory research, farmer field schools (FFS) and the training and visit (T&V) system were designed to achieve specific training objectives. For example, the intensive season long FFS approach is designed to train farmers on ecological principles and to improve their observational and decision making skills with regard to knowledge intensive technologies and practices. Demonstrations on the other hand are an effective tool for training farmers on specific skills and practices.

The farmer learning group (FLG) approach, as described in this document, is a structured group based learning approach designed to teach farmers specific skills and practices using demonstrations, field exercises and discussion as the key training and learning tools.

A FLG consists of 20-30 farmers who meet regularly in a field (demonstration plot) led by a trained facilitator who follows the PRD curriculum. The key characteristics of the FLG are:

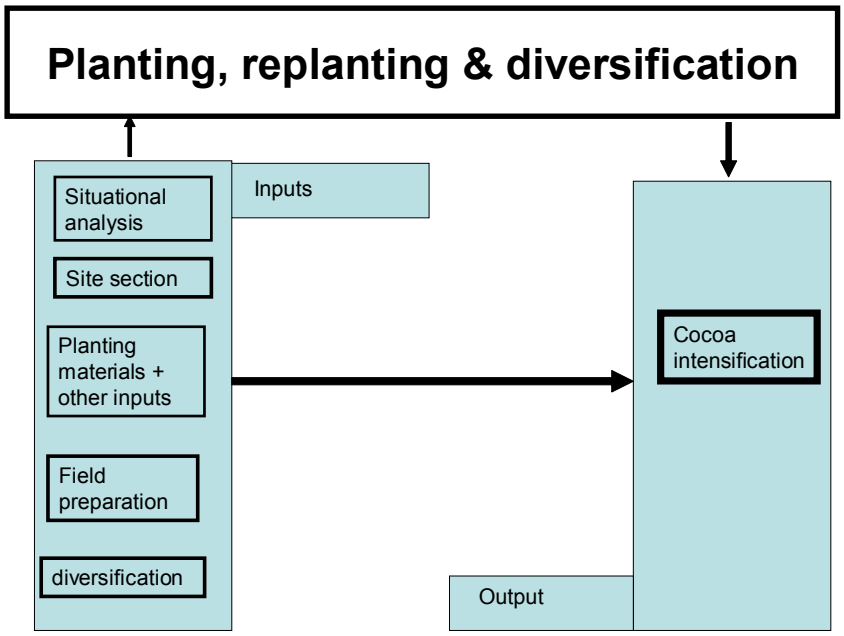
- Technically competent facilitators who can lead group activities and facilitate learning.
- Hands on learning whereby farmers learn and practice implementing skills and best practices
- Flexible, interactive, non-lecture demonstrations and practical field exercises conducted on one or several learning fields

FLG places strong emphasis on discussion and debate which allows farmers to become aware of misconceptions and the limitations of certain existing practices and how improved practices and knowledge can boost productivity.

Training procedure

The idea behind PRD is to use field exercises to improve farmers' knowledge and skills on how to establish a new cocoa farm or rejuvenate an old one. To do this the curriculum requires the trainer to divide the technical bulletins in the curriculum into five parts with each component corresponding to specific exercises. The components are situational analysis, site selection, planting material acquisition and seedling production, field preparation and planting, and plant diversification as represented in diagram 1 below:

Diagram 1: Schematic representation of PRD training



The five components serve as inputs driving planting, replanting and diversification in addition to agro-chemicals and credit in order to facilitate cocoa farm intensification (output). The trainer needs to use the topics in the technical bulletins to explain the five components and use the exercises to demonstrate the practical aspects of the technical bulletins.

Components and exercises

1. Situational analysis:
Exercises are: understanding cocoa intensification, deciding which cocoa trees to rehabilitate or eliminate, making decision about where to replant cocoa

2. Site selection:
Exercises are: soil characterization

3. Planting materials and seedling production:
Exercises are: collecting, processing and storing local tree seeds for sowing, preparing to start a nursery, sowing cocoa in poly bags, effect of poly bag size on seedling survival, sowing on nursery beds, and monitoring of nurseries

4. Field preparation and planting:
Exercises are: lining, pegging and holing, importance of spacing, importance of shade for young cocoa trees, planting plantain and cassava as temporary shade for cocoa, preparing to plant non-cocoa trees in cocoa farms, planting cocoa in the field

5. Plant diversification:
Exercises are: identifying tree diversification options, selecting desirable non-cocoa trees for cocoa cultivation, selecting and promoting trees are already growing in the cocoa farms, developing a farm map for making decisions about tree planting, killing undesirable trees in a cocoa farm, formation and structural pruning, pruning forest trees in cocoa farm, know your rights regarding ownership of forest trees

Farmer Learning Groups and Farmer Field Schools

While the FLG shares some similarities with FFS, there are important methodological differences between the two approaches as summarized in Table 1.

