



Provision of adequate tree seed portfolios



Norway's International
Climate and Forest Initiative
(NICFI)

Coordination of training activities at PATSCO 2018, part 2

Consultancy Report

November 2018

TRAINING

DRAFT REPORT

Short-Term Consultancy

on

**Coordination of Training Activities at
PATSPPO 2018, Part 2.**

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ABBREVIATIONS

AAU	Addis Ababa University
CEE-FRC	Central Ethiopia Environment & Forest Research Center
CSR	Corporate Social Responsibility
EBI	Ethiopian Biodiversity Institute
CEE-FRA	Central Ethiopian Environment and Forest Research Center
EEFRI	Ethiopia Environment and Forest Research Institute
EMI	Ethiopian Management Institute
GoE	Government of Ethiopia
MEFCC	Ministry of Environment Forest and Climate Change
PATSPO	Provision of Adequate Tree Seed Portfolios (Project name)
PR	Public Relations
TNA	Training Needs Assessment
TSC	Tree Seed Centre
RTSC	Regional Tree Seed Centre
TSTCU	Tree Seed Technology Coordination Unit
WGCENR	Wondo Genet College of Forestry and Natural Resources
UCPH	University of Copenhagen

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Arvid Sloth

1.0 Introduction

The project “Provision of Adequate Tree Seed Portfolios (PATSP0)” aims to enhance productivity and resilience of Forest Landscape Restoration in Ethiopia. It is implemented over a four-year period (2017-20) by the World Agroforestry Centre (ICRAF) in close collaboration with the Ethiopian Environment and Forest Research Institute (EEFRI).

Specifically, the PATSP0 support Ethiopia in its ambitious programme of forest landscape restoration with a commitment to restore more than 20 million ha of degraded forest landscapes, by provision of genetically diverse planting material of a range of multiple productive tree species.

The project will contribute towards Ethiopia’s Climate Resilient Green Economy (CRGE) strategy, which is a green growth strategy, via the national forest restoration targets for the next 20 years and beyond. Restoring and planting of vast landscapes require an able and effective organization to provide large quantities of quality seed for tree planting. PATSP0 addresses this directly by providing a multiple tree species programme able to provide:

1. organizational setup of the tree seed sector, including stakeholder identification and roles and responsibilities, based on a sector analysis;
2. species specific knowledge for most priority tree species;
3. a built up of the tree genetic resources for the future, comprising exploration, mobilisation, conservation, establishment, management and improvement; and
4. capacity to monitor and deliver quality seed and seedlings of multiple species required for large scale restoration.

A basic precondition for fulfilment of the goal and outputs is that the organisational set-up, including PATSP0 and major stakeholders involved, have the required technical, institutional and motivational capacity.

The identification and assessment of potential training providers is therefore a logical first step of training coordination in the setting up of a training programme to meet the objectives of PATSP0. Moreover, this assessment is a natural continuation of the Capacity Needs Assessment undertaken earlier in 2018 and builds directly on the results from the needs assessment.

The ToR for the consultancy is attached as Appendix A and the Consultant’s Schedule is presented in Appendix B.

The report primarily presents a compilation of comprehensive results obtained during the two missions. A series of course descriptions, as core output, is presented in the main report whereas the range of other results are briefly described in the main report but presented in separate appendices for easy reference and ready use.

The report is prepared for PATSP0 and its Management Team will decide the use of the recommendations made in the report, i.e. which courses to be selected for outsourcing incl. approval of curricula and financial contract with the service providers.

2.0 The assignment’s expected results.

The purpose of this consultancy is to develop, systematise a system for coordination of PATSP0’s training activities. Expected outputs are

- a) An assessment of training institutions, research institutions, universities and resource persons, which/who potentially can targeted for outsourcing of PATSPO Training courses.
- b) A detailed description of the courses to be implemented including a time plan for 2018- 2021.
- c) A general presentation of what training material required for the individual courses.
- d) Models for possible agreements between PATSPO and the institutions doing outsourced training courses.
- e) Assist in organizing, participate in and assess selected courses implemented in 2018.

Furthermore a few additionally and related tasks were undertaken and completed. These are:

- f) Development of: “Farmers Tree Collection and Processing” extension/training package.
- g) In-house capacity building of Project Management Officer to increase capacity to assist in training planning, coordination and evaluation.
- h) Participated and contributed with presentation in “PATSPPO Information and Collaboration Meeting” on 31 October 2018.

3.0 Results

Identification of Service Providers for outsourced training activities

Service providers were identified and assessed during the part 1 of this consultancy. Based on desk review, key informants, visits to the premises and investigative interviews examining the institutions’ facilities, management capacity, course offers, curricula, trainers’ CV and their experience in hosting tailor-made courses with external trainees; - a short list was made. The short-list service providers are thus assessed as capable to undertake PATSPO and is shown below.

Table 1.

Service providers assessed qualified for undertaking of PATSPO training
Ethiopia Environment and Forest Research Institute (EEFRI)
Ethiopian Biodiversity Institute and Forest Gene Bank (EBI)
Ethiopian Management Institute (EMI)
Central Ethiopian Environment and Forest Research Center (CEE-FRC)
Addis Ababa University
Mekelle University
Haramaya University
Hawassa University & Wondogenet College of Forestry
Saint Mary University (private)
Unity University (private)
PATSPO project

In addition, individual consultants or the partner University of Copenhagen may be used when assessed feasible in the concrete situation.

Training courses

Based on the Capacity Needs Assessment and additional information obtained during the investigative interviews with service providers, courses prioritised by PATSPO were identified, formulated and described. The purpose of the course descriptions is to provide sufficient details to define the individual course in terms of objective, methodology, contents, material and duration. These course descriptions will therefore jointly with a detailed quotation define what exactly must be delivered by service providers.

The objective of the course description is multifold:

Firstly, to describe in more detail which technical knowledge the target groups need;

Secondly, to form a central tool in PATSPO's training planning and budgeting, ensuring effective planning;

Thirdly, to make-up an essential part of Request for Proposal in the outsourcing process, by in turn specifying the product and service required and ensuring that the client (PATSPO) and the service provider share the same and interpretation of the products and services to be delivered.

Fourthly, to direct and assist the trainers in course preparation and implementation;

Fifthly, to let the participants and their superiors understand and assess the objective and contents of the various training offers.

Overview of identified courses

Table 2.

Course Title	Objective	Duration (days)	Description
BIOLOGY AND ECOLOGY COURSES			
Natural Vegetation Distribution and Species Identification	Learn the composition, diversity, ecology of natural forest populations and identification techniques for native trees.	5 -7	Table 3
Seed Biology	Learn the structure and functions of seed parts in angiosperms and gymnosperms	5	Table 4
TREE SEED PROCUREMENT TECHNICAL COURSES			
Seed Source Establishment, Development and Mgt.	Become capable of seed source development and management	8	Table 5
Seed Collection, Transporting, Processing, Storage and Monitoring	Become capable of managing the entire tree seed value chain from collection, transport, processing, packaging and distribution.	8	Table 6
Farmers tree seed collection and processing	Improve quality of seed collected by farmer groups, through awareness of the basics for tree seed selection, field testing of seed vitality, collection, cleaning, processing and temporary packing for transport.	1	Table 7
Seed Lab Operations	Learn and refresh knowledge and skills in basic seed lab operations and basic processing.	5 (to 10)	Table 8
MANAGEMENT COURSES			
Awareness, Extension and Public Relation (outreach)	Learn how to produce tree seed extension and public relations materials and how to carry out successful outreach.	7 – (10)	Table 9
Marketing and Customer Relation Course	Learn the basics of marketing for addressing customer needs for quality tree seed services.	5	Table 10
Chain of Custody Seed Documentation and Monitoring	Learn to set up professional chain of custody and seed documentation system.	5	Table 11
General Management	Improve skills on management and adaptation to changing conditions in the business environment and customer make up.	8	Table 12
PC Professional Driving Licence	Gain a better understanding of the use of MS office and browsers for tree seed service and beyond.	5	Table 13
Entrepreneurship and Income Generation	Improve skills on entrepreneurship and income generation.	5	Table 14
CROSS-CUTTING ACTIVITIES			
Regional Study Tour	Exchange experience and establish partnership with TSCs in the region	7	Table 15
International Study Tour	Exchange experience and learn from others via establishment of forestry partnerships for future professional cooperation at strategic and policy levels	7	Table 16

Course descriptions

Course descriptions are the results of detailed Training Needs Assessment and given in the form of syllabi in the tables below.

Each course is described as the summary of the topics to be covered. The description includes the standard information like title, subject, detailed contents, methodology, but also a guidance, for the teachers' inspiration and assistance, on recommended and relevant training literature. This is meant as a service to the trainer and provided in a separate slot in each course description. It is noteworthy that the literature references listed are primarily sources free available at the internet and thus easily accessible.

Tables 3- 16 below outline course descriptions.

Table 3.

Course title: Natural Forest vegetation and tree species identification and distribution in Ethiopia.	
Duration: 5 days	
Participants: 20-25	
Course objectives: Learn the composition, diversity, ecology of forest populations and their distribution, and identification techniques for individual tree species.	
General description: Understanding the diversity of forest ecosystems and forest tree species, their distribution and properly species identification is the basis for procurement of quality tree seed in Ethiopia. Currently the knowledge on the natural forest populations and their species diversity is limited for most key actors in the tree seed sector. Therefore, the knowledge base should significantly be improved to properly guide tree species selection and -identification, as well as seed collection and seed distribution. The course will enhance knowledge of staff working with seed procurement to understand the diversity in vegetation zones, the species in each zone, ecological characteristics that define the distributions, and practical implications of the differences in terms of seed collection, seed distribution and gene conservation.	
Learning outcomes: Improved knowledge of the forest vegetations and enhanced capacity on species distribution and identification of Ethiopian forest trees.	
Specific course contents: <ol style="list-style-type: none"> 1. The vegetation of the world, history and development. Classic theory on vegetation distribution and classification into zones 2. Ethiopian natural vegetation types and their distributions- forest types, forest communities, ecological differences and threats to natural vegetation 3. Tree species distribution and their identification techniques using identification keys, plant specimens and herbarium 4. Conservation and use of natural forest populations as seed sources- genecology and agroecological zonation, seed sourcing and seed transfers. 	
Methodology: The course will be offered for five days by integrating theory and practical sessions. The theory will be offered for 3-4 days (8 hours every day) in a spacious room equipped with a projector and other training materials. The practical will be offered for 1-2 days by organizing field excursions to natural populations where diversity and ecological differences can be appreciated. A given batch of trainees will be composed of 20-25 persons working in the tree seed sector. A prior evaluation of trainees will be carried out by ICRAF/PATSPO so that their training needs are properly identified.	Resources: Trainers Course manual Program assessing guides Projector Field sites for visit
Training material:	

It is important that the material used gives a top down historical view on evolution of the world's vegetation. The earth's surface evolution including plate tectonics material would be a fine beginning. This could be followed with material/literature on evolution of the plant kingdoms. Material giving an overall plant classification from family-genus-species-races and populations (for trees: provenances) fits nicely here and provide an overall understanding.

Narrowing down on the vegetation of the African continent and subsequently on the dryland, mountainous, highland and Rift Valley vegetation and focusing in on the tree species, will be a perfect entry for the species identification/distribution part.

The last half of the course would be on skill training in species identification and literature on tree species monographies combined with field identification would be suitable for that.

Examples on internet references: Walter's Vegetation of the Earth. The Ecological Systems of the Geobiosphere. Authors: Breckle, Siegmund-Walter. <https://www.springer.com/us/book/9783540433156>

<https://www.britannica.com/science/plate-tectonics>

<https://courses.lumenlearning.com/wmopen-geology/chapter/outcome-theory-of-plate-tectonics/>

<https://www.earthmagazine.org/article/when-and-how-did-plate-tectonics-begin-earth>

<https://www.worldatlas.com/articles/plant-species-in-ethiopia.html>

https://www.worldagroforestry.org/usefultrees/frontpages/Useful_Trees_Ethiopia.pdf

<https://www.cabdirect.org/cabdirect/abstract/19630601789>

Table 4.

