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Co-producing knowledge: A demand-led, prosperity-focused, research agenda with forest and farm producer organisations

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ABSTRACT

Gaps in Forest and Farm Producer Organisations' (FFPOs) knowledge, which are being widened by local and global uncertainties, undermine FFPOs' pursuit of broad conceptions of prosperity. As current methods of knowledge generation face several challenges, we use a knowledge demand survey from 41 FFPOs in six countries to show how co-productive methodologies can facilitate FFPOs delivery of prosperity. Our analysis of the knowledge demand survey shows how FFPOs' diversity of aims, knowledge needs, and capacities at different tiers of organisation, are well suited to co-productive methodologies. We conclude with eight-steps for co-producing knowledge with FFPOs: (1) collaborative exchange to identify areas of interest; (2) co-commitment to a topic; (3) researcher-led literature search for context; (4) FFPO-documented case studies; (5) co-learning event to exchange and integrate findings; (6) production of initial knowledge product; (7) testing of initial knowledge product; and (8) final co-learning event to refine knowledge product prior to dissemination.

1. Introduction

Prosperity is a worthy ambition. It may be defined as a 'negotiated vision of that which people value and have reason to value in line with the common good' (Macqueen et al., 2018b, p.2). Perhaps the most widely negotiated (and contested) vision of human prosperity is captured by the Sustainable Development Goals (SDGs). As Forest and Farm Producer Organisations (FFPOs) manage an estimated 90 percent of all farms and 30 percent of all forest land in the Global South (FAO, 2018), they can make significant contributions to broad visions of prosperity (Macqueen et al., 2018b) and delivery of the SDGs at scale (FAO and AgriCord, 2016).

Despite being diverse, FFPOs can be generally defined as people-centred forest- and farm-based organisations owned, controlled, and run by and for their members to realise their common economic, social, environmental, and cultural needs and aspirations (International Cooperative Alliance (ICA), 2020). FFPOs have varying spatial coverages and functions that allow them to be grouped into four-tiers working locally (first-tier), regionally (second-tier), nationally (third-tier), and internationally (fourth-tier) (Macqueen et al., 2018b). FFPOs also work across, social, economic, and environmental sectors, creating a genuine triple-bottom-line (Wanyama, 2014; Macqueen et al., 2018a, 2018b).

Socially, FFPOs can deliver local benefits by improving social and human capital (Mojo et al., 2015) and providing social and cultural services (Bolin and Macqueen, 2019), and national benefits by lobbying for improved policy representation for, and investment in, their communities. FFPOs generate local economic benefits by improving smallholder access to markets and encouraging value addition activities (Scherr et al., 2003; Ton, 2008), whilst also making international contributions through the US\$ 869 billion - US\$ 1.29 trillion in 2017 dollars gross annual value of smallholder production (Verdone, 2018). Environmentally, FFPOs deliver local benefits by promoting agroecological practices (Hou-Jones and Macqueen, 2019), which can create multi-functional landscapes that deliver larger scale environmental benefits (Hart et al., 2016).

Knowledge is a vital and often limiting resource in FFPOs' delivery of the benefits described above and their broader pursuit of prosperity. Additionally, achieving the SDGs requires collaborative multi-stakeholder approaches (Alston, 2020; Bowen et al., 2017). Therefore, we argue that member-based-organisations such as FFPOs must be at the centre of knowledge production in a demand-led, co-produced research effort. In this paper, we utilise knowledge demand surveys (KDS) (a form of learning needs assessment (Sleezer et al., 2014) that identifies knowledge gaps and priorities in order to help target them for improved

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performance) to explore the knowledge demands of 41 FFPOs and highlight the suitability of co-productive approaches to meeting FFPO knowledge needs for the pursuit of prosperity and delivery of the SDGs. We reflect on both what knowledge needs FFPOs prioritise and how that knowledge is best produced: what forms of knowledge, for whom, and by whom (Leach and Scoones, 2007; Wyborn et al., 2019)? The analysis focuses on moving away from common top-down outsider-led knowledge creation, towards more meaningful engagement of FFPOs.

1.1. FFPOs and shared knowledge: the benefits of having it and challenges arising in its absence

Access to shared knowledge creates several benefits for FFPOs; it is essential in sustaining FFPO functionality as it attracts members (Cherukuri and Reddy, 2014; Nugusse et al., 2013) and informs several key activities through which FFPOs pursue prosperity. For example, shared knowledge enables political advocacy for rights (e.g. shared agendas for more equitable distribution of resources and fairer terms of trade). It enhances scale efficiencies in markets (e.g. shared and thereby lower production costs – alongside shared negotiating power over sales prices). It enhances FFPOs' ability to provide social and cultural services (e.g. shared understanding of diverse FFPO member experiences and challenges). Shared knowledge is also essential for resilience and adaptive capacity to local and global uncertainties which arise in economies through market volatility (Murphy, 2012), social demographics through youth out-migration (Macqueen and Campbell, 2020; Proctor and Lucchesi, 2012), and environments through the climate crisis (Call et al., 2019; Morton, 2007). Responding to such uncertainty is challenging for FFPOs as changes are often unannounced, rapid, and beyond the scope of traditional knowledges and strategies.¹ As such, FFPOs must build their resilience through new knowledge about the threats being faced and appropriate responses to them (Ribot, 2014).

A lack of shared knowledge can create challenges for FFPOs. Internally, a lack of shared knowledge between FFPO members on good decision-making practice or diverse member needs may underpin poor governance systems, possibly leading to elite capture (Persha and Andersson, 2014) or common resource management issues (Gibson et al., 2005) which may exacerbate gender inequalities (Agarwal, 2001) and impede cost sharing and scale efficiencies (Humphries et al., 2012). Externally, knowledge gaps between FFPOs and other actors perpetuate mis-understandings and mis-alignment, which underpin unfavourable operating environments (Chirwa et al., 2005). For example, knowledge gaps between FFPOs and the state (i.e. FFPOs with poor policy literacy and/or states being unaware or dismissive of FFPO needs) may create tenure insecurity (Anderson et al., 2015) or poor access to infrastructure and support services (Shiferaw et al., 2011). Additionally, knowledge gaps between FFPOs and financial institutions (i.e. FFPOs unaware of how to access finance and/or financial institutions unaware of FFPO operations) often underpin perceptions of high risk that impede FFPO access to finance (Macqueen et al., 2018a) and restrict FFPO access to markets (Scherr et al., 2003).

The benefits of having and challenges of lacking shared knowledge highlight its importance to FFPOs. However, there is less certainty about the efficacy of current methods of knowledge production by, for, and with FFPOs.

¹ Traditional knowledges and strategies are based on FFPOs long histories of living in forest landscapes. They cover broad understandings on ways of being in the world as well as more specific sectoral knowledges e.g. on agricultural production systems. Reference to traditional *knowledges* recognises that there is no single traditional knowledge but multiple, equally valid, knowledges (Acosta, 2012; Deneulin, 2012).

1.2. FFPO knowledge production

1.2.1. Modes of producing new knowledge

FFPO generation and acquisition of knowledge can be split into internal and external approaches. Both approaches are highly political and power-imbued (Leach and Scoones, 2007; Yates, 2014), involving contestation, pluralism, informed dissent, and difference (Turnhout et al., 2020) between a growing diversity of actors and methodologies (FAO, 2014; Global Forum For Rural Advisory Services (GFRAS), 2015; Spielman et al., 2011).

