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Asset-Based Mentoring for Quality-Oriented Patchouli Oil Production in Tellu Limpoe, Bone Regency

Zakaria*[1)], Arisal A[2)], Nur Aicsya[3)], Riska[4)]
[1,2,3,4)] Institut Agama Islam Negeri Bone, Indonesia
e-mail corespondency: zakaria28041970@gmail.com[*)]

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Abstrak
Smallholder patchouli-oil production requires coordination across cultivation, postharvest handling, distillation, and quality assessment. This article examines an Asset-Based Community Development (ABCD)-informed mentoring program in Gaya Baru, Samaenre, Tellangkere, and Polewali Villages, Tellu Limpoe District, Bone Regency, during 2025. Activities included field observation, two focus group discussions (FGDs), plantation mentoring, distillation assistance, and a field discussion of oil quality. The first recorded FGD involved 32 participants: 24 farmers, four village-government representatives, two extension officers, and two program-team members. Field inventories recorded 17 distillation facilities in July and 26 in November, although comparability between inventories has not been established; the difference is not attributed to the intervention. Available records do not demonstrate quantified improvements in farmer competencies, patchouli alcohol content, or compliance with national quality standards. The documented contribution is the organization of existing fields, production experience, processing facilities, and institutional expertise into a quality-oriented mentoring sequence. Future programs should document participatory decisions, maintain batch-level production records, and apply traceable sampling and validated laboratory procedures to assess changes in practices and product quality.

Kata Kunci:
ABCD, Pendampingan Masyarakat, Minyak Nilam, Penjaminan Mutu, Penyulingan

Abstrak
Produksi minyak nilam oleh petani skala kecil memerlukan keterpaduan budidaya, penanganan pascapanen, penyulingan, dan penilaian mutu. Artikel ini mengkaji program pendampingan berbasis Asset-Based Community Development (ABCD) di Desa Gaya Baru, Samaenre, Tellangkere, dan Polewali, Kecamatan Tellu Limpoe, Kabupaten Bone, pada 2025. Kegiatan mencakup observasi lapangan, dua diskusi kelompok terarah (FGD), pendampingan kebun, pendampingan penyulingan, serta diskusi penilaian mutu minyak. FGD pertama melibatkan 32 peserta, yaitu 24 petani, empat wakil pemerintah desa, dua penyuluh pertanian, dan dua anggota tim. Inventarisasi lapangan mencatat 17 fasilitas penyulingan pada Juli dan 26 pada November, tetapi kesetaraan kedua pendataan belum terverifikasi sehingga selisihnya tidak dikaitkan secara kausal dengan program. Dokumentasi yang tersedia belum membuktikan peningkatan kuantitatif kompetensi petani, kadar patchouli alcohol, atau pemenuhan standar mutu nasional. Kontribusi yang terdokumentasi ialah pengorganisasian lahan, pengalaman produksi, fasilitas penyulingan, dan keahlian kelembagaan lokal ke dalam rangkaian pendampingan berorientasi mutu. Program lanjutan perlu mencatat keputusan partisipatif, menerapkan pencatatan produksi per kelompok hasil penyulingan, serta menggunakan pengambilan sampel yang tertelusur dan pengujian laboratorium tervalidasi untuk menilai perubahan praktik dan mutu produk.

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INTRODUCTION

Patchouli (Pogostemon cablin (Blanco) Benth.) is an aromatic crop whose essential oil is used in fragrance-related industries and remains relevant to Indonesia's plantation economy. The Indonesian Ministry of Agriculture's 2024 commodity outlook provides a national production perspective, while the critical review by van Beek and Joulain situates patchouli oil within a wider body of research on harvesting, drying, distillation, chemistry, sensory properties, and product integrity (van Beek & Joulain, 2018). Importantly, the figures projected by a commodity outlook are not interchangeable with independently observed local production data. In this article, the national literature therefore establishes sectoral context rather than estimating output, income, or oil quality in Tellu Limpoe (Pusat Data dan Sistem Informasi Pertanian, 2024).

