Baseline Assessment and Gap Analysis of Systems for Training Extension Workers and Delivering Extension Services to Farmers

Prepared by Coffee Quality Institute
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1. Baseline Assessment of Systems for Training Extension Workers and Delivering Extension Services to Farmers

The agricultural extension service is often described as the “dissemination and use of improved agricultural technology and management practices.”1 More broadly, it can be viewed as a tool for agricultural development. Generally, an agricultural extension service can serve – but is not limited to – three goals:

- Achieving national food security
- Improving rural livelihoods
- Improving natural resource management

Traditionally, agricultural extensions have been divided into two categories: extension and advisory services. Extension consists of educational programs that extend the work of universities and research institutions into farming communities, while advisory services relates to educational activities managed by Ministries of Agriculture.

A variety of agricultural extension system types exist, depending on the context. These are most commonly grouped into:

- Technology transfer models. The conventional transfer-of-technology models are the top-down and feedback models. In the top-down model (i.e., research – extension – farmer), technology transfer is a one-way process where technologies developed by researchers are passed on to extension services to be transferred to users. The weakness of this model is that it does not involve farmers in identifying the constraints and adapting the research to local conditions.
- Participatory extension models. This model puts the farmer at the center. It aims to strengthen a farmer’s capability to cope with a changing environment, to solve his/her problems and to take informed decisions. This requires extensionists with a different and challenging expertise and skill set, which goes beyond simple knowledge of “how to grow a crop”
- Market-oriented extension models. These models encourage the switch from traditional production-driven farming systems to ‘market and profit-driven farming’. It involves helping farmers learn how to identify and implement appropriate managerial action to help improve their farming businesses.
- Non-formal education/extension models. Under these models often the freedom and choice of the subject matter is left with producers. This means that the curriculum is not fixed, but varies according to the needs identified by the producers in the training session. The extension agent leverages the producer’s local expertise and experience and allows knowledge flow.

All system types are functional and serve specific purposes. In the context of coffee production usually a combination of the last three models (participatory, market-oriented and non-formal) have been implemented to a relative degree of success. Farmer Field Schools (FFS) are a good example of such combination. Using the FAO definition, ‘A Farmer Field School brings together a group of farmers, livestock herders or fisherfolk, to learn on how to shift towards more sustainable production practices, by better understanding complex agro-ecosystems and by enhancing ecosystem services. A FFS group meets regularly during a production cycle, setting up experimentation and engaging in hands-on

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1 Swanson and Rajalahti, 2010
learning to improve skills and knowledge that will help adapt practices to their specific context. The FFS empowers individuals and groups to move towards more sustainable practices and improve livelihoods.\(^2\)

1.1. A Brief History of Agricultural Extension in Timor-Leste

Coffee production was introduced during the Portuguese colonial times. The Portuguese had a stronger preference for establishing large coffee plantations, and by the end of the colonial period (1975), around 45 percent of the coffee exported from Timor-Leste was grown on large plantations.\(^3\) The establishment of a plantation system saw the rise of labor practices that included forced cultivation of cash crops, forced labor, illegal recruitment, and starvation wages.\(^4\)

Agricultural extension in Timor-Leste began during the Indonesian period (1975-1999).\(^5\) During this time, the country had an extensive network of extension officers tasked to deliver technical advice, as well as the provision of inputs and other market-related services. Indonesian authorities promoted and implemented agricultural extension based on technology transfer models, specifically the “training and visit” model.\(^6\) Under this model, extension officers would employ different strategies to engage with farmers. As part of the service, producers would often receive free inputs for their crops.

The main focus of the extension service was both food security and cash crops. Extension officers could use up to three different technology transfer models:\(^7\)

- **Group training**: This model was used mainly for cash crops. Groups were formed with the support and oversight of the chefe suco (head of the suco). The extension officer would be in charge of setting the agenda, planning the activities, and leading the group to grow and increase production of a particular cash crop (i.e., coffee).
- **Person to person**: This model was used mainly for food security programs and other ad-hoc activities, most of which happen on the farm. This model was identified as the most successful model to introduce change and innovations on farms.
- **Door-to-door**: This is a household approach used for a diversified livelihood strategy, comprising both food security and cash crop farming. Considering that time is a constraint for multiple members of the household, these engagements would happen mainly on mornings and evenings.