Table 1: Characteristics of farmer learning groups and classical farmer field schools

Activities	Farmer learning group	Farmer field schools
Training objectives	Improve farmer skills and adoption of recommended/ best practices	Improve farmer knowledge, observational and decision making skills
Frequency of meeting	As needed	Regularly (weekly or biweekly)
Training cycle	As needed	Season long
Emphasis on agro-ecological principles	Low	High
Learning location	Single or multiple learning plots at different stages of development with no control	FFS plot divided into experimental and control plot
Emphasis on experimentation and data collection	Low	High
Training tools	Demonstration and field exercises	Agro-ecosystem analysis, discovery learning exercises and field exercises
Emphasis on farmer empowerment	Medium-Low	High

It is anticipated that FLGs should meet every two weeks or when necessary weekly, according to the activities being carried out. FLG activities are conducted in the field on three learning plots:

1. A nursery site (large enough for at least 24 seedlings for training purposes or more if participants want to raise their own seedlings)
2. Site for new establishment (clear an area large enough to plant 24 trees)
3. A mature plantation (trees 7 years of age and above; this can be the FFS FP plot or another farm)

After the training ends, the newly planted site should be maintained as a demonstration plot for other farmers to appreciate the value of applying recommended practices. You may need to find other farms with specific conditions for some exercises (e.g. pruning, collecting tree seed).

Criteria for selecting the learning plots

- Proximity to the central meeting place and/or FFS plots
- Ownership by a group member
- Agreement of the farm owner
- Nursery site: must be near a reliable water source and near the plot where the trees will be planted
- Site for new establishment: Should be near the nursery site, in a place where many people pass; owner should be willing to continue managing the farm to demonstrate recommended practices after the end of the training

Training modules

Module 1: Understanding cocoa intensification

Learning objectives/outcomes	At the end of this module, participants should be able to: • Explain the concept of cocoa intensification • Understand what needs to be done to intensify cocoa and agricultural production in general • Be aware of the benefits, outcomes, potential conflicts and issues associated with cocoa intensification	
Time	**3 hours**	
Content	**Methods**	**Tools**
		Flip chart, facilitator's manual/handouts
Concept of cocoa intensification (1 hour)		
• Meaning of intensification	Presentation, discussion	Flip chart
• Factors relating to intensification	Presentation, discussion	Flip chart
Benefits of cocoa intensification (1 hours)		Flip chart
• Increase in productivity	Presentation, discussion	Flip chart
• Environmental sustainability	Presentation, discussion	
What to do (1 hour)		
• Farmers	Discussion, exercises	
• Governments	Discussion, exercises	Flip chart
• Private sector	Discussion, exercises	

Module 2: Deciding which cocoa trees to rehabilitate or eliminate

Learning objectives/outcomes	At the end of this module, participants should be able to: • Systematically evaluate the productivity of cocoa trees on their farms in order to make decisions about which trees to rehabilitate or eliminate	
Time	**4 hours**	
Content	**Methods**	**Tools**
		Flip chart, facilitator's manual/handouts
Importance for rehabilitation (1 hour)		
• Indicators for productivity	Presentation, discussion	Flip chart
• How to observe production	Presentation, discussion	
Deciding on which tree to eliminate (3 hours)		
• Things to consider	Presentation, discussion	Flip chart
• How do you decide	Presentation, discussion	Flip chart
• Analysis of pods on trees	Presentation, discussion, exercise	Flip chart, calculator
• Identifying cocoa trees to be removed	Discussion	Flip chart

Module 3: Soil characterisation

Learning objectives/outcomes	At the end of this module, participants should be able to: • Identify and select suitable soil for cocoa cultivation	
Time	**4 hours**	
Content	**Methods**	**Tools**
Characteristics of suitable soil for cocoa (1 hour)		
• Good internal drainage - attributes	Presentation, discussion	Flip chart, facilitator's manual/handouts
• Define and explain soil texture	Presentation, discussion	
Demonstrating soil texture (2 hours)		
• Sandy soil	Demonstration, discussion	Soil sample, water, container
• Silty soil	Demonstration, discussion	Soil sample, water, container
• Loamy soil	Demonstration, discussion	Soil sample, water, container
• Clayey soil	Demonstration, discussion	Soil sample, water, container
Identifying good soil texture (1 hours)		
• Demonstrate how to identify suitable soil for cocoa	Demonstration, Discussion	Soil sample, water, container