Oil quality is determined through interactions across the production chain, not by a single downstream examination. The state and preparation of plant material, drying and storage, extraction duration, and physical performance of the distillation system can change both oil yield and chemical characteristics. For example, Yahya and Yunus examined the influence of sample preparation and extraction time on steam-distilled patchouli oil, while Smith et al. experimentally investigated condenser cooling-water flow and drying conditions (Smith et al., 2024; Yahya & Yunus, 2013). Srivastava et al. further examined chemical characteristics across drying stages (Srivastava et al., 2022). These studies identify plausible technical domains for farmer mentoring; they do not demonstrate that the practices observed in the present program were modified or that participating producers attained comparable analytical results.

A quality-oriented program should also distinguish quality awareness, a selected screening activity, laboratory quantification, and compliance with a formal product standard. Patchouli alcohol (PA) is an important constituent of patchouli oil, but the use of PA as one quality indicator does not eliminate the need to consider other applicable characteristics and test procedures. The catalogue of the Indonesian National Standardization Agency lists both SNI 06-2385-2006 and SNI 2385:2019 Konfirmasi 2025; the latter is a reconfirmation of SNI 2385:2019 based on a modified adoption of ISO 3757:2002. Their detailed normative requirements should be checked against the complete standards rather than inferred from catalogue titles alone. Analytical work on oil purification (Ramayanti et al., 2021) and dried medicinal herb matrices (Zhao et al., 2005) illustrates laboratory approaches to PA-related analysis, but neither publication validates an undocumented field measurement undertaken within this program (Badan Standardisasi Nasional, 2006, 2025).

Production decisions are also social and economic decisions. Mukhtar et al., analysed quality considerations and factors influencing farmers' choice of distillation boilers in Aceh (Mukhtar et al., 2020); Cantika et al., considered partnership institutions within Aceh Jaya's patchouli agroindustry (Cantika et al., 2022); and Effendy et al., discussed agricultural institutions and agribusiness development (Effendy et al., 2020). These studies show why equipment, information, institutional

coordination, and market organization are relevant when designing technical assistance. Their evidence concerns settings outside Bone Regency and therefore cannot substantiate assumptions about the specific market relationships, cost structures, or bargaining conditions of farmers in Tellu Limpoe.

Indonesian community-service literature has already documented multiple forms of assistance for patchouli-producing communities. Ahmad et al., reported a village-partner intervention focused on improving distillation technology (Ahmad et al., 2023); Zikri et al., discussed seedling-related innovation and field demonstration (Zikri et al., 2023); and Hifnalisa et al., described patchouli nursery training with tangible planting-material outputs (Hifnalisa et al., 2025). A broader cluster-based intervention in Aceh integrated institutional strengthening, field-school activities, and upstream–downstream technology transfer (Zikri et al., 2023). Consequently, neither technical training nor the integration of cultivation and processing is intrinsically novel. What requires examination is how a particular intervention identifies pre-existing community assets, organizes actors around them, and documents progress towards a specified purpose.

Asset-Based Community Development (ABCD) offers a relevant analytic lens because it begins with capacities and relationships present in a community rather than defining residents exclusively by deficits. Its foundational formulation emphasizes mapping and mobilizing individual, associational, and institutional assets (Kretzmann & McKnight, 1993); Mathie and Cunningham situate this orientation within citizen participation and community-driven development. More recent analyses warn that mobilizing local resources is not automatically equivalent to empowering local actors (Mathie & Cunningham, 2003). Mathie, Cameron, and Gibson examine the opportunities and constraints created by relations of power (Mathie et al., 2017), while Maclure calls for ABCD practices to address power systems beyond the immediate community (Maclure, 2023). This distinction matters whenever technical experts, village institutions, buyers, and farmers possess unequal opportunities to influence decisions.

ABCD also raises demanding questions about evaluation. Ward demonstrates the relevance of theory-based evaluation for understanding when and how community assets contribute to change (Ward, 2023). South et al., describe an asset-based, collaboratively designed evaluation that respects experiential knowledge while assembling different sources of evidence (South et al., 2024). Browne proposes an evidence-cycle framework attentive to the gathering, appraisal, use, and transparency of evidence in community development (Browne, 2024). Taken together, these sources caution against equating participant attendance with empowerment, activity completion with increased competence, or coincident economic changes with program impact. A rigorous account can still be useful when quantitative outcome data are missing, provided it is explicit about what the records actually establish.

