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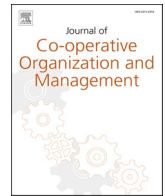
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Supporting self-organisation in farmer organisations in developing countries: A case with a group of farmer groups in Indonesia[☆]

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ABSTRACT

Governance through self-organisation in which participation is essential has been acknowledged to be important to enable farmer organisations to perform their roles in a sustainable manner. This paper focuses on empowering farmer organisations in developing countries to self-organise their governance to deal with encountered challenges. To this purpose, a co-creation approach was implemented with a group of farmer groups located in a horticultural production centre in Indonesia. In multiple co-creation sessions organised over time, the need for a new form of governance was identified, solutions proposed, (partially) implemented, evaluated and adapted. The results show that: 1) through co-creation, farmer organisations in developing countries can be empowered to self-organise; 2) self-organisation facilitates farmer organisations to learn to adapt to change; 3) self-organisation increases the commitment of farmer members; and 4) decentralised governance is a promising solution for growing farmer organisations.

1. Introduction

Farmer organisations (FOs), e.g. farmer groups, cooperatives, strive to improve their farmers' position in their production and supply chains through, e.g. improving access to markets, production inputs, transportation, technology. To enable FOs to perform their roles in a sustainable manner, governance is needed (Beber, Theuvsen, & Otter, 2018; Markelova et al., 2009).

Governance, with respect to FOs, encompasses a set of rules and decision-making structures to govern farmer members in the organisation, and between the FOs and external actors (e.g. markets, funding institutions, extension programmes) (Beber et al., 2018; Markelova et al., 2009). Previous studies on governance in FOs have focused on analysing the types of governance (discussed in more detailed in Section 2) and its impacts on FOs performance, e.g. (Benos, Theo, Kalogeras, Verhees, Sergaki, & Pennings, 2016; Cechin, Bijman, Pascucci, & Omta, 2013; Chaddad & Iliopoulos, 2013).

This paper focuses on the process of (re)organising the governance of FOs, especially in developing countries, to deal with the encountered challenges. The challenges that most FOs in developing countries face, for examples, are free-riding behaviour of farmer members that erodes their commitment, lack of capacity to fulfil market requirements (quality, quantity, supply schedule), lack of access to finance, and lack of common goals between farmer members that is related to the lack of communication between them (Gramzow et al., 2018; Kirsten & Sartorius, 2002; Lutz & Tadesse, 2017). More specifically, this paper focuses on the process of (re)organising FOs governance initiated by farmer members, and then the process of (re)organising is performed by farmer members themselves, or it is called self-organisation (Zeijl Rozema, Corvers, Kemp, & Martens, 2008). Although self-organisation has been proposed (Apparao et al., 2019; Markelova et al., 2009; Ochieng, Knerr, Owuor, & Ouma, 2018) empirical studies on the potential of self-organisation in FOs are still limited and only found in developed countries, e.g. in France by Hannachi, Fares, Coleno, and Assens (2020).

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One of the essential elements in self-organisation in FOs is participation of farmer members. Participation in this context refers not only to the involvement of farmers in FO's activities, but also their involvement in the decision making process (Fischer & Qaim, 2014; Mwambi, Bijman, & Mshenga, 2020). However, as most farmers in developing countries are smallholder farmers characterised by lack of access to assets, market, technology, and knowledge (Kariuki & Place, 2005; Mheen-Sluijer & Cecchi 2011; Sáenz-segura, 2006), most often have less participation in contributing to the decision making process of their FOs. With respect to this, empowerment to improve farmers' awareness of: 1) situations (own and other farmers' situations); and 2) ability to take actions (through working together) to change their situations are very crucial (Kusnandar, van Kooten, & Brazier, 2019).

Most studies on participation of farmers in FOs in developing countries focuses on understanding factors (economic and social) contributing to the participation of farmer members, e.g. (Belay, 2020; Cechin, Bijman, Pascucci & Zylbersztajn, & Omta, 2013; Fischer & Qaim, 2014; Gyau, Mbugua, & Oduol 2016; Mwambi, Bijman, & Mshenga, 2020). This paper addresses the research question: Can farmers in developing countries be empowered to participate in self-organising the governance of their FOs? An approach based on the co-creation proposed by Kusnandar et al. (2019) is used to empower farmers in this study. A group of farmer groups located in a horticultural production centre in Indonesia is the case of study. This organisation comprises 13 sub-groups that work together to supply produce to supermarkets (discussed in more detail in Section 3). Based on this organisational structure, the empowerment on which this paper focuses comprises two levels: 1) the group of farmer groups; and 2) the sub-group, to enhance farmer members' participation in the decision-making process.

This paper focuses on the gap in knowledge on what's needed to empower farmers to self-organise in the context of FOs in developing countries. The results of this study can be used by governments, NGOs, universities and other stakeholders to design programmes for FOs development in developing countries.

2. Literature review

Different types of governance with different levels of self-organisation are deployed by FOs in developing countries. These types and levels are described below together with means to empower FOs and to embrace co-creation.

2.1. Governance in farmer organisations

Governance, in this paper, is defined as a set of rules and decision-making structures encompassing formal and informal institutions that govern involved actors in a social system (Kusnandar, Brazier, & Kooten, 2019). With respect to FOs, governance has the function to govern farmer members in the organisation, and between the FOs and external actors (e.g. markets, funding institutions, extension programmes) (Beber et al., 2018; Markelova et al., 2009).

Governance of FOs can be distinguished into: governance ruled and legalised by the government; and, governance determined by the organisations themselves. Governance encompassing the procedure and the requirements for the establishment of FOs are ruled and legalised by the government (Beber et al., 2018; Shen & Shen, 2018). Meanwhile, governance related to agricultural production and supply chain (APSC)¹ (both, internal governance and governance with external parties) is determined by the organisation themselves (Cechin, Bijman, Pascucci & Zylbersztajn, & Omta, 2013; Markelova et al., 2009).

Governance of FOs w.r.t. APSC relates to the nature of FOs in which farmer members have roles as the owner, shareholder, supplier, and

management (Limnios, Mazzarol, Soutar, & Siddique, 2018). FOs in take roles in APSC to not only maximise their profits but also to maximise the benefit of farmer members, i.e. social and economic objectives (Benos et al., 2016; Bijman & Wijers, 2019; Limnios et al., 2018).

In general, governance of FOs w.r.t. APSC can be distinguished into: 1) traditional; and 2) non-traditional governance (Benos et al., 2016; Chaddad & Iliopoulos, 2013; Grashuis & Su, 2019; Iliopoulos, Varnik, Filippi, Volli, & Laanevali-Vinokurov, 2019). Traditional governance is characterised by centralised activities (including decision making process) performed by the management of FOs consisting of members who are selected by all farmer members through certain mechanisms, e.g. deliberation, voting (Chaddad & Iliopoulos, 2013; Grashuis & Su, 2019).