Module 4: Making the decision about where to replant cocoa

Learning objectives/outcomes	At the end of this module, participants should be able to: • Decide how to plant or replant cocoa	
Time	**4 hours**	
Content	**Methods**	**Tools**
Importance of rehabilitation (1 hour) • Factors of low production of cocoa • Identifying available resources	Presentation, discussion Presentation, discussion	Flip chart, facilitator's manual/handouts, pod counting results
Options for replanting (2 hours) • Under planting • Gradual replanting • Complete replanting • New planting	Presentation, discussion Presentation, discussion Presentation, discussion Presentation, discussion	Flip chart Flip chart Flip chart Flip chart
Deciding on a better option (1 hours) • Things to consider • How do you decide	Discussion Discussion	Flip chart Flip chart

Module 5: Killing undesirable trees in a cocoa farm

Learning objectives/outcomes	At the end of this module, participants should be able to: • Gradually eliminate unwanted shade trees in cocoa farms	
Time	**4 hours**	
Content	**Methods**	**Tools**
Definition of unwanted trees in cocoa (1 hour) • Meaning of unwanted trees • Importance of unwanted trees	Presentation, discussion, exercise Presentation, discussion, exercise	Flip chart, facilitator's manual/ handouts
Importance of gradual killing of unwanted trees (1 hour) • Recycling of nutrient • Gradual reduction of shade cover • Mechanical damage • Ecosystem functions • Firewood	Discussion Discussion Discussions Discussions Discussions	Flip chart Flip chart Flip chart Flip chart Flip chart
Routine killing of undesirable trees (2 hour) • Description of method for killing trees • Mentioning and explaining items to be used and how	Demonstration, exercise Demonstration, exercise	Flip chart Flip chart

Module 6: Preparing to start a cocoa nursery

Learning objectives/outcomes	At the end of this module, participants should be able to: • select a suitable site for a nursery • understand the difference between hybrid and traditional cocoa varieties • understand the essence of obtaining hybrid planting material from a certified seed source	
Time	**5 hours**	
Content	**Methods**	**Tools**
Factors to consider in nursery site selection (4 hour)		Flip chart, facilitator's manual/ handouts
Location:		
• flat surface	Presentation, discussion, exercise	
• proximity to reliable source of water	Presentation, discussion, exercise	
• Easy accessibility to operator	Presentation, discussion, exercise	
• Good drainage		
Management:		
• Fence provision	Presentation, discussion	Flip chart
• Shade provision	Discussion, field exercises	Flip chart
• Conditions needed for nursery	Discussion, field exercises	Flip chart
• Constructing nursery bed	Discussion, field exercises	Flip chart
The essence of hybrid cocoa pod as planting material (1 hour)		
• Difference between hybrid and traditional varieties	Presentation, discussion, exercise	Flip chart
• Reasons for not sowing seeds from planted hybrid materials	Presentation, discussion, exercise	Flip chart
• Identifying hybrid sources for farmers	Presentation, discussion, exercise	Flip chart
• How many seed per pod and how many seeds needed per hectare of land	Presentation, discussion, exercise	Flip chart

Module 7: Using improved planting materials

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand the value of obtaining planting materials from approved sources and the risk of sowing seeds from pods harvested on farm • Differentiate between good and bad cocoa pods	
Time	**5 hours**	
Content	**Methods**	**Tools**
Where to obtain improved planting materials (30 minutes)		Flip chart, facilitator's manual/ handouts
Factors to consider before getting cocoa pods (30 minutes)	Presentation, discussion, exercise Presentation, discussion, exercise Presentation, discussion, exercise	
How to prepare seeds before sowing (1hour) • Difference between hybrid and traditional varieties • Reasons for not sowing seeds from planted hybrid materials • Identifying hybrid sources for farmers • How many seed per pod and how many seeds needed per hectare of land	Presentation, discussion Discussion, field exercises Discussion, field exercises Discussion, field exercises Presentation, discussion, exercise	Flip chart Flip chart Flip chart Flip chart Flip chart