Course title: Seed Biology	
Duration: 5 days	
Course objectives: Learn the structure and functions of seed parts in angiosperms and gymnosperms	
General description: Understanding the nature and functions of different components of seed as well as the process in seed formation in angiosperms and gymnosperms, and seed aging is important. Seed physiological activities and responses to environmental conditions and seed handling will vary with species. Orthodox and recalcitrant seeds have different storage requirements. The course will deal with the biological basis of seeds and seed quality.	
Learning outcomes: A theoretical platform for learning and updating seed biology knowledge	
Specific course contents: <ol style="list-style-type: none"> 1. Seed development- flower development and structures, fertilization, fruit and seed structures and development, seed maturation 2. Seed vigour and viability – germination, dormancy, seed pre-treatments 3. Seed longevity and storage – orthodox and recalcitrant seed differences; seed aging; storage environment and conditions effect on vitality 4. Seed health -infection of seeds by plants pathogens and infestation by insect pests; fungicide, bactericide, and other treatments 5. Seed test- seed purity, MC, seed weight, germination tests and, tetrazolium test. 	
Methodology: The course will be offered for five days by integrating theory and practical sessions. The theory will be offered for 4 hours every day in a spacious room equipped with a projector and other training materials. The practical will (as necessary) be offered for 2 hours every day in a seed lab equipped with the necessary facilities for seed testing. A given batch of trainees will be composed of a	Resources: Trainer Course manual Program assessing guides Projector Tree seeds

maximum of 15 professionals/practitioners in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Germinator, Germination trays and petri dishes
<p>Training material:</p> <p>Lots of references and material is available on seed physiology, genetics and biology. It is important that focus is on literature giving a basic understanding of how seed develops, different seed types and how their vitality and longevity is impacted by environmental factors. Knowledge of dormancy and pre-treatment would be central. Literature and experience on threats to seed vitality by pathogens, and know-how on prevention of the same, is central.</p> <p>Hand-outs on how to do seed testing; including seed purity, MC, seed weight, germination tests and, tetrazolium tests must be part of the material as well.</p> <p><u>Examples on internet references:</u></p> <p>The former Danida Forest Seed Centre and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceedings on seed biology and handling are available on the University of Copenhagen homepage.</p> <p>https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/</p> <p>https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/technical-notes/</p> <p>https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/</p> <p>From the Indonesia Tree Seed project an easily assessible illustrated booklet is freely available:</p> <p>https://www.researchgate.net/publication/307876123_A_guide_to_seed_quality</p> <p>ICRAF has posted a free tool-kit on agroforestry seed:</p> <p>http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/DANIDA%20guide.htm</p> <p>A comprehensive hand-book, Tropical Forest Seed is available against payment at Springer-Verlag:</p> <p>https://www.springer.com/gb/book/9783540490289</p>	

Table 5.

Course title: Seed source establishment, development and management
Duration: 8 days
Course objectives: Become capable of seed source development and management
General description: Improving the quality of tree seeds entails the use of seed sources that meet planting objectives and match the planting sites. A seed source can be identified from natural forestry populations, plantation forests and farmland tree resources. In addition, modern seed production areas and seed orchards can be established and managed for maximum seed production. Currently the staff has inadequate knowledge and skills in seed source identification, mother tree selection, seed source establishment and management, as well as seed sources documentation. The course will offer scientific basis for seed sources development and management.
Learning outcomes: A cadre of core staff fully capable of identifying, establishing and managing different types of seed sources
<p>Specific course contents:</p> <ol style="list-style-type: none"> 1. Introduction to tree improvement- genetic basis, tree breeding, silviculture, field designs, genetic gains 2. Identification of seed sources and mother tree selection- selection of species and seed sources, documentation and mapping

3. Seed orchard development and management- types of orchards, orchard establishment and management.	
Methodology: The course will be offered for eight days by integrating theory and practical sessions. The theory will be offered for 5 days (8 hours every day) in a spacious room equipped with a projector and other training materials. The practical will be offered for 3 days by organizing field excursions to natural forests, plantations and farmlands. A given batch of trainees will be composed of a maximum of 15 seed centre staff/managers and experts in the tree seed sector.	Resources: Trainer Course manual Program assessing guides Projector Field sites for visit
Training material: Specialist trainings like this requires special training material. The trainer needs to look much for material giving basic knowledge and practical skills in establishment of tree seed sources. It covers a wide spectrum from identification of seed sources to establishment of seedling/clonal seed orchards for improved seed and tree breeding. Multiple of literature sources are available. The most important is that the trainer assesses the knowledge and management capacity on the ground and select material that matches situation. <u>Examples on internet references:</u> The former Danida Forest Seed Centre (DFSC) and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceedings on seed biology and handling are available on the University of Copenhagen homepage. https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/ https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ ICRAF has reference on agroforestry manual on tree seed source establishment and management: http://www.worldagroforestry.org/sites/default/files/Tree_Seed_source_classification_manual.pdf The New Forest Project has posted an illustrated guidance: http://www.newforestsproject.org/pdfs/NFP_TreeStands_SeedProduction.pdf	

Table 6.

Course title: Seed collection, transport, processing, storage and monitoring
Duration: 7 days
Course objectives: Become capable of managing the entire tree seed value chain from collection, transport, processing, packaging and distribution.
General description: The importance of procuring and supplying quality tree seeds to the afforestation and reforestation activities has been recognized in Ethiopia for several decades now. However, tree seeds in distribution do not largely fulfil the requirements for a quality seed and the handling of tree seeds has several pitfalls due to the limited knowledge and capability of people working in the sector. Major improvements are needed in seed collection planning and targeting and seed handling. The course will offer knowledge and hands-on skill on essential leverage points in tree seed value chain.
Learning outcomes: A cadre of core staff fully capable of harvesting, transporting, processing and storage.
Specific course contents: <ol style="list-style-type: none"> 1. Tree reproductive phenology- phenological variations among species, populations, seasons and years, preparing phenological calendar, assessment of fruit and seed yield 2. Seed collection- Planning seed collection, conducting seed collection, fruit and seed handling between collection and processing 3. Seed processing- processing techniques for different fruit types, seed drying techniques

4. Seed storage and distribution – storage conditions, monitoring seed vitality, seed packaging for distribution.	
Methodology: The course will be offered for 7 days (8 hours a day) by integrating theory and practical sessions. The theory and the practical sessions each will take 64 hours in total. Practical session will include field evaluation of fruiting populations, seed collection, transport, processing, drying, storage and packaging. A given batch of trainees will be composed of a maximum of 15 technical staff in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Trainer Course manual Program assessing guides Projector Field sites for visit
Training material: This is a specialised course which requires specialised forest tree seed literature. This course will be more focused on skill training and therefore literature focusing on the practical application shall be prioritised.	
<u>Examples on internet references:</u> Word Agroforestry Centre offers access to a platform: “Tree Seeds for farmers - A toolkit and reference source”: https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source Cambodia Tree Seed Project (CTSP) has published an excellent production: “FARMERS TREE PLANTING” which contains a comprehensive illustrated chapter seed collection and processing. https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf FAO has published an illustrated manual on seed collection, transport, storage and pre-treatment: <i>COLLECTION, STORAGE AND TREATMENT OF TREE SEEDS</i> . http://www.fao.org/docrep/006/AD226E/AD226E00.htm#TOC World Agroforestry Center has published an agroforestry guide <i>AGROFORESTRY EXTENSION MANUAL FOR KENYA</i> , which contains quality chapters on seed collection and seed procurement. http://www.worldagroforestry.org/Units/Library/Books/Book%2006/html/10.5_local_seed_collect.htm?n=112 The former Danida Forest Seed Centre (DFSC) and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceeding on seed biology and handling are available on the University of Copenhagen homepage. https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/ https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ Global Trees Campaign has published an informative check list: http://www.globaltrees.org/wp-content/uploads/2014/01/GTC-Brief-5-seed-collection-hi-res.pdf Others: http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/Robbins/F120b%20Guidelines%20for%20seed%20collection.pdf	

Table 7.

Course title: Farmers tree seed collection and practical seed processing
Duration: 1 day
Course objectives: Improve farmer groups’ seed collection through building awareness and skills in seed collection and handling at the collection site.
General description: Farmers, cooperatives and communities are collecting a significant share of tree seed used in Ethiopia. Seeds that are collected may be of low vitality or may treated wrongly resulting in reduced germination and quality. Seed procurement methods at the collection site can be improved through simple and easy means and basic awareness.

<p>The course will offer basic awareness and hands-on skills in tree seed handling and processing in the field. The target group is however large and widespread and therefore the training method will adapted to fit these realities. This is a very practical hands-on course.</p>	
<p>Learning outcomes: Awareness and skills in handling seed at the collection site.</p>	
<p>Specific course contents:</p> <ol style="list-style-type: none"> 1. Seed selection and collection 2. Field testing of seed vitality 3. Seed cleaning 4. Seed processing of dehiscent fruits, berry and drupe, cones 5. Seed drying of orthodox seed types 6. Germination tests in petri dishes and sand media of different tree species, recording and evaluation of germination. 7. Seed labelling 8. Seed temporary storing and packing for transport to seed centre. 	
<p>Methodology:</p> <p>The course will be offered for 2 days (6 hours a day) at the community sites and be very practical and hands-on. The different topic will be explained by flip-charts with drawings and pictures to forum aiming at 50 participants of people who have or will be involved in seed handling.</p>	<p>Resources:</p> <p>Course manual, Flip chart paper and stand Field sites for visit</p>
<p>Training material:</p> <p>This training is aimed at farmers, seed collectors and new staff at tree seed centres and seed merchants dealing with larger quantum of tree seed.</p> <p>It is intended as a generalised course to non-tree seed specialists. Therefore basic hands-on skills training shall prioritised. As many farmers are hired to collect tree seeds for private seed dealers as well as for the tree seed centres emphasis shall be placed on the how-to-do seed collection in practice, including from which trees and how seed are safely harvested and temporary stored.</p> <p><u>Examples on internet references:</u></p> <p>Cambodia Tree Seed Project (CTSP) has published an excellent production: <i>"FARMERS TREE PLANTING"</i> which contains a comprehensive illustrated chapter on seed collection and processing. https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf</p> <p>FAO has published an illustrated manual on seed collection, transport, storage and pre-treatment: <i>COLLECTION, STORAGE AND TREATMENT OF TREE SEEDS</i>. http://www.fao.org/docrep/006/AD226E/AD226E00.htm#TOC</p> <p>Global Trees Campaign has published an informative check list: http://www.globaltrees.org/wp-content/uploads/2014/01/GTC-Brief-5-seed-collection-hi-res.pdf</p> <p><u>Others:</u></p> <p>https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/</p> <p>http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/Robbins/F120b%20Guidelines%20for%20seed%20collection.pdf</p> <p>World Agroforestry Centre has published:</p> <p>http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/Robbins/F120c%20Seed%20processing%20and%20treatment.pdf</p> <p>Seed Processing Holland provides a technical manual presenting processing methods and tests with advanced equipment. https://www.seedprocessing.nl/en/17/200/general_information.html</p>	

World Agroforestry Centre offers access to a platform: *"Tree Seeds for farmers - A toolkit and reference source"*: <https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source>

The former Danida Forest Seed Centre (DFSC) and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceedings on seed biology and handling are available on the University of Copenhagen homepage.

<https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/>

<https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/>

ICRAF has published a booklet addressing seed processing and test. *"TREE SEED MANAGEMENT"*

<http://envis.nic.in/ifgtb/pdfs/Tree%20Seed%20Management.pdf>

Cambodia Tree Seed Project has also published a SEED TESTING GLOSARY:

<http://www.treeseedfa.org/uploaddocuments/IntroductiontoSeedTesting.pdf>

Table 8.