In many cases in developing countries, FOs implement traditional centralised governance of, e.g. market, production plan, produce quality control, transportation (Roy & Thorat, 2008; Hoi, Mol, & Oosterveer 2009; Trebbin, 2014). This kind of governance is useful to synchronise supply with demand, to pursue the economies of scale (efficiency), and to improve the quality standard of farmers' produce to meet global market requirements (Trebbin, 2014).

Traditional governance has been successful for FOs with a small number of homogenous farmer members (Chaddad & Iliopoulos, 2013). However, when FOs grow, this governance is challenged by factors such as, heterogeneity of involved actors, information intransparency, and unequal benefit distribution, that can harm the sustainability of FOs (Cechin, Bijman, Pascucci & Zylbersztajn, & Omta, 2013; Grashuis, 2018; Hohler & Kuhl, 2018; Klaas-Wissing & Albers, 2010).

To adapt to the growth of organisations, FOs in developed countries have successfully transitioned to non-traditional governance characterised by: 1) *separation* in which many activities and decision making are decentralised in units or sub-organisations; 2) *delegation* in which activities and decision making are delegated to professionals (Chaddad & Iliopoulos, 2013). However, this type of governance is rarely found in developing countries (Chaddad & Iliopoulos, 2013).

This paper focuses on supporting growing FOs in developing countries, to self-organise to determine the appropriate governance for their organisations. The next section discusses governance through self-organisation.

2.2. Governance through self-organisation

Governance through self-organisation is characterised by collective decision making with a horizontal relation between actors (Zeijl Rozema et al., 2008). Self-organisation is defined, in this paper, as a dynamical and adaptive process that emerges from local interactions (without central control) to (re)organise governance systems (Serugendo, Irit, & Karageorgos, 2006; Wolf & Holvoet, 2004). Governance established through self-organisation is believed to be of value as it is based on local context with direct actor involvement for which acceptance and compliance of actors are inherent to the approach (Mollick et al., 2018; Ostrom, 2009; Zeijl Rozema et al., 2008).

The ability of FOs to self-organise depends on two factors: 1) policy measures (Brusselaers, Poppe, & Azcarate, 2014); and 2) participation of farmer members (Andrews & Shah, 2003; Kusnandar et al., 2019). Regarding the first factor, self-organisation is enabled by policy measures that allow FOs to be adaptable and flexible (Brusselaers et al., 2014). In the case of Indonesia, the regulation of farmer organisations² focuses more on regulating their establishment. Meanwhile, the FOs, to some extent, have autonomy over their governance, including governance related to APSC activities. In addition, the government supports FOs through production input aids (e.g., fertiliser subsidies, tool and machine aids) and capacity building (e.g., agricultural extension

¹ Encompassing the aspect of production, market, logistics, finance, capacity development (Markelova, Meinzen-Dick, Hellin, & Dohrn, 2009).

² Regulation of Ministry of Agriculture of Republic of Indonesia, Number 82/Permentan/OT.140/8/2013 on Guidelines for the Development of Farmer Group.

programmes). Given this, this paper focuses on the second factor: participation of farmer members. Participation, in this paper, is defined as “to be part of a specific larger whole, to be in a reciprocal relationship with a specific larger whole, for actors to have the ability to act and to take responsibility” (Brazier & Nevejan, 2014). To participate in self-organising FOs, farmers (as members of FOs) contribute to the decision making process to (re)organise the governance of their FOs, and to take actions based on the agreed governance (Andrews & Shah, 2003; Kusnandar et al., 2019).

However, in the decision-making process, most FOs in developing countries are typically dominated by a few members (Bijman & Wijers, 2019; Mwambi et al., 2020), while most other members are less involved. Lack of access of most farmer members to knowledge, information, assets, market and technology are believed to contribute to this situation (Kariuki & Place, 2005; Mheen-Sluijer & Cecchi 2011; Sáenz-segura, 2006).

As FOs grow (especially in market access and membership), they often face the challenge of organising farmer members (w.r.t. APSC activities) to fulfil market requirements. This challenge often results in many farmer members no longer being involved (Bijman & Wijers, 2019). In addition, an increase in the number of farmer members often leads to divergence of interests and goals (Cechin, Bijman, Pascucci, Zylbersztajn, & Omta, 2013) that, in turn, affects the commitment of farmer members to the FOs (Apparao, Garnevska, & Shadbolt, 2019). This paper explores the potential of self-organisation to overcome such challenges in the governance of their FOs (Bijman & Wijers, 2019; Cechin et al., 2013).

To enable self-organisation in FOs in developing countries, empowerment is required. The next section discusses the principles of empowerment and empowerment of FOs, especially in developing countries.

2.3. Empowering farmer organisations

Empowerment can be defined from different perspectives. It can be the process of improving capacity to act, increasing opportunity to control and use resources, and giving space to contribute to the decision-making process (Perez-Ramirez et al., 2012; Richardson-Ngwenya et al., 2019; Rowlands, 1995). Furthermore, empowerment can also be the process of increasing the potential capability (Richardson-Ngwenya, Restrepo, Fernandez, & Kaufmann, 2019) through improving awareness of situations and capability to act and take responsibility and to self-organise (Kusnandar et al., 2019).

Based on its area, empowerment can address the problem w.r.t. basic needs (e.g. food, water, health, education), productivity, income, capacity building, and institutions (Civera, De Colle, & Casalegno, 2019).

With respect to FOs, empowerment can also be seen from other perspectives. It can be the process of increasing the capability of FOs to support farmer members in APSC activities, strengthening organisational structure and governance of FOs including giving greater autonomy and responsibilities to farmer members (Civera et al., 2019; Pezeshki-Rad, Biglari, & Zamani-Miandashti, 2011), and facilitating interaction between farmer members to learn from their peers and to pursue their common goals (Sirdey & Lallau, 2020).

Many programmes have been conducted to empower FOs in developing countries. These programmes have empowered farmer members to work together to increase their capabilities with respect to production (Kraaijvanger, Veldkamp, & Almekinders, 2016; Minah, 2021; Perez-Ramirez, Ponce-Diaz, & Lluch-Cota, 2012; Richardson-Ngwenya et al., 2019; Sirdey & Lallau, 2020), access to markets (Bacon, 2010; Ferguson & Kepe, 2011; Sanginga et al., 2004; Ton, Grip, Lancon, Onumah, & Proctor, 2014), and information dissemination (Ferguson & Kepe, 2011).

Building upon previous works of empowering FOs, this paper explores the potential of empowering FOs and their members to self-organise their governance to deal with challenges with which they are

confronted. Farmer members are involved in every step of this process (including situation analysis, decision-making process, and implementation) (Bijman & Wijers, 2019; Pezeshki-Rad et al., 2011). For this, a method based on a co-creation approach proposed by Kusnandar et al. (2019) is deployed.

The next section discusses the co-creation approach to empower FOs to self-organise.

2.4. Co-creation approach to empower FOs to self-organise

A co-creation approach to empower APSC actors (farmers and local traders) to improve their governance has been developed by the authors, reported in Kusnandar et al. (2019) and expanded in Kusnandar, van Kooten, and Brazier (2021). This approach then is called COCREATE.