Traditionally, each extension service officer was responsible for a particular geographical area that generally coincided with the geographical boundaries of the suco. The extension officer was usually selected within these boundaries. He or she was a member of the community, spoke the local language, and was familiar with the local traditions and customs. The officer would not only be a member of the community, but would gradually become an expert of a particular geographical area and would develop specific skills to run the suco accordingly.\(^8\)

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\(^2\) FAO, *Global Platform for Farmer Field Schools*
\(^3\) Oxfam, ‘Overview of the coffee sector in Timor-Leste,’ 2003
\(^4\) Oxfam, ‘Overview of the coffee sector in Timor-Leste,’ 2003
\(^5\) Policy Framework for Agricultural Extension in Timor-Leste, 2008
\(^6\) National Agricultural Extension Manual (NAEM), Timor-Leste, 2011
\(^7\) National Agricultural Extension Manual (NAEM), Timor-Leste, 2011
\(^8\) From meeting notes with Fernando Santana, Director of DNCPI, and Juliao dos Santos, Coffee Director DNCPI
From several conversations with local stakeholders, it seems there are mixed feelings about the effectiveness of the Indonesian agricultural extension. On the one hand, it seemed that the extension service was efficient, effective, and reasonably well-funded. On the other hand, the service has also been criticised for being extremely hierarchical, with a strong top-bottom approach. It is believed it was an instrument to oversee and control the local population, and that it served only one purpose: increase overall production. This seems to be in line with Indonesia’s overall marketing strategy around coffee: “Extract income through the quantity of cheap coffee they could purchase for forward sale.”

1.2. Timor-Leste National Agricultural Extension After Independence

When Indonesian occupation came to an end, Timor-Leste was under the transitional administration of the United Nations Transitional Administration in East Timor (UNTAET), which established the Ministry of Agriculture Forestry and Fisheries (MAFF). At the time, MAFF was a skeleton structure and had no provision for extension at the local level, nor for vocational or technical education. The previous extension service was abandoned, and UNTAET did not allocate a budget to publicly fund agricultural extension service in the country. On the contrary, it was believed that the extension service could be funded by the private and non-profit sector.

After restoration of independence in 2002, the new Government of Timor-Leste planned to build on private extension services, based on input supply and marketing. However, it soon recognized that the private sector lacked the necessary bandwidth to respond to the needs of local farming communities. In the meantime, agricultural production decreased further due to a deterioration of agricultural knowledge and skill, as well as the availability of farm inputs and machinery. In response, the Ministry (now christened the Ministry of Agriculture and Fisheries, or MAF) decided to establish a national extension service program in 2007. The national extension service is currently positioned under the Director General of Agriculture and within the National Directorate of Agricultura, Horticultura and Extensão (see Chart 1 below).

Today, MAF is organized so that in each municipality, the municipal agricultural offices have local officers for each of the main disciplines (i.e., agriculture, irrigation, livestock, forestry, fisheries, and agribusiness, which includes coffee). In addition, at the administrative post level, there are 65 extension coordinators responsible for supervising the suco extension officers (SEO) in their respective administrative posts. There are 442 SEOs, nominally one for each suco, providing general agriculture advice to farmers.

The national extension service was developed and funded with the support of EU-funded projects, specifically the Rural Development Programs (RDP II and RDP IV). The system is founded on a few basic principles (see Chart 2) and performs several tasks (see Chart 3).

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9 From meeting notes with Fernando Santana, Director of DNCPI, and Juliao dos Santos, Coffee Director DNCPI
10 Oxfam, ‘Overview of the coffee sector in Timor-Leste,’ 2003
11 National Agricultural Extension Manual (NAEM), Timor-Leste, 2011
12 Tomak, ‘Market System & Value Chains Assessment,’ 2016
13 Tomak, ‘Market System & Value Chains Assessment,’ 2016. Please note that in conversation with the Director General of Agriculture, Horticulture and Extension, it seems that today there are only 300 SEOs.
14 National Agricultural Extension Manual (NAEM), Timor-Leste, 2011
Chart 1. Organizational structure
At the suco level, extension workers are responsible for a relatively large area and are expected to provide support for a full range of crops and other agricultural products, including coffee. As is often the case, resources and support provided to extension workers can be scarce and below desired levels. When this occurs, priority is often given to food crops, a necessary condition to guarantee food security.

As in most countries where coffee production occurs, public extension service usually relies on one individual (extension worker) to cover a large variety of crops within a specified area – usually referred as village or community. Although not ideal, this set-up is usually driven by lack of necessary funds to
employ more extension workers, reduce their crop focus and/or their geographical area of responsibility. What seems to be different from the norm in Timor Leste is the existence of the National Directorate of Coffee and Industrial Plants (DNCPI). The Directorate currently employs a number of coffee professionals with a considerable amount of coffee production expertise and know-how. DNCPI staff are involved in the training of extension workers in all matters concerning for example coffee nursery management, coffee seedlings production and planting.