Course title: Seed lab operations	
Duration: 10 days (alternatively a 5 days highly intensive refresher course)	
Course objectives: Learn and refresh knowledge and skills in basic seed lab operations and basic processing.	
General description: Optimal seed lab operations is critical to undertake successful seed tests and germination experiments in seed labs. A well-functioning seed lab that is equipped with equipment, tools and tests methods is important for any tree seed centre providing quality seed. The seed lab operations involve sample preparation, moisture content, purity and seed weight determinations, carrying out seed pre-treatments and germination tests as well as vitality tests and seed health assessments. The course will deal with the state-of-the-art seed lab operation that are accepted by international standards.	
Learning outcomes: Basic seed testing is conducted for all fresh seed lots and periodical test is conducted for stored seeds	
Specific course contents: <ol style="list-style-type: none"> 1. State-of-the-art tools and equipment and their handling and use- micro-ovens, seed counters, germinators, desiccators etc. 2. Internationally accepted seed sample preparations for testing 3. Internationally accepted seed physical quality tests: seed moisture content determination protocols, seed weight determination protocols, seed purity determination protocols 4. Carrying out internationally accepted germination tests on tree seeds- big seeds vs tiny seeds, hard coated vs soft coated seeds 5. Carrying out internationally accepted tetrazolium test for tree seed viability assessment 6. Identifying seed health problems and treatment options. 	
Methodology: The course will be offered for 10 days by integrating theory and practical sessions. The theory will be offered for 2-4 hours every day in a spacious room equipped with a projector and other training materials. The practical will be offered for 4 hours every day in a seed lab equipped with the necessary facilities for seed testing. A given batch of trainees will be composed of a maximum of 15 professionals/ practitioners in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Trainer Course manual Program assessing guides Projector Tree seeds Germinator, Germination trays and petri dishes
Training material: General literature on agricultural seed laboratory operations may be of relevance. Specific information directed on tree seed labs. is only limited available at cost free platforms.	
<u>Examples on internet references:</u> World Agroforestry Center has published a safety guide for seed lab operations: http://www.worldagroforestry.org/products/grunew/downloads/ICRAF-Seed-laboratory-safety-manual.pdf https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ The former Danida Forest Seed Centre (DFSC) and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceedings on seed biology and handling are available on the University of Copenhagen homepage. https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/	

The Alberta Forest Service has published a paper on “Tree Seed Standards:
[https://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/formain15749/\\$FILE/seed-testing-standards-manual.pdf](https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/formain15749/$FILE/seed-testing-standards-manual.pdf)

Table 9.

Course title: Awareness, extension and public relations (outreach)	
Duration: 7 days (or 10 days with additional practical and product making)	
Course objectives: Learn how to produce tree seed extension and public relations materials and how to carry out successful outreach.	
General description: It is highly desirable that the awareness of the community in general and seedling producers on tree diversity and quality seed increases from time to time. Therefore, they should be reached through different media including social media, seed leaflets and brochure on seed properties of different tree species, how to grow them and where to grow them and their uses. This would create demand for seeds of diverse of tree species. The course will deal with awareness creation, extension and public relations tools.	
Learning outcomes: Increased awareness of the importance of using good seeds of diverse tree species	
Specific course contents: <ol style="list-style-type: none"> 1. Production of extension materials- seed leaflets, posters 2. Fundamentals of public relations 3. Public relations- (social media integrated) PR communication techniques. 	
Methodology: The course will be offered for seven days by integrating theory and practical sessions. The theory will be offered for 4 hours every day in a spacious room equipped with a projector and other training materials. The practical will be offered for 2 hours every day on production of PR materials, seed leaflets, posters, media shots and spots. A given batch of trainees will be composed of a maximum of 15 seed centre staff/managers and experts in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Trainer Course manual Program assessing guides Projector Computer Colour printer
Training material: This is a course on awareness and extension methodologies on the importance of using good quality seeds and planting material. Thus, the emphasis here shall be on literature that deals with awareness, extension, outreach methodologies, PR and communication in general. The training will subsequently apply the theory learnt on the task of sending messages of the importance of using quality tree seed. For this awareness, outreach and PR materials needs to be developed by the participants.	
<u>Examples on internet references:</u> The European Commission’s Intelligent Energy Europe programme has produced a kind of universal training manual on awareness raising http://www.eltis.org/sites/default/files/awareness_raising_communication_campaigns_6.pdf UNESCO has published a manual on principles of awareness raising: http://unesdoc.unesco.org/images/0014/001476/147637e.pdf	

Table 10.

Course title: Marketing and customer relation course	
Duration: 5 days	
Course objectives: Learn the basics of marketing for addressing customer needs for quality tree seed services.	
General description: It is highly desirable that the seed centre managers and sales staff deliver quality services to their customers. It all begins with collecting seeds from quality / certified seed sources, to packaging well processed, healthy and highly pure seeds with acceptable high germination rate, which generally can vary with species and seed sources and other unforeseen factors that result in varied germination rates. All the seed sold need to be packaged with the necessary details on seed source and lab test results. Customers need to be informed online on available seeds and their prices on various online platforms. There should also be a means through which satisfaction of the customers and feedbacks are assessed to improve services and address complaints. The course will deal with modern marketing techniques and customer.	
Learning outcomes: Ability to plan and apply sound marketing and communication strategies for high customer satisfactions.	
Specific course contents: <ol style="list-style-type: none"> 1. Marketing techniques- revenue generation, sales management 2. Marketing communications- social media and online communications 3. Customer service excellence- delivering quality customer service, guide for customer satisfaction surveys, complaint handling. 	
Methodology: The course will be offered for five days by integrating theory and practical sessions. The theory will be offered for 6-8 hours every day for four days in a spacious room equipped with a projector and other training materials. The practical will be offered for 1 day by arranging a visit to a business firm. A given batch of trainees will be composed of a maximum of 15 seed centre staff/ managers and sales personnel in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Trainer Course manual Program assessing guides Projector
Training material: Training material on general marketing and customer relation building will apply well to this course. The trainer must however ensure that the general principles are applied on relevant examples on tree seed during the course.	
<u>Examples on internet references:</u> Marketing training manual: https://energypedia.info/images/f/fd/It dg-marketingtrainingmanual.pdf Manual on Education Marketing and building customer loyalty: https://cdns3.trainingindustry.com/media/3188458/intrepid%20educationalmarketing.pdf Customer relation: https://www.onebusiness.ca/sites/default/files/MEDI_Booklet_Customer_Relationship_Management_Accessible_E.pdf	

Table 11.

Course title: Chain of custody seed documentation and monitoring	
Duration: 5 days	
Course objectives: Learn to set up professional chain of custody and seed documentation system.	
General description: Seed documentation is a crucial activity in seed service as seeds should not be distributed or stored without the accompanying relevant information, and therefore the database will be useful for subsequent planning and action. Currently seeds are inadequately labelled and registered. A proper chain of custody is necessary for seed centres to be viewed as professional and gain trust of customers. The course will offer knowledge and hands-on skill on essential leverage points in tree seed value chain.	
Learning outcomes: A strong tree seed documentation system and high customers trust on the quality of seeds under distribution.	
Specific course contents: <ol style="list-style-type: none"> 1. Developing formats and labels 2. Developing IT based database 3. Operating and maintaining database. 	
Methodology: The course will be offered for five days by integrating theory and practical sessions. The theory will be offered for 4 hours every day in a spacious room equipped with a projector and other training materials. The practical will be offered for 4 hours every day, partly in IT labs. A given batch of trainees will be composed of a maximum of 15 tree seed centre officers. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Trainer Course manual Program assessing guides Projector IT room
Training material: Basically, this is about Chain of Custody product systems. Much can be learnt from FLEGT and FSC Chain of Custody systems, which are mostly developed for wood products but the well tested principles can advantageously be applied to tree seed governance as well. This will be up to the trainer to construct such examples with tree seed as the product. However, there is also developed specific labelling and documentation systems for tree seed. They are referenced below. <u>Examples on internet references:</u> Word Agroforestry Centre offers access to a platform: <i>“Tree Seeds for Farmers - A toolkit and reference source”</i> : https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source University of Copenhagen offers a technical note on tree seed ordering procedures: https://curis.ku.dk/ws/files/20711494/tn61.pdf ; https://static-curis.ku.dk/portal/files/20712909/Chapter14 and https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ University of Copenhagen also offers a paper addressing seed labelling: https://ign.ku.dk/english/employees/forest-nature-biomass/?pure=files%2F20646143%2FTrade and transfer of forest seed	

Table 12.

Course title: Management
Duration: 8 days
Course objectives: Improve skills on management and adaptation to changing conditions in the business environment and customer make up.

General description: Management (beginner to middle level)	
Learning outcomes: Improved skill in general and basic management.	
Specific course contents: <ul style="list-style-type: none"> • Management theories and concepts principles of management, applying management theories at workplace • Planning- importance of planning, resource management planning • Personnel management and motivation factors, building effective and motivated workforce, effective communications, supervision of business operations • Leadership- strategic leadership, data-driven decision making 	
Methodology: The course will be offered for eight days (about 8 hours every day) in a spacious room equipped with sufficient computers, a projector and other training materials. A given batch of trainees will be composed of a maximum of 15 seed centre managers and experts in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Resource person(s) Course manual Program assessing guides Projector
Training material The Training Needs Assessment revealed a great need for basic management and business orientation in all their factettes. Regarding the training material it is found that there is already so much readily available material (manuals, guidelines and literature) on general management. The local training providers have demonstrated that they already have more or less ready-made training manuals on general management. It is concluded that these will be sufficient for this first management course.	

Table 13.

Course title: PC Professional Driving License	
Duration: 5 days	
Course objectives: Gain a better understanding of the use of MS office and browsers for tree seed service and beyond.	
General description: Currently the staff has none or inadequate skills in making registration and establishing databases in Microsoft Excel and Microsoft Access. They also have limited knowledge and obligations in obtaining information and knowledge from surfing the internet. The course will offer basic knowledge and skills to use MS office pack and browse internet and also upload information.	
Learning outcomes: Productive engagement of the tree seed officers in most functions at the tree seed centre.	
Specific course contents: <ol style="list-style-type: none"> 1. Data management in MS Excel 2. Data management in MS Access 3. Internet surfing and accessing tree seed databases 4. Introduction to Web surfing. 	
Methodology: The course will be offered for five days (about 8 hours every day) in a spacious room equipped with sufficient computers, a projector and other training materials. A given batch of trainees will be composed of a	Resources: Trainer Course manual Program assessing guides

maximum of 15 seed centre staff/managers and experts in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Projector Computers
Training material: The Training Needs Assessment revealed a need for confident pc use and the most common software applications. Training manuals for pc training is readily available at the training institutions and covers the need sufficiently. Further references references are therefore not necessary.	

Table 14.

Course title: Entrepreneurship/income generation	
Duration: 5 days	
Course objectives: Improve skills on entrepreneurship and income generation.	
General description: Entrepreneurship	
Learning outcomes: Improved skills in idea generation, identification of business opportunities.	
Specific course contents: <ul style="list-style-type: none"> • Entrepreneurship (what, why and how), • Business case planning • Profit-loss calculation • What is sustainable business • Customer relation building, • Income generation • PR and CSR 	
Methodology: The course will be offered for five days (about 8 hours every day) in a spacious room equipped with sufficient computers, a projector and other training materials. A given batch of trainees will be composed of a maximum of 15 seed centre staff/managers and the private sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	Resources: Resource person(s) Course manual Program assessing guides Projector
Training material: The training material for this course shall be both empowering and build skills and confidence. Below are three selected reference which exactly do that. Moreover, they also take departure in the context of developing countries. <u>Examples on internet references:</u> Deutsche Stiftung Weltbevölkerung has produced an excellent training manual which is very applicable to the Ethiopian context: <i>“Entrepreneurship Development Training Manual”</i> : https://www.dsw.org/uploads/tx_aedswpublication/ENTREPRENUERSHIP_TRAINING_MANUAL.pdf FAO has produced a likewise context applicable <i>“Business Training Manual”</i> : http://www.fao.org/3/a-at412e.pdf COMCEC offers a manual which is likewise focusing on the challenges in a developing country context: <i>“Training Manual on Entrepreneurship and Management of small businesses for Women”</i>	

Table 15.