The goal of this approach is to empower participants to work together to design and implement solutions for the challenges with which they are faced, and to adapt when situations change. A common understanding of their challenges is essential. Hence, empowering participants to learn from each other's positions and perspectives is the foundation of the COCREATE approach (Kusnandar et al., 2019, 2021). Reflection based on paraphrasing is essential to this approach:

“...when a participant is talking, other participants listen and are silent. Then, when another participant is going to talk, he/she has to paraphrase what the previous speaker has just said before he/she is allowed to contribute his/her ideas to the discussion” (Kusnandar et al., 2019).

COCREATE (Kusnandar et al., 2021) consists of three main activities: design, implementation, and follow-up. In the design and implementation activities, participants work together to understand their own and others' situations, learn from others' perspectives to pursue improvement of their common understanding, to co-create and implement agreed solutions. In the follow-up design, participants work together to identify barriers in implementing the solutions, analyse the source of these barriers, and co-create new solutions (Kusnandar et al., 2019, 2021).

During co-creation activities participants are supported by facilitators who ensure the co-creation procedures (including the paraphrasing technique) are followed by participants, and mediate requests for information (Kusnandar et al., 2019, 2021).

The next section describes the implementation of COCREATE in a case-study with farmer groups in Indonesia in which governance was a challenge.

3. Method

Participatory action research (Kidd & Kral, 2005) was performed in a single case study with a farmer organisation in Indonesia (Yin, 2003), more specifically with a group of farmer groups.

This group of farmer groups is located in the sub-district of Pangalengan, Bandung District, West Java, one of the horticultural production centres in Indonesia. Farmer members of this FO cultivate various kinds of horticultural crops, for example beans (various types), white radish, tomato (various types), cabbage, carrots, potatoes, chillies.

This participatory action research was conducted in collaboration between the Systems Engineering Section, Faculty of Technology Policy and Management, TU-Delft, Netherlands, and the Study Programme of Agribusiness, Faculty of Agriculture, Padjadjaran University (Unpad), in the period between June, 2017 and May, 2018.

3.1. Setting

The group of farmer groups (GFG) of Pangalengan was initiated by a formal farmer group located in Pangalengan sub-district. This formal farmer group participated in a programme in market access organised by a local university. As a result, in 2015, they acquired access to supermarkets as an outlet for their produce, increasing their market

Table 1

Number of participants in the design activities and follow-up design.

		Number of farmers
Design activities (June–July 2017)	Workshop 1	13
	Workshop 2	12
	Workshop 3*	15
Follow up design (April–May 2018)	Workshop 1	15
	Workshop 2	18

* Extension meeting due to time constraint in Meeting 2.

significantly. As they could not fulfil the market demand themselves, they involved other farmer groups in the neighbourhood to join them to supply produce to these supermarkets. The informal GFG of Pangalengan was formed consisting of a number of sub-groups of farmers some of which themselves are formal farmer groups.

When the action research was performed (in 2017) the GFG of Pangalengan supplied produce to 4 supermarkets, and they had 13 sub-groups with approximately 100 farmers involved (each sub-group has, on average, eight farmers). Each sub-group has its own coordinator who is a member of the GFG management team (GFG Management).

Contracts with supermarkets were managed by the initiator of the collaboration, the FG of Pangalengan. The GFG Management is responsible for coordination of production, post-harvest activities, quality evaluation, finance and market access and development.

Quality evaluation (e.g. % of Grade A, B, C) is the basis for the payment to farmer members. With respect to price, there is a price agreement between the GFG and farmer members based on the contract price with supermarkets. Farmers receive payment after the GFG has received payment from the supermarkets, most often within 3–4 weeks. With respect to financial arrangements, some sub-groups that have formal legality (formal farmer groups) have acquired governmental programmes for tools and machines. There is sharing in using tools and machines between farmer groups coordinated by the GFG. They also have access to governmental agricultural extension programmes.

3.2. The implementation of co-creation approach to support self-organisation in GFG of Pangalengan

The COCREATE approach discussed in Section 2 has been implemented to empower farmer members of GFG of Pangalengan to self-organise their governance to deal with challenges they encounter.

3.2.1. The design activities

The design activities consisted of three workshops between June and July, 2017, in Pangalengan. Participants of these workshops are representatives of sub-groups and the GFG Management (Table 1). These workshops were supported by 3 facilitators (2 research assistants from Unpad and 1 researcher from TU Delft).

These workshops were organised to: 1) improve the understanding of participants on the challenges encountered by their GFG (i.e. the initial situations); and, 2) co-create solutions to improve their governance to deal with the challenges (i.e. the first desired situation).

3.2.2. Implementation activities

After the design activities, there was a period in which the GFG (the sub-groups and the GFG Management) implemented solutions agreed in the design activities (i.e. the transition period). The transition period lasted between July 2017 and April 2018, after which the follow-up design commenced.

3.2.3. Follow-up design activities

The follow-up design consisted of two workshops conducted between April and May 2018, in Pangalengan. Participants of these workshops were the same representatives of sub-groups and the GFG Management. These workshops were also supported by 3 facilitators (2 research

assistants from Unpad and 1 researcher from TU Delft).

These workshops were organised to: 1) share understanding of the implementation of agreed solutions and the changes in the situation during the transition period (i.e. the transition situations); and 2) improve solutions based on the experience in the transition period (i.e. the second desired situations).

The number of participants in the co-creation workshops is shown in Table 1.

4. Results

This section discusses the results of co-creation implementation by the GFG of Pangalengan (supported by facilitators) to self-organise their governance (during the period of research between 2017 and 2018) to deal with their challenges. The activities in the co-creation approach are discussed below.

4.1. The design activities

This section discusses the process of design, challenges identified and solutions co-created in the related activities.

4.1.1. The process of design activities

The first workshop of design activities started with facilitators explaining the goals and procedure of the workshop, including the paraphrasing technique. Then, facilitators and participants introduced themselves. In the first workshop, participants worked together to identify the initial situations and challenges they encountered (discussed in Section 4.1.2). After that, in the second and third workshops, participants worked together to co-create and determine agreed solutions to be implemented.

In these workshops, participants first used post-it notes to write down their ideas concerning challenges and solutions and then discussed them together. Initially, participants needed to be continually reminded by the facilitators to paraphrase what the previous speaker had said before presenting their own thoughts. However, after some time, most participants were used to the procedure, and adopted it well.

When the participants discussed the solutions (in the second workshop), there was quite intense discussion due to different perspectives. A third workshop was planned on a different day to continue the discussion. In this workshop, participants came up with the agreed solutions. The paraphrasing technique implemented in these workshops supported participants to pursue a common understanding of their situations, as is illustrated by the division of responsibilities between the GFG Management and the sub-groups upon which they agreed (presented in Section 4.1.3).

4.1.2. Challenges faced by the GFG of Pangalengan

From the design activities, participants indicated that the GFG of Pangalengan faced the challenges of: 1) commitment of farmer members to the GFG; 2) internal information flow; 3) bottlenecks in the production and supply chain; and 4) financial arrangements.

