The capacity building of an agroforestry demonstration plot: participatory market chain approach

T A Wisudayati*, Danu¹, D Octavia², K A Hendarto¹, R U D Sianturi¹, Megawati¹ and Desmiwati¹

¹) Forest Tree Seed Technology Research & Development Center (FTSTRDC)
Jl. Pakuan Ciheuleut PO BOX 105, 16001, Bogor, Jawa Barat, Indonesia
²) Center for Standardization of Sustainable Forest Management Instrument-Agency for Standardization of Environment and Forestry Instrument

*Email: triastutiwisudayati@gmail.com

Abstract. Establishing the Cempaka forestry partnership agroforestry demonstration plot in the Batutegi Forest Management Unit, Lampung Province, should increase small-scale farmers' participation in planting and enhancing their welfare. They need facilitation and supporting programs to evolve continuously, grow business rapidly, and enable forest sustainability. From previous research, the existing training and the extension supporting programs focus on technological improvements in agroforestry demonstration plots, such as modern nurseries training and incentives awarding. There is minimal understanding of small-scale farmers about the broader market chain beyond their direct market. However, improving the market chain will be sustaining the process of innovation and environmental empowerment. The upscale market chain has an impact on poverty alleviation by enhancing institutional capacity and market linkages. Therefore, integrating a market chain perspective is a crucial priority for planning the demonstration plot capacity program. This research intends to design the procedures for linking small-scale farmers to the market chain using a three-sequence phase usually elaborated in the Participatory Market Chain Approach (PMCA). The data were collected by applying a questionnaire, and then they were described by using a narrative-based qualitative method. The emerging results from this study are the policy implications for improving the performance of the market chain in a standard timeline, namely the assessment phase, the innovation phase, and the action phase. Ideally, policy leaders should pay attention to the assessment phase that identifies interactions among market chain actors. The innovation phase develops on-site learning exercises and tests shared innovation. The action phase promotes in topic meetings and action groups.

1. Introduction
The ASEAN-ROK Forest Cooperation (AFoCo) agreement was signed on 18 November 2011. The project was agreed to build agroforestry demonstration plots in three pilot locations, one of which is the Cempaka forestry partnership in the Batutegi Forest Management Unit, Lampung Province. In cooperation with the Research, Development, and Innovation Agency, The Ministry of Environment and Forestry, the project conducted regular technical training for small-scale farmers and technology transfer activities to design and develop the Forest Management Information [1]. By farming in agroforestry demonstration plots areas, small-scale farmers can harvest commercial crops, such as nutmeg, cloves, rubber, durian, petai, jengkol, eucalyptus oil, banana, coffee, cocoa, cempaka, resin,
maja, mangosteen, and hazelnut. Overall, the average crops growth condition for the demonstration plot at the age of 12 months after planting was 70.17% [2]. The high percentage of plant growth is due to the increased participation of small-scale farmers in maintaining, such as cutting weeds, planting shade crops, and replanting. There are even some farmers who are aware of making their replanting seeds. If overall managed well, small-scale farmers could sell to get more income.

Furthermore, when the AFoCo agreement project has to end, unassisted small-scale farmers can retain the participation stability in planting because the environmental goal of maintaining forest cover is vital. Among the critical factors that affect the participation of small-scale farmers are economic factors [3]. Therefore, policy leaders and other public instruments that provide infrastructure and support services must consider a marketing-related capacity for scaling up the forest-based agribusiness outputs. There is a shortage of skilled small-scale farmers who are capable of managing and organizing their market chain performance. Each of small-scale farmers is necessary to determine the market chain actors and acquire demand creation. In a prior consultation forum with the small-scale farmers, they need a business development support program, including technical equipment and devices. One of the key areas of agreement is strengthening capacity-building to support the development of forest-based agribusiness [4]. This study complements previous studies, particularly linking small-scale farmers to the market chain using a three-sequence phase usually elaborated in the Participatory Market Chain Approach (PMCA). By describing the PMCA effectiveness phase for the capacity-building program, the study raises the poverty alleviation of small-scale farmers on the Cempaka forestry partnership and achieves its forest sustainability

2. Research methods

2.1 Study site description

This study was conducted in the Cempaka forestry partnership. The agroforestry demonstration plot is located in the Batutegi Forest Management Unit, Lampung Province, which has several small-scale farmers who need poverty alleviation.

2.2 Data collection and analysis

This study applied social science methods for document analysis and empirical content analysis. Qualitative analysis is a widely and effectively applied method of data analysis. Data were collected using open-ended and semi-structured questionnaire interviews, direct observation, and document and archival reviews. The discussion was conducted with 19 purposefully small-scale farmers and forestry partnership officers to collect data. An open-ended interview was also conducted during a group discussion with six farmers groups to investigate access mapping and marketing identification.