Course title: Regional study tour
Duration: 7 days
Course objectives: Exchange experience and establish partnership with TSCs in the region.
General description: Exchange visits and partnerships need to be strengthened among tree seed centres in eastern and southern Africa as they operate under shared biophysical (natural vegetation, planted species and climatic types), socioeconomic and technological contexts. The staff of the tree seed centres have little or no experience in visiting and learning and sharing experiences with the tree seed centres in the region. The study tour will offer insights and hands-on skill on standard tree seed operations and will serve as a platform for greater partnership in the region’s tree seed sector.

Learning outcomes: Broader knowledge of TSC management and professional network and the role of private sector.	
Specific course contents: <ol style="list-style-type: none"> 1. Tree seed regulations and tree seed certification- tree seed related laws, seed sources and seed certification, seed quarantine 2. Tree seed system and management- actors in seed system, tree seed operations, seed sources, seed databases 3. Partnerships- exchange visits, project development options, germplasm exchange. 	
Methodology: The study tour will be organized by PATSPO or consultants engaged for that purpose, and the potential countries to visit are Tanzania, Rwanda, Uganda, Kenya. Tree seed centre managers and selected staff and experts will participate in the study tour.	Resources: Organiser Tour guide Publications and reports by host country
Training material: It is of outmost importance for a successful and maximal learning outcome of a study tour that the participants are well prepared. This can best be done by in advance providing literature focused on the specific technical contents of the programme. In addition, a discussion-day before departure addressing issues, dilemmas, ecological, cultural and governance differences and similarities with the Ethiopian challenges would elevate the learning platform and outcome of the study tour. Likewise, the tour could advantageously be concluded with a one-day seminar on what they have learnt and how it best can be implemented in the participants work context in Ethiopia. Consequently, training material can best be identified when the participants are identified and the tour programme made.	

Table 16.

Course title: International study tour	
Duration: 7 days	
Course objectives: Exchange experience and learn from others via building of forestry partnerships in the region for future professional cooperation at national strategic and policy level.	
General description: Visit other countries which have adopted techniques, policies and methodologies which may be of benefit for Ethiopian reforestation and forest sustainability in general.	
Learning outcomes: Strategic and sustainable forest management and the importance of forest policy and visibility in other country's macro-economy politics. Broder knowledge of the roles of trees and quality seed in sustainable forest management and climate change mitigation and adaptation.	
Specific course contents: <ol style="list-style-type: none"> 1. Seed bank management-germplasm collection, documentation and testing 2. Tree seed research- seed physiology, seed drying, longevity 3. Tree breeding 	
Methodology: The study tour will be organized by PATSPO, and the potential institutions to visit are for example The Millennium Seed Bank in London, Stellenboch University in South Africa. Tree seed centre managers, selected staff and experts will participate in the study tour.	Resources: Organiser Tour guide Publications and reports by host country Labs Seed sources
Training material: It is of outmost importance for a successful and maximal learning outcome of a study tour that the participants are well prepared and focused on which issues they want to investigated during the tour. As this is much a learning exercise for decision makers and high-ranking civil servants the preparation can include that the tour organiser jointly with the participants identify overall issues of strategic-, governance and political importance for the forestry and the tree seed sector. This may be further advanced into defining and describing dilemmas and specific strategic challenges to which the tour participants shall give their reflective recommendations to after completion of the tour. This is suggested to be in the shape of a one- day seminar giving central issues more discussion space and decide on how improvements can be implemented in Ethiopia.	

Outsourcing framework

Upon discussion with the client (PATSPo) and the identified service institutions a model for tender documents for “Request for Proposal” was developed, tested and adjusted

For public institutions the concept of responding professionally to Request for Proposals is still new and challenging. This is mainly because that besides it necessitates internal approvals and efforts, also requires cross-cooperation among technical- administrative- and financial departments within the service providing institution. PATSPo is in this matter spearheading a developing trend that is also coming to public institutions in Ethiopia. In that way PATSPo is promoting development in wider circles than the seed sector.

An example of an outsourcing framework is found in APPENDIX C.

Course delivery evaluation

A course evaluation method integrating the service providers and the participants opinions was also developed. The form is presented at APPENDIX D.

Evaluation of Proposals

The evaluation of the incoming proposals (responding to Requests for Proposal) is done on several criteria: Technical contents, competences and background of the lecturers in subject matter, the financial offer (total as well as individual entries) and suitability of venue and timing.

Experienced gained, is that especially the financial proposal needs to be controlled in detailed as calculations commonly contain serious omissions and errors. Another element is that the reasonability of individual entries needs to be evaluated. Examples on costs far beyond the ordinary as well as unsustainable low cost estimates have been observed.

The Evaluation Form is presented in APPENDIX E.

Training Plan 2018-21

A four-year training plan was developed on the basis of the findings and recommendations of the Capacity Needs Assessment, the PATSP Project Document and current capacity situation at PATSPo.

The Training plan is comprehensive and flexible. It groups and presents the training activities and specifies timing, number of participants, duration and potential service providers and venue of each individual course. For the short-term planning 2018 and 2019 the plan is detailed. For the longer-term 2020-21 it is more roughly-filled in. Many more activities shall be included in the 2020-21 detailed plan pending on the experience gained in 2018-19 and upcoming needs.

The Training Plan is found in APPENDIX F.

Training Coordination Tool

A prerequisite for successful outsourcing of many training courses is the firm and precise management of the various steps and phases in the outsourcing process. Several actions in terms of following-up, encouragement, observation of deadlines, responding to inquiry, technical and financial evaluation, declining letters need to be undertaken in addition to the preparation of new “Request of Proposals” and development of new courses.

Thus, a 2-page table is developed highlighting the key activities and dates, for the internal use of PATSPO.

The Training Coordination Tool is presented in APPENDIX G.

Training of Trainer

An outline for a practical five-day TOTs course for coming trainers for the proposed one-day “Farmer Seed Collection Extension” activity was developed. The TOT contains as specific real-life exercise as one of the days, is suggested to be the undertaking of the first “Farmers Seed Collection” activity, whilst the trainer and fellow new trainers are present and can give feed-back.

The outlines is presented in APPENDIX H.

Farmers Tree Seed Collection and Seed Processing

An extension package was developed and compiled: It contains a detailed extension activity description, a programme, list of relevant extension literature to study in advance, list of items and equipment to bring, two detailed supportive session guides with key questions and advise on structure as personal help to the extension worker and a budget proposal.

The package is presented in APPENDIX I.

4.0 CONCLUSION AND RECOMMENDATIONS

Outsourcing of training is a comprehensive affair and the administrative and technical backup is challenging and critical.

Service providers appear interested in undertaking training activities against payment and overhead. It is concluded that, service providers’ top management, generally acknowledges the system of preparing competitive proposals although they would, of course, rather directly be requested to undertake specific trainings. Especially, at the larger classic universities have difficulties in acknowledging that they are not automatically the obvious top choice for the client.

The biggest obstacles of outsourcing PATSPO training activities are seen as the service providers’ motivation and capacity to respond to requests for proposal, through proposal-making of acceptable quality. Furthermore, it is the consultant’s observation, that whether a service provider responds to a Request or Proposal or not, depends on whether an employee is personally motivated to take-up the task of making a project proposal, rather than it is a management that ensures that a proposal will be done and forwarded by the institution.

Email correspondence is still not a secure way of communication with service providers as emails sent to the institutions' official email addresses seems in several cases not to be handled and the requests and/or correspondence falls between chairs.

It is concluded that proposals' financial calculations commonly contain serious omissions and errors; favouring as well non-favouring of the service provider. Examples on costs far beyond the ordinary as well as unsustainable low cost estimates are also been observed. An observation is that service providers who had strictly adhered to the given tender and budget forms, without adding creative new entries in the tables, have less calculation errors, omissions and generally more reasonable budgets.

Eventually it is concluded that if the outsourcing process is well supported by PATSPO and well taken up by providers then the proposed activities will almost fill out all available time for training for the target groups for 2018. That means that there is hardly room for much additional capacity building.

It is of outmost importance that experiences gained in 2018-19 are compiled and analysed and lessons learnt are extracted, since these will be essential inputs to the 2020 training plan.

Eventually, it will be a demanding task internally for PATSPO to manage all the many ongoing and rolling outsourcings and it would need attention and be considered as a learning process for PATSPO as well.

Recommendations

1. **Apply a supportive coaching role towards service providers:** It is recommended that PATSPO applies a firm but active and supportive role in outsourcing. The client (PATSPO) needs to be more proactive than a client usually is. The service providers need reminders and following-up along with encouragement and feed-back. This goes both for their senior management and those trusted staff that have been assigned or taken up the assignment to make proposal or implement training. Verbal or face-to-face support works much better than email reminder, and is necessary.
2. **Firm administration and management of outsourcing:** It will be a learning challenge for PATSPO to handle and evaluate (technically, financially and request clarifications). It is therefore recommended that PATSPO carry out very precise and firm monitoring and following-up on the dates and activities given in the PATSPO TRAINING AND COORDINATION TOOL sheet, Appendix G.
3. **Training consultancy:** In late February there are many reminders. March-April 2019 are especially loaded with several functions, training invitations, evaluations of many proposals, preparation of new requests for proposal. July is loaded with many trainings and Training Consultancy assistance may be needed to assist in these matters, especially in March-April 2019.
4. **Apply supplementary alternative means when outsourcing is not successful:** The received proposal for Seed Source Establishment Course could not be approved. Three alternative options appear to be viable recommendations in the given situation:
 - a) Directly request the EEFR/CEE-FRC to undertake the course based on a given budget max, course description and other general terms. Conditions should not be more favourable than those for outsourcing, as it otherwise will undermine the outsourcing process).

- b) Arrange with a capable individual resource person who, as a contractor, undertakes the course package technically, practically and logistically.
- c) Arrange the course through PATSPO own arrangement, resources and some external teachers.
- d) A combination of the above, which will require more coordination and pressure on PATSPO's resources.

5. **Prepare Training Plan 2020 based on analysed experiences and review of service providers:** In the last quarter of 2019, and based on lessons learnt and needs, a detailed the 2020 PATSPO Training Plan has to be developed, possibly as a combined exercise with a review of the service providers.

Appendix A: ToR for the consultancy

Annex 1

(to Consultancy Agreement)

Provision of Adequate Tree Seed Portfolios (PATSPO) in Ethiopia, 2017-2020

TERMS OF REFERENCE

Coordination of training activities at PATSPO 2018, part II

1. BACKGROUND

Provision of Adequate Tree Seed Portfolios (PATSPO) to enhance productivity and resilience of Forest Landscape Restoration in Ethiopia is a project supported by a grant from the Government of Norway through the Norwegian International Climate and Forest Initiative (NICFI). The project is implemented by the World Agroforestry Centre (the International Centre for Research in Agroforestry - ICRAF) in close collaboration with the Ethiopia Environment and Forest Research Institute (EEFRI) under the Ministry of Environment, Forest and Climate Change (MEFCC), and other institutions working in the tree seed sector in Ethiopia. PATSPO is a four year project 2017 – 2020 based on an agreement between the Royal Norwegian Embassy in Ethiopia (RNE) and ICRAF.

PATSPO is designed to support Ethiopia in its ambitious programmes of forest landscape restoration with a commitment to restore more than 20 million ha of degraded forest landscapes within the next 20 years.

A major challenge of forest landscape restoration work is that it generally requires the use of planting material in large quantities of a broad spectrum of genetically diverse, healthy and productive tree species.

PATSPO addresses this major challenge by providing a multiple tree species programme able to provide:

1. organizational setup of the tree seed sector, including stakeholder identification and roles and responsibilities, based on a sector analysis;
2. species specific knowledge for most priority tree species;
3. a built up of the tree genetic resources for the future, comprising exploration, mobilisation, conservation, establishment, management and improvement; and
4. capacity to monitor and deliver quality seed and seedlings of multiple species required for large scale restoration.

PATSPO includes a substantial training and education component designed to provide capacity building for all major actors in the tree seed sector in Ethiopia. The primary focus of the training component is on the Tree Seed Technology Coordination of EEFRI (TSTC) and the four Regional Seed Centres, but also stakeholders from the public and private sector are targeted. The training component will include courses, fellow ships, study tours and workshops covering all technical aspects of the project.