Chart 4. DNCPI structure

Made up of 31 Dili-based staff and seven municipality-based staff, this department, located under the General Director for Forestry is partly responsible for delivering some of the tasks outlined below, which refer to Director of Forestry:15:

- Support in the formulation of policies, programs, and plans related to forestry, environment conservation, industrial plants and biodiversity, and coffee
- Coordinate the execution of policies, plans, and programs related to forestry, conservation, coffee, and industrial plants
- Develop environmental standards in respect to forestry and watersheds
- Ensure the conservation of the country’s biological diversity to promote the sustainable management of natural environment, coffee, and industrial plants
- Promote the integration of environmentally sustainable practices within forestry, coffee, and industrial plants
- Promote the implementation of deterring mechanism against deforestation and soil degradation within local farming communities
- Support in the formulation of an integrated soil management strategy that prioritizes recuperation and conservation of biodiversity
- Elaborate weekly, monthly, quarterly, and annual reports

15 Jornal da Republica, Serie I nr. 23
Program Overview

In 2016, DNCPI launched a coffee renovation and rehabilitation program. The program aims to target about 21,000 hectares (Ha) of coffee, mainly cultivated by smallholder producers. Part of the program consists in providing producers with the necessary technical assistance and tools to renovate and rehabilitate their coffee trees. The program also provides producers with cash incentives to cover the costs associated with renovating and rehabilitating coffee trees. The program is made on a voluntary basis, and any household willing to participate – regardless of plot size and ownership – can enroll in the program and access its services.

Upon enrolment, households receive training from extension workers stationed in that particular suco. It is the responsibility of the extension workers to make sure households receive adequate training and are supported throughout the process. The trainings are based on basic renovation and rehabilitation strategies, which include planting, pruning, composting, and terracing when applicable. When planting, new seedlings are planted next to old trees, and when the new plant starts bearing fruit, the older one is finally uprooted. The benefit of this system is that it allows households to minimize production loss during the early stages of newly planted trees. Provision of basic tools include shears, machetes, and chainsaws\(^\text{16}\).

Under this program, each household can determine the portion of their coffee trees they intend to renovate – no matter how small. However, technical assistance, materials, and cash incentives are only available for two consecutive years. After that, if the household wishes to continue renovating and rehabilitating, it will do so at its own expense.

DNCPI targets to renovate and rehabilitate about 500 Ha per year. This means that it will take over 40 years to renovate and rehabilitate the targeted 21,000 Ha. It is clearly a very long-term program, and DNCPI has shown concerns over how effective the program can really be. Typically, households show little interest in farm maintenance beyond what was done during the program activities. Despite the program being in its early stages, there is also growing concern that household have low adoption rates of improved agricultural practices.

1.3. International Cooperation and Publicly Funded Projects

Under the Rural Development Program (RDP IV), a complete Strategy for the Training of Extension Workers and for the Implementation of Extension Campaigns on Coffee was developed. The strategy provides some key important insights on which systems of extension and training have been developed recently in the country. The strategy focuses both on how to develop competence and technical expertise among agricultural extension workers and how they will in turn train producers across all coffee-producing municipalities\(^\text{17}\).

The training manual contains four modules:

1. **Rejuvenation and pruning**, which includes:
   a. Determining pruning area

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\(^{16}\) Based on conversations with DNCPI staff, it seems that tools provided for the renovation and rehabilitation activities remain under the property of DNCPI.

\(^{17}\) RDP IV, strategy for the training of extension workers and for the implementation of extension campaigns on coffee, p4, 2016.
b. Pruning methods
c. Use of firewood
d. Shade control
e. Organization of trainings
f. Monitoring of pruning practices

2. Seedling production and planting, which includes:
   a. The importance of coffee seedling production in a nursery
   b. Nursery life-cycle
   c. Nursery dimensions
d. Building a nursery
e. Compost making
f. Filling polybags
g. Seeds
h. Seedling propagation
   i. Irrigation
   j. Cleanliness and phytosanitary requirements
   k. Nursery diversification
   l. Nursery management

3. Farm management, which includes:
   a. Soil preparation
   b. Planting
c. Fertilization
d. Soil erosion control
e. Weed management
f. Shoots management
g. Phytosanitary control
   h. Shade management and diversification
   i. Annual calendar

4. Harvest, processing, and storage, which includes:
   a. Harvesting
   b. Coffee processing in Timor-Leste
c. Processing phases
      i. Separating floaters *Separação de “café bóia”*
      ii. Pulping
      iii. Fermentation
      iv. Washing
      v. Drying
d. Storage

RDP IV also developed four simplified training manuals that cover each of the modules described above. These manuals are intended to be distributed and shared with producers.
1.4. Current Private Sector-Led Coffee Extension Models

If at the national level coffee extension services are minimal, within the private sector, there have been significant efforts in developing systems of extension services to support farmers in production, productivity, and market linkages.

1.4.1. Cooperativa Café de Timor (CCT)

CCT is an important supply chain commercial stakeholder and is considered to be running the most structured farmer training program in the country, with a team of 32 agronomists and a network of about 162 trainers\(^1\). As a membership-based organization composed of 16 primary organizations, CCT can rely on its members delivering all of (or at least part of) their entire coffee production – strictly in the form of cherries. This means that all farmer programs focus mainly on pre-harvest practices, rather than post-harvest practices. CCT heavily invested in the establishment of two farms (for Arabica) – one on flat land and the other on a slope – and uses these two farms to hold farmer trainings on pre-harvest best practices.