The program was implemented in Gaya Baru, Samaenre, Tellangkere, and Polewali Villages, Tellu Limpoe District, Bone Regency, where patchouli cultivation, farmers' production experience, distillation facilities, village institutions, and extension services provided a practical basis for mentoring. The initial inventory described 17 distillation units, while field discussions identified a need for more systematic quality-related information. Rather than treating equipment provision as the principal intervention, the program sought to connect existing local capacities with cultivation guidance, distillation discussion, and introductory quality assessment. This article examines how those activities were organized, how community assets entered the mentoring process, and which program outputs can be supported by the available documentation. The contribution is a descriptive evaluation of a quality-oriented mentoring pathway, not an experimental estimate of its impact.

METHODS

The community-service program took place in Gaya Baru, Samaenre, Tellangkere, and Polewali Villages, Tellu Limpoe District, Bone Regency, South Sulawesi. The implementation period was recorded as June–November 2025, while the dated activities available for analysis begin with field observation on 15 July 2025. The four villages were selected purposively on the basis of existing patchouli cultivation and distillation activities and the relevance of quality-oriented mentoring. A systematic household sampling frame and comprehensive site-selection documentation were not available; therefore, the participating locations are treated as purposively selected program settings rather than a representative district sample.

A descriptive, process-oriented evaluation was used to examine the implementation sequence, participating actors, mobilized assets, and documented outputs. No comparison group, complete individual baseline-endline assessment, or validated skills rubric was incorporated into the available dataset. Consequently, the analysis does not estimate causal treatment effects or quantitative changes in knowledge, productivity, economic returns, or oil composition. Literature on community development and patchouli processing was used to interpret the intervention logic and identify feasible improvement mechanisms while keeping observations from Tellu Limpoe analytically distinct from findings obtained in other study settings.

The first focus group discussion (FGD), held on 11 October 2025, was recorded as involving 32 people: 24 patchouli farmers from the four villages, four village-government representatives, two agricultural extension officers, and two members of the program team. These categories sum to 32 participants. However, the retained attendance detail does not allow the distribution of farmers among the four villages to be established. A second FGD, held on 8 November 2025, addressed pests and diseases; a verifiable attendance total was not available and is therefore not reported. Participation is described at the level supported by activity records, rather than as a measure of district-wide coverage.

The ABCD resource categories visible in the account include land and standing crops as natural and production-related assets; farmers' hands-on knowledge as human assets; distillation facilities as physical assets; farmer relationships as social assets; and village government and extension services as institutional assets. These categories identify potential resources for collective activity. They do not, by themselves, establish how decisions were taken, whether farmers chose mentoring priorities, who assumed leadership, or whether relationships continued after the program. Where the manuscript refers to mobilization, the term is used descriptively for the involvement of existing actors and facilities unless additional evidence of community-led decisions becomes available.

Implementation was organized for descriptive analysis around five interconnected ABCD-related stages: asset discovery, mobilization, technical action, evaluation, and reflection (Sulastri et al., 2023). Field observation and discussions informed the recognition of agricultural and processing assets; meetings and field activities connected farmers, extension officers, and village representatives; mentoring addressed cultivation, plant-health issues, and distillation; and the closing quality-oriented activity highlighted further needs for traceable testing. Table 1 shows the documented sequence and associated evidence boundaries. This distinction between program activities, plausible mechanisms, and demonstrated outcomes follows principles emphasized in ABCD evaluation literature (Ward, 2023; South et al., 2024).