Internal knowledge generation draws on the collective knowledge and experiences of FFPO membership (Dolinska and D'Aquino, 2016; Val et al., 2019). Its benefits include being demand-led (as FFPO action is mandated by members), being congruous with local knowledges and contexts, and having a greater sense of local ownership (Šumane et al., 2018). However, limitations are imposed on internal knowledge by low FFPO education and resource capacities (Shiferaw et al., 2011) and the possibility of local elite capture, which can prevent knowledge from being inclusive or applicable to the differentiated realities of marginalised groups (Agarwal, 2001).

In contrast, external knowledge production for FFPOs, historically implemented through NGOs, multi-lateral institutions, academics, or government extension, benefits from the relatively high capacity of such organisations, who bring technical knowledge from a range of experiences (Dolinska and D'Aquino, 2016). However, external knowledge production also has limitations. External knowledge products can be ineffectual due to incompatibility with local contexts, institutions, and ways of knowing (Clever, 2012; Dolinska and D'Aquino, 2016), which they can be framed as more 'legitimate' than and thus overshadow and exclude (Šumane et al., 2018). Additionally, the risk of elite capture still applies (Platteau, 2004) and a lack of trust between knowledge creators and FFPO implementers can prevent knowledge influencing practice (Campbell et al., 2016). External knowledge production has also been accused of de-politicising issues, rendering them technical and obscuring pathways to meaningful change (Li, 2011). Lastly, external knowledge production can be more responsive to prevailing development narratives and funding opportunities than to locally expressed needs (Banks et al., 2015). These ethical and technical challenges mean external knowledge products are often unsuitable for implementation and 'left on the dock', unused (Cash et al., 2006) and thus failing to shape practices or deliver prosperity (Clark et al., 2016; West et al., 2019).

Overcoming the shortfalls of both internal and external knowledge production requires an appreciation of the social and plural nature of knowledge and the politically contested nature of its production (Norström et al., 2020; Pohl et al., 2010). In light of these considerations, there is growing momentum for the adoption of co-productive and demand-led models that produce more context-specific and 'useable' knowledge (Dilling and Lemos, 2011; Lemos et al., 2012; Norström et al., 2020) and include local actors such as FFPOs, not just as invited participants, but as leaders of the process (Jupp et al., 2010).

1.2.2. How a co-produced knowledge agenda could improve FFPOs delivery of prosperity at scale

In the context of sustainable development, co-production of knowledge can be defined as 'iterative and collaborative processes involving diverse types of expertise, knowledge, and actors to produce context-specific knowledge and pathways towards a sustainable future' (Norström et al., 2020, p.183). There are several benefits to this approach. Normatively, co-productive processes, if well implemented, can be more inclusive, accountable, and democratic than loading dock approaches; allowing multiple, culturally embedded knowledges and power structures to be acknowledged, hopefully resulting in a collective vision (Scoones, 2009; Turnhout et al., 2020). Technically, the likelihood of implementation of co-produced knowledge is higher due to greater understanding and ownership of the process by all stakeholders,

and thorough consideration of the social and political environments in which knowledge is to be implemented (Meadow et al., 2015; Salomaa, 2018; van der Hel, 2016; Wall et al., 2017).

In addition to its general utility for sustainable development (Norström et al., 2020), co-production of knowledge is specifically relevant to FFPOs for four reasons. Firstly, co-produced knowledge is well suited to designing strategies for adaptation, a key FFPO challenge, as it explicitly focusses on usability, making knowledge easier to implement during uncertainty (Djenontin and Meadow, 2018; Weichselgartner and Kasperson, 2010). Secondly, co-production mandates cooperation between diverse actors in the FFPO sector (states, FFPOs, private businesses, development agencies), a lack of which currently underpins FFPO challenges. Thirdly, as FFPOs already broker relationships between smallholders and other decision makers in forest-farm landscapes, they have characteristics of boundary organisations that are key to animating and reducing the transaction costs of co-production (Lemos et al., 2018), positioning FFPOs to be leaders of such processes. Finally, participation in co-production and exposure to new ways of working can improve an FFPO's internal capacity for knowledge generation and implementation (Jupp et al., 2010; Norström et al., 2020), increasing their ability to benefit members.

Despite clear benefits and applicability to the FFPO context, co-production is not without challenges. Challenges can be social, structural, and functional in nature (Weichselgartner and Kasperson, 2010). Social challenges include managing unequal power relations between parties (Muñoz-Erickson, 2014; Pohl et al., 2010; Turnhout et al., 2020) and integrating different worldviews, cultures, and ways of knowing into project processes (Klenk and Meehan, 2017). Structural challenges arise from embedded institutional differences in timeframes, standards, and reward systems, placing stress on knowledge generation (Irwin et al., 2018). Finally, functional challenges stem from divergences in objectives, priorities, and scope of research, which arise where knowledge generating institutions may be more accountable to their funders than to FFPOs (Banks et al., 2015).

Whilst these co-production challenges cannot be 'managed-away', they can be partially addressed by completely including *all* actors through *all* stages of the research process. Inclusion ensures that research questions and methods reflect all organisations involved (Djenontin and Meadow, 2018) and encourages the open discussion of contrasting framings, power structures, and different value positions which allows uncertainty and controversy to be explicit (Scoones, 2009).

Co-producing knowledge clearly has potential to contribute to FFPO prosperity and the delivery of the SDGs. As such, the empirical section of this paper assesses how existing FFPO knowledge gaps are suited to co-production and how such processes could be implemented.

2. Materials and methods

2.1. Sample

41 FFPOs were sampled from six countries (full details in Appendix A), Ghana ($n = 12$), Kenya ($n = 4$), Zambia ($n = 6$), Nepal ($n = 3$), Vietnam ($n = 13$) and Ecuador ($n = 3$) by staff of the International Institute for Environment and Development (IIED). The 41 sampled FFPOs were highly diverse; they were at different stages of maturity (>20 years old ($n = 6$) to <4 years old ($n = 16$)); worked at different scales (first- ($n = 18$), second- ($n = 16$) and third-tier ($n = 7$)); had a large range of membership sizes (<200 ($n = 14$) to >1200 ($n = 15$), up to 8,500,000); and engaged in diverse activities, the most common of which was mixed agroforestry and development of multi-commodity value chains ($n = 17$).

All the FFPOs sampled are currently in partnership with the Forest and Farm Facility (FFF), for which FFPOs were selected by national experts from state institutions, civil society institutions, the private sector, and development agencies based on (1) the relevance of the

proposed work to the four outcome areas of FFF (policy advocacy, forest and farm enterprise development, climate resilience, and social and cultural service provision); (2) the logic of the proposal and evidence of motivation and capability in its preparation; and (3) any other criteria pertaining to regional or sectoral priorities agreed by the national experts. FFF is co-managed by the Food and Agriculture Organisation of the United Nations (FAO), IIED, the International Union for the Conservation of Nature (IUCN), and the European agri-agencies – Agricord. FFF is overseen by a steering committee comprised in its majority by representatives of locally controlled forestry and FFPOs. FFF strengthens the existing efforts of FFPOs through direct financing, first and foremost for their members, but also for the global pursuit of the SDGs and climate goals (FAO and AgriCord, 2016; Mayers, 2019).