Training and extension materials of all kinds within the overall scope of tree seed procurement will be prepared and made available in large numbers.

The consultancy will feed into output area number four mentioned above and focus on the preparation of an overall plan (2018-2021) for training courses done by the PATSPO staff, consultants and resource persons and –institutions in Ethiopia. Particular emphasis will be given to define and describe courses, which can be implemented by/outsourced to qualified institutions/universities and resource persons without too much involvement of PATSPO staff and international consultants, - this in order for PATSPO to provide a larger number of much needed training courses to its stakeholders.

Detailed information on training needs is available in the Training Needs Assessment Report, February 2018 and in the report on 'Coordination of Training Activities at PATSPO, Part 1'.

2. OBJECTIVE

The objective of the consultancy is:

'Technical and managerial qualifications of staff members of TSTC and the four PSCs (1. Priority) and of major stakeholders (2. Priority) upgraded leading to a well-functioning tree seed sector providing larger quantities of quality seed in support of forest landscape restoration and other tree planting efforts in Ethiopia'

3. METHOD OF WORK

The consultant and selected resource persons from PATSPO will work as a team following the TOR and guidance from the Project Management Team. The consultant will discuss the TOR and the Training Needs Assessment Report with the STL and PI in Copenhagen before leaving for Ethiopia, in order to identify focus areas for training courses to be included in the overall plan for training courses.

While in Ethiopia, the consultants and PATSPO resource persons will visit selected training institutions, research institutions and universities to assess management capacities and technical capacities within the technical areas of relevance for PATSPO training courses to be outsourced to Ethiopian institutions.

A briefing meeting will be held with the PATSPO staff in Addis Ababa in the beginning of the consultancy, where the TOR will be discussed and the itinerary for the consultancy finally decided upon. A debriefing meeting will be arranged at the end for the consultancy to present their

preliminary findings and conclusions for comments by the PATSPO staff. When back in Copenhagen the consultant will present findings for discussion with the STL and the PI before the report is drafted.

4. OUTPUTS

Three major outputs will be produced:

- i) A short description of the identified courses for implementation by PATSPO and for outsourcing to Ethiopian institutions.
- j) An assessment of selected training institutions, research institutions, universities and resource persons, which/who potentially can targeted for outsourcing of PATSPO Training courses.
- k) A more detailed description of the courses to be implemented including a time plan for 2018-2021 describing which institution is responsible for the different courses, where and how the courses will be implemented (training methodology), target group, number of participants, etc.
- l) A general presentation of what training material required for the individual courses.
- m) Models for possible agreements between PATSPO and the institutions doing outsourced training courses.
- n) Assist in organizing, participate in and assess selected courses implemented in 2018.

Output a) and b) relate to the first and part of the consultancy (Part 1, already undertaken), whereas c) to f) primarily relate to the second part of the consultancy (Part 2).

5. ACTIVITIES

The activities of the consultants will include, but not necessary be limited to:

- a) Outline short description of PATSPO training courses PATSPO 2018-2021, - outsources courses and 'in-house' courses.
- b) Identify, visit and asses training institutions, research institutions and universities for capacity to undertake outsourced PATSPO training courses.
- c) Prepare s draft plan for PATSPO training courses 2018-2021, in-house and outsource courses. .
- d) Prepare a general description of potential training material for the different courses with references to existing material available.
- e) Prepare outline for agreements/contracts for outsourcing training courses.
- f) Overview, assist in and assess the implementation of outsourced training courses in 2018.

6. STAFFING AND QUALITICATIONS

One consultant from UCPH and one resource person from PATSPO will form the consultant team.

The consultant from UCPH will be Mr. Arvid Sloth, who has a forestry background and substantial experience and knowledge on tree seed procurement from many years of practical work and research at Indochina Tree Seed Programme (2000-2005) in Cambodia. In addition, Arvid Sloth has

considerable educational experience from many years working with the Forestry College in Denmark and experience on policy development processes from a number of countries.

Arvid Sloth prepared the Training Needs Assessment Report for PATSPO in February 2018 and undertook the first part of this consultancy in June 2018.

The resource person from PATSPO to be identified.

7. TIMING AND DURATION OF THE ASSIGNMENT

The consultancy will be implemented in two parts, the first was the full month of June 2018 of which 4 to 22 in Ethiopia. The second part is for five weeks in August - September 2018 of which 2-3 weeks will be in Ethiopia. The remaining time of the two periods will be spend in Denmark for preparation and reporting. The possibility for third visit will be considered and decided upon following part 2.

8. REPORTING

The consultant will prepare: i) a report holding outputs a) and b); ii) a report holding outputs c) to f) and iii) a brief 'debriefing report' for each visit (see appendix 1).

The consultant will present and discuss the contents of the reports with the PATSPO PMT before departure from Ethiopia, and submit a draft report to PATSPO no more than 10 days later. PATSPO will provide comments to the report within one week after receiving the draft and the consultant will submit the final report one week later.

A note on general requirements (including quality) and guidelines for travel (BtO) and consultancy reports to PATSPO annexed to the TOR.

9. SUPPORT FROM PATSPO

PATSPO will support the consultant and the resource person in technical, staffing and practical matters, as well as in organizing itinerary, meeting plan, booking hotels and domestic flights. Relevant background - and other information will be made available. When in Addis Ababa the consultant will work from the ICRAF Office at the ILRI Compound.

PATSPO, August 2018

Provision of Adequate Tree Seed Portfolios (PATSP0), 2017-2020

General requirements and guidelines for travel and consultancy reports

The guidelines below apply to staff of PATSP0 and consultants recruited by or through PATSP0 unless otherwise agreed upon.

General guidelines

PATSP0 consultants should submit a debriefing note to PATSP0 before the end of the stay in Ethiopia, and usually also a technical report as specified in the Terms of Reference (TOR) for the consultancy.

Debriefing note

The debriefing note is a short, typically 2-4 page note. The debriefing note should be submitted to PATSP0. Any further distribution of the report will be carried out by PATSP0 and must not be done by the consultant without prior agreement.

The debriefing note should contain:

- Purpose and background of consultancy with reference to TOR in annex.
- Achievements: degree of fulfilment of TOR (outputs produced), the course of the consultancy with reference to itinerary and persons met in annexes, any problems encountered and possible specific observations related to the consultancy.
- Follow-up: outstanding work to be done by the consultant (with reference to any deadlines in TOR), or PATSP0, and possible recommendations for additional work with relevant reference (justification) to achievements.
- General observations (optional): possible general observations and recommendations related to the project and the context of the project.

Technical reports

Technical reports can be reports covering a single well-defined technical discipline, *e.g.* infrastructure, equipment, seed source identification, seed collection/climbing, seed extraction, seed testing, seed documentation; or reports covering several disciplines, often for planning purposes, *e.g.* baseline surveys, integrated strategies, project implementation plans, seed research plans.

Reports from training courses shall include the course programme, a list of training materials used, a list of trainees, an evaluation of the achievements as considered by the participants as well as the consultant, and suggested follow-up. The evaluation should include an assessment of (i) the performance of the trainees, (ii) the quality of the training material and (iii) the need for follow-up. If considered appropriate by the consultant the debriefing note and the training course report may be combined into one.

The specific requirements of each technical report in terms of contents and deadlines for submission will usually be specified in the terms of reference. Reports must be submitted in hard-copy as well as

electronic format. All rights to the outputs delivered will belong to PATSPO and the project unless otherwise agreed.

All sources of information and documentation shall be indicated and well described (literature, interview, etc.).

Often a draft report should be submitted to the project before the departure of the consultant from the project.

The cover of such reports should include the following information:

- Draft consultancy report
- Title of consultancy
- Period of consultancy
- Name of consultant (and other contributors)
- Title of project

The following standard phrase should be included in the colophon or the introduction of the report: The present report is a draft consultancy report prepared for the project. The draft is subject to review by PATSPO before finalisation.

Reports will be finalised (as final draft or final report) by the consultant according to comments and instructions given by PATSPO.

The final report will be published by PATSPO with a cover as above will contain the following standard phrase: The present report is a consultancy report prepared for and reviewed by PATSPO.

PATSPO, May 2018

Appendix B: Consultant's schedule

23 August- 14 September 2018

16-22	Preparation of training tendering documents and	11	Organising and analysing information collected. Making email and telephone reminders for more information. Planning additional visits.
23-24	International travel	12	Evaluation of received proposals. Debriefing notes and debriefing. Adjustments in tables. Selection of Service providers.
25-26	Week-end	13	Inspection of Unity University's Training Camp facilities in Geferesa
27-28	Contacting and re-sending the pre-pared training proposal/tender packages to service providers.	14	Travel day
29-31	Searching, reviewing and classifying training material suitable for all planned courses.	15-16	Weekend
01-02	Week-end	16-17	Developing Training Plan and Action Plan
03	Briefing by PATSPO management. Replying to inquiries by service providers.	On-going	Supporting PATSPO operation from home base.
04-05	Training Plan 2018-21 preparation. Searching, reviewing and classifying training material suitable for all planned courses.		
08-09	Week-end		
10	Researching available training material for courses.		

29 October – 20 November 2018

24-26	Preparation of training tendering documents and	08-09	Capacity building in training coordination for key ICRAF/PATSPO staff involved in training coordination
29	International travel	10-11	Weekend
30	Introduction to assignment. Participation in ICRAF meeting with international research representatives. Preparation for workshop input and presentation at PATSPO Workshop	12-	Developing Farmers Seed Collection and Processing extension Package. Reviewing revised training proposals from services providers.
31	PATSPO Workshop with stakeholders. Participation and contribution.	13-16	Update PATSPO TRAINING PLAN 2018-21 Preparation of invitations of proposals for 8 (+4) courses in 2019 to 19+ Service Providers. Develop Training Coordination and Planning detail and when/what to do detailed list Nov 2018-Dec 2019. Further refinement of Farmer Extension package.
01-	Searching, reviewing and classifying training material suitable for all planned courses.	17-18	Weekend re-cap on training coordination, closing loose ends.
01-07	Following up on ongoing training, evaluating incoming training proposals from service providers. Clarifying technical and economic issues in proposals. Requesting budgets and proposals.	19-26	Preparing debriefing note. International travel. Followed by report preparation.

Appendix C: Tender material for Request for Proposal (an example)

Invitation to prepare training course proposal for ICRAF/PATSPO

Dear Sir/Madam

Your institution has been identified as a potential service provider for delivering of training courses to ICRAF/PATSPO (Provision of Adequate Tree Seed Portfolios).

We are therefore pleased to invite you to the first round of competitive training proposal preparation. We do hope that your institution is still interested and will organise for the filling-in and returning of the attached forms.

For a justified comparison and to provide equal opportunities for service providers PATSPO has set-up a procedure for submission and assessment of training proposals. The procedure is simple and comprises the return of duly filled-in training forms A-E returned timely to the PATSPO. Forms and details are given in the attachment to this e-mail. Please fill in the forms and return them to PATSPO **before 01 June 2019**.

The proposal forms are requested returned to:

Ms. Sime, Mekdes
Project Management and Outreach Officer, ICRAF-Ethiopia
Email: M.Sime@cgiar.org
Tel. +251 116 172 000

PATSPO will subsequently evaluate the received proposals from three training institutions and likely enter into a contract with the institution, which has made the most favourable proposal, for the implementation of the training course.

We look forward to receiving the forms and wish you the best of luck.

Kindly confirm that you have received this email.