With respect to commitment of farmer members to the GFG, farmer members often do not supply the agreed quantity and quality of produce to the GFG (through their sub-groups) needed to fulfil the contracts, especially when the price in the traditional markets is higher. This situation has become worse as market demand increases (as market access increases). With respect to information flow, as the number of sub-groups increases and the geographical distance between members increases, the information flow no longer suffices. With respect to bottlenecks in the chain, the GFG faces a labour shortage for post-harvest activities and quality monitoring and grading³ as market demand

³ The GFG hired and trained people from neighbourhood to do post-harvest activities and quality monitoring and grading activities.

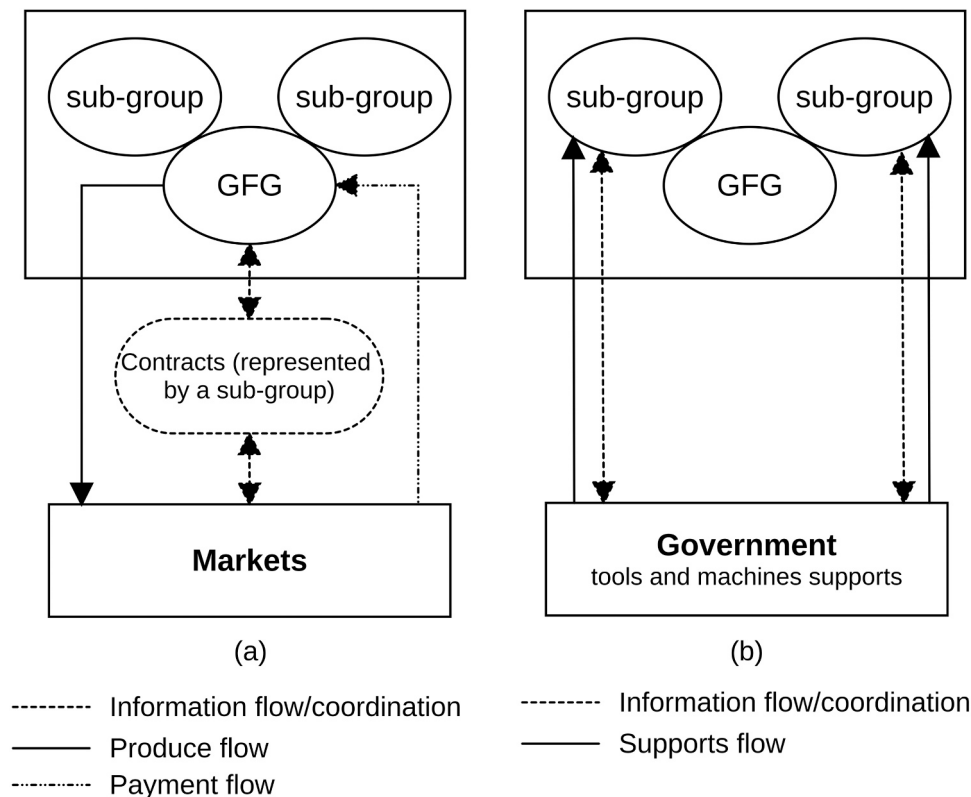


Fig. 1. The initial situation of the GFG of Pangalengan with respect to governance with external parties: (a) with the market; (b) with the government.

increases. Meanwhile, with respect to financial arrangements, farmer members of the GFG (who are smallholder farmers) require financial support in cash and production inputs (e.g. seeds, fertilisers, pesticides), while neither the GFG nor the sub-groups are in the position to provide such types of support.

4.1.3. The solutions co-created in the first round (to achieve the first desired situations)

Solutions co-created by participants are based on the four challenges with which the GFG of Pangalengan was faced mandating improved governance of the GFG, including the division of responsibilities between the GFG Management (centralised) and sub-groups (decentralised).

A. Governance to deal with the challenge of commitment of farmer members.

The challenge of the commitment of farmer members is related to the agreement of supplying produce through the GFG to fulfil market contracts. With respect to market contracts, the GFG, represented by a sub-group (the GFG initiator), had formal (written) contracts with supermarkets encompassing product, price, quality, quantity, and supply schedule (Fig. 1.a).

In the initial situation, the responsibility of managing produce to fulfil the market contracts was centralised at the GFG. Meanwhile, farmers (in every sub-groups) were responsible for supplying produce (in bulk) through the GFG with informal (verbal) agreements between farmer members (through their sub-groups) and the GFG (Fig. 2.a). These agreements are based on the contracts with markets, for example, the GFG implemented the price based on produce quality, with a price agreement in advance (contract price adjusted to markets).

To deal with the challenge of the commitment of farmer members (to supply produce through the GFG), in the design activities, the GFG decided to have sub-groups perform monitoring on farming activities of

farmer members (to increase produce quality⁴ and to supply produce based on agreement). Also, there will be a change in the system of produce supply such that farmer members (through sub-groups) are to supply packaged/graded produce, instead of produce in bulk (related to the challenge of the bottleneck in the chain).

B. Governance to deal with the challenge of information flow.

With respect to the challenge of information flow, related to the distribution of market, supply plans and produce quality (as the basis of payment) information. In the initial situation, with respect to the market and supply plan information, the GFG Management had meetings with the coordinator of sub-groups on market contracts, to discuss produce supply plans (that have been made by the GFG Management) to fulfil the market contracts. Then, based on these plans, the coordinators were responsible for making planting crop schedules for their sub-groups and to distribute them to their farmer members (Fig. 2.b).

In the design activities, participants agreed to improve communication between the coordinators of sub-groups and the GFG Management, both through face to face (regular meetings) and online communication (WhatsApp group). Meanwhile, to improve information distribution to farmer members, every sub-group agreed to organise regular meetings, both to share information from the GFG Management and to gather information from farmer members. These regular meetings will also be used as a medium to determine planting crop schedules through discussions between farmer members and their coordinators.

⁴ The GFG of Pangalengan, supported by Unpad, extension programmes, developed and disseminated standard procedure for farming to improve produce quality of farmer members.