The FFPOs included in this study were selected through convenience sampling; they were being visited for FFF technical backstopping, providing an opportunity to conduct KDS. In this instance, due to financial and logistical constraints, convenience sampling was the most realistic way of attaining access to often remote FFPOs and allowing them to directly and openly express their knowledge needs. We feel that despite the limitations of convenience sampling, the analysis and recommendations presented in this report remain valid for three reasons. Firstly, KDS were implemented with a diverse FFPOs. Secondly, empirical findings are supported by existing literature on the efficacy of co-productive methods (see Section 1.2.2). Finally, our findings are not being used to recommend specific knowledge products, but rather a methodology for producing knowledge with FFPOs.

2.2. Data collection

2.2.1. Survey design

A semi-structured survey (Longhurst, 2016) was designed by IIED staff to profile each FFPO. It was tested and refined in Kenya. The survey was structured to capture the organisational characteristics (age, area of operation, membership, values, activities), challenges, and resultant knowledge needs of FFPOs across six main value categories that make up prosperity (as developed in (Macqueen et al., 2018b)). Prosperity is always a negotiated concept and therefore differs from place to place. The SDGs provide perhaps the most globally negotiated articulation of prosperity, but the 17 goals comprise many overlapping value categories whose complexity is difficult to use in KDS. IIED work has highlighted widespread convergence in what people often value, allowing prosperity to be disaggregated into three clusters of six non-commensurate value categories (adapted from (Macqueen et al., 2018b)). The KDS assigned each category of prosperity a corresponding set of questions that focused on the challenges and knowledge deficits FFPOs experienced in that category; these are given in parenthesis below.

Values based on familiarity: (1) sustained environmental and cultural heritage (respondents encouraged to cite challenges and knowledge needs relating to land and natural resources); (2) material wealth and health (business and finance).

Values based on common interest: (3) affirmative social relations (organisational relationships and communication); (4) health and security (policies, justice, and security).

Values based on passion: (5) personal and reproductive fulfilment (youth education and training); (6) cognitive identity and purpose (cultural integrity and gender equality).

Structuring the survey in this way intentionally aimed to ensure that the responses did not cluster around a single knowledge deficit but spanned the full breadth of possible FFPO challenges. At the end of the questionnaire, and throughout, FFPOs were encouraged to state any additional issues that they thought would benefit from knowledge generation.

2.2.2. Survey administration

Data was collected between February 2019 and September 2019 during the launching of phase 2 of the FFF programme. The survey was

administered by three IIED staff-members (covering two countries each). Assistance was provided by in-country FFF programme facilitators, and, when required, a local translator.

The survey methodology, and the use of the data in refining FFF priorities for co-production of knowledge, was always announced at the start. Subsequent participation was always voluntary should the FFPO wish to continue. Respondents always included the FFPO chairperson and generally other elected members of the FFPO secretariat – varied technical teams elected and mandated by the smallholder membership to run the FFPO. If the survey was conducted when a group activity was taking place, e.g. FFPO meeting, other FFPO members also participated. Respondents offered information mainly through discussion, first in smaller groups and then in a larger group setting, comprising a mix of FFPO representatives and genders. There was no limitation to the number of answers that could be given to each question.

2.3. Data analysis

The survey responses were analysed collectively by the lead IIED researcher, with perceived similar expressions of knowledge needs grouped together into categories (checked against the perceptions of the other IIED surveyors). For each of the six pillars, a range of categories emerged from the individual FFPO responses. The frequency with which each category was mentioned by the 41 FFPOs was recorded to highlight the specific challenges that were most common for each issue. In addition, questions on FFPO organisational characteristics were assessed to identify common values that FFPOs pursue. These findings were then matched with existing literature on FFPOs and co-productive approaches to knowledge generation to assess the potential for wider utilisation of co-productive methodologies with FFPOs.

2.4. Limitations

The initial purpose of the KDS was to guide FFF's future co-productive work with, and investment in, FFPOs and to inform in-country actors of FFPO knowledge needs. These practical considerations introduce three primary limitations to the data when being used for academic inquiry.

Firstly, in the rare instances where wider member participation was not possible, the nature of FFPO leadership personnel (often middle-aged men) meant women and youth were under-represented in KDS responses. Meaningful inclusion of under-represented voices is essential in the pursuit of equitable and empowering outcomes through co-production (Djenontin and Meadow, 2018), and this must be addressed in our future work through broader sampling. This will be especially important in work seeking to create implementable FFPO knowledge products that could impact the lived experiences of such individuals. As this paper does not seek to recommend specific knowledge products but rather ways of working, the impacts of this limitation on validity are reduced.

Secondly, when translation was required, it was done by a local non-professional facilitator who may have had vested interests in outcomes and thus added their own interpretations to suit FFF goals. Positionality of translators, and indeed researchers, is an issue affecting all research. The translations were discussed with facilitators after the interviews to ensure, as far as possible, interpretations were true to FFPO responses. This was only an issue in a few locations as in most instances responses in English were possible.

Finally, during KDS analysis we applied generic labels such as 'climate resilience' and 'agroforestry' to FFPO responses to render them groupable. Such labels remove important local contextual factors and modes of expression. As this paper aims to present a broad synthesis on FFPO knowledge needs and its main contribution pertains to the value of co-production as a methodology, such a generalisation is necessary. However, when conducting co-productive research with FFPOs to generate usable knowledge products, such contextual specificities must

be retained.

3. Results

3.1. Organisational characteristics

FFPOs expressed a variety of reasons for formation (Fig. 1). The two most common reasons are economic: improved income and market access. The other reasons for foundation are a diverse representation of social, environmental, and additional economic interests.

FFPOs also pursue diverse values, with the three most common being environmental, economic and social in nature. The remaining values, apart from reputation for quality and professionalism (economic) and efficient resource use (environmental), are overwhelmingly social in nature (Fig. 2).

3.2. Knowledge needs

Several FFPOs stated that they required continued external support to overcome knowledge deficits relating to uncertainties caused by globalisation and the climate crisis. However, FFPOs also expressed their frustration at the lack of recognition of their ways of knowing and being in existing knowledge products and policies. For example, an Ecuadorian FFPO leader suggested that 'Ecuadorian policy of Buen Vivir² does not really reflect what we think is power – not about economic power but about the indigenous knowledge that gives us power. For many Buen Vivir means having a vehicle or staying in a hotel'. Other FFPOs stressed the value of, and need to conserve, traditional knowledges and practices such as the chakra agroforestry production systems,³ which are seen as deeply connected with their own health, citing that '[the] Chakra will be healthy if other chakras around it are healthy too. Human health is also related to the chakra health. The Chakra has a dialogue with the forest'. In order to improve the representation of their traditional practices and knowledges, whilst also adapting to the increasing uncertainties, FFPO members suggested they can find some answers in their traditional knowledges but also require help from others, such as research institutions, for instance to identify timber and other alternative species that are commercially attractive and work well in the chakra.

Below, we report the findings of the KDS across the six key pillars of prosperity.

3.2.1. Land and resources

Options and implementation strategies for improving resilience to climate change such as climate smart agriculture were the primary knowledge need related to land and resources ($n = 23$), with climate related issues such as how to cope with increasing pests and diseases also mentioned ($n = 5$). Beyond climate change, the knowledge demands were predominantly instrumental challenges such as soil fertility maintenance ($n = 9$), seed procurement ($n = 5$), and post-harvest storage options ($n = 3$). In total, 21 categories were identified.