The modules of CCT’s pre-harvest trainings, outlined in their own Organic Coffee Production Manual\(^2\), are:

- **Prepara fini café** (Coffee seedlings)
- **Prepara fini ba viveirus** (Setting up a coffee nursery)
- **Prepara plantasaun ba café** (Land preparation)
- **Manutensaun ba café oan nebe kuda** (Plantation maintenance for newly planted trees)
- **Prosesu Halo Kompos** (Compost making)
- **Manutensaun ba plantasaun café** (Coffee plantation maintenance)
- **Prevene pesti no moras café ho Sistema organiku** (Organic systems for prevention of pests and diseases)
- **Etape Ku’U Café** (Coffee harvesting and processing)
- **Kualidade Café** (Coffee quality)

CCT is also known for having built a composting program for its members. Since wet mill operations are centralized, the pulp is collected at the wet mill and mixed with coffee husk. At a later stage, CCT distributes the compost back to its farmers so that they can individually collect it and apply it on their trees.

As a result of their training efforts, between 2012 and 2016 CCT claims to have led the rehabilitation of about 15,673 Ha of trees and renovated about 105 Ha\(^3\). At the moment, CCT is running quite an extensive renovation and rehabilitation program that aims to reach 3,000 households per year across multiple coffee municipalities (including Aileu, Ainaro, Ermera, Liquica, and Same). Households that are interested in participating in this program receive technical support from project staff, planting materials, and free tools. The model aims to have each household rehabilitate up to one quarter of their farm every year for four years. The expectation is that technical support will be available only on the

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\(^1\) From Coffee Small Survey Data, MAF/ ADB
\(^2\) *Livru Manual Produsaun Café Organiku*, 2009
\(^3\) From *Coffee Small Data Survey*, ABD
first year, and the project has developed a basic training package of good agricultural practices on
demonstration plots that are managed directly by CCT staff.\footnote{There are 280 project staff.}

The training package covers a comprehensive coffee rehabilitation program that involves pruning
mature coffee trees and overgrown trees to facilitate reproductive growth. CCT is promoting a modified
Beaumont-Fukunaga Vertical Pruning System. It also includes a training package on the use of organic
composting to increase soil fertility. For renovation, the training package promotes the planting of new
seedlings that are provided free of charge to households. Seedlings are sourced through a network of
over 400 nurseries that are outsourced to private entrepreneurs.

Overall, CCT over the years has developed a robust training package for its own extension officers. An
important component that perhaps could be further explored is around CCT’s training methodology. It
seems that the methodology is founded on principles of participatory and market-oriented extension
models. However, more can be learned on what is the structure of a training session, what
visual/practical aids are being used during the session, and what systems of monitoring and evaluation
are implemented.

\subsection*{1.4.2. Parc Interpeople’s Cooperation (PARCIC)}

With a strong focus on promoting people’s cooperation and fair-trade practices, PARCIC established
operations in Timor-Leste in 2002. Its mission is to support people achieving self-reliance through fair
trade and direct exchange. PARCIC supported the establishment of a smallholder farmer cooperative
called COCAMAU located in Maubisse.

PARCIC counts on 3 training staff who are delivering training to about 500 farmers in Ainaro and Ermera
municipalities. Training sessions focus on good agricultural practices, which include:

- Planting
- Pruning
- Soil management
- Coffee processing
- Organic farming
- Financial management

Training manuals have been developed specifically for wet processing, nursery management, and coffee
tree maintenance manual (pruning and cut-back). Trainings are usually delivered in a group format.
Most rehabilitation and renovation activities are done on a selected demo plot made available by
members of the community. A community nursery was established in 2006, but after 2009, members
seem to have discontinued its maintenance.

PARCIC is also starting a new rehabilitation and renovation program targeting over half of COCAMUA’s
members. The program aims to rehabilitate about 200 Ha in five years.

\subsection*{1.4.3. Café Brisa Serena}

Café Brisa Serena is a coffee buyer and exporter based in Letefoho, Ermera. The business is an offshoot
of the NGO Peace Winds Japan. In 2011, Peace Winds Japan established Café Brisa Serena with the goal
to support the buying and exporting of Timor-Leste coffee. Today Café Brisa Serena also manages Café Letefoho, a specialty coffee shop in the capital Dili. Core to their business model is mentoring and guiding local coffee farmers in Ermera and Liquica districts in producing high-quality coffee. The company has six staff trainers delivering training to about 445 farmers and supporting them with planting materials. Training on good agricultural practices includes:

- Planting
- Pruning
- Soil management
- Pre-harvest and post-harvest practices
- Financial management
- Organic farming
- Gender equity