Table 1. Sequence of Community-service Activities and Documented Outputs

Date	Activity	Source-reported documentation	Evidence boundary
15 Jul; 25 Sep 2025	Field observation and local interviews	Production context; initial inventory of 17 units	Inventory protocol and individual unit records not supplied
11 Oct 2025	FGD 1: production potential and quality	32 attendees by reported role; technical topics	Attendance and documented consensus require records
18 Oct 2025	Plantation mentoring	Planting-distance, plant-type and pest-related topics	No validated adoption or skills scores
8 Nov 2025	FGD 2: pests and diseases	Technical discussion reportedly held	Verified attendee count unavailable
15 Nov 2025	Distillation assistance	Observation at existing facilities; reported follow-up inventory 26	Comparability and village-level counts unresolved
29 Nov 2025	Field quality-assessment discussion	Screening-related activity illustrated in manuscript	No validated PA results or SNI-compliance evidence

The analytical categories were: (i) existing local assets, (ii) participation and organization of technical activities, (iii) observed production contexts, (iv) the distinction between quality-related discussion and measurement, and (v) documented limitations relevant to subsequent monitoring. Chronological activity reports and photographs were interpreted as support for a description of implementation, not as direct measures of learning or chemical quality. A record was classified as an

outcome only where a defined indicator and sufficient evidence of change were available. This manuscript contains no such validated quantitative outcome series.

Information was assembled from field observations, informal interviews, FGD and activity documentation, photographs, and distillation-unit inventories. Descriptive analysis organized the available material by program stage and resource type, compared accounts across dated activities, and distinguished documented outputs from unmeasured outcomes. Attendance totals were checked against the reported role composition, while inventory figures were examined for internal arithmetic and consistency of definitions. These documentary checks improve transparency but are not substitutes for independently validated participant rosters, unit-level registers, or laboratory records.

For the distillation inventory, an operational unit was defined in the project account as a facility observed to be available for patchouli processing at the time of a field visit. This definition does not establish continuous operation, a new investment, or actual throughput. Consistent unit identifiers and a complete comparison of the eligibility criteria used in the July and November visits were not available. Accordingly, the analysis presents the aggregate totals as contextual observations without interpreting the arithmetic difference as a change attributable to the program. Village-level follow-up figures are withheld pending reconciliation of source records.

Quality-related records were also assessed for analytic traceability. For a numerical PA result to support a scientific claim, the sampling unit and batch must be identified and linked to the production context; sample handling, analytic method, instrument and calibration details, reference materials, and quality-control procedures must be available. The retained manuscript does not provide the necessary chain of documentation. The field activity is consequently reported as a quality-assessment discussion or screening-related activity rather than laboratory-verified PA quantification. A formal statement of full compliance with any national standard is outside the evidentiary scope of these records (Badan Standardisasi Nasional, 2006, 2025; Ramayanti et al., 2021; Zhao et al., 2005).

RESULTS AND DISCUSSION

Existing Community Assets and Production Context

The documented starting point was a community with an established agricultural and processing base, not a location lacking productive resources. The initial observation on 15 July 2025 reportedly identified 17 distillation units distributed across the four villages: ten in Gaya Baru, two in Samaenre, one in Tellangkere, and four in Polewali. The sum is internally consistent. The program narrative also refers to existing patchouli land, operator experience, village institutions, and agricultural-extension personnel. This combination makes an asset-oriented approach conceptually appropriate: it allows technical assistance to begin from capacities and infrastructure already

embedded within the community rather than defining the intervention solely as an equipment-transfer project.

The distinction between identifying an asset and demonstrating its collective mobilization is analytically central. Counting distillation units characterizes physical availability; documenting farmers' experience indicates a plausible human resource; and reporting the presence of local officials identifies institutional contacts. Yet an ABCD claim about mobilization would additionally require evidence of which assets were chosen by residents, how priority problems were negotiated, and whether community actors coordinated or governed a subsequent activity. Kretzmann and McKnight place community assets at the starting point of the approach (Kretzmann & McKnight, 1993), whereas Mathie and Cunningham emphasize citizen agency (Mathie & Cunningham, 2003). Measured against these principles, the preserved record supports asset identification and the organization of related activities more strongly than it supports independently demonstrated community governance.