² Buen Vivir, literally meaning "good life" or "living well", is a pluralistic and holistic philosophy adopted by several indigenous movements in Latin America. Buen Vivir can be viewed as a "long quest for alternative lifestyles" and as in opposition to hegemonic neoliberal approaches to governance and development (Acosta, 2012; Deneulin, 2012).

³ Chakras are culturally significant traditional agroforestry systems practiced by indigenous peoples throughout Latin America. Whilst highly diverse, chakras are commonly located on small forest farm plots (generally <1.5 hectares) where starches, fruits, legumes, hardwood species, and medicinal plants are cultivated, primarily for consumption but also for sale (Jarrett et al., 2017; Perreault, 2005).

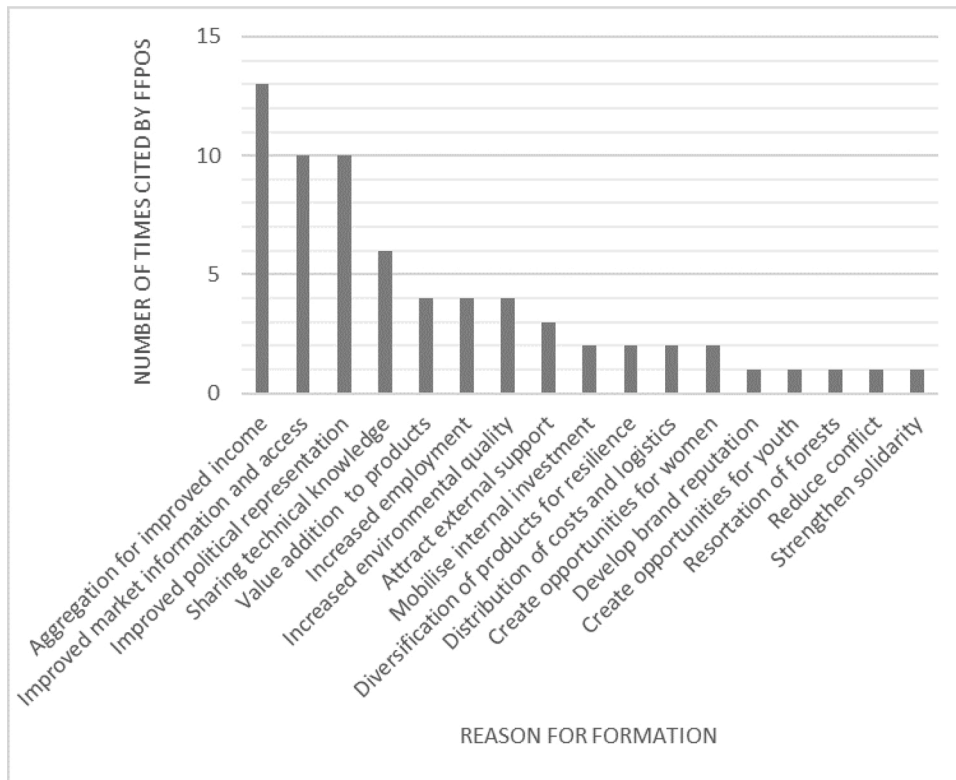


Fig. 1. Reasons for FFPO formation.

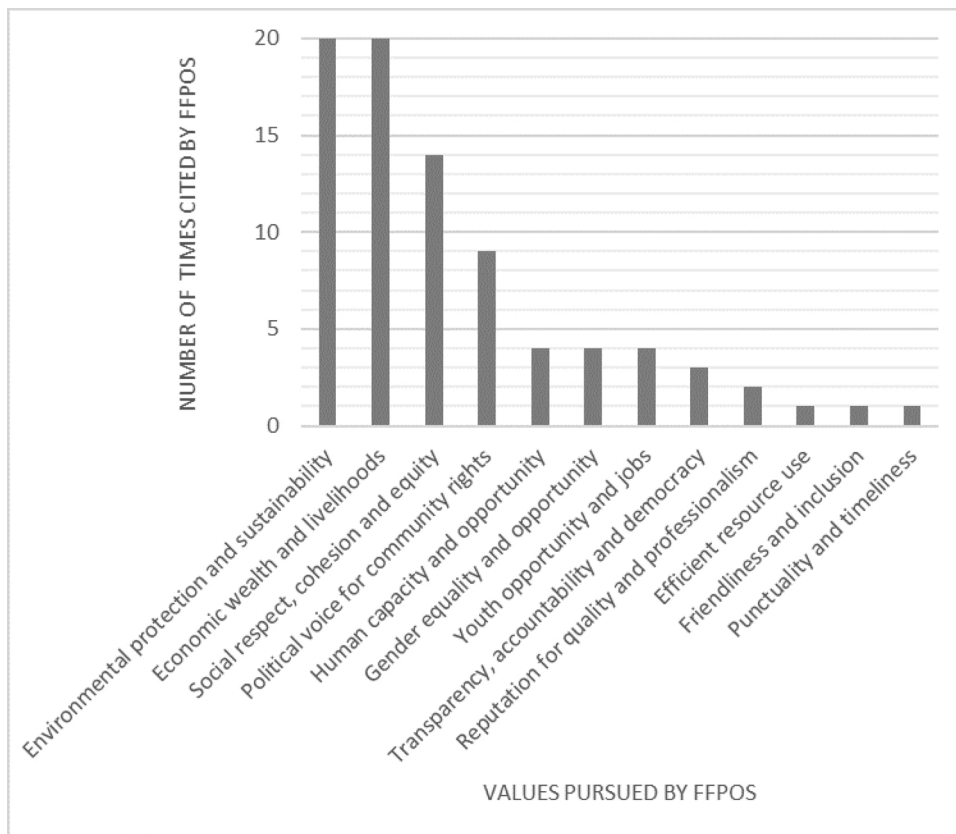


Fig. 2. Values pursued by FFPOs.

3.2.2. Business and finance

Strategies for the mobilisation of finance (n = 24) were by far the most common FFPO business and finance knowledge need. Other needs address specific facets and skills of FFPO business operation, including market analysis (n = 14), business plan formation (n = 9), branding (n = 9), utilisation of ICT (n = 8), processing options (n = 8), group business management (n = 7), quality grading approaches (n = 7), long- and short-term options for income diversification (n = 7), and improvement of negotiation skills (n = 5). In total, 23 categories were identified.

3.2.3. Organisational relationships and communication

The FFPOs surveyed overwhelmingly expressed a need for knowledge on how to maintain and improve aspects of internal governance (Fig. 3). Additional knowledge needs related to organisational relationships and communication included leadership training (n = 7), methods of external promotion (n = 7), internal communication mechanisms (n = 7), organisational exchanges (n = 7), mechanisms of conflict management (n = 6), types and attainment of sustainability standards (n = 5), and FFPO/Cooperative tactics (n = 5). In total, 19 categories were identified.