PMCA is an instrument for facilitating change in market chains that lack coordination, creating an environment that fosters interaction among market chain actors, promotes mutual learning and trust, and stimulates shared innovations [5]. Figure 1 reports on a capacity-building program for achieving forest sustainability, enhancing market-related capacity, or improving market actors' interaction using PMCA.
We focus our analysis on a three-sequence phase that is usually elaborate in the PMCA process and compared the performance of marketing-related capacity. This study relied on the assessment phase, the innovation phase, and the action phase for empirical data, which were evaluated based on the business development support. Phase 1 of the PMCA begins with a rapid market survey and ends with a workshop where market chain actors meet Research, Development, and Innovation Agency to discuss possible innovations. Phase 2 involves a series of group meetings and applied research to analyze market opportunities. A key goal of this phase is to build trust among participants (see figure 2). Phase 3 involves joint activities that seek to develop concrete innovations, which might be technical (technologies), institutional (agreements, support services, organizing), and commercial (supply, distribution, quality incentives). The PMCA formally ends with a significant public event where market chain actors and service providers present their innovations and meet national policymakers, donor representatives, media, and others [6]. After the formal closure, the Research, Development, and Innovation Agency may be called on by specific actors or asked to backstop new institutions.
3. Result and discussion

3.1 Assessment phase (2-4 months)

Based on a prior study, 31 medicinal crops of Indonesia are demanded more than 1,000 tones/year for the traditional medicine (jamu) industry, spices, and export [7]. Some medicinal and spices crops are harvested by small-scale farmers in the Cempaka forestry partnership, such as mangosteen, eucalyptus oil, nutmeg, and cloves. The raw material of medicinal crops is needed, especially the medicinal plants which were still harvested from their natural habitat (forest). Therefore, the intensive effort to select the appropriate crop types to be planted in agroforestry demonstration plots is a must.

Agroforestry product diversification is also a priority program in strengthening forest management models as a sustainable natural resource asset [8]. Forest management models are not only oriented towards the production of natural products, but management strategies are directed at diversifying processed products [9]. Data collected using the structured questionnaire shows that the problems most frequently asked by small-scale farmers are price certainty and market regulations in natural products. Small-scale farmers’ advice is that market regulations protect and maintain a fresh market for natural products. However, for marketing their product in a fresh market, small-scale farmers are disconnected from the urban market center. Farmers recommend field collectors/agents or numerous intermediaries who directly buy natural products from them.

If there is a market for natural products, it is possible to expand processed products for a processing market [10]. They have a minimal understanding of the process of market characterization and market targeting. Moreover, there is a mismatch of small-scale farmers' products with requirements from large/small processors in a processing market. Consequently, in the assessment phase that approximately will be held in 2-4 months, we must identify the market opportunities identification and their prioritization. Here is the assessment phase illustration of its market chain actors (see figure 3).
3.2 Innovation phase (6-8 months)

To improve the interactive sessions of an on-site learning exercise, there will be thematic meetings of the learning group, fresh market learning, and processing market learning groups. They held 6-8 sessions of small-scale farmers with market testing that must be developed to have the awareness and ability to manage learning experiments. If every learning group does not feel that they obtain a significant part of their income from an on-site learning exercise, they may not be willing to execute the collective responsibilities. Economic factors that are particularly important for local people are the income they get from community empowerment [11]. This also pointed out that the ongoing development of the innovation phase is technical, commercial, and institutional implementation factors. Firstly, in fresh market priority, technologies of plant rotation and planting calendar coordination are important factors. Other developed factors are the norm of marketing agreement through consolidators. While sorting and grading have been developed to use for a commercial product. Secondly, in processing market priority, technologies of seed supply for processing type varieties are essential factors. Other developed factors are the norm of retailers’ networks, women-led enterprises, and access to business development support. While branding, packaging and improved traditional medicine or food have been developed to use for a commercial product. The innovation phase is figured in the market chain priority illustration (see figure 4).

Figure 3. Map of assessment phase during PMCA

Figure 4. Map of innovation phase during PMCA
3.3 Action phase (4-6 months)

Topical meetings with business development support providers will sustain small-scale farmers' learning and action groups in a public event. The action phase mentioned that business development support providers would efficiently and effectively guide small-scale farmers in their marketing campaigns and promotion because small-scale farmers lack public attention to their business activities. Corresponding to the capacity building program, it can be found that several issues are relevant and consistent for this action phase. Analyzing the new/expanded business with forwarding and backward linkages is to develop a significant principal effect for demand creation. Collecting several independent women-led entrepreneurs and women's processor’s group is to link via a learning network. Considering rationalized market chains through value-adding intermediaries is to enrich collaboration as improved chain performance of another market target (see figure 5 and 6).