Module 8: Understanding grafting

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand the essence of grafting • Know the various techniques in grafting	
Time	**5 hours**	
Content	**Methods**	**Tools**
Define grafting and explain the various terns (1 hour) • Rootstock • Scion • Bud woods	 Presentation, discussion, exercise Presentation, discussion, exercise Presentation, discussion, exercise	Flip chart, facilitator's manual/ handouts
Describe and demonstrate the various grafting techniques (2 hours) • Whip graft • Cleft graft • Bark graft • Side graft	 Presentation, discussion Discussion, field exercises Discussion, field exercises Discussion, field exercises	 Flip chart Flip chart Flip chart Flip chart

Module 9: Sowing cocoa in poly bags

Learning objectives/outcomes	At the end of this module, participants should be able to: • Determine good soil for filling poly bags in nurseries • Understand the implications of sowing poly bags, on seed bed and planting at stake	
Time	**5 hours**	
Content	**Methods**	**Tools**
Importance of fertile soil (black soil) (1 hour) • Distinguish between sandy soil and loamy soil • Describe how to obtain fertile soil	Presentation, discussion Presentation, discussion	Flip chart, facilitator's manual/ handouts
Options for sowing seeds (1 hours) • Sowing seeds in poly bags • Sowing seeds on seed beds • Planting at stake	Presentation, discussion Presentation, discussion Presentation, discussion	Flip chart Flip chart Flip chart
Sowing in poly bags (1 hour) • Preparing the poly bag • Filling the poly bag • Putting in the seed in the soil • Poly bag arrangement • Watering regime	Presentation, discussion Presentation, discussion Discussion, presentation	Flip chart Flip chart Flip chart
Sowing on nursery bed(1 hour) • Advantages and disadvantages	Discussions, presentation	Flip chart
Sowing at stake (1 hours) • Advantage and disadvantage		

Module 10: The effects of poly bag size on seedling survival

Learning objectives/outcomes	At the end of this module, participants should be able to: • Determine the advantages of using poly bag and the effects of small bags on seedling survival rate	
Time	**2 hours**	
Content	**Methods**	**Tools**
Importance of poly bags size (2 hour) • Discuss the essence of volume and it's impact on root formation • Discuss the minimum period of seedlings in the nursery	Presentation, discussion, field exercise Presentation, discussion, field exercises	Flip chart, facilitator's manual/handouts Flip chart

Module 11: Monitoring a cocoa nursery

Learning objectives/outcomes	At the end of this module, participants should be able to: • Undertake nursery management routines properly	
Time	**4 hours**	
Watering regimes (1 hour) • Discuss daily watering regimes in relation to age of seedlings	Presentation, discussion	Flip chart, handouts
Germination and seedling survival (1 hours) • Explain germination percentage • Explain seedling survival rate • Explain seedling establishment rate	 Presentation, discussion, exercise Presentation, Discussion, exercise Presentation, Discussion, exercise	Flip chart Flip chart Flip chart Flip chart
Importance of weeds, insects and diseases in nurseries (1 hour) • Damage by weeds and remedy • Damage by insects and remedy • Damage by diseases and remedy	 Presentation, Discussion, exercise Presentation, Discussion, exercise Presentation, Discussion, exercise	 Flip chart Flip chart Flip chart
Duties of nursery operator (1hours) • Explain the importance of nursery operator • Describe the duties of a nursery operator	 Presentation, Discussion Presentation, Discussion	 Flip chart Flip chart

Module 12: Planting plantain and cassava as temporary shade for cocoa

Learning objectives/outcomes	At the end of this module, participants should be able to: • Explain the importance of temporary shade for cocoa • Understand the cleaning process of plantain and cassava • Plant best varieties of plantain and cassava properly in cocoa farms	
Time	**4 hours**	
Content	**Methods**	**Tools**
Concept of temporary shade in cocoa agroforestry (1 hour)		Flip chart, facilitator's manual/ handouts
• Define the characteristics of shade crops or tree	Presentation, discussion, exercises	Flip chart
• Explain the role of food crops as shade for cocoa	Presentation, discussion, exercises	Flip chart
Treating plantain and cassava planting materials (2 hours)		
• Sources of plantain and cassava varieties		
• Hot water treatment for plantain	Presentation, discussion,	Flip chart
• Warm water treatment for cassava	field exercises	
Food crop spacing (1 hour)		
• Plantain	Discussion, field exercise	Flip chart
• Cassava	Discussion, field exercise	Flip chart