Initial field observations suggested that farmers' quality-related decisions were influenced by buyer expectations and that local procedures for traceable quality assessment were limited. The frequency and magnitude of those conditions were not systematically measured, so the observation should be read as a program-context consideration rather than a prevalence estimate. Studies from Aceh show that equipment costs, marketing relationships, and institutional coordination can shape patchouli-production choices (Cantika et al., 2022; Effendy et al., 2020; Mukhtar et al., 2020). These comparisons underline the need to connect technical mentoring with accessible quality information and farmer decision-making, without assuming identical market mechanisms across regions.

A follow-up inventory during the 15 November 2025 distillation visit reported 26 units, compared with 17 identified during the July observation. The difference of nine units is an arithmetic comparison between two reported totals, not verified evidence that nine new facilities were constructed or activated. The available unit-level information does not establish the comparability of the two inventories, including whether identical coverage and operating criteria were used. The change is therefore retained only as background on the evolving local production context and is not used as evidence of program impact.

Table 2. Aggregate Distillation-Unit Inventories Recorded During the Program

Observation	Date	Reported count	Permissible interpretation
Initial inventory	15 Jul 2025	17	Inventory at first observation
Follow-up inventory	15 Nov 2025	26	Inventory at subsequent visit
Arithmetic difference	—	+9	Descriptive difference; not attributable to the program

Figure 1. Field Observation Documentation in Polewali Village, Tellu Limpoe District

Technical Discussion, Participation, and the Asset-Mobilization Process

The reported activity sequence connected observation and discussion with two forms of field-based technical assistance. The FGD of 11 October 2025 brought together farmers, village representatives, extension personnel, and program-team members. Subsequent plantation mentoring on 18 October addressed reported topics such as plant type, planting distance, and possible pest issues. A second discussion on 8 November addressed pests and diseases; a distillation-related visit followed on 15 November. This chronology shows that the team did not treat quality as a separate laboratory issue but organized attention across cultivation, plant health, and processing. It does not demonstrate that individual farmers subsequently changed their practices.

An FGD can contribute to ABCD when it enables community actors to interpret their assets, identify priorities, and choose action collectively. The existing account specifies the categories of people present, but it does not preserve the decisions taken, disagreements encountered, or agreed responsibilities. For this reason, the program should not be described as conclusively community-led on the basis of attendance alone. Mathie et al., and Maclure show why analysis of agency and power relations is indispensable: community participation may be constrained even when meetings are well attended (Maclure, 2023; Mathie et al., 2017). Future reporting would benefit from describing who proposed each topic, whether farmers modified the agenda, and how decisions were carried forward between meetings.

Figure 2. FGD on Patchouli Production and Quality-Oriented Assistance

The involvement of agricultural extension officers offers a plausible bridge between local experience and specialized agronomic advice. Likewise, existing processing facilities potentially provide demonstration settings in which practices can be discussed in relation to the equipment producers actually operate. These possibilities represent a practical rationale for the mentoring design, not observed evidence of sustained knowledge transfer. Similar Indonesian interventions have used demonstrations and training to address patchouli seedling or production problems (Ahmad et al., 2023; Hifnalisa et al., 2025; Zikri et al., 2023). To demonstrate stronger added value, a subsequent evaluation in Tellu Limpoe would need process records showing how farmer experience influenced the choice and adaptation of technical content.

The first FGD brought 24 farmers into a forum also attended by village officials, extension officers, and program-team members. This composition created an opportunity for exchanging local experience with institutional and technical perspectives. Nonetheless, the available evidence does not establish how opinions were represented, whether priorities were jointly selected, or whether participation continued across subsequent activities. In ABCD terms, attendance indicates access to a participatory setting but is not sufficient to verify community-led decision-making or sustained agency (South et al., 2024; Ward, 2023).

Production Practice and Their Relevance to Oil Quality

A quality-oriented mentoring approach has a technical rationale because patchouli oil properties arise from multiple upstream and processing decisions. Reviews and experimental investigations highlight the relevance of harvesting, drying, storage, extraction conditions, and

analytical practices (van Beek & Joulain, 2018; Yahya & Yunus, 2013). Srivastava et al., examined chemical characteristics in oils associated with different drying stages (Srivastava et al., 2022). For a community program, these findings suggest that an effective learning conversation should address how material is selected and handled before it reaches the still, rather than beginning only with an end-product label or a single numerical target.