3.2.4. Policies, justice, and security

Improving the ability to interface with policy, which FFPOs recognised as often inconsistent and harmful to their operation (n = 3), was a key theme in the knowledge demands falling under policies, justice, and security. The top four knowledge needs (Fig. 3) all address improving the abilities of, and opportunities for, FFPOs to influence and engage with policy. Additional knowledge needs were sought on attaining land rights for women (n = 8), ways of using the media to be heard (n = 4), integrating customary laws together and with policy (n = 4), and how to

engage with infrastructure planning processes (n = 3). In total, 12 categories were identified.

3.2.5. Youth education and training

FFPOs provided a diverse list of possible trainings for youth members, whose inclusion was sought by several FFPOs (n = 12). Most training suggestions focused on economic benefits for youth members through value addition (n = 13), market research (n = 7), business management planning (n = 6), branding techniques (n = 4) and contract negotiation (n = 3). Additional knowledge needs showed a desire for information on how to engage youth in practical farming activities such as nursery development (n = 6), and exchange visits (n = 3). Need for knowledge on how to engage and train illiterate youth groups (n = 4) was also expressed. In total, 17 categories were identified.

3.2.6. Cultural issues and gender equality

Knowledge on how to further gender equality goals dominated suggestions for knowledge products regarding cultural issues and gender equality. The specific areas for knowledge and action for gender equality raised were women’s role in business (n = 19), inclusion of women in leadership and decision-making (n = 13), women’s access to natural resources (especially land) (n = 8), and gender equitable benefit sharing (n = 4). In addition to the strong gender component, FFPOs expressed several knowledge needs relating to the maintenance, recording, and utilisation of traditional cultures. Specifically, FFPOs sought knowledge on how to engage youth in aspects of traditional culture such as festivals, foods, and farming techniques (n = 4), how to attain support for these cultural practices (n = 3), how to record traditional product uses and practice (n = 3), and how culture could be utilised in marketing strategies (n = 6) and for cultural tourism (n = 3). In total, 15 categories were identified.

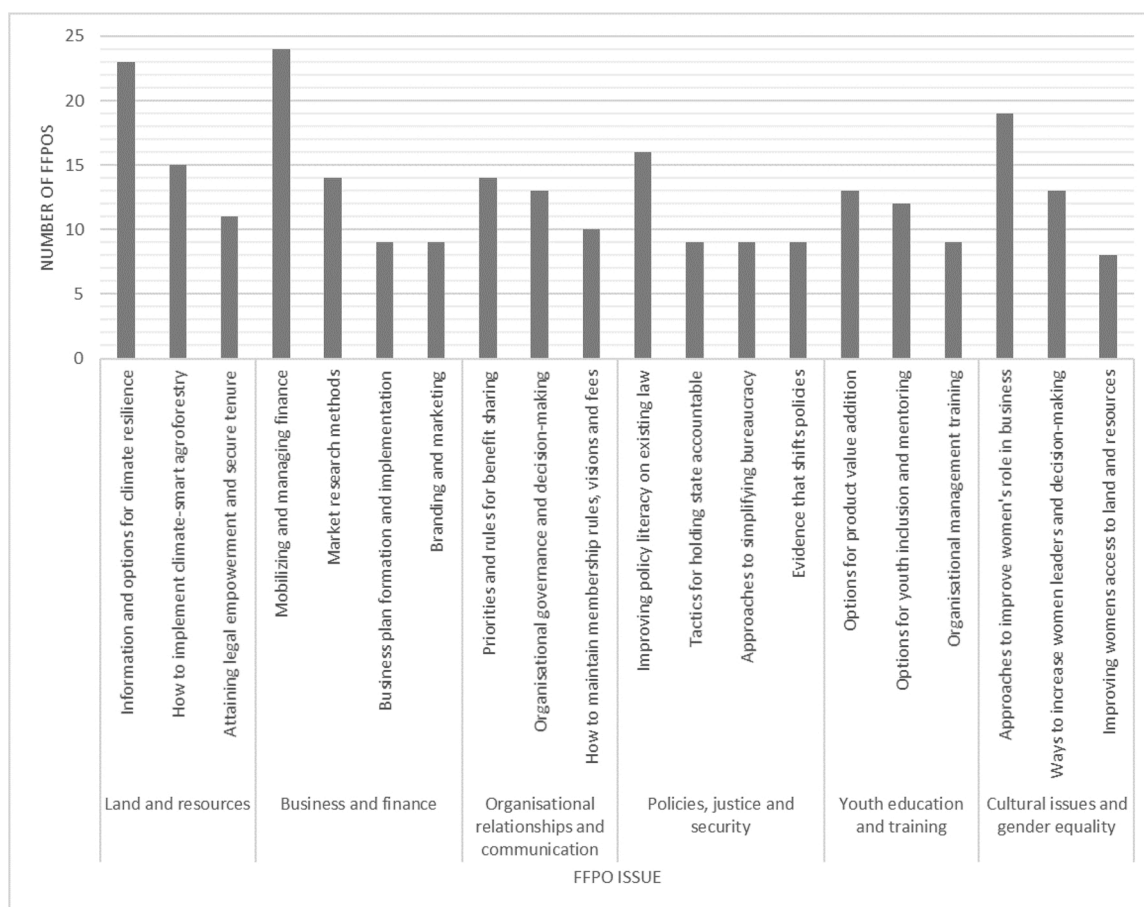


Fig. 3. FFPO knowledge needs per pillar of prosperity.

were identified.

4. Discussion

4.1. Diverse organisations and members require diverse knowledge products

Responses to the KDS overwhelmingly echo existing evidence that FFPOs are diverse organisations (Hou-Jones and Macqueen, 2019; Macqueen and DeMarsh, 2016; Wanyama, 2014), with multiple reasons for formation (Fig. 1) and a variety of pursued values (Fig. 2). This diversity puts FFPOs in stark contrast to many for-profit corporations that often more narrowly pursue financial returns and commonly have no direct accountability for providing broader prosperity for local people and landscapes (Macqueen et al., 2018b). This contrast in the diversity of pursued values highlights the comparative advantages of FFPOs in delivering broad notions of prosperity, the SDGs, sustainable forest management, and resilience, of which diversity is a key attribute (Hou-Jones and Macqueen, 2019).

The diverse reasons for formation (Fig. 1), pursued values (Fig. 2), and knowledge needs (Fig. 3) highlighted by analysis of the KDS are deeply rooted in and reflective of the contextual specificities of places, institutions, and cultures in which local organisations such as FFPOs are embedded (Clever, 2012). To be inclusive of such diversity and heterogeneity, knowledge production with FFPOs must be context-sensitive (Norström et al., 2020) and FFPO projects and support mechanisms must be flexible. This renders previously mainstreamed ‘one-size-fits all’, ‘loading dock’ approaches less normatively and technically desirable (Dilling and Lemos, 2011). In contrast, co-productive approaches mandate inclusivity and flexibility and directly involve FFPOs and their diverse knowledge systems, values, and politics. This approach ensures knowledge products are congruous with and inclusive of local knowledges and practices such as Buen Vivir and the chakra. Co-production also creates an opportunity for complementary (not overshadowing) contributions from external knowledge sources, which FFPOs expressed in the KDS as essential in adapting to changing social, economic, and environmental conditions. Importantly, such external contributions are only present in co-production when needed, desired, and invited by FFPOs, who, whenever possible, should lead co-production (Latulippe and Klenk, 2020). In addition to the sampled FFPOs’ diversity mandating co-productive approaches, the nature of their knowledge demands also points to the utility of co-producing with FFPOs.