Module 13: Soil Conservation

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand the effect of soil erosion • Understand and apply mulch • Make and utilize compost	
Time	**2 hours**	
Content	**Methods**	**Tools**
Describe soil erosion (1 hour) • Causes and effects • How to prevent soil erosion	 Presentation, discussion, exercises Presentation, discussion, exercises	Flip chart, facilitator's manual/handouts Flip chart
Describe mulching (1 hour) • Advantages and disadvantages of mulching • How to apply mulch	Presentation, discussion, field exercises	Flip chart
Demonstrate how to make compost (1 hour)	Presentation, discussion, field exercises	Flip chart

Module 14: The importance of spacing

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand the concept of competition between cocoa trees and the importance of spacing	
Time	**2 hours**	
Content	**Methods**	**Tools**
Concept of competition (1 hour) • Explain competition • Provide examples ***Importance of spacing (1 hours)*** • Advantages and disadvantages of spacing	 Presentation, discussion, exercises Presentation, discussion, exercises Presentation, discussion, field exercises	Flip chart, facilitator's manual/handouts Flip chart Flip chart

Module 15: The importance of shade for young cocoa trees

Learning objectives/outcomes	At the end of this module, participants should be able to: • Observe the effects of too much sunshine on young cocoa trees • Understand the relationship between shade and black pod • Understand the relationship between too much light and mirids	
Time	**3 hours**	
Content	**Methods**	**Tools**
Shade for cocoa (2 hour) • Define temporary shade and give examples • Define permanent shade and give examples • Effect of shade on cocoa	 Presentation, discussion, exercises Presentation, discussion, exercises	Flip chart, facilitator's manual/handouts Flip chart
Importance of shade (1 hours) • Shade and mirids • Shade and black pod	 Presentation, discussion Presentation, discussion	 Flip chart Flip chart

Module 16: Lining, pegging and holing

Learning objectives/outcomes	At the end of this module, participants should be able to: • Make planting rows at the recommended spacing	
Time	**3 hours**	
Content	**Methods**	**Tools**
Recommended spacing for cocoa, food crops and other trees (1 hour)		Flip chart, facilitator's manual/handouts
• Explain the importance of recommended spacing for various crops	Presentation, discussion, exercises	Flip chart
• Provide the recommended spacing for various crops	Presentation, discussion, exercises	
Planting distance (2 hours)		
• Describe the process of lining and pegging	Discussion, field exercise	Flip chart
• Describe holing and its importance	Discussion, field exercise	Flip chart
• Demonstrate lining, pegging and holing		

Module 17: Planting cocoa in the field

Learning objectives/outcomes	At the end of this module, participants should be able to: • Plant cocoa correctly	
Time	**2 hours**	
Content	**Methods**	**Tools**
Prior to planting routine (2 hour) • Identify and discuss the activities to be conducted before planting cocoa in the field on the day of planting • Demonstrate the planting procedure • Explain the planting process	Presentation, discussion Presentation, discussion, field exercises Presentation, discussion, field exercises	Flip chart, facilitator's manual/handouts Flip chart Flip chart Flip chart

Module 18: Formation and structural pruning

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand the different types of pruning and their importance • Perform formation and structural pruning	
Time	**3 hours**	
Content	**Methods**	**Tools**
Pruning (1 hour)		Flip chart, facilitator's manual/handouts
• Define pruning	Presentation, discussion	Flip chart
• Describe formation, chupon (side shoots) and structural pruning	Presentation, discussion	Flip chart
• Explain the purpose of each of the pruning methods mentioned above	Presentation, discussion	Flip chart
Importance of pruning (2 hours)		
• Explain the importance of each of the pruning methods mentioned	Presentation, discussion, field exercises	Flip chart
• Demonstrate the various pruning methods	Presentation, Field exercise	Flip chart

Module 19: Identify tree diversification options

Learning objectives/outcomes	At the end of this module, participants should be able to: • Systematically decide on which trees they should plant on their cocoa farms • Be aware of the environmental and economic issues they need to consider when making the decisions about which trees to plant on cocoa farms	
Time	**3 hours**	
Content	**Methods**	**Tools**
Tree diversification in cocoa (1 hour) • Define tree diversification in cocoa • Explain terms in the diversification process	 Presentation, discussion, field exercise Presentation, discussion, exercises	Flip chart, facilitator's manual/handouts Flip chart
Different options for diversification (2 hours) • Food crops • Fruit crops • Timber • Describe the stages of each diversification option and its importance	 Presentation, discussion Presentation, discussion Presentation, discussion Presentation, discussion	 Flip chart Flip chart Flip chart Flip chart