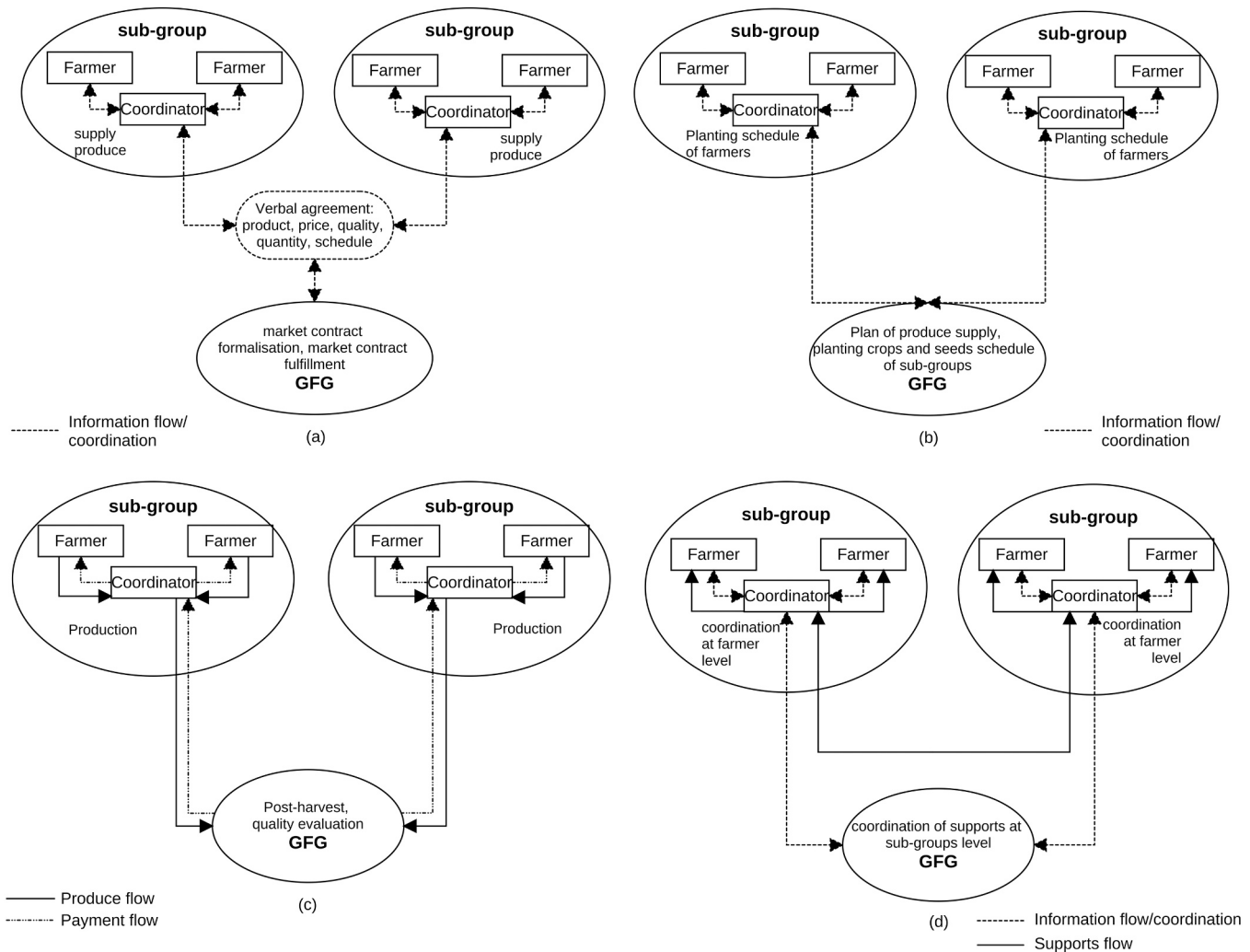


Fig. 2. The initial situation of the GFG of Pangalengan with respect to internal governance: (a) supply agreement; (b) produce supply plan; (c) internal supply chain; (d) financial support.

C. Governance to deal with the challenge of bottlenecks in the chain.

The challenge of bottlenecks in the chain is related to internal production and supply chain activities. In the initial situation, the GFG Management was responsible for post-harvest activities and quality monitoring and grading⁵ (e.g. % of grade A, B, C), informing farmer members through their coordinators of the results as the basis for payment (Fig. 2.c). In addition, the GFG Management also coordinated the internal supply of seeds.⁶ Farmer members (in every sub-groups) were responsible for production (planting, maintaining and harvesting crops).

As mentioned before, there were bottlenecks in the post-harvest and produce quality evaluation due to labour shortage. In the design activities, participants agreed to distribute these activities to the sub-groups. Therefore, the sub-groups agreed to supply graded/package produce to the GFG (to be supplied to supermarkets). With respect to labour, farmers in every sub-groups agreed to participate in post-harvest activities and produce quality monitoring and grading (with an incentive

scheme). An additional benefit of this approach is increased transparency of produce quality information for farmers. The GFG Management agreed to help sub-groups to train their farmer members together with experienced coordinators and some farmer members.

D. Governance to deal with the challenge of financial arrangements.

With respect to financial arrangements, some of the sub-groups (themselves formal farmer groups) have acquired in-kind financial support from governmental programmes, limited to agricultural machines and tools (Fig. 1.b). There is a share of the use of agricultural machines and tools between sub-groups coordinated by the GFG Management (Fig. 2.d).

Farmer members, however, require financial support in cash and/or in kind (i.e. production inputs). In the design activities, participants agreed to formalise their GFG by pursuing the establishment of a farmer cooperative to enable them to access formal funding institutions as an appropriate legal entity. Each sub-group agreed to contribute to fulfil the requirement of seed capital.⁷

The initial and first desired situations of the GFG of Pangalengan are shown in Table 2.

⁵ The GFG hired and trained people from neighbourhood to do post-harvest activities and quality monitoring and grading activities.

⁶ Some seeds (e.g. tomato, potato, beans, carrot) are provided by the GFG to support farmer members (with a credit scheme), and there are farmer members who have specialised in producing these seeds.

⁷ Based on the government rules, to establish a cooperative, such amount of money is required to be used as seed capital.

Table 2

The initial and first desired situations of the GFG of Pangalengan with respect to governance.

Initial situation		First desired situation	
Centralised	Decentralised	Centralised	Decentralised
Market contracts (to deal with the challenge of commitment of farmer members)			
– Formalising market contracts (represented by a sub-group).	– Supplying produce (in bulk) through the GFG	– Formalising market contracts (represented by a sub-group).	– Supplying graded/ packaged produce through the GFG
– Managing produce supply to fulfil market contracts.		– Managing produce supply to fulfil market contracts.	– Monitoring farmers.
The plan of produce supply (to deal with the challenge of information flow)			
– Decision making on produce supply plans, planting crop and seed supply schedules at sub-group level.	– Information distribution by the coordinators.	– Face to face meetings and online communications between the GFG Management and the coordinators.	– Sub-group meetings to share information (e. g. market, production, financial arrangements) and to decide planting crop schedules at farmer level (based on centralised plan).
– Meetings between the GFG Management and the coordinators.	– Planting crop schedules at farmer level by the coordinators (based on centralised plan).	– Decision making on produce supply plans, planting crop and seed supply schedules at sub-group level.	
Internal supply chain (to deal with the challenge of bottleneck in the chain)			
– Supplying seeds.	– Produce quality information distribution.	– Supplying seeds.	– Planting, maintaining and harvesting crops.
– Post-harvest and produce quality evaluation.	– Planting, maintaining and harvesting crops.		– Post-harvest and produce quality evaluation.
			– Produce quality information distribution
Financial support (to deal with the challenge of financial arrangements)			
– Coordination in sharing of the use of tools and machines.	– Access to government programmes (some sub-groups).	– Establishing a cooperative.	– Contributing to seed capital of cooperative.
		– Coordination in sharing of the use of tools and machines.	– Access to government programmes (some sub-groups).

The initial situation of the GFG of Pangalengan with respect to governance with external parties is provided in the Fig. 1.

Fig. 2 illustrates the initial situation of the GFG of Pangalengan with respect to internal governance encompassing supply agreement, the produce supply plan, internal supply chain activities, and financial supports (tools, machines, seeds).