4.2. FFPO knowledge demands lend themselves to co-productive methodologies

Three key findings from the FFPO knowledge needs highlighted by the KDS suggest a strong potential for co-productive approaches to fill FFPO knowledge gaps and contribute to FFPO prosperity: (1) pre-existing local practices exist for most needs, (2) there are existing broad literatures and external practices on most needs, and (3) communication gaps exist between key stakeholders.

Firstly, KDS responses highlighted that FFPOs already have ideas on how to pursue prosperity in the face of uncertainty (Fig. 3). They expressed a desire for knowledge on improving practices they are often already engaging in such as climate smart agriculture (3.2.1), investing in commodity value addition to improve youth employment prospects (3.2.5), and encouraging women in business to further gender equitability (3.2.6). Any external actor looking to support FFPOs to fill knowledge gaps should take time to understand, recognise, and build upon these existing FFPO-identified strategies and understandings of prosperity. Co-production works in this way; it is not about parachuting in externally identified ‘best practices’, as per many external knowledge generation practices, but rather about understanding and finding complementarity with existing FFPO interests and activities (Goldman et al., 2018).

Secondly, many of the FFPO knowledge demands identified through the KDS, such as climate resilience, FFPO governance, and gender inclusivity (Fig. 3), are already covered by vast and varied literatures. However, knowledge needs remain. These needs suggest current methods of knowledge production and dissemination from academia and development institutions frequently fail to reach FFPOs in useful ways. Academic papers often lack broad synthesis and actionable conclusions, are hidden behind paywalls, and written in academic jargon. This makes them almost completely inaccessible for FFPO audiences (this paper included). Similarly, researchers within multi-lateral institutions are often incentivised to design studies that focus on the measurable and tangible outcomes that are defined by donors and often occlude the specific political and social contexts (Banks et al., 2015) that FFPOs are deeply embedded in and which must be understood to overcome FFPO challenges. This reality represents a growing disconnect between knowledge and practice in sustainability interventions (West et al., 2019). Co-production has been identified as a potential means of overcoming such challenges at the knowledge-practice interface and is well suited to creating usable knowledge to overcome the identified knowledge gaps (Campbell et al., 2016; Weichselgartner and Kasperson, 2010).

Finally, several knowledge gaps highlighted by the KDS suggest a failure of communication or understanding, both externally between FFPOs and other stakeholders (e.g. between financial institutions and FFPOs creating knowledge gaps on access to finance), and internally between FFPO members (e.g. between FFPO members young and old, or men and women leading to knowledge gaps on internal governance). Additionally, as shown above, there is also a clear disconnect between research and practice communities. Co-productive approaches would ideally include all such stakeholders (Djenontin and Meadow, 2018), providing a forum for communication and open contestation of experiences, needs, and positions, and acknowledgement of power differentials (Pohl et al., 2010; Turnhout et al., 2020). By breaking down these communication barriers and including a range of viewpoints, well-run co-production can create knowledge products that are accessible and context sensitive and therefore implementable (Norström et al., 2020), overcoming challenges identified by the KDS. Additionally, the process of co-production allows stakeholders to synthesise dispersed insights into absorbable clear chunks, engage in peer-to-peer sharing to give confidence, and debate and feedback on ideas and practices to make the knowledge sink in. Through participation, all actor groups are likely to benefit from increased knowledge of, and capacity to effectively work in, their sector; highlighting how the process of co-production and its facilitation of stakeholder cooperation is of equal, if not greater, value than the actual knowledge product that is produced (Norström et al., 2020).

4.3. Co-producing knowledge builds resilience in times of increased uncertainty

The shown applicability of co-production to FFPO knowledge gaps mean co-production can help FFPOs build resilience to uncertainty. Co-productive strategies can be used to identify possible and actual threats to FFPO operations and facilitate FFPOs to develop, disseminate, and contextualise existing practical solutions that insulate against these threats, supplementing them with knowledge and resources from other co-producing actors. The importance of co-producing knowledge and engendering resilience to uncertainty has been underscored by the recent COVID-19 crisis (Ceballos et al., 2020; Guido et al., 2020) and continuing implications of climate change (Call et al., 2019; Morton, 2007), both of which have profound impacts on smallholder farmers. Responses must be guided by the needs, desires, and lived realities of the FFPOs that operate on the front lines of these crises and are essential in mitigating adverse impacts (Norström et al., 2021). KDS results suggest co-production can make this possible. For example, co-production for climate change challenges was highlighted by FFPOs throughout the

KDS (3.2.1), who believe they need support to achieve climate resilience. Additionally, despite the KDS being conducted pre-COVID-19, knowledge gaps highlighted by the KDS suggest co-production can support FFPO COVID recovery. For example, co-production can overcome access to finance knowledge gaps (3.2.2), improving FFPOs' ability to access COVID-19 response funds and thus facilitating recovery.

4.4. Co-producing knowledge with different tiers of FFPOs

Regarding the implementation of co-productive methodologies, the FFPO knowledge gaps highlighted by the KDS lend themselves to different scales of co-production with different tier FFPOs. Initiating co-production with the appropriate tier FFPOs will increase the likelihood that support is delivered efficiently as an appropriate scale of action ensures the correct stakeholders are engaged and knowledge products consider the necessary actors to reflect the context of their implementation (Norström et al., 2020). To ensure context sensitivity, principles of subsidiarity (Sachs, 2012) should be employed so knowledge is co-produced at as local a level as possible (i.e. with first- or second-tier FFPOs), apart from when scale of applicability or the level of necessary stakeholders mandates action at a national or international scale. Below, we outline how the knowledge demands of the sampled FFPOs lend themselves to co-production with different tier FFPOs.

First-tier FFPOs are well suited to co-producing knowledge pertaining to their member's production systems, which require specific agronomic, social, or economic guidance that is spatially variable and therefore ill-suited to large scale knowledge production. For instance, we see the identification of specific species for climate smart agriculture (3.2.1) as an issue that would benefit from co-production between climate scientists, plant scientists, and FFPOs at the local level, as different areas have different growing conditions and preferences.

Second-tier FFPOs are suited to co-producing knowledge that can be utilised at a sub-national level such as economic value chain development (3.2.2), climate vulnerability mapping (3.2.1), or youth engagement strategies (3.2.5), all of which were raised in the KDS. For example, second-tier FFPOs could work to co-produce knowledge on market niches and their respective quality standards within a particular value chain to improve the product quality from their members, which will in turn improve their own revenues from any value-added processing they undertake.

Third-tier national FFPOs such as federations or unions are well suited to co-producing knowledge about policy, justice and security and national business and finance issues as they typically have sufficient political capital (Forest and Farm Facility (FFF), 2016) and technical capacity to engage national actors in co-productive processes. For example, third-tier FFPOs would be well suited to co-producing knowledge with national banks on how to finance FFPOs and create FFPO-appropriate financing mechanisms, which are currently lacking (Macqueen et al., 2018a) and are a key knowledge demand (3.2.2). As they operate at the national level, third-tier organisations would also be suited to co-productive work on FFPO engagement with national policies, improving FFPOs collective ability to advocate for favourable operating environments (3.2.4).