Module 20: Selecting desirable non-cocoa trees for cocoa cultivation

Learning objectives/outcomes	At the end of the module, participants should be able to: • Demonstrate good understanding of what a desirable forest tree is • Identify at least 10 most desirable attributes of a forest tree for cocoa cultivation • Identify at least 10 indigenous forest trees that have desirable attributes for cultivation with cocoa • Create and apply a decision-support tool for selecting desirable forest trees for cocoa cultivation	
Time	**4 hours**	
Content	**Methods**	**Tools**
As appropriate for the training, explain the following terminologies necessary to create the decision-support tool: • Desirable attributes • Numerical rating system • Matrix • Temporary shade • Permanent shade • Shade quality • Moisture • Soil fertility • Weed suppression • Mechanical damage • Wind break • Good aeration • Good timber value • Good non-timber forest product value • Alternative hosts for diseases and pests	Presentation, discussions, field exercise	Facilitators manuals and handouts Flip chart

Module 21: Developing a farm map for making decisions about tree planting

Learning objectives/outcomes	At the end of this module, participants should be able to: • Make a farm map documenting tree resources on cocoa farm	
Time	**4 hours**	
Content	**Methods**	**Tools**
Importance of farm maps (1 hour) • Explain the nature of a farm map • Explain the legal implication of a planted and documented timber tree and that of naturally regenerated timber tree in the context of the country	 Presentation, discussion, exercises Presentation, discussion, exercises	Flip chart, facilitator's manual/handouts Flip chart
Mapping process (3 hours) • Explain the essence of using land marks • Explain use of the cardinal points • Explain the essence of a reference point and the direction of planting • Describe the procedure • Develop a sample of a farm map	 Presentation, discussion, field exercises Presentation, field exercise Discussion, field exercise Discussion, field exercise	 Flip chart Flip chart Flip chart Flip chart

Module 22: Collecting, processing and storing local tree seeds for sowing

Learning objectives/outcomes	At the end of this module, participants should be able to: • Identify best sources of local tree seeds • Process and store tree seeds properly before sowing	
Time	**4 hours**	
Content	**Methods**	**Tools**
Seed collection activities (1 hour) • Explain the seed collection activities (seed tree selection, collection, extraction, drying, packing and storing • Give the importance of these activities	Presentation, discussion	Flip chart, facilitator's manual/ handouts Flip chart
Identify a species for tree seed collection (3 hours) • Identify the species and time for seed collection • Provide rules for selecting mother trees for seed collection • Complete the tree seed collection activities	Presentation, discussion, field exercises Presentation, discussion, field exercises Discussion, field exercise	Flip chart Flip chart Flip chart

Module 23: Sowing on nursery beds

Learning objectives/outcomes	At the end of this module, participants should be able to: • Use nursery beds for sowing tree seeds • Construct nursery beds properly	
Time	**4 hours**	
Content	**Methods**	**Tools**
Nursery bed construction (1 hour) • Working the soil • Preparing the bed	Presentation, discussion, field exercise Presentation, discussion, field exercise	Flip chart, facilitator's manual/ handouts Flip chart Flip chart
Seed sowing on the bed (3 hours) • Preparing the bed for seed sowing (what to do) • Sowing the seeds • How to transplant bare-root seedlings	Presentation, discussion, field exercises Presentation, discussion, field exercises Discussion, field exercise	Flip chart Flip chart Flip chart

Module 24: Preparing to plant non-cocoa trees in cocoa farm

Learning objectives/outcomes	At the end of this module, participants should be able to: • Prepare seedlings for transplanting • Design an appropriate planting pattern for planting tree seedlings in cocoa • Plant tree seedlings properly in cocoa farms	
Time	**4 hours**	
Content	**Methods**	**Tools**
Transplanting (1 hour)		Flip chart, facilitator's manual/handouts
• Explain the importance of hardening off	Presentation, discussion	
• Describe transplanting from poly bags, seed beds, and compare the advantages and disadvantages of each method	Presentation, discussion	Flip chart
Planting arrangement for tree seedlings in cocoa (2 hours)		
• Define the planting pattern for tree seedlings (triangular spacing in cocoa)	Presentation, discussion, field exercises	Flip chart
• Describe the process of designing the planting pattern and demonstrate the process by developing a sample	Presentation, discussion, field exercise	Flip chart
Planting tree seedlings in cocoa (1 hours)		
• Dos and don'ts when planting tree seedlings in cocoa fields	Presentations, discussions, field exercise	Flip chart