4.2. Implementation phase (the transition situation)

In the implementation activities (during the transition situation), the GFG Management and the sub-groups have tried to implement the solution proposed and on which they had agreed during the first 3 workshops. However, challenges were encountered as described below.

A. The implementation of agreed governance to deal with the challenge of commitment of farmer members

In the transition situation, sub-groups were struggling to monitor

farming activities of farmers, especially with respect to the implementation of a standard procedure for farming. The result was low quality produce. This situation became worse because the GFG Management only accepted grades of produce required by supermarkets, while marketing the rest became the responsibility of the sub-groups themselves. This led to many farmer members (in every sub-group) selling all of their produce to traditional local traders again because of the less strict quality requirement, and the payment is much faster compared to supermarkets.⁸ In addition, a small number of sub-groups acquired direct access to supermarkets and exporters by themselves. This situation resulted in new conflicts in the GFG of Pangalengan.

B. The implementation of agreed governance to deal with the challenge of information flow

In the transition situation, the GFG tried to improve their internal communication, for example, by creating a WhatsApp group consisting of GFG Management and the coordinator of sub-groups. Meanwhile, at the sub-group level, a couple of sub-groups started to have meetings among themselves. However, because of the situation in market governance, most of these activities did not continue.

C. The implementation of agreed governance to deal with the challenge of bottlenecks in the chain

In the transition situation, a small number of sub-groups started to do post-harvest activities and quality monitoring and grading by themselves. Meanwhile, the rest were still struggling. In doing post-harvest activities at sub-groups level, female household members were involved.

D. The implementation of agreed governance to deal with the challenge of financial arrangements

In the transition situation, with respect to the plan of establishing a cooperative for more financial support, the GFG was struggling to collect contributions from the sub-groups to fulfil the requirement of seed capital. The internal conflict mentioned above also made it more difficult for the GFG to pursue the plan of establishing a cooperative. Despite this situation, one sub-group acquired access to funding on their own through collaboration with an investor.

4.3. The follow-up phase

The follow-up phase consisted of 2 workshops in which the experiences and challenges of the solutions upon which they had agreed and implemented during the transition phase were discussed, barriers identified, and new solutions proposed. This section discusses the process of follow-up design activities and new solutions co-created in these activities.

4.3.1. The process of follow-up design

The first workshop of follow-up design started with facilitators explaining the goal of the workshop and reminding participants about the procedure, especially the paraphrasing technique. Then, facilitators and participants introduced themselves.

At the beginning of this workshop, facilitators gave participants space to share their thoughts about what happened in the transition situations. However, most participants were silent. Only the head of GFG was willing to talk. Then, facilitators encouraged participants to share their thoughts and perspectives using post-it notes. This procedure worked. In fact, participants were willing to explain what they wrote and to discuss their findings with each other. A quite intense discussion followed in which facilitators strictly reminded participants to implement the paraphrasing technique. This workshop resulted in the agreement among participants to change the governance of their GFG to improve the situation. This new governance was to be discussed in the

⁸ The payment from traditional local traders takes 2–3 days, while from supermarket take 3–4 weeks.

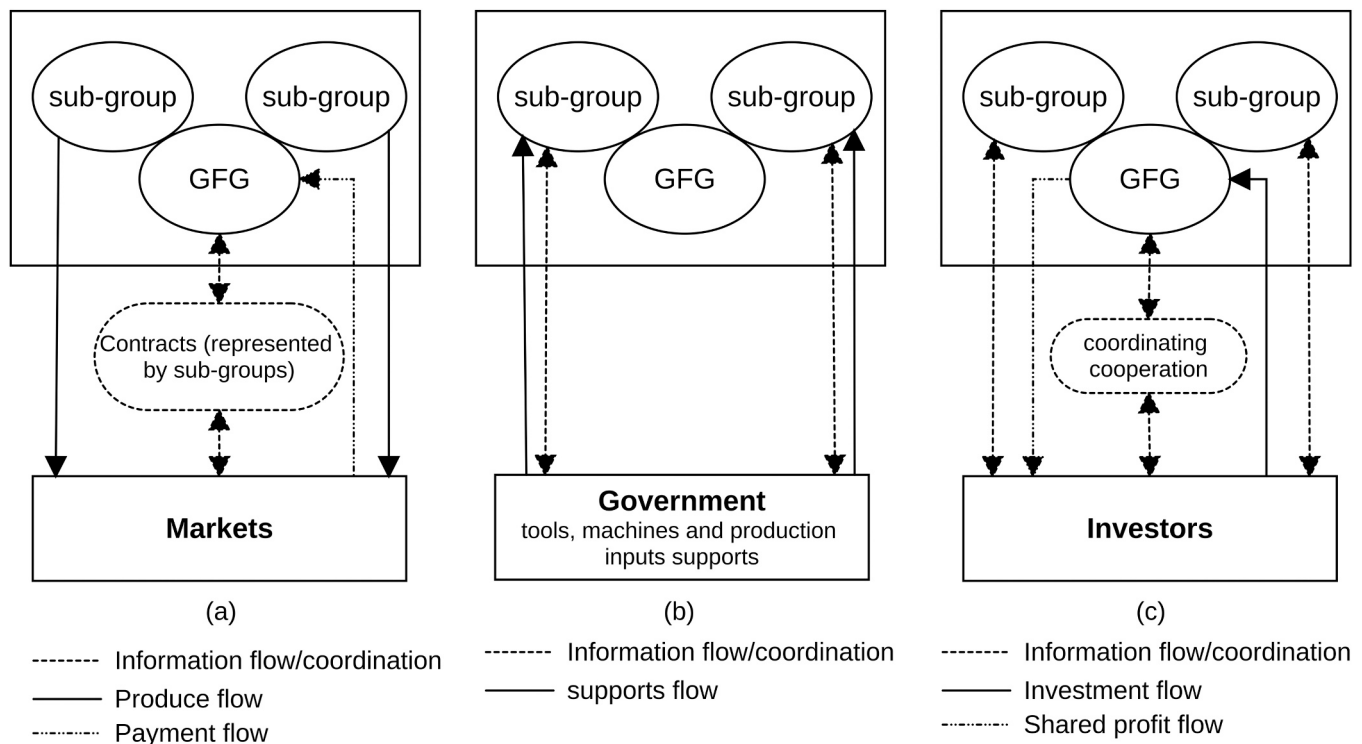


Fig. 3. The desired situation of the GFG of Pangalengan with respect to the governance with external actors: (a) with the market; (b) with the government; (c) with investors.

second workshop.

In the second workshop, using post-it notes, participants shared their ideas, followed by the discussion in which the paraphrasing technique was implemented. This resulted in the agreement of the new governance of GFG discussed below in [Section 4.3.2](#).

4.3.2. Solutions co-created in the follow-up design (the second desired situations)

Solutions discussed in the follow-up design are related to governance to deal with the four challenges with which the GFG of Pangalengan were faced.