Finally, fourth-tier multinational FFPOs are suited to co-production of knowledge products that aim to provide FFPO knowledge products that are applicable in a range of contexts and can be adapted to fit a range of scenarios. For example, FFPO-specific methods of business incubation (Macqueen and Bolin, 2018) or risk management (Bolin et al., 2016) which address business plan formation (3.2.1), and can be produced at the international level and then translated by third-, second- and first- tier FFPOs ready for implementation in specific contexts. Fourth-tier FFPOs are also suited to co-producing knowledge on advocacy strategies for FFPO rights and values, which are often pursued at the international level, where global agendas such as the SDGs are built and gain traction.

Whilst it is important to co-produce at the scale appropriate to the

knowledge need, as several needs expressed in the KDS (e.g. climate resilience) apply across scales, there is also a need to support and encourage dissemination between FFPO tiers. This can be achieved through FFPO-to-FFPO knowledge exchanges, which are often themselves sites of knowledge co-production (Dolinska and D'Aquino, 2016; FAO, 2017). These established inter- and intra-FFPO networks provide an opportunity for increasing the reach of co-produced methodologies and knowledge products, benefiting smallholder prosperity and furthering FFPO contributions to the SDGs. Additionally, encouraging FFPO-to-FFPO dissemination reduces FFPO reliance on external partnership for knowledge generation, which can prove inconsistent and subject to donor pressures (Banks et al., 2015). For such FFPO-to-FFPO dissemination to be effective, these approaches must be adequately funded and allow for flexibility during implementation of knowledge products to provide FFPOs and individual smallholder farmers the agency required to adapt knowledge products to fit with their localised social, economic, and environmental realities (Val et al., 2019).

4.5. Implementing co-production with FFPOs

The analysis of the KDS highlights the utility of using co-productive methodologies to meet diverse FFPO knowledge needs and enhancing their pursuit of diverse and locally applicable notions of prosperity in times of uncertainty. In order to mainstream co-productive methodologies to realise this potential at scale, development donors and institutions must be prepared to accept changes to their current procedural norms. They must: dedicate the necessary funds and time for sustained, patient, trusting, and open-ended interaction for knowledge co-production with FFPOs (Chirwa et al., 2005; Lemos et al., 2018); embrace uncertainty and potential conflicts (Turnhout et al., 2020); show humility and employ critical reflexivity when encountering and working with different knowledge systems (Šuman et al., 2018; van der Hel, 2016; West et al., 2019); avoid entering into partnerships with premeditated ideas on suitable problems or solutions, or how to report on them, in order to be able to respond to FFPO ideas and needs (Goldman et al., 2018); accept implementing co-produced knowledge is often likely to produce 'soft' rather than 'tangible' outcomes, with little inferable causality (Norström et al., 2020); and be open to processes and products of co-production manifesting themselves differently in different locations (Norström et al., 2020), reflecting the heterogeneity of the FFPO sector. These requirements present several challenges for actors in the development sector whom are often constrained by the rigid demands of donors and host institutions (Banks et al., 2015).

Reflecting on the literature on co-productive methodologies and our experience of initiating a co-production and KDS through the FFF, which is a product of around 15 years of work under different projects, we suggest eight guiding steps for researchers looking to co-produce knowledge with FFPOs. These steps are to be read through the lens we have adopted throughout this paper; they are not intended to be prescriptive, nor one size fits all, but rather must be adapted and agreed upon by the diverse actors (especially FFPOs) engaging with them prior to the commencement of activities and revisited throughout (Lemos et al., 2018).

- (1) Variably formal exchanges between identified researchers and FFPO stakeholders through some form of demand survey that allows FFPOs to collectively prioritise future knowledge generation.
- (2) Co-commitment on both sides to co-lead a process of documenting one topic of knowledge need across very different knowledge contexts (academic findings and practical stakeholder experiences).
- (3) A responsive researcher-led literature search to help contextualise any new knowledge product and inform discussions with FFPOs on how knowledge might best be attained and shared by and with relevant stakeholders.

- (4) A responsive set of practitioner case studies that are produced against a template informed by best practitioner-academic understanding to ensure the possibility of sharing across different elements of that template.
- (5) The co-presentation of those cases and background analysis in a joint researcher-FFPO learning event where findings and useful practices can be discussed.
- (6) The synthesis of those useful steps into some form of a guidance toolkit with broad principles that are framed in accessible language.
- (7) Testing of the toolkit by FFPOs and documenting impacts of its flexible use in variable contexts.
- (8) A further researcher-FFPO learning event to discuss and refine the toolkit before publication in both FFPO-accessible forums and as a policy briefing for policymakers who influence FFPO operating environments.

We recognise that the difficulties of securing sufficiently flexible funding over an extended period make a drawn-out process such as the above challenging for many. However, the shown potential and applicability of co-producing knowledge with FFPOs highlighted by the literature and our KDS analysis mandate a change in donor attitudes towards the funding of such initiatives which can provide the necessary, meaningful, and prolonged engagement between involved stakeholders that is required to develop implementable knowledge products and further FFPO provision of prosperity.

5. Conclusion

Our collection and analysis of key FFPO knowledge needs reflects how current methods of knowledge generation have had limited success in filling knowledge gaps that impede FFPO benefit delivery. As such, we argue for the proliferation of co-productive methodologies when working with FFPOs, which we show to be highly suitable to their diverse operational contexts and needs. We provide an eight-step process for realising the potential of co-productive methodologies to

facilitate FFPO’s pursuit of prosperity, to build FFPO resilience in uncertain times, and to be implemented across tiers of co-ordinating FFPOs. Whilst a switch from traditional to co-productive methods of knowledge generation will be challenging due to structural and institutional constraints, we believe we have provided sufficient evidence of applicability and pathways to benefit to mandate the widespread adoption of co-productive methodologies with FFPOs.

Declaration of Competing Interest

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Appendix A

Appendix 1: Details on all 41 sample FFPOs. (* members = individual people unless stated otherwise. Gender disaggregation given where available)

Country	Name of FFPO	Area of operations (tier of organisation)	Date of founding	Main activities	Number of members*
Ecuador	Wiñak	53 communities in Napo province. (2 nd tier)	2010	Cacao, guayusa (tree – leaves used for tea), and plantain value chains.	256 members (218 women)
Ecuador	Runashitu	Chontapunta parish, Napo province. (1 st tier)	1973	Ecotourism, community bank, cocoa farming, and chakra production.	85 members
Ecuador	Sacha Laran (ASOGROSACH)	Hatum Sumako parish, Napo province (1 st tier)	2014	Produce and process passion fruit, guava, lemongrass, chonta (peach palm), guayusa (tree – leaves used for tea), araza fruit, guava honey, and do water filtering.	56 members (31 women)
Ghana	Kasena Nankana Baobab Cooperative Union (KANBAOCU)	Upper East Region (2 nd tier)	2016	Agriculture and NTFP harvesting and processing (shea, baobab, tamarind, and honey)	2372 members
Ghana	Tele-Bere	Upper East Region (2 nd tier)	2017	NTFPs (shea nuts and butter, Baobab seeds and powder), agriculture, and local production and trade of goods (local beer, traditional cloth, hair products)	2907 members (2470 women)
Ghana	KAMALA	Upper West Region (2 nd tier)	2004	NTFPs (shea butter), agriculture (maize, soybeans, ground nuts), VSLAs, and grain storage.	3000 members (1800 women)
Ghana	Community action in development and research (CADER)	Lawra District, Upper West Region (2 nd tier)	2010	Agriculture (maize, soybeans, cowpea, groundnuts), vegetable production, and animal rearing	750 members (500 women)
Ghana	Zuuri Organic Vegetable Farmers’ Association (ZOVFA)	Upper East Region (2 nd tier)	1993	Promotion of organic production of groundnuts, millet, sorghum, maize and other vegetables, fruits, and NTFPs (honey, shea nuts, and tamarind)	5000 members (4000 women)
Ghana			1990		1000 members