Yours sincerely,

Kiros Meles Hadgu
Scientist/Country Representative ICRAF
Project Director
Provision of Adequate Tree Seed Portfolios (PATSP0)



ICRAF Ethiopia Office, c/o ILRI Campus, Gurd Shola, P.O. Box 5689,
Addis Ababa, Ethiopia

T: +251-11 617 2000 ext. 2491
M: +251 930 105 748
E: K.Hadgu@cgiar.org or kirhadgu@gmail.com
Skype: kirhadgu

Soren Moestrup
Senior Team Leader
Provision of Adequate Tree Seed Portfolios (PATSP0)



ICRAF Ethiopia Office, c/o ILRI Campus, Gurd Shola, P.O. Box 5689,
Addis Ababa, Ethiopia

Direct Email: smoe@ign.ku.dk ;
Mobile: +251 90 568 7089; Mobile: +45 22 27 76 27

Training Course Proposal Forms

Service providers will have to carefully fill-in the forms in order to be considered for providing training services to ICRAF/PATSPO.

PATSPO thereafter evaluates the offers and intends to enter into a contract for the implementation of the specific training course, with the institution which has made the successful offer.

TITLE OF COURSE: **"AWARENESS RAISING AND OUTREACH COURSE"**

(AS PRACTICAL WITH FOCUS ON THE TREE SEED SECTOR)

COURSE DESCRIPTION-SYLLABUS

An overall guiding course description is outlined in the box below. This is the result of training needs assessment undertaken.

In addition, the training institution will develop detailed programmes, session guides, exercises and handouts.

Course title: Awareness, extension and public relations (outreach)	
Duration: 7 days	
Participants: 15 pax	
Course objectives: Learn how to produce tree seed extension and public relations materials and how to carry out successful outreach.	
General description: It is highly desirable that the awareness of the community in general and seedling producers on tree diversity and quality seed increases from time to time. Therefore, they should be reached through different media including social media, seed leaflets and brochure on seed properties of different tree species, how to grow them and where to grow them and their uses. This would create demand for seeds of diverse of tree species. The course will deal with awareness creation, extension and public relations tools.	
Learning outcomes: Increased awareness of the importance of using good seeds of diverse tree species	
Specific course contents: 4. Production of extension materials- seed leaflets, posters 5. Fundamentals of public relations 6. Public relations- (social media integrated) PR communication techniques.	
Methodology: The course will be offered for seven days by integrating theory and practical sessions. The theory will be offered for 4 hours every day in a spacious room equipped with a projector and other training materials. The practical will be offered for 2 hours every day on production of PR materials, seed leaflets, posters, media shots and spots. A given batch of trainees will be composed of a maximum of	Resources: Trainer Course manual Program assessing guides Projector Computer Colour printer

15 seed centre staff/managers and experts in the tree seed sector. A prior evaluation of trainees will be carried out so that their training needs are properly identified and met.	
<p>Training material:</p> <p>This is a course on awareness and extension methodologies on the importance of using good quality seeds and planting material. Thus, the emphasis here shall be on literature that deals with awareness, extension, outreach methodologies, PR and communication in general. The training will subsequently apply the theory learnt on the task of sending messages of the importance of using quality tree seed. For this awareness, outreach and PR materials needs to be developed by the participants.</p> <p><u>Examples on internet references:</u></p> <p>The European Commission's Intelligent Energy Europe programme has produced a kind of universal training manual on awareness raising http://www.eltis.org/sites/default/files/awareness_raising_communication_campaigns_6.pdf UNESCO has published a manual on principles of awareness raising: http://unesdoc.unesco.org/images/0014/001476/147637e.pdf</p>	

PARTICIPANTS: Participants are not yet finally selected. They will be selected from Regional Tree Seed Centers, Forest Research Center, other partner organisations and also from a number of private companies dealing with tree seed. The majority of the participants may have a Certificate/Diploma/BSc background and a few of participants will have a MSc degree and yet other few ones will have a diploma/certificate background. Participants will be those who need to know the more advanced knowledge of seed development and reaction to environmental factors. Some of the participants have already have participated in other week courses dealing with tree seed management.

DEADLINE FOR RETURNING OF FORMS: 01. June 2019.

PATSPO will be reviewing received proposals on an ongoing basis. Thus, invited service providers are requested to complete and filled-in the forms as soon as possible.

To be considered for implementing training courses PATSPO needs to have received the attached forms (Training forms A -E) duly filled-in by the given deadline. PATSPO will select a service/training provider shortly after the expiration of the deadline.

MODE of APPLICATION

All duly filled in forms A – E shall be forwarded in PDF format to the ICRAF/PATSPO Office in Addis Ababa, see contact details below.

PROPOSAL QUALIFYING FOR SELECTION.

- All the attached forms A-D must be fully and correctly filled-in and timely returned. No other terminology or slots than these given in the attached forms will be considered
- Favourable quality-price ratio.
- Teaching and learning quality convincingly elaborated.
- Logistically arrangement (course conduction, accommodation, meals, transport) convincingly explained and elaborated.

- Accounting procedures observed.
- Availability to the preferred time.

PATSPO is not bound to accept any proposal, and reserves the right to annul the selection process at any time prior to Contract award, without thereby incurring any liabilities.

PREFERRED TIMING FOR CONDUCTING THE COURSE: 01- 07 August 2019

Although PATSPO has given a time preference for conduction of the course, PATSPO is well aware that the training institutions also have their own programmes to attend to as well as busy periods. PATSPO will therefore do whatever possible to accommodate other timings as well. Thus, a proposal which gives another time slot than the one preferred by PATSPO, may yet have a fair chance to qualify.

EVALUATION

The course organizer shall forward course evaluations immediately upon completion of the course. The participants', the course organiser's and PATSPO own observations form the basis for PATSPO's evaluation and with that the basis for the final payment (Ref. Training Form F.)

CONTACT

All correspondence in relation to this proposal shall done to:

Ms. Sime, Mekdes
Project Management and Outreach Officer, ICRAF-Ethiopia
Email: M.Sime@cgiar.org
Tel. +251 116 172 000

TRAINING FORM A.

FACT SHEET

Course title:	
Course venue:	
Number of participants:	
Time for execution:	
Name and contact (tel./email) of person having the overall responsibility for the course (one person representing the service provider):	
Name and contact (tel./email) of person having the training and learning responsibility:	
Name and contact (tel./email) of person having the financial responsibility on behalf of the service provider (only one person):	

TRAINING FORM B.

PROPOSED TRAINING PROGRAMME, specified to days and hours, for the course named: _____

PROPOSED TRAINING PROGRAMME, specified to days and hours, for the course named:

[illegible]

TRAINING FORM C.

KEY TRAINERS' QUALIFICATIONS

Name	Position	Education	Specialty	Years of teaching experience

TRAINING FORM D.

BINDING BUDGET. PART I				
	ITEM	UNIT COST	No. OF UNITS	SUB-TOTAL, - BIRR
LECTURING				
Fee preparation & planning				
Trainer fee				
Trainer subsistence allowances				
Training materials				
Transport field				
Sub-total				
FACILITIES				
Training room rent				
Group rooms				
Equipment rent				
Pick-up and transport of participants				
Sub-total				
OVERHEAD¹				
Sub-total				
TOTAL				

BINDING BUDGET. PART II				
	ITEM	UNIT COST	No. OF UNITS	SUB-TOTAL, - BIRR
PARTICIPANTS				
Per diem ²				
Meals provided ² (specify BF and/or lunch and/or diner)				
Coffee & Tea (no. of services)				
Accommodation ²				
Sub-total				
OVERHEAD¹				
Sub-total				
TOTAL				

GRAND TOTAL³	
--------------------------------	--

Explanatory notes:

¹ Overhead: Overhead is acceptable but will of course weigh towards the overall costs evaluation. Overhead consists of service fees, coordination fees, administrative costs, course organisation and set-up etc.

² It is recommended that to the total per diem and related costs (meals & accommodation) will be set at a level corresponding to the course holding institution's own rates.

³ PATSPO may decide to accept the budget partially or in full and/or direct required changes.

The grand total can never be exceeded when requesting final payment after the course has been implemented. Any need for diversion of the main budget lines (the sub-totals) of more than 20% requires PATSPO written pre-approval, before alterations can be executed.

We, the undersigned, offer to provide the stated training services in accordance with your request for proposals. We also understand that you are not bound to accept any proposal you receive.

Overall course responsible.

Name, date and signature: _____.

TRAINING FORM E.

PAYMENT REQUEST

Advance and final payment will be paid as soon as possible upon satisfactory delivery. Payment is aimed to take place within two weeks of approval of satisfactory delivery.

ADVANCE PAYMENT	
Advance payment is needed (0-50%. YES/NO	
State reason for need of advance payment.	
Advance payment requested in BIRR. A maximum up to 60% may be accepted.	
Name, position and contact on the training institution's financial responsible.	
Full Banking details for potential advance payment and for the final payment	

The service provider will, invoice PATSPO for the grand total, reduced for the received advance. The invoice should be sufficient itemized, detailed and transparent to give PATSPO opportunity to process the payment.

Appendix D: Training Evaluation Form.

COURSE EVALUATION

- The course organizer is obliged to request all the participants to fill out a course evaluation form at the last day of the course. The evaluation forms should be scanned and forwarded to PATSPO to the contact address, not later than 3 days after course completion.
- PATSPO also invites the course organizer to compile his/hers own evaluation impressions in a separate note to be forwarded along with the evaluation forms.
- As an integrated part of the PATSPO quality assurance the PATSPO staff or external independent hired specialists may observe in full or selected parts of each training course, (all costs of the observer is covered directly by PATSPO).

Course Topics (write topic names in chronological order below)	Relevance (rank from 1-5 – Five is highest)	Quality of training including hand-outs and exercises (rank from 1-5 – Five is highest)	Learning outcomes and ability to apply the newly acquired skills and knowledge (rank from 1-5 – Five is highest)	Participant's comments
Topic				
Topic				
Topic				
Topic				
Topic				
Topic				
Topic				
Topic				
Topic				
Topic				
Course facilities	Satisfaction (rank from 1-5 – Five is highest)	Participant's comment		
Accommodation quality				
Training room				
Meals				
Transport				

Appendix E: Evaluation form Training Proposals

Preliminary Evaluation of Received Training Proposals with deadline xxx.xxxxx 2018 –
For internal use only.

Name of course: xxxxxx (xxx days training and xxx participants)				
Bidding Institutions	Professional Contents and qualifications	Compare and dates on RFPs and the Proposal	Budget	Clarification required/suggestions