Module 25: Selecting and promoting trees that are already growing in cocoa farms

Learning objectives/outcomes	At the end of this module, participants should be able to: • Select and integrate naturally regenerated tree wildlings and saplings in cocoa fields	
Time	**3 hours**	
Content	**Methods**	**Tools**
Identification of naturally regenerated forest trees (1 hour)		Flip chart, facilitator's manual/ handouts
• How to identify desirable forest trees in cocoa fields	Presentation, discussion	Flip chart
• Explain the difference between natural regeneration and planted seedlings	Presentation, discussion	Flip chart
Integrate wildings and saplings in cocoa (2 hours)		
• Explain wildlings and saplings	Presentation, discussion, field exercise	Flip chart
• Describe the process of promoting wildlings and sapling in cocoa		Flip chart
• Select and maintain sample species in a given area designated for cocoa	Presentations, discussions, field exercise	Flip chart

Module 26: Pruning forest trees in cocoa farm

Learning objectives/outcomes	At the end of this module, participants should be able to: • Prune forest trees properly	
Time	**3 hours**	
Content	**Methods**	**Tools**
Pruning (1 hour) • Explain pruning in general and refer to that of cocoa • Identify some forest trees for pruning	Presentation, discussion Presentation, discussion	Flip chart, facilitator's manual/handouts Flip chart
The process of pruning (2 hours) • Describe and demonstrate how pruning is done in a young forest tree	Presentation, discussion, field exercises	Flip chart

Module 27: Know your rights regarding ownership of forest trees

Learning objectives/outcomes	At the end of this module, participants should be able to: • Understand their rights regarding forest tree ownership • Assess damage caused by felled timber trees • Use a simple formula to determine compensation	
Time	**4 hours**	
Content	**Methods**	**Tools**
Legal framework on forest tree ownership (1 hour)		Flip chart, facilitator's manual/handouts
• Discuss the legal framework on tree ownership in the different contexts in which it exists	Presentation, discussion	Flip charts
• Identify any traditional authority involved with tree ownership in the area	Presentation, discussion	Flip chart
• Solicit opinion from framers on their views on the national and traditional legal rights on forest trees	Presentation, discussion	Flip chart
Estimate compensation for damage caused by felled trees (2 hours)	Presentation, discussion, field exercise	Flip chart
• Define the various parameters for estimating compensation		
• Develop the formula for estimating compensation	Presentations, discussions, field exercise	Flip chart
Calculation (1 hours)		
• Calculate an example		

Annex - Schedule for PRD in FLG training

Month	Sessions
March	**(3 sessions)** Understanding cocoa intensification Making the decision about where to replant Deciding which trees to rehabilitate or eliminate
April	**(3 sessions)** Soil characterization Lining and pegging and digging planting holes Hot water treatment; Planting food crops
May	**(2 sessions)** Identifying tree diversification options Selecting desirable and undesirable shade trees
June	**(3 sessions)** Farm diversification map Planting Shade trees/Planting cocoa (simulation training)
July	**(1 session)** Formation pruning, Structural pruning
August	**(2 sessions)** Promoting natural tree regeneration of desirable trees Killing unwanted shade trees
September	**(2 sessions)** Starting a nursery (construction of shed/fence, filling poly bags, constructing nursery beds)
October	**(2 sessions)** Experiment with poly bag size Knowing your rights to timber ownership Sowing on nursery beds, Planting in poly bags
November	**(1 session)** Nursery monitoring
December	**(1 session)** Collecting and processing tree seed
Total number of sessions	**20**

The proposed schedule for cocoa ICPM and PRD to be implemented is shown in the diagram below:

	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
ICPM										
PRD										

Note: After December, facilitators are required to monitor seedlings in the nurseries until they are transplanted into the field. Countries should define modalities for activities after December.

Materials needed for training

Required
Flip chart stand
Flip chart paper
Boards (5)
Markers of several colours
Knife
Poly bags (7"x10" or 8 cm x 25 cm)
Cocoa pods
Measuring tapes
Shovels/spades
Rakes
Pick axes/mattocks
Wheelbarrows
Nylon ropes
Air-tight containers
Small plastic bags
Two 20-30 m ropes
4 baskets, containers or paper bags
Scale
Notebooks and pens for each participant
Pegs
Calculator
Sample of a *Mirid* or picture/illustration
Paint for marking trees

Documents
Sample of a farm map
Timber regulations
Pod count chart
Optional
Illustration or photograph of properly pruned cocoa tree