![Diagram](Source: Author, processed, year 2021)

**Figure 5.** Link established/strengthened of the fresh market by the capacity building program
Source: Author, processed, the year 2021

**Figure 6.** Link established/strengthened of the processing market by the capacity building program

### 4. Conclusions and recommendation

#### 4.1 Conclusions

This study shows that PMCA is an effective tool in sustaining learning and innovation, growing the business of nature, and processing products, and reducing forest cover loss in an agroforestry demonstration plot. The systematic study is a good starting point for expanding the capacity-building program with the two types of market priority. This study provides a qualitative assessment of marketing-related capacity and a good baseline for designating and linking small-scale farmers to the market chain. It is necessary to understand the underlying three phases of PMCA for improving the performance of the market chain. Firstly, policy leaders focus on the assessment phase that identifies interactions among market chain actors. Secondly, the innovation phase develops on-site learning exercises and tests shared innovation. Thirdly, the action phase promotes in topic meetings and action groups. Also, this study provides a more profound understanding of local communities developing and testing innovation differently, requiring further forest sustainability. For forest sustainability, well-structured capacity building has an essential factor in the poverty reduction chain because they are the crucial initial step in business planning to be utilized by small-scale farmers.

#### 4.2 Recommendation

Despite the promising potential of a farmers group as a business unit, this result is solely based on social analysis during the AFoCo agreement. A future research agenda for cross-study visits are needed to share best practices across market boundaries. Further research is primarily via other social forestry programs, especially for the consideration of access to business development support providers. Performance of technical, institutional, and commercial with different framework or social forestry programs is likely to be varied from the one presented in this analysis.
References

[1] AFoCO Secretariat 2017 *AFoCo Annual report 2016* source url: http://afocosec.org/wp-content/uploads/2019/08/2016_AFoCo-Annual_Report.pdf

[2] Danu & Octavia, D 2020 *Proc.Conf Talenta Conference Series: Agricultural and Natural Resources (ANR)* Pembangunan demplot agroforestri di KPHL Batutegi Lampung 3 1 (DOI:10.32734/anr.v3i1.832)

[3] Hlaing, E. E. S., & Inoue, M. 2013 Factors affecting participation of user group members: comparative studies on two types of community forestry in the Dry Zone, Myanmar *Journal of forest research* 18 1 60-72.

[4] AFoCO Secretariat 2019 *AFoCo Annual report 2019* source url: http://afocosec.org/wp-content/uploads/2021/01/2019-AFoCO-Annual-Report-sheet.pdf

[5] Zschocke, T 2012 *Participatory Market Chain Approch (PMCA) User Guide* International Potato Center

[6] Bernet, T., Devaux, A., Thiele, G., López, G., Velasco, C., Manrique, K., & Ordinola, M. 2008 *The participatory market chain approach: stimulating pro-poor market-chain innovation* 563 2016-38895.

[7] Pribadi, E. R. 2015 Pasokan dan permintaan tanaman obat Indonesia serta arah penelitian dan pengembangannya. *Perspektif* 8 1 52-64.

[8] Andayani, W. 2016 *Proc. Conf Pertemuan ilmiah Tahunan ke-2 KOMHINDO: Pengelolaan hutan berbasis KPH untuk keberlanjutan produksi, ekologi, dan sosial ekonomi budaya masyarakat* Prospek ekonomi pembangunan KPH (Kesatuan Pengelolaan Hutan) sebagai entitas bisnis melalui strategi diversifikasi produk dan jasa (Banjarbaru, Loksado, Kalimantan Selatan, 8-9th of October 2016).

[9] Kaskoyo, H., Mohammed, A. J., & Inoue, M. 2014. Present state of community forestry (Hutan Kemasyarakatan/HKm) program in a protection forest and its challenges: Case study in Lampung Province, Indonesia. *Journal of forest and environmental science* 30 1 15-29.

[10] Narakusuma, M. A., Fauzi, A. M., & Firdaus, M. 2013. Rantai nilai produk olahan buah manggis. *Jurnal Manajemen & Agribisnis* 10 1 11-21.

[11] Kar, S. P., & Jacobson, M. G. 2012. NTFP income contribution to household economy and related socio-economic factors: Lessons from Bangladesh. *Forest Policy and Economics* 14 1 136-142.

Acknowledgment
We thank AFoCo project for its supports and Bapak Yayan Ruchyansyah (Head of Batutegi Forest Management Unit) for his insights for this research.