Conclusion: xxxx

Recommendation (Including argumentation) (3-10 lines): xxxx

Appendix F: Training Plan 2018-21

Course Title		PATSP O tailor Y/N	Syllabus outline ¹ N/Y- Table	Durat ion days	Location	No. Participan ts	Participant category	Service Providers ²	2018												2019				2020 ³				2021 ³							
Training Needs Assessment									3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Q1	Q2	Q3	Q4	Q1	Q2
Survey and Assessment of Service Providers									Consultant																											
Preparation of tender material, calls for bidding and evaluation of offers and training									Consultant																											
Biology and Ecology Training																																				
Intro Seed Biology	Y	Y	Y	5	ILRI, Addis	22	RTSC, CEE-FRC, Seed officers	UCPH																												
Intro Seed Physiology	Y	Y	Y	5		20	RTSC, CEE-FRC, Seed officers	UCPH																												
Intro Seed Propagation	Y	Y	Y	5		20	RTSC, CEE-FRC, Seed officers	UCPH																												
Natural Vegetation & Species distribution	Y	Y	Y	5		20-25	Managers + tech. staff+private sector	Addis Uni. EBI																												
Seed Biology (general + focus on tree seed)	Y	Y	Y	5	Region	20	RTSC, CEE-FRC, EEFR, TRC, private	Haramaya Uni. EBI																												
Seed Technical Training																																				
Seed Source Description	Y	na.	Y	5	A RTSC, CEE-FRC	3	RTSC, CEE-FRC Seed officers	UCPH																												
Seed Source Establishment & dev.	Y	Y	Y	8	Region	15	Managers+tech. staff-private sector	PATSCO (Wondogenet)																												
Seed Collection, Transport, Processing, Storing	Y	Y	Y	7	Region	15	Managers+tech. staff-private sector	Wondogenet Uni./EEFR/FRC																												
Farmers Seed Collection and field processing	Y	Y	Y	1-2	Multiple villages	50	Farmers engaging in seed collection	PATSCO, RTSC, CEE-FRC																												
Seed Lab Training and Knowledge Exchange	Y	Y	Y	6	Bahir Dar S.C.	6	New seed lab staff from Mekelle Seed Center	Exchange																												
Seed Lab Operations	Y	Y	Y	5	(FRC)	15	Seed lab heads and key staff	Haramaya Uni. (PATSCO)																												
Management Training																																				
PC Prof.Driving License	(Y)	Y	Y	5	Addis	15	Staff of RTSC, CEE-FRC's and private seed firms	Unity Uni. EMI, St. Mary Uni.																												
Management Training	(Y)	Y	Y	8	Region	15	Managers, Planners, Officers with mgt. potential	Unity Uni. EMI, St. Mary Uni.																												
Awareness/Outreach Training	Y	Y	Y	7 (-10)	Addis/Region	15	Officers, Secretaries	Unity Uni., PATSCO																												
CoC /Seed documentation, monitoring	Y	Y	Y	5	Region	20	techn. staff, private sector	EBI, PATSCO																												
Entrepreneurship/Income generation	(Y)	Y	Y	5	Region	15	Private sector, RTSC, CEE-FRC officers	EMI, Unity Uni., St. Mary Uni.																												
Marketing and CRM	Y	Y	Y	5	Region	12	Staff in sale and marketing	EMI, Unity Uni., St. Mary Uni.																												
Cross-cutting Training																																				
Exchange Tour among RTSCs	Y	Y	Y	14	RTSC, CEE-FRC	Average (12)	Hawassa & Amhara RTSC, CEE-FRC	PATSCO																												
Regional Study Tour	Y	(Y)	Y	7	African region	15	Officers, staff and private sector	PATSCO																												
International Study Tour (UK)	Y	(Y)	Y	7	Africa	12	Decision makers and politicians	PATSCO																												
Workshops: Lessons learned	Y	Y	Y	1	Addis	25	Key staff, decision makers, customers, private	PATSCO																												
Notes:																																				
¹ Course description/Syllabus from Training Consultancy June 2018																																				
² Service providers are listed in order of preliminary quality evaluation																																				
³ Detailed plan will be prepared on the basis of experience gained in 2018-19																																				

Appendix G: Training Coordination Tool

PATSPO Training Coordination and Planning. Covering the Period Nov. 2018 – Dec. 2019

Course title	Action done and when	S. Mekdes Column. Selected institution/contact person	Costs and advance	S. Mekdes' Column Reminder	Deadline for Submission	Timing/venue for the training	S. Mekdes' Column Invitations/following -up deadlines for PATSPO	Comments
PC course	Invitations to Unity Uni., St. Mary, Emi July 2018	St. Mary, Dean Mr. Tedla tedla_haile@smuch.edu.et	186,000		6. Sept. 2018. Proposal received and accepted (among others)			Course successfully conducted in October 2018. Evaluation sheets not received.
Intro Seed Physiology	Invitations send	PATSPO/Lars Smith UCPH				12-16 Nov. Suba Forest-Addis 2018	Done	
Intro Seed Propagation		PATSPO/Lars Smith USPH				10-14 Dec. 2018		
Management Course	Invitations to Unity Uni., St. Mary, Emi July 2018!	Unity University/ Unity uuextraining@gmail.com Selamawit Abera Director, Executive Training Program	175,505		6 September Proposal received and accepted (among others)	21-28 January 2019 Uni's training centre 30 km west for Addis	Yes – Contract received. 15 Nov. 2018 confirm dates and sign contract Invitations + reconfirmation with service provider: 1 dec. 2018	
Seed source establishment, development and Mgt.	Invitations July 2018 Hawassa - Wondogene t	Wondogenet. Zebene Asfew zebeneasfaw@gmail.com Amara Tesfya at7206@gmail.com	Under revision (ref appendix 1.). Revision not received as per deadline 12 Nov. 2018		01 Nov 2018 (extended to 12 Nov. due to many required	5-10 March 2019/Wondogene t	Budget requested revised. Ref. direction appendix A. Invitations + potential reconfirmation with service provider if	NB: This course needs to be re-tendered in one way or another.

Course title	Action done and when	S. Mekdes Column. Selected institution/contact person	Costs and advance	S. Mekdes' Column Reminder	Deadline for Submission	Timing/venue for the training	S. Mekdes' Column Invitations/following -up deadlines for PATSPO	Comments
					budget changes)		revised budget is ok: 15 January 2019	
Seed Biology Course	EBI + Haramaya	Haramaya Uni/Mr. Amara Kebebe (amarekebede@gmail.com)/Mr. Ayle AKuma/Kibebew Kibret	Been under several revision. Now approved at XXX. 15 Nov. Decline letter to EBI		01.Nov 2018	Haramaya Uni/6-10 May 2019	Budget approved. 15 Nov 2018 . Request for contract Invitations + reconfirmation with service provider: 1 April 2019 .	55% budget advance.
Seed Source Establishment	PATSPO	PATSPO /Karsten				27 Nov – 1 Dec. 2018	Karsten will notify participants	
Farmers Seed Collection and processing	PASPO + Centres	PASPO + Centres	Extension Package/guidance developed Girma, Arvid		Multiple	Field	Multiple	
Entrepreneurship and income generation	Unity/EMI	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		5 Dec. 2018	15.12. 2018	25 Feb-01 March 2019	If proposal accepted - Invitations and reconfirmation with provider by 15 January 2019 .	Request for Proposals sent on 09.11.2018
Seed Lab operation	Haramaya EBI	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest. 018		19. Feb. 2019	01.03.2019	08-12 April 2019	If proposal accepted - Invitations and reconfirmation with provider by 05 March 2019	Request for Proposals sent on 13.11.2018
Seed collection, transport, processing, storing	Wondogenet EEFR/IFRC (PATSPO)	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		19. Feb. 2019	01.03.2019	20-26 May 2019	If proposal accepted - Invitations and reconfirmation with provider by 15 April 2019	Request for Proposals sent on 13.11.2018
Marketing and CRM	Unity/Emi	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		19. Feb. 2019	01.03.2019	10-14 June 2019	If proposal accepted - Invitations and reconfirmation with	Request for Proposals

Course title	Action done and when	S. Mekdes Column. Selected institution/contact person	Costs and advance	S. Mekdes' Column Reminder	Deadline for Submission	Timing/venue for the training	S. Mekdes' Column Invitations/following -up deadlines for PATSPO	Comments
							provider by 15 April 2019	sent on 13.11.2018
Natural vegetation and species distribution	Addis Ababa/ EBI	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		19. Feb. 2019	01.03. 2019	01-05 July 2019	If proposal accepted - Invitations and reconfirmation with provider by 15 May 2019	Request for Proposals sent on 13.11.2018
PC professional driving licences	St. Mary Uni	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		19. Feb. 2019	01.03.2019	08-13 July 2019	If proposal accepted - Invitations and reconfirmation with provider by 15 May 2019	Request for Proposals sent on 13.11.2018
Chain of Custody/seed documentation	EBI/PATSPO	Call for proposal sent 13-14 Nov. 2018 + following-up by phone on reception and interest.		19. Feb. 2019	01.03.2019	22-26 July 2019	If proposal accepted - Invitations and reconfirmation with provider by 15 June 2019.	Request for Proposals sent on 13.11.2018
Awareness and outreach course	Unity Uni, St. Mary, EMI		Arvid has sent file for Request for Proposal to Mekdes on 13 Nov 2018 to be sent out on 01 March 2019	20. May 2019	01.06.2019	01-07 August 2019	Send request for Proposal on 01 March 2019 If proposal accepted - Invitations and reconfirmation with provider by 15 June 2019	Request for proposal not sent but prepared and shall be sent 01 March 2019
PLANNED COURSES STANDING BY AND PENDING ON EXPERIENCE GAINED IN 2019								
Management Training	Unity	Pending on success of the first. Call for proposal for the second not send		01. March 2019- RFP		June 2019	Pending lessons learnt from first time	
Seed collection, transport,	Wondogenit + EEfri	Pending on success of the first. Call for proposal for the second not send		01. Sept. 2019- RFP		November 2019	Pending lessons learnt from first time	

Course title	Action done and when	S. Mekdes Column. Selected institution/contact person	Costs and advance	S. Mekdes' Column Reminder	Deadline for Submission	Timing/venue for the training	S. Mekdes' Column Invitations/following -up deadlines for PATSPO	Comments
processing, storing								
Regional study tour	PATSPO					August 2019		
International study tour	PATSPO					(April) 2019		

Outline for Training of Trainers for Farmers Seed Collection Extension Activities PATSPO

Participants: 15 participants, interested in Extension activities, from the Regional Tree Seed Centres and CEE-FRC.

Objective: Train a small cadre of seed officers to carry out extension activities, with particular focus on undertaking the “Farmers Tree Seed Collection and processing” extension activity.

Venue: At a RTSC. e.g. in Bahir Dar.

Duration: During December-January. 5 days.

Preparatory organising work: A farmers meeting with 25 seed collecting or interested farmers has to be pre-arranged to take place on the fourth day.

Participants’ home work in advance: The participants must read, understand and reflect upon and thus be very familiar with the below listed literature before the training.

- A Guide to Seed Quality. (PATSPPO 2018).
- FARMERS TREE PLANTING”, Chapter 3, which contains a comprehensive illustrated chapter seed collection and processing. (Cambodia Tree Seed Project).
https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf
- Seed Collection and Handling Manual (Eshete, G./PATSPPO).
- Tree Seeds for Farmers - A toolkit and reference source” chapter 8-9. (ICRAF).
<https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source>.

Day and time	Subject
Day 1.	General extension methods and the importance of conveying messages the most effective ways
Day 2.	Assess the Extension Programme for the Farmers Tree Seed Collection Extension activities. Select and prepare methods suitable to the different topics of the Farmers Tree Seed Collection Extension activity
Day 3.	Refine the preparation of the Farmers Tree Seed Extension Activity.
Day 4.	Execute the Extension in real life. Different participants take responsibility for the different parts of the program
Day 5.	Reflection on the fourth day and identify areas for improvement. Make action plan what to next.

FARMERS TREE SEED COLLECTION AND PRACTICAL SEED PROCESSING

An extension worker's training guide

This package consists of:

1. Activity Description (including objectives, methodology, literature)
2. Planning steps
3. Program outline
4. Session guides
5. Example on approvable budget
6. Three sets for key literature for the extension worker to be very familiar with:
 - Seed Collection and Handling Manual, Chapter 1-2. (Eshete, G. /PATSPPO)
 - FARMERS TREE PLANTING", Chapter 3, an illustrated chapter on seed collection and processing. (Cambodia Tree Seed Project).
https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf
 - Tree Seed for Farmers - A toolkit and reference source" chapter 8-9. (ICRAF).
<https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source>