The reported plantation visit addressed plant characteristics, spacing, and pest-related concerns, while the second FGD focused on pests and diseases. These are plausible entry points for examining production consistency, but the manuscript does not provide specific pest diagnoses, field-by-field agronomic observations, intervention protocols, or subsequent practice assessments. It would therefore be inappropriate to identify any particular disease as the principal local constraint or to assert that a specific control method was successfully adopted. The added value of the present evidence is more modest: it shows that the program included cultivation- and plant-health-related topics within a broader quality-oriented sequence.

The distillation activity likewise relates to an important segment of the value chain. Smith et al., found that condenser cooling-water flow and drying conditions affected experimental extraction performance and oil characteristics in a setting in Maluku (Smith et al., 2024). Yahya and Yunus studied sample preparation and extraction time (Yahya & Yunus, 2013), while Arliani et al., compared multiple and single steam-injection configurations (Arliani et al., 2024). Taken together, these studies support the general claim that seemingly operational choices can have measurable consequences for distillation performance. Their experimental settings and measured values cannot be transferred to the facilities observed in Tellu Limpoe, for which condenser specifications, feed masses, batch duration, temperatures, and laboratory outcomes were not supplied.

It is also necessary to distinguish evidence of technical relevance from evidence of optimal technology. Advanced approaches such as supercritical carbon dioxide extraction can be experimentally valuable comparisons (Soh et al., 2020), but they differ from the accessible distillation equipment described in the community program. The mentoring logic should therefore consider feasibility, maintenance skills, operating costs, and compatibility with available infrastructure before making technological recommendations. Studies of farmer choices about distillation boilers (Mukhtar et al., 2020) suggest such practical constraints can shape adoption, although the present manuscript does not quantify their relative importance among participating farmers.

Figure 3. Distillation-Assistance Activity at a Local Processing Facility

A stronger follow-up mentoring program could turn these technical domains into a transparent batch-recording procedure. At minimum, a record could identify the farmer or distillation unit, harvest date, material characteristics, drying or storage conditions, feed mass, heating or steam-generation method, approximate processing duration, condenser operation, oil recovery, storage container, and sample identifier. Such a procedure would not itself demonstrate improved quality, but it would establish the continuity of evidence needed to relate changes in practice to changes in product characteristics. It would also allow community experience to become part of a cumulative local knowledge base rather than remaining in dispersed conversations and photographs.

Field Screening, Traceable Analytical Quality, and the National-Standard Question

The 29 November 2025 activity is described as a field oil-quality screening and discussion session. The retained documentation demonstrates that this topic was included in program activity reporting, but it does not provide a traceable analytical sequence from an identified oil batch to a laboratory result. No reliable record of sample coding, producer or unit linkage, sampling conditions, storage, transport, replicate analysis, calibration, chromatograms, or quantified uncertainty was available. In the absence of these materials, the activity cannot substantiate a numerical PA percentage. Nor can it substantiate full conformity with a multi-parameter product standard.

Analytical literature illustrates why this evidentiary threshold matters. Ramayanti et al., investigated PA-related changes during purification of patchouli oil with an adsorbent and used GC-MS in a clearly specified research setting (Ramayanti et al., 2021). Zhao et al., developed GC-MS/MS analysis of patchoulic alcohol in dried herbal material, which is analytically informative but employs a different sample matrix (Zhao et al., 2005). Those studies provide examples of instrument-supported chemical analysis; neither validates the methods, sample provenance, or

results of an undocumented field procedure in Bone. Moreover, the chemical review by Xu et al., concerns a wider pharmacognostic and herbal-quality literature that should not be mistaken for direct evidence of oil-standard compliance (Xu et al., 2022).

The national-standard context requires equally careful interpretation. SNI 06-2385-2006 has been used as a historical reference for Indonesian patchouli oil, while the BSN catalogue also identifies SNI 2385:2019 Konfirmasi 2025 as an applicable reaffirmed document aligned, with modifications, to ISO 3757:2002. Catalogue entries alone do not establish which test parameters or acceptance thresholds were assessed in the field activity. Any future claim of product conformity should therefore be based on the authoritative text of the selected standard, a documented sampling design, and valid results for all parameters relevant to the conformity claim (Badan Standardisasi Nasional, 2006, 2025).