A. Governance to deal with the challenge of commitment of farmer members.

In the follow-up design, to deal with the challenge of commitment of farmer members, participants agreed to change the role of the GFG, especially with respect to the market. In this new governance, the sub-groups are to become responsible for managing the produce supply to fulfil acquired market contracts ([Fig. 4.a](#)). The shift of this responsibility is followed by the shift in incentives. To support the sub-groups, the GFG agreed to coordinate sub-groups in fulfilling market contracts (related to the governance to deal with the challenge of information flow). In addition, the GFG agreed to take a role in coordinating contract formalisation represented by sub-groups, especially sub-groups who have formal legality ([Fig. 3.a](#)).

B. Governance to deal with the challenge of information flow.

In the follow-up design, related to the decentralisation of market responsibility, sub-groups agreed to become responsible for decision making on plans to fulfil market contracts. In this new form of governance, sub-groups are to be responsible for making the produce supply plans, planting schedules, and production input plans.⁹

Meanwhile, the GFG agreed to take a role as an information hub for sub-groups, for example, to coordinate sub-groups in case of produce shortage in certain sub-groups, when there is oversupply in other sub-groups ([Fig. 4.b](#)).

C. Governance to deal with the challenge of bottlenecks in the chain.

During the follow-up design, participants agreed to continue the plans agreed in the design activities in which the sub-groups are responsible for post-harvest and produce quality evaluation ([Fig. 4.c](#)). This decision is also related to the plan to decentralise the market responsibility.

A. Governance to deal with the challenge of financial arrangements.

During the follow-up design, participants agreed to hold on to the plan of establishing a cooperative. To acquire financial support, the sub-groups agreed to look for investors with whom to collaborate in profit-sharing systems (inspired by the previous successful sub-group), instead of trying to access funds from formal funding institutions ([Fig. 3.c](#)). In addition, the formal sub-groups will maintain access to governmental programmes ([Fig. 3.b](#)). Meanwhile, the GFG agreed to play a role in information sharing with respect to potential investors and supporting sub-groups to formalise such cooperation (with investors) ([Fig. 4.d](#)).

The transition and second desired situations of the GFG of Pangalengan with respect to governance to deal with their challenges is shown in [Table 3](#).

The second desired situation of the GFG of Pangalengan with respect to the governance with external actors is depicted in the [Fig. 3](#).

The second desired situation of the GFG of Pangalengan with respect to internal governance encompassing supply agreement, the plan of produce supply, internal production supply chain, and investment from investors are depicted in the [Fig. 4](#). Internal governance of support from the government and production inputs are still the same.

⁹ In the desired situation, the GFG have plans to provide production inputs support (e.g. seeds produced externally, fertilisers, pesticides).

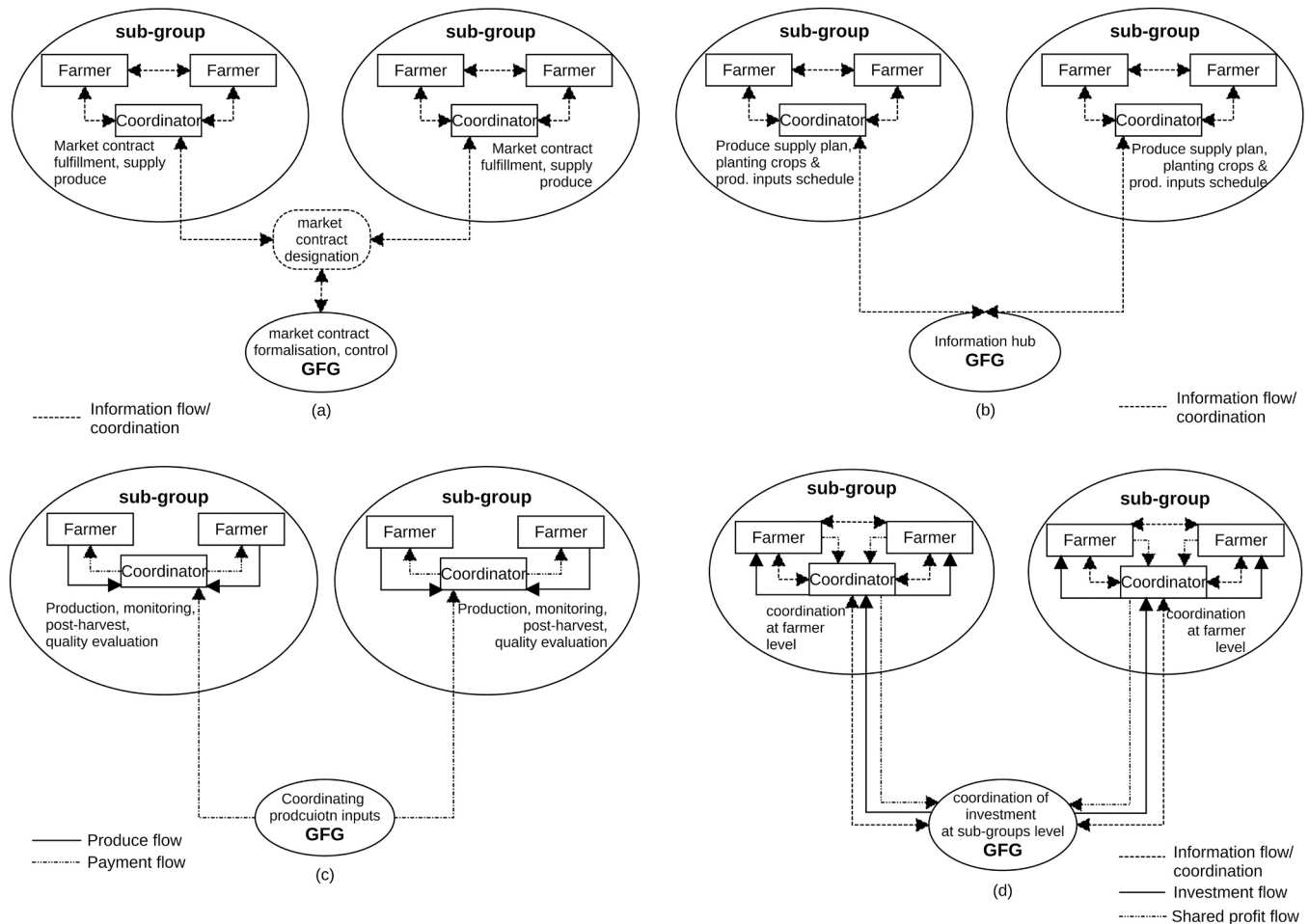


Fig. 4. The desired situation of the GFG of Pangalengan with respect to internal governance: (a) supply agreement; (b) the plan of produce supply; (c) internal supply chain; (d) investments from investors.

5. Discussions

This paper reports on participatory action research to empower farmers in developing countries to self-organise the governance of their FOs. Based on the case of GFG of Pangalengan in Indonesia, this study shows that through co-creation approach, farmers can be empowered to participate to self-organise the governance of their FO to deal with encountered challenges.