1.4.4. Alter Trade Timor (ATT)

ATT is a local coffee cooperative working with about 500 households in Ermera district. ATT supports its members in the production and processing of coffee, and providing market linkages through partner companies like Trade Winds. Core to its business model, ATT provides training to its members through its six staff members. Training on good agricultural practices includes:

- Planting
- Pruning
- Soil management
- Pre-harvest and post-harvest practices
- Financial management
- Organic farming
- Gender equity

1.5. Agricultural Extension Training Institutes

1.5.1. East Timor Coffee Institute (ETCI)

ETCI is an accredited institution located in the town of Gleno in Ermera. It is an official institution recognized by the Agência Nacional para a Avaliação e Acreditação Académica (ANAAA). Currently, ETCI is authorized to offer the following university higher education courses:

a) Curso de tecnologias agrícolas (Agricultural technology course)
b) Curso de gestão e comércio agrícolas (Agricultural trade and management)
c) Curso de técnico agroflorestal (Agroforestry technician)
d) Curso de técnicas de colheita e processamento de café (Course of techniques of harvest and coffee processing, lecturer of the degree of bachelor)

To date, ETCI has graduated around 500 trained coffee professionals (see Table 1).
Table 1. ETCI graduation figures

<table>
<thead>
<tr>
<th>Graduation year (May)</th>
<th>Number of graduated students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>50</td>
</tr>
<tr>
<td>2012</td>
<td>152</td>
</tr>
<tr>
<td>2017</td>
<td>258</td>
</tr>
</tbody>
</table>

Figures disclosed during meeting at ETCI Gleno facility.

2. Gap Analysis of the Existing Extension Systems and Extension Training Manuals

2.1. Extension Systems

According to Young (2015), one issue that deserves attention is making a concerted decision over what extension methodology is most suitable for Timor-Leste smallholder farmers. “MAF’s extension structure is now in place (based on suco level extension officers training within the boundaries of the suco) but it is unclear – based on the documentation available and discussion with stakeholders - over what specific extension methodology to be used.” Young (2015) points out that “while FAO use the Farmer Field School (FFS) approach on their ‘Enhancing Food and Nutrition Security and Reducing Disaster Risk through the Promotion of Conservation Agriculture’ Project, Rural Development Program (phase IV) uses a single crop-focused demonstration and FFS approach and concentrates on one crop for one year, and then moves onto the next crop/s.” This means that MAF, DNCPI and DNAHE have the opportunity to define which extension methodology is most suited for the country, and then make sure that all projects and programs follow the same strategy – to avoid confusion.

The choice of extension methodology needs to consider the current farming systems, household structures, and larger community structures if the introduction/adoptions of new farming techniques is to be seen over time. Below is a summary of important factors to consider:

(i) Household labor division within East Timor smallholder coffee communities include all household members actively participating in one or multiple functions related to coffee farming. (See Table 2.)

Table 2. Household Labor Division

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22 Young, Situational Analysis of the Agricultural Sector in Timor Leste, 2015
23 Young, Situational Analysis of the Agricultural Sector in Timor Leste, 2015
In Table 2, there are clearly defined roles for both women and men. Women are invested in looking after seedlings and trees and most of post-harvest practices. Men are responsible for more physically straining work – for example, land clearing and preparation. They also oversee marketing and sales, which gives them direct access to coffee sales proceeds. Children play supportive roles, along with elders. The division of labor along gender lines seem comparable to coffee-growing communities in most parts of the world.

When considering which extension methodology to adopt, it is important to consider that most of the labor required to grow and harvest coffee is done by the women of a household. And it is reasonable to assume that any new or improved farming techniques on a farm will continue to be performed by women. Men, on the other hand, may have the final word on how household financial assets (including coffee proceeds) will be redistributed and used to support new/improved farming techniques (i.e., pruning, equipment, etc.). It seems that gender roles within the agricultural sector are well understood; major programs and project under MAF all have their own specific strategies that account for this. However, it seems that in coffee, many gender-related constraints are not necessarily taken into account. Keeping that in mind, it seems reasonable to assume that any extension service that overlooks the current gender role distribution in the household may not achieve the desired adoption rate simply because it targets the wrong people or because the people trained do not dispose of the necessary assets required to roll out changes on the farm.

(ii) Looking at the existing rural community structures within Timor-Leste, it seems there are a variety of traditions and customs that vary among peoples and districts. It is recommended to be mindful of how coffee-farming communities are organized and their particular views of the world. While there may be a strong desire to experiment with new initiatives among coffee professionals, rural community members may place more value in time-honored approaches to farming that seemed to have worked in the past and supported generations before our time. Traditionally, ancestors are considered to play an important role in the daily life of rural communities in Timor-Leste, and they may represent a positive influence reinforcing the legitimacy of traditional knowledge patterns that

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24 Young, 2015, p. 88
25 Agribusiness investment in Timor-Leste, Guidelines supporting win-win outcomes
have proven effective in the past and resisting practices that could endanger the survival of present and future generations. Ancestors are not unresponsive to change, but like members of the present generation, they will need (through ritual) to be informed of the logic of new approaches proposed. It is common knowledge that smallholder farmers can and do perform coffee rituals on their farms – however they have shown sensitivity in sharing this information and making it public knowledge. Although it is premature to consider exactly how time-honored farming approaches, ancestral relations, and extension service methodology can find a common ground, it does make sense to evaluate this delicate balance when designing extension service structure and training design. It also speaks to the importance of establishing an extension service that can connect, relate to, and work within these layered structures.