The distinction is not simply terminological. Quality awareness refers to recognizing the relevance of identifiable production and testing conditions. Preliminary screening may help identify an issue or a need for further analysis, depending on the device and procedure used. Laboratory quantification requires analyte specificity, calibrated measurement, and traceable sample documentation. A conformity decision additionally requires an appropriate standard and evidence for its applicable requirements. The preserved project record supports reporting a discussion around quality assessment and the recognition, in this article's editorial evaluation, that stronger documentation is necessary. It does not demonstrate that farmers' awareness increased, that batches achieved a particular PA concentration, or that products passed certification.

For future implementation, an accessible two-level procedure is preferable to an unsupported claim of immediate standard compliance. The first level is a community-maintained batch register that captures source, handling, processing, and sample identity; the second is periodic, independently traceable laboratory testing using an appropriate method and reporting chain. The design should identify responsibility for sample collection, finance, interpretation, and communication of results to producers. Such institutional details matter because an elaborate testing protocol will have little practical benefit if results cannot be linked to specific batches or used by farmers in decisions. The proposal is a recommendation based on gaps in the current documentation, not an outcome of the completed program.

Figure 4. Field Oil-Quality Screening and Discussion Activity

Contribution of the Mentoring Sequence and Comparison with Related Programs

In terms of program design, the documented sequence links four domains that are often treated separately: recognition of local resources, dialogue with farmers and supporting institutions, attention to cultivation and processing practices, and the introduction of quality-assessment concepts. The sequence is a defensible organizing contribution because the program records report concrete activities at dated points and identifies assets used as their settings. The contribution must be expressed as an account of how the mentoring was structured; the current record cannot sustain the stronger formulation that the sequence was proven effective in improving farmer competence, production efficiency, market performance, or product chemistry.

Comparison with prior Indonesian community-engagement studies clarifies the program's contribution. Ahmad et al., addressed improved distillation technology with village production partners (Ahmad et al., 2023), while Zikri et al., and Hifnalisa et al., discussed farmer capacity-building related to patchouli seedlings (Hifnalisa et al., 2025; Zikri et al., 2023). Zikri et al., reported a broader upstream-to-downstream cluster approach including farmer organization, cultivation, postharvest activity, and distillation technology (Zikri et al., 2025). Against these precedents, the specific contribution of the Tellu Limpoe program is not technological novelty or a demonstrated yield effect; it is the organization of existing community assets into a sequence of technical mentoring and quality-oriented discussion that can inform the design of more accountable future evaluation.

This restrained contribution is compatible with a critical understanding of ABCD. The framework can help avoid overlooking local practical knowledge or creating unnecessary

dependence on external equipment. Yet Mathie et al., and Maclure caution that a celebratory narrative of local strengths can conceal unequal access to resources and decision-making power (Maclure, 2023; Mathie et al., 2017). An intervention that involves a village institution or extension officer is not automatically inclusive. To make a stronger claim, subsequent work should record which farmer groups participate, whose knowledge is treated as authoritative, what constraints lie outside the community's control, and whether collective arrangements enable producers to act on information about quality and markets.

Evidence quality is itself an institutional concern. Browne evidence-cycle perspective suggests that programs should not only collect data but also appraise, use, manage, and communicate it (Browne, 2024). South et al., show how evaluation can be co-designed so that community experience and formal measures inform one another (South et al., 2024). Applied prospectively, these insights imply that the records of inventory, meeting decisions, field observations, and sample testing should be linked rather than stored as unrelated outputs. They also imply that an evaluation should begin with a realistic theory of change: identifying assets may enable coordinated action; coordinated action may enable changes in specific practices; verified practices may affect product characteristics under defined conditions. Each transition requires its own evidence rather than being assumed from the previous stage.