The co-creation approach (COCREATE) (Kusnandar et al., 2019, 2021) implemented in this action research empowered participants (the GFG Management and sub-groups representatives) to increase their understanding not only of their own situations but also of their organisation situation to improve their common understanding. Intense discussion during the co-creation process facilitated participants to share their own experience and knowledge with each other and to learn from each others' experience/knowledge, improve common understanding, co-construct knowledge, and co-create governance that they believed appropriate for the FOs situations. This finding is in line with (Dolinska and D'Aquino, 2016; Kpamma, Adjei-Kumi, Ayarkwa, & Adinyira, 2017; Ostergaard, Simonsen, & Karasti, 2018).

This study also found that the self-organisation in the GFG of Pangalengan is an evolving process. Challenges identified in the initial situations evolved during the transition period as a result of the implementation of new governance (agreed in design activities workshops). In fact, it resulted in internal conflict. However, in the follow-up design workshops, the co-creation procedure facilitated the GFG to understand their common challenges. Then, based on this understanding,

initial solutions were evaluated and adapted to deal with evolved challenges. Supporting self-organisation through co-creation has successfully facilitated the GFG to learn over time to improve their capacity to adapt to the changes. Such self-organisation has the potential to enable FOs to develop sustainably (Abaru & Nyakuni, 2006; Apparao et al., 2019).

In the self-organisation process on which this paper reports, the commitment of farmer members of the GFG of Pangalengan was sustained through participation in the multiple sessions of co-creation. Hence, the GFG of Pangalengan was able to maintain inclusion of farmer members (Apparao et al., 2019). The space to share understanding on situations to find common goals provided by the co-creation approach is believed to have strengthened the commitment of farmer members of the GFG of Pangalengan as their sense of ownership to the organisation increased (Limnios et al., 2018).

With respect to governance, in the initial situation, the GFG of Pangalengan implemented centralised governance in which many decision-making process and activities related to APSC are performed by GFG Management. This type of governance faced challenges as the GFG of Pangalengan grew, especially in the number of farmer members and market access. As the number of farmer members of the GFG of Pangalengan increased, the heterogeneity increased especially in terms of interests (Apparao et al., 2019; Grashuis, 2018; Hohler & Kuhl, 2018). As the information flow in the GFG of Pangalengan no longer sufficed to support all farmer members, it triggered the free riding behaviour of farmer members that decreased the commitment of farmer members to supply their produce to the GFG (as agreed) (Apparao et al., 2019;

Table 3

The transition and second desired situations of the GFG of Pangalengan with respect to governance.

Transition situations		Second desired situation	
Centralised	Decentralised	Centralised	Decentralised
Market contracts			
– Formalising market contracts (represented by a sub-group).	– Supply graded/ packaged produce through the GFG (not all).	– Formalising market contracts (represented by appropriate sub-groups).	– Supplying produce through the sub-groups
– Managing produce supply to fulfil market contracts.	– Monitoring farmers (still struggling).	– Coordinating sub-groups to fulfil market contracts.	– Managing produce supply (to fulfil appointed market contracts).
			– Monitoring farmers
The plan of produce supply			
– Meetings between GFG Management and the coordinators (face to face and online).	– Sub-group meetings to share information and to decide planting crop schedules at farmer level (not regular).	– Information hub (face-to-face and online)	– Sub-group meetings to share information and to determine produce supply plans, planting crop and production inputs schedules.
– Decision making on produce supply plans, planting crop and seed supply schedules at sub-group level.			
Internal supply chain			
– Supplying seeds.	– Planting, maintaining and harvesting crops.	– Supplying production inputs.	– Planting, maintaining and harvesting crops.
– Post-harvest activities (not all).	– Post-harvest and produce quality evaluation (a couple of sub-groups).		– Supplying produce to sub-groups (all sub-groups).
– Produce quality evaluation (not all).	– Produce quality information distribution.		– Post-harvest and produce quality evaluation activities (all sub-groups).
			– Produce quality information distribution (all sub-groups).
Financial supports			
– Establishing cooperative (struggling).	– Collecting seed capital for cooperative establishment (struggling).	– Information sharing with respect to potential investors.	– Access to investors (more sub-groups).
	– Access to investor (one sub-group).	– Supporting formal cooperation.	– Access to government programmes (some sub-groups).
	– Access to government programmes (some sub-groups).		

Grashuis, 2018). The centralised governance implemented by the GFG of Pangalengan also resulted in the challenge of bottleneck in the chain as market access increased. Meanwhile, the challenges of financial arrangements are commonly faced by FOs in developing countries (Gramzow, Batt, Afari-Sefa, Petrick, & Roothaert, 2018). These

challenges, most often, lead to the unsuccessful FOs to maintain their farmer members (Francesconi & Wouterse, 2015; Markelova et al., 2009).

In the co-creation process studied in this paper, after exploring these challenges, the GFG of Pangalengan came up with solutions to change their governance, from centralised to decentralised, that was co-created, agreed and implemented by the GFG of Pangalengan, or it can be called governance through self-organisation (Zeijl Rozema et al., 2008). In this new form of governance, most GFG Management responsibilities with respect to market, supply plans, internal supply chain activities, and financial supports were moved to the sub-groups. The GFG Management new roles include contract formalisation, information coordination, and monitoring.

The GFG believes that decentralised governance can help them deal with their challenges (commitment of farmer members, information flow, bottlenecks in the chain, financial arrangements) because it facilitates more farmer members to participate in the activities of the GFG. This is in line with previous works on production and supply chain governance, e.g., (Klaas-Wissing & Albers, 2010; Lee & Billington, 1993; Lintukangas, Peltola, & Virolainen, 2009). The GFG is aware that this decentralised governance requires sub-groups to have the capacity to perform their roles. As sub-groups have been involved in supplying produce to supermarkets since 2015, it is believed that their capacity has improved.

This case illustrates the transition of an FO in a developing country from traditional centralised governance to non-traditional decentralised governance. Even though centralised governance, implemented by most FOs in developing countries, is effective in pursuing efficiency (Trebbin, 2014), the growth of FOs frequently results in challenges (e.g., heterogeneity, bottlenecks in activities and information flow) that decentralised governance is believed to address.

6. Conclusion

This paper addresses the question of whether farmers in developing countries can be empowered to participate to self-organise the governance of their FOs. For this, following action research methodology, the co-creation approach is implemented in a case of growing FO in Indonesia, more specifically with a group of farmer groups of Pangalengan.

Based on the results, four findings are shown in this paper: 1) through co-creation, farmers in developing countries can be empowered to participate to self-organise the governance of their FOs; 2) self-organisation facilitates FOs to learn to adapt to the changes; 3) self-organisation increases the commitment of farmer members due to the increase in participation; and 4) decentralised governance is a promising solution for FOs to deal with challenges, such as the commitment of farmer members, information flow, the bottleneck in the chain, and financial arrangements.

The process of reorganising governance, however, is a long-term process and requires new forms of evolving support for self-organisation in FOs in developing countries. Adopting this approach in agricultural extensions programmes is a promising strategy to enable continuous empowerment of FOs in developing countries.

Declaration of Interest

None.

Data Availability

No data was used for the research described in the article.

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