In most of the extension service models that were shared and discussed during the CQI visit, there was limited mention of household and community structures’ compatibility with extension service models adopted on the ground. There was also limited information regarding which specific training methodology is being used to deliver skills and know-how. It seems that the most popular methodology revolves around encouraging the formation of community-based groups that on a voluntary basis agree to participate in training sessions that are scheduled by group. Group formation and selection is often done in collaboration with the local chefe suco or other recognized leaders in the community. The location and selection of demo plots is usually done in a similar manner.

### 2.2. Training Manuals

Below is a matrix outlining some of the gaps and areas of improvement for coffee training manuals that have been developed by RDP IV and CCT:

<table>
<thead>
<tr>
<th>Training Methodology</th>
<th>Area of Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>No adult learning component in the methodology</td>
<td>The training methodology is a fundamental aspect of delivering a training. It must reflect adequate and appropriate adult learning techniques and must follow a very clear format. For example: 1. Connection with experiential learning 3. Introduction of training content 4. Affirmation by doing/practice 5. Agreement on adoption strategy, tools, and products developed by the group 6. Closing</td>
</tr>
<tr>
<td>Training manual for trainees only</td>
<td>The training and extension system should always develop two manuals: 1. Trainer’s manual – This is a standardized manual that not only specifies training content but outlines all steps of the training delivery (see above). It includes a list of training materials needed (i.e., pruning equipment, hand pulpers, etc.). It highlights specific KPIs to be met upon completion of the training and allows for on-site training evaluation by participants.</td>
</tr>
</tbody>
</table>

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26 Agribusiness investment in Timor-Leste, Guidelines supporting win-win outcomes
| Lack of robust organic fertilization program | Training manuals do not offer a comprehensive set of composting practices and techniques. Composting methodologies are not adequately shared, and there seems to be a lack of visual aids to show the multilayered structure of a compost pile. Training manuals do not seem to address two important issues:

1. Any rehabilitation program will require a considerable amount of organic compost (up to 7 kg/tree) and preferably in combination with the use of micro-organisms. Although it may not be realistic for a small holder to apply exactly the suggested amount, it should be stressed that less than 2-3Kg will significantly reduce chances of improving nutrition.  

2. Café Brisa Serena did try a composting pilot with one of its partner communities; the project aimed at introducing Bokashi technology. However, the project did not seem to yield the desired outcomes. |
| Monitoring and evaluation protocols | It seems that the level of engagement between trainers and trainees is regulated by the number of training sessions over the span of a complete harvest cycle. It does not, however, specify whether there is additional support and follow up after the training delivery. No clear M&E protocols are being presented. |

The training calendar developed by Rural Development Program’s RDP IV program (see Chart 5) seems to be adequate and should probably be used for reference. Composting activities are currently not considered in the calendar. It would also be valuable to integrate other crop farming activities in this calendar, especially food crops, which tend to take priority over coffee production. The integration of all food crops can provide a more realistic view of the entire household workload throughout the year. The calendar also does not specify how household chores and responsibility will be divided among household members. Household labor division must be taken into consideration, especially in determining whether it is realistic for household members to invest more of their time/resources in these activities in comparison to their entire workload. For this particular reason, household participation to trainings – rather than individual representatives – is encouraged. Trainings must provide time and space for the household to assess what can be realistically done, by whom and when.
3. Analysis of Options to Improve the Quality, Coverage, and Efficiency of Extension Service and Training Packages

3.1. Refining Models for Training and Extension

During the CQI field visit, a wide number of industry stakeholders were consulted to gather their perspective on the challenges affecting the coffee sector in the country. On problems related to yield and productivity, there is shared agreement on what led to today’s situation:

- Low adoption rates of new or different pre-harvest practices
- Evidence of effectiveness and efficiency of extension training model is not always available
- Lack of economic incentives lead to overall weak response to training
- Diseases and insect infestation
- Default organic farming without nutrients is a major yield limiting factor
3.1.1. Peer Review of Current Training Packages and Manuals

Any strategy aiming to improve and refine the extension service should consider two important components:

- Reinforcing technical skills and know-how on all aspects of coffee production
- Availability of materials and resources to implement the strategy

It is important to acknowledge that most private-sector entities are already employing trained staff, the largest being CCT. Public extension workers, on the other hand, may or may not have had access to trainings, depending on whether they participated in the RDP II and RDP IV extension workers’ programs28. There should be a concerted effort to map the allocation of extension workers (public and private) that are currently delivering trainings across coffee communities. It would be interesting to determine where there may be an overlap of resource allocation of resources and where there may be a lack of resources.