Things that farmers should provide
Watering can
Machetes
Mat
Ladder

Using this manual for cocoa certification training

Many companies purchasing cocoa in West Africa and people who eat chocolate products in developed countries are concerned about the effects of cocoa production on cocoa farmers, their communities and the environment. They want to make sure that cocoa farmers are receiving higher incomes and have a good living standard. One way to make sure this happens is to provide cocoa farmers who produce cocoa following certain requirements such as good agricultural practices, responsible labour practices etc with a certificate. Cocoa farmers and communities that receive this certificate can then get a higher price for their cocoa from buyers. To receive a certificate, farmers must meet all the requirements established by certification bodies. There are currently several cocoa certification systems or standards such as UTZ Certified (www.utzcertified.org), FairTrade International (www.fairtrade.net) and Rainforest Alliance (www.rainforest-alliance.org).

Topics covered by most cocoa certification codes include:

Good agricultural practices

- Good agricultural practices and post-harvest handling
- Cocoa farm maintenance
- Soil management and fertilization
- Integrated pest management

Social issues

- No forced and child labor
- Payment of minimum wage
- Transparent and accountable group management
- Equal opportunities for men and women
- No discrimination, respectful treatment of workers
- Access to health care
- Access to education
- Good relations with the community
- Good living conditions
- Health and safety training
- Safe and healthy working conditions
- Accident and emergency procedures

Environmental issues

- Responsible use of agrochemicals
- Biodiversity protection and strengthening
- Prevention of soil erosion
- Protection of water sources
- No deforestation of primary forest;

- Use of shade trees
- Protection of endangered species
- Conservation plan for natural habitat
- Minimized environmental pollution, waste management

(Adapted and modified from UTZ Certified Code of Conduct for Cocoa-Summary)

Many of the training exercises covered in this and other manuals in the STCP Good Agricultural Practices series address the requirements of certification standards. Topics not addressed by the STCP manuals include labour practices, gender equality, group management, access to education and health care. Using the UTZ code as an example, the following table shows which training exercises correspond to specific control points

Certification codes and STCP protocols

UTZ control points	STCP protocols
1.A COCOA FARM ESTABLISHMENT AND REHABILITATION	
1.A.1 Suitable planting and grafting material is used	Using improved planting materials
	Understanding grafting
	Collecting, processing and storing local tree seeds for sowing
	Preparing to start a nursery
	Sowing cocoa in poly bags
	Effect of poly bag sizes on seedling survival
	Sowing on nursery beds
	Monitoring of nurseries
1.B COCOA FARM MAINTENANCE	
1.B.1 The producer performs good cultural control within the cocoa farm	Formation pruning
	Sanitary pruning
	Deciding which cocoa trees to rehabilitate
	Importance of shade for young cocoa trees
	Preparing to plant non-cocoa trees in cocoa farms
	Planting plantain and cassava as temporary shade for cocoa
	Planting cocoa in the field
	Lining, pegging and holing
	Importance of spacing
1. C SOIL MANAGEMENT AND FERTILIZATION	
1.C.1 The producer uses natural techniques to maintain and optimize soil fertility and structure	Soil conservation
	Soil characterization
	Understanding cocoa intensification
	Making a decision about where to replant cocoa
3. NATURAL RESOURCES AND BIODIVERSITY	
3.A.1 The producer uses techniques to prevent soil erosion	Soil conservation
3.C.1 The producer maintains shade trees on the farm to enhance biodiversity and as protection against weather risk	Identifying tree diversification options
	Selecting desirable non-cocoa trees for cocoa cultivation
	Selecting and promoting trees that are already growing in the cocoa farm
	Developing a farm map
	Planting non-cocoa trees in cocoa
	Knowing your rights regarding ownership of forest trees

FOREST & LANDSCAPE WORKING PAPER - REVISION 2011 46 / 2010

To intensify their farms, farmers need to make conscious efforts to rehabilitate old and non-producing farms and/or establish new cocoa farms using best practices. The planting, replanting and diversification curriculum helps to improve farmers' knowledge and skills in order to carry out the necessary best practices in revamping old farms and/or starting new ones. The curriculum helps to train farmers on 24 field exercises in 20 sessions over a 10 month period from March to December

Forest & Landscape Denmark
University of Copenhagen
Rolighedsvej 23
DK-1958 Frederiksberg
Tel: 3533 1500
sl@life.ku.dk
www.sl.life.ku.dk

National centre for research, education and advisory services within the fields of forest and forest products, landscape architecture and lanscape management, urban planning and urban design