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Country	Name of FFPO	Area of operations (tier of organisation)	Date of founding	Main activities	Number of members*
	Tuna Women Development Program (TUWODEP)	Sawla-Tuna-Kalba district, Savannah Region (2 nd tier)		Agriculture activities for local markets (maize, rice, soya, groundnuts, millets, cowpeas, barbara beans, and cashew nuts), animal rearing, and shea butter processing	
Ghana	Abrono Organic Farmers Association (ABOFA)	Bono East Region (2 nd tier)	1992	Promotion of organic farming (food crops and vegetables), promotion of trees on farms (teak, cashew, cocoa, mango; mahogany, moringa and indigenous species), beekeeping, and ecotourism.	4000 members
Ghana	Peasant Farmers Association of Ghana (PFAG)	National, across 10 Regions (3 rd tier)	2005	Policy advocacy for members, facilitate business development programs for smallholder farmers, governance of cooperatives, agricultural activities of member FFPO's vary by region.	40,000 members (18,000 women)
Ghana	Kokoo-Pa Farmers Association (KKFU)	7 districts in the Ashanti, Brong Ahafo and Western Region (2 nd tier)	2009	Cocoa, cassava, and plantain production	10,700 members (2890 women)
Ghana	National Tree Growers Association (NTGA)	Ashanti Region (2 nd tier)	2016	Mixed tree plantation development (teak and native species)	3000 members
Ghana	Achichire-Sureso Pebaseman Community Resource Management Area (ASP CREMA)	Western region (2 nd tier)	2004	Food crops (casava, maize, rice, plantain), cash crops (cocoa, rubber, coffee, allanblackia (tree – seeds used for oil)), trees for timber (mahogany, cedar, ofram, embir, and odum), and beekeeping	4000 members
Ghana	Kuapa Kokoo Cooperative Cocoa Farmers and Marketing Union Limited (KKFU)	All cocoa growing areas except Volta Region (3 rd tier)	1993	Cocoa production	100,000 members
Kenya	Community Tree Nursery Growers Association (COTNGAK)	National, across 16 provinces (3 rd tier)	2012	Tree and ornamental plant seedling production	3000 members
Kenya	Nakuru Smallholders Fruits Producer Association (NASFPA)	Nakuru County (2 nd tier)	Unknown	Fruit growing	1200 members (400 women)
Kenya	Nakuru Smallholder Timber Association (NASTA)	Nakuru county (2 nd tier)	Unknown	Timber production	1067 members
Kenya	Tree Growers Association of Nyandarua (TGAN)	Nyandarua county (2 nd tier)	2016	Timber production	500 members
Nepal	Association of family forest owner's Nepal (AFFON)	National, across 49 districts (3 rd tier)	2015	Legal advocacy from grassroot to national level, capacity building, and supporting commercialisation of agriculture.	5000 members
Nepal	National Farmers Group Federation Nepal (NFGF)	National, across 56 districts (3 rd tier)	2010	Network organisation of farmers, establish stakeholder relations to mobilise networks (private, non-state, and state), capacity building, and policy advocacy for marginalised groups.	93,700 members (59,031 women)
Nepal	Federation of Community Forestry Users Nepal (FECOFUN)	National, across 7 provinces and 77 districts (3 rd tier)	1995	Improve organisation, capacity building from local to federal levels, policy advocacy, government collaboration (local, provincial, federal), and pursuit of social justice.	8,500,000 members
Vietnam	Vietnam Cinnamon and Star Anise Cooperative	Dao Thinh community, Yen Bai Province (1 st tier)	2017	Cinnamon growing and processing	23 members
Vietnam	Herbal Medicine Collective	Dao Thinh community, Yen Bai Province (1 st tier)	2019	Herbal medicines production	14 members
Vietnam	Silkworm Collective Group	Dao Thinh community, Yen Bai Province (1 st tier)	2018	Silk production	87 members
Vietnam	Tan Nguyen Cooperative	Tan Nguyen community, Yen Bai Province (1 st tier)	2005	Acacia and cinnamon production. Exploring FSC certification.	15 members
Vietnam	Agroforestry Collective Group	Tan Nguyen community, Yen Bai Province (1 st tier)	2019	Acacia tree growing.	315 member households
Vietnam	Hoang Thanh Cooperative	Phuong Vien community, Bac Kan Province (1 st tier)	2017	Rice, herbal plants, and Magnolia tree growing	7 member households and 100 individual associate members
Vietnam	Unorganised Magnolia group	Phuong Vien community, Bac Kan Province (1 st tier)	n/a	Magnolia tree growing	Unquantified yet
Vietnam	Yed Duong Cooperative	Yen Duong community, Bac Kan Province (1 st tier)	2018	Pumpkin, zucchini, sticky rice, dry bamboo shoots, and seasonal local products	20 members (12 women) and 40 associate households
Vietnam	Nhung Luy Cooperative	Yen Duong community, Bac Kan Province (1 st tier)	2018	Dried rice, dried bamboo, Chinese sausage, cultivation of herbs and spices, and sugar cane juice	12 members (6 women) and 30 associated households
Vietnam	Dong Lai Organic Pomelo Collective Group	Dong Lai community, Hoa Binh Province (1 st tier)	2013	Pomelo and herb production, acacia tree growing, and pig rearing	25 member households (75 associated member households)
Vietnam	Tu Ne Beekeeping Group	Tu Ne community, Hoa Binh Province (1 st tier)	2010	Honey production	37 members
Vietnam	Unorganised Acacia Tree Growers Group	Tu Ne community, Hoa Binh Province (1 st tier)	n/a	Acacia tree growing	Unknown
Vietnam	Pomelo Cooperative	Tu Ne community, Hoa Binh Province (1 st tier)	2010	Pomelo production	Unknown
Zambia	Cotton Association of Zambia (CAZ)	National, across 5 Provinces (3 rd tier)	2005	Represent cotton producers	60,000 members
Zambia			2017		1158 members

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Country	Name of FFPO	Area of operations (tier of organisation)	Date of founding	Main activities	Number of members*
	Zambia National Forest Commodities Association (ZNFCA)	National, across 5 Provinces (2 nd tier)		Nurseries, fruit trees, NTFPs (caterpillars and honey), timber, and charcoal production	
Zambia	Choma Charcoal Association	3 Chiefdoms around Choma (2 nd tier)	2016	Charcoal production	554 members
Zambia	Masopo and Tubeleke Clubs	Choma and Musopo (1 st tier)	2015	Basket weaving, chicken and pig rearing, and tree plantations (eucalyptus and pine)	52 members (40 women)
Zambia	Mboole Rural Development Initiative	Cooma chiefdom (1 st tier)	Unknown	Nursery and orchard plantation	12 members
Zambia	Tree Nursery Association	Choma city (1 st tier)	2017	Seedling production	36 members

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