1. ACTIVITY DESCRIPTION

Title: Farmers tree seed collection and practical seed processing
Duration: 1 day
Course objectives: Become aware of the practical basics for tree seed selection, field testing of seed vitality, collection, cleaning, drying, processing and temporary packing for transport.
<p>General description: Farmers, cooperatives and communities are collecting a significant share of tree seed used in Ethiopia. Seeds that are collected may be of low vitality or may be treated wrongly resulting in reduced germination and quality.</p> <p>Seed procurement methods at the collection site can be improved through simple and easy means and basic awareness.</p> <p>The course will offer basic awareness and hands-on skills in tree seed handling and processing in the field. The target group is however large and widespread and therefore the training method will be adapted to fit these realities. This is a very practical hands-on course.</p>
Learning outcomes: Better seed collection and field processing by farmers.
<p>Two sessions:</p> <p>9. Seed collection</p> <ol style="list-style-type: none"> a. Good quality b. Mother tree selection c. Harvesting techniques and safety d. Temporary storage <p>10. Seed handling</p> <ol style="list-style-type: none"> e) Field testing of seed vitality f) Cleaning g) Practical seed processing (de-pulping/de-winged)

h) Packing and labelling	
<p>Methodology: This is an extension activity and will be offered for 1 days (two sessions of 2 hours each) at the community sites and be very practical and hands-on. The different topic will be explained by flip-charts with drawings and pictures to forum aiming at 50 participants of people who have or will be involved in seed handling.</p>	<p>Resources: Flip chart paper and stand Mini-technical posters</p>
<p>Training material: This training is aimed at farmers, seed collectors and new staff at tree seed centres and seed merchants dealing with larger quantum of tree seed. It is intended as a generalised course to non-tree seed specialists. Therefore, basic hands-on skills training shall prioritised. <u>The best mean to that will be through the use of examples and demonstration.</u> As many farmers are hired to collect tree seeds for private seed dealers as well as for the tree seed centres emphasis shall be placed on the how-to-do seed collection in practice, including from which trees and how seed are safely harvested and temporary stored.</p> <p><u>Examples on internet references:</u> Cambodia Tree Seed Project (CTSP) has published an excellent production: “<i>FARMERS TREE PLANTING</i>” which contains a comprehensive illustrated chapter on seed collection and processing. https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf</p> <p>FAO has published an illustrated manual on seed collection, transport, storage and pre-treatment: <i>COLLECTION, STORAGE AND TREATMENT OF TREE SEEDS</i>. http://www.fao.org/docrep/006/AD226E/AD226E00.htm#TOC Global Trees Campaign has published an informative check list: http://www.globaltrees.org/wp-content/uploads/2014/01/GTC-Brief-5-seed-collection-hi-res.pdf</p> <p><u>Others:</u> https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/Robbins/F120b%20Guidelines%20for%20seed%20collection.pdf World Agroforestry Centre has published: http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Further%20reading/Robbins/F120c%20Seed%20processing%20and%20treatment.pdf Seed Processing Holland provides a technical manual presenting processing methods and tests with advanced equipment. https://www.seedprocessing.nl/en/17/200/general_information.html Word Agroforestry Centre offers access to a platform: “<i>Tree Seeds for farmers - A toolkit and reference source</i>”: https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source The former Danida Forest Seed Centre (DFSC) and the Forest & Landscape Denmark have posted multiple of free publications, articles, lecture notes and technical notes and proceedings on seed biology and handling are available on the University of Copenhagen homepage. https://ign.ku.dk/english/outreach-publications/publications/previous-publications-series/ https://sl.ku.dk/rapporter/forest-landscape-books-leaflets/ ICRAF has published a booklet addressing seed processing and test. “<i>TREE SEED MANAGEMENT</i>” http://envis.nic.in/ifgtb/pdfs/Tree%20Seed%20Management.pdf Cambodia Tree Seed Project has also published a SEED TESTING GLOSARY: http://www.treeseedfa.org/uploaddocuments/IntroductiontoSeedTesting.pdf</p>	

2. PREPARATORY PLANNING STEPS & CHECK LIST

Trainer's technical and practical preparation.

1. **The Extension Worker's Technical baggage:** The Trainer will consult the session guides (below) and the key literature listed above (and attached) and become confident in the subjects. The extension trainer must prepare the sessions in detail. This includes which messages to convey, when and how. It also includes preparing flip-charts giving central messages and last but not least be very familiar with the knowledge elaborated in the following easily accessible literature:
 - A Guide to Seed Quality. (PATSPPO 2018).
 - FARMERS TREE PLANTING", Chapter 3, which contains a comprehensive illustrated chapter seed collection and processing. (Cambodia Tree Seed Project).
https://www.treeseedfa.org/doc/Manual_English/Chapter31TreePlantingTechniques.pdf
 - Seed Collection and Handling Manual (Eshete, G./PATSPPO).
 - Tree Seeds for Farmers - A toolkit and reference source" chapter 8-9. (ICRAF).
<https://www.worldagroforestry.org/output/tree-seeds-farmers-toolkit-and-reference-source>.

2. Planning

- Identify site. Preferably the extension activity will take place outdoor and in the field in or next to a seed source.
- The Trainer must plan systematically and well in advance through an annual plan with fixed dates and location (Woreda and Kebele). Locations should be decided on the basis assessment of availability of species in demand (i.e. which species seed are needed in the coming years).
- Set number of participants to 25.
- Process budget request to PASPO at least one month in advance and jointly for 3 separate Farmer Seed Collection Extension Activities.

3. Notification of community on date and venue.

The activity will cover farmers already involved in seed collection as well as potentially interested farmers from 1-2 Kebeles.

This is a technical extension activity and unnecessary administrative procedures shall be limited as much as appropriate. Therefore, use the most effective and least bureaucratic methods to approach and invite the farmers.

4. Preparation of logistics

- Transport (Seed Center Vehicle)
- 25 sets of stationery (notepads and pens) for participants
- 30 sets of lunch sandwiches/water/tea & coffee
- Flip chart/white board

3. PROGRAMME

FARMERS TREE SEED COLLECTION AND PRACTICAL SEED PROCESSING

Venue: On location in the selected Kebele

1-day activity/25 farmers

Objective: Improved quality seed collection by farmers, through awareness of the practical basics for tree seed selection, seed vitality, collection, cleaning, drying, processing and temporary packing for transport. This aims to make farmers/communities interested in and able to collect and handle good quality seed and take part in seed collection activity.

Time	Subject
<u>Morning Session</u> 9:00-9:30 am	Registration and Welcome
9:30-10:00	Introduction of trainers, participants and programme and objectives
10:00	<ul style="list-style-type: none">• “What’s in it for me” (income generation, better trees for households, environmental protection)• Importance of good quality tree seed• Selection of species, stands and mother trees• Availability of species and stands suitable for seed collection, in the Kebele
10:30	Short tea break (10 min)
	<ul style="list-style-type: none">• Seed collection techniques<ul style="list-style-type: none">○ Harvesting time and methods○ Safety○ Short-term protected storage in the field
01:00- 2:00 pm	Lunch break
<u>Afternoon Session</u> 2:00 – 4:00 pm	Field testing of seed vitality by cutting <ul style="list-style-type: none">• Practical seed processing<ul style="list-style-type: none">○ Cleaning, depulping, de-winging○ Pod drying/seed drying○ Field seed extraction methods• Packing and labelling• Temporary storage• Species in demand• Discussion of potential cooperation and establishment of cooperatives• Closing

4. SESSION GUIDE:

- These session guides are for the tree seed extensionist only and meant as a help for them to plan the details.
- **Material to bring from the Tree Seed Centre:** Flip chart + stand or white board + The Coloured PATSPO Seed Extension Posters, the + locally made seed processing material (buckets, sacks, jars, seed labels for farmers, extraction tools). 25 sets of PATSPO notebook and pen.

Trainers Guide for Morning Session – SEED COLLECTION

Subject	Key point to address	Method
Introduction of participants and trainers	Request the participants to inform whether they have experience in seed collection.	Small talk
“What’s in it for me”	<p>Explain the scope for income generation and for selection of good seed for planting at households.</p> <p>Give examples on successful seed collection practises and income generation from elsewhere.</p> <p>Convey a success story on how participation in seed collection has helped household’s economy via seed cooperatives.</p> <p>Stronger community cooperation and management and protection of their seed source.</p>	An open and frank presentation
Importance of good quality tree seed	<p>Demonstrate and explain the 7 points for good quality seed.</p> <p>Provide an example for each of these 7 points for quality seed.</p> <ol style="list-style-type: none"> 1. Seed collected from minimum 25 unrelated mother trees (explain the work “unrelated” with easy understandable examples) 2. Seed produced by outbreeding (opposite to inbreeding). 3. Seed with normal shape and without pest and diseases 4. Seed with good germination ability (demonstrate cutting test and difference between viable and nonviable seed) 5. Seed with good storability (explain briefly why some seed has more and others less storability. Categorise the seed found the particular area in terms of storability) 6. Species/provenance matching planting site 7. Inherited traits (explain inheritance in relation to planting purpose) <p>Also explain poor quality seed and the consequences of using them.</p>	Story telling with examples and demonstration
Selection of species, stands and mother trees	<p>The Seed Centre does only buy seed from agreed species from approved seed source/locations.</p> <p>Explain the reasons for and importance of mother tree selection and that they are unrelated.</p> <p>Seed collection stands/sites: Should be accessible, healthy, attributes and trees of good appearance (stem, branching habit, foliage).</p>	Explanation and examples
Availability of species and stands suitable for seed	<p>Discussion of availability of species availability in the Kebele.</p> <p>Trainer presents an overview (a list) of species in demand, maybe as a flip-chart showing the species names.</p> <p>Inform about the use and importance of different relevant and needed species.</p> <p>Make a list on flip-chart on the availability.</p>	Information and investigative discussion

collection, in the Kebele		
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Trainers Guide for Afternoon Session – SEED HANDLING

Subject	Key point to address	Method
<p>Practical seed processing</p> <p>Cleaning, depulping, de-winging</p> <p>Seed extraction methods</p> <p>Pod drying/seed drying</p>	<p>Introduce the objective of processing.</p> <p>Introductory processing techniques as relevant for the specific species in the area.</p> <p>A short demonstration of seed processing of some of the available species in the area (material and seed made ready in advance). For demonstration only use processing material/equipment <u>locally available</u>.</p> <p>A handful of fruits/seeds of local species would be necessary for the demonstration.</p> <p>The demonstration can show cleaning, de-pluping, de-winging, drying and extraction, pending on the local seed availability.</p> <p>An important message is that drying shall not be under direct sunlight and ventilation is required.</p>	<p>Small presentations follow-up by demonstration and question-answer session</p>
<p>Packing and labelling</p> <p>Temporary storage</p>	<p>Give and show examples of packaging.</p> <p>Ventilated cotton sacks, jars with open lid.</p> <p>Labelling in accordance to the Seed Center's instructions (local species name, collection time, collection place, name of collector).</p> <p>Storage shall always be in a dry and ventilated place. Also explain the storage disadvantages for seed vitality.</p>	<p>Demonstration and explanation.</p> <p>Drawing of good storage place.</p>
<p>Species in demand</p>	<p>Inform the Seed Center's species and quantity demand and explain that demand, may vary from year to year, both in species priority and quantity.</p> <p>Open floor discussion on which species can be supplied from the area.</p>	<p>In advance make a flip chart or a hand-out of desired species</p>
<p>Discussion of potential future cooperation with the Seed Centre and establishment of cooperatives</p>	<p>Open floor discussion on potentials and challenges in seed collection.</p> <p>Discussion on species that pose special challenges in seed collection.</p> <p>Convey some indication of payment levels for different kind of processed seed including payment for the packaging material.</p> <p>Information on that government budgets can be irregular and pick-up and payment of collected seed therefore can be delayed.</p> <p>Screening of interested farmers.</p> <p>Agreement on next step.</p>	<p>Discussion and information</p>
<p>Closing</p>	<p>Ask someone to say some words on what he/she has learnt today.</p>	

5. BUDGET SUGGESTION FOR AN AVERAGE “FARMERS TREE SEED COLLECTION AND PRACTICAL SEED PROCESSING” EXTENSION EVENT

The budget procedure is to request PATSPO for the approval of the financial advance minimum one month before the first extension activity is planned to take place. It is suggested to refer to this example of an approvable budget.

To minimise administrative procedures, it is furthermore recommended to at the same time request for approval for 3 subsequent Farmers Tree Seed Collection Extension for activities to take place within a 3 months period. The total budget request will then accumulate to 26.865 Birr.

No.	Expenditure title	Unit	No. of units	Unit price	Total price (ETB)
4	Fuel for TSC vehicle	liter	50	18	900
5	Per diem: trainer & driver	Birr	3	400	1.200
	Per diem participants	Birr	25	200	5.000
6	Lunch(sandwich)	No.	30	80	2,400
7	Tea & coffee	No.	30	5	150
8	Water (1/2 liter)	No.	60	7	420
			TOTAL		10.070

Note. In special cases with long distances and more connected extension activities, which will require staying overnight far away from Seed Center per diem for accommodation of trainers can be considered added.

6. KEY LITERATURE

The four sets of key literature are enclosed for your ready reference.

- FARMERS TREE PLANTING”, Chapter 3.
- Seed Collection and Handling Manual, Chapter 1-2.
- Tree Seed for farmers 8-9. (ICRAF).



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