In terms of which specific training methodology should be adopted, it seems that group trainings are among the most common form of trainings currently delivered. However, a peer review of the methodology should be encouraged among all sector stakeholders, especially for those trainings with evaluations and assessments – made by participants – available to share. If any, there should be agreement among all stakeholders that training evaluations and assessments by participants are an absolutely necessary component of any training session. They are often the only tool that allows for review and improvement of training methodology and content.

Another important aspect for delivering successful trainings is accounting for the different stages of coffee production. In the RDP IV extension strategy, three stages were identified:

- A first stage taking place between May and July, on “the harvest, storage, and processing of coffee”
- A second stage on “the pruning of coffee” between August and October
- A third stage taking place in November on “the production of coffee seedlings in a nursery,” with the month of December dedicated to “the administration of a plantation from cultivation to harvest”

When determining which month each stage begins and ends, it should also be considered which other farm activities may be “competing” in any given month. Special attention needs to be given to food crop production, which holds the highest priority among households. For this reason, it is important to develop a consolidated training calendar that accounts for coffee and other food crop production. Over the years, there have been several productions of coffee training packages. Some private-sector companies have developed their own packages, specifically designed for the producers and communities they are affiliated with. At the same time, programs like RDP IV developed nationwide training packages for smallholders.

Upon review of training packages that were made available, it seems that there are no major inconsistencies in the guidelines provided. MAF/DNCPI to endorse the current training manual from RDP IV immediately (it already has their logo on it!) and to commit to a regular periodic review and updating as more information from research, demonstration, and M&E of ongoing training becomes available. For example, updating every 2-3 years. Under this model, industry stakeholders would be invited to comment on the proposed updates and would be free to make use of the training materials when

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28 Strategy for the Training of Extensionists and for the Implementation of Extension Campaigns on Coffee, RDP IV
delivering their own training. For training that is funded by the government or its partners, the use of
the official training materials, or at least of consistent materials could be required

3.1.2. Peer Review of Existing Demo Plot Methodologies and Adoption of National Demo Plot Design

Consultation with several stakeholders has led to the decision to review current demo plot designs. The
term ‘demo plot’ can be used loosely to refer to any plot that is being used to demonstrate new
techniques to neighboring farms. However, in this paper demo plots are defined as plots that are used
to generate data on performance of new approaches, which requires more robust systems of data
collection and control. Some of the existing demo plots – for example CCT’s – could become the first
demo plots where robust data collection occurs. In the future, analysis of in-field performance of
techniques and measure could feed into the on-going revision and updates of training materials.

In the meantime, it is important to consider a few things when mapping and identifying demo plots:

• Technical expertise and know-how that had previously been circulated through past projects should
  be reviewed and built on
• Training methodologies should be identified and prioritized; methodologies should account for
  several factors, including:
  o Coffee is only one of the several crops being grown on a farm
  o Division on household labor on the farm
  o Average age of a coffee farmer in the country
  o Food security issues
  o Existing community structures of power, local farming traditions, and customs
• There should be a common understanding on the systems of data collection and control that need
  to be implemented

Problems of low and slow adoption and implementation rates among smallholder farmers are often
related to poor training design, rather than simply a lack of interest among farmer participants. As
Rogers would argue, ”an important factor affecting the adoption rate of any innovation is its
compatibility with the values, beliefs, and past experiences of the social system.” In order to develop a
sensible demo plot design, a few important elements need to be taken into considerations:

• Relative advantage: This means a household is able to discern whether the return on the investment
  justifies the time and resources that have been allocated to adopt new farming techniques.
• Compatibility: New farming techniques are compatible with smallholders’ needs, value system, and
  past experiences.
• “Trial-ability”: The ability to test new techniques on a limited, controlled environment.
• Observability: This assumes that the ability to observe direct results of new/improved technique and
  adoption rates are closely intertwined.

Based on the elements described above, the demo plot methodology should be built on four main
principles:

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29 Page 3, Performance Evaluation of The USAID/Timor-Leste Consolidating Cooperative and Agribusiness Recovery Project
30 Rogers, Diffusion of Innovations, 2003
31 Rogers, Diffusion of Innovations, 2003
(i) **Demo plot is manageable.** The average farm size is between 1-2 Ha per household. The size of the demo plot is important. It needs to be large enough to have statistical relevance from the data collected. At the same time, it needs to be small enough that a household can conduct most activities required on the demo plot. Any demo plot that requires extensive work and directly interferes with other farming activity will not work, unless a compensation mechanism in place.