For sustainability, a credible next step would be a jointly agreed monitoring arrangement with modest, explicit indicators. Process indicators might include the number of units with complete batch registers, the number of meetings with documented farmer-approved decisions, or the proportion of tested samples that can be traced to a production batch. Outcome indicators would depend on genuinely comparable observations of practice, laboratory-reported quality parameters, or clearly defined institutional functioning. Measures should be feasible for the participants and reported without retroactively assigning responsibility for changes that cannot be linked to the program. Such an approach is more informative than announcing general improvements in empowerment or quality without a basis for checking them.

Limitations and Implications for Future Evaluation

Several limitations constrain interpretation. First, the programme period is recorded as June–November 2025, although the available dated activity sequence begins in July. Second, attendance detail is incomplete for the second FGD, and the first FGD does not provide a village-by-village participant breakdown. Third, records of jointly determined priorities, responsibilities, and repeated practice adoption are limited. Fourth, comparability of the distillation inventories is uncertain because unit-level identifiers and consistent measurement protocols were not established. Fifth, complete pre- and post-activity assessments and validated skills instruments were not available.

Finally, the quality-screening documentation was insufficient for PA quantification or verification of full SNI conformity, and no longitudinal outcomes were recorded.

These limitations have consequences for the interpretation, not just the wording, of results. A process-oriented article can describe what was organized, who was reported to have attended a documented event, and what quality-control requirements were identified during subsequent evaluation. It cannot determine whether the program caused additional investment, increased knowledge, improved equipment use, or altered chemical quality. The descriptive approach also should not be presented as representative of all producers in Tellu Limpoe or transferable without attention to local assets and institutions. A useful future design would integrate contemporaneous minutes, defined participant rosters, unit-level inventories with stable identifiers, repeated observations of agreed practices, laboratory sampling protocols, and a community-involved reflection mechanism.

CONCLUSION

Available program records document a sequence of asset-informed mentoring activities relating to patchouli cultivation, plant health, distillation, and quality-related discussion in four villages of Tellu Limpoe District, Bone Regency. The first recorded FGD reportedly involved 32 participants, including 24 farmers, and the program made use of existing land, facilities, practical knowledge, village institutions, and extension personnel as points of engagement. These details support a descriptive interpretation of the program as a structured attempt to connect local production assets with quality-oriented technical assistance. They do not, without additional evidence, demonstrate improved farmer skills, higher PA content, standard-compliant oil, or sustained collective empowerment.

The two inventories described 17 and 26 available distillation units, but the counts cannot establish increased processing capacity or an effect of mentoring without comparable unit-level records. Likewise, the quality-oriented field activity should not be interpreted as laboratory-validated PA measurement. The practical implication is to pair future ABCD mentoring with a monitoring system agreed by farmers and other local actors: documented priorities, stable equipment identifiers, batch-level production logs, traceable sampling, appropriate laboratory tests, and repeated observations of selected practices. Such an approach could connect the community's existing assets to stronger evidence on technical learning and product quality without compromising its participatory rationale.

DECLARATIONS

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Author Contributions (CRediT)

Zakaria: Conceptualization, Methodology, Project administration, Supervision, and Writing-original draft; Arisal A: Investigation, Resources, Data curation, and Writing-review & editing; Nur Aicsya: Investigation, Formal analysis, Visualization, and Writing-original draft; Riska: Investigation, Data curation, Visualization, and Writing-review & editing.

Conflict of Interest

The authors declare that there are no conflicts of interest related to this study and the writing of this article. All processes related to program implementation, data collection, analysis, and presentation of findings were conducted objectively in accordance with academic purposes and the development of digital learning practices.

Data Availability and AI Use

Data Availability: The findings presented in this article are based on field observations, activity reports, Focus Group Discussion documentation, photographic records, and distillation-unit inventories collected during the community service program. The supporting materials have not been deposited in a public repository. Some records are incomplete, particularly those relating to participant assessments and laboratory-based oil-quality measurements. Accordingly, the article reports only findings supported by the available documentation.

AI Use: ChatGPT (OpenAI) was used to assist with academic language editing, manuscript restructuring, and the identification and organization of relevant literature. The authors retain responsibility for the accuracy, integrity, and scholarly content of the manuscript.

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