(ii) **Demo plot is replicable.** As mentioned above, data collection statistical relevance is important. However, in order to keep the demo plot manageable, it means that replication of treatment on the same plot may prove to be too complex for one individual whose time is not completely dedicated to demo plot activities. Treatment replication therefore means setting up a multitude of demo plots across districts and production zones. To be easily replicable, the demo plot size needs to be small.

(iii) **Demo plot has comparable treatments.** There is a difference between a model farm and a demo plot. The model farm is an example of a well-managed farm that follows specific good agricultural practices (GAP). It is usually the farm of selected leaders or trainers within a coffee-growing community. A demo plot is a system for comparative analysis of one or multiple treatments and a control. On a demo plot, treated and untreated trees stand side-by-side, and if the treatments are successful, their benefits are clearly visible on the demo plot. It is important to maintain the comparative treatment approach and allow for visible identification of treated trees versus untreated trees. This may be one of the most effective ways to engage coffee producers in adopting new farming techniques.

(iv) **Demo plot setup is relatable.** The demo plot must resemble the conditions and characteristics of coffee farms within a specific community. In order to engage coffee producers in adopting new farming techniques, the demo plot must look and feel like their own farms. Relatability is another important factor in showcasing that the treatments will lead to similar results given that the farm conditions are similar.

Our consultation with several stakeholders highlighted how taking coffee producers to a demo plot outside their own community or district can contribute to mistrust and skepticism on whether treatments will work “back at home.”

### 3.2. Recommendations on Demo Plot Design

In consultations with stakeholders, it is clear that demo plot strategies in the past yielded mixed results. Low participation rates among farmers and slow adoption rates are among the challenges faced regularly. In order to avoid falling into a similar pattern, the demo plot methodology should follow certain overarching criteria:

- **Community involvement.** Whether or not a farmer has already expressed interest in establishing a demo plot, it is important to hold stakeholder meetings within the *aldea* (village) to introduce the idea of establishing a demo plot within the community.

- **Choosing treatment.** Although treatments may have been already “chosen” by the technical staff, it is absolutely important that the farmers’ committee actively engages in the discussion and choice of treatments to test on the plot. Although it is called a”demonstration plot,” farmers need to feel a sense of ownership over major design decisions such as treatment selection.

- **Less is more.** Treatment selection should consider the time and resources that a household is willing to invest for the successful rollout of the demo plot. When the demo plot is established at a smallholder farm, one or two treatments in addition to a control treatment is often sufficient. In this
manner, a plot is split into two or three sub-plots, one being the control and the other being the treatments.

- **Farm replication.** For research and testing purposes, replication is fundamental. Replication often means replicating the same treatments on other farm plots. This means within an aldea (or possibly a suco), there will be more than one demo plot.

- **Location.** Accessibility is important. The demo plot should be located in a place within the aldea that is easily accessible by the community. Depending on the specific local topography, the demo plot can be on flat land and/or on slopes.

- **Demo plot size.** There have been a multitude of conversations with stakeholders over the most adequate demo plot size. If one wants to uphold the principle of compatibility and promote a more participatory approach to demo plots design, then perhaps it is best to leave this decision to the farmers’ committee themselves. This approach assumes that farmers are probably the best party to determine what size they are most comfortable to work with. Research seems to indicate that most farmers tend to choose rather large treatment sizes, as much as a hectare (Ha)\(^{32}\). Also, if multiple farms are replicates, then demo plot sizes could also vary.

- **Shape of the demo plot.** In an ideal scenario, the shape of the plot would be rectangular. However, most smallholder farms are not of rectangular shape. Let the household take a leadership role in choosing both the size and shape of the plot.

- **Data collection.** Most farmers will not need data to determine whether a treatment is successful or not. The plot needs to show visible and comparable advantages when treatments are implemented. The household is in charge of collecting basic numbers of data and recording it in the simplest way possible (such as mobile phone technology, for example). The data should be discussed with all farmer committees and possibly shared across the entire community (aldea). Note that during harvest time, data collection will be a sensitive issue if strict times and dates for data collection are imposed. It is important to note that other more urgent household cross-cutting issues – such as access to cash – are at stake during harvest time. It is unreasonable to hold a household accountable to a pre-fixed data collection routine.

**It is important to also consider a few important factors once the demo plots are set up:**

Extension officers need to agree with the farmer committee on a schedule of meetings. The schedule needs to be approved by all and must be respected. Extension officers are known everywhere for not showing up” at pre-arranged meetings.

It is very possible that a community may decide to reject one or multiple treatments if they do not yield the expected results. This can – and should – happen if this is a shared sentiment among farmers. Treatment selection is only the initial stage, but treatment adaptation is common and is part of the learning process.

Some households may decide to interrupt the demo plot on their farm. This can happen and is part of the natural course of setting up a participatory demo plot design. Replication is what will eventually balance it out and will maintain statistical relevance.

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\(^{32}\) Bentley & Baker, 2002
### Short-Term Priorities

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<td><strong>Map of demo plots across the country</strong></td>
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### Long-Term Priorities

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