Agricultural Innovation through Collaborative Governance: A Case Study of Community Empowerment in Wanagiri Village, Bali, Indonesia

Abstract:

This study aims to answer the research question *how does collaborative governance contribute to agricultural innovation*? Innovation system and collaborative governance literature can solve information and coordination barriers to innovation respectively but not both, creating the need to integrate the two literatures into an interdisciplinary study. A single case-study in Wanagiri Village, Bali, Indonesia, was used to answer the research question. Semi-structured interviews and document analysis were conducted to identify innovation functions and collaborative governance factors present in the case study. The findings suggest that collaborative governance contributes to agricultural innovation by providing a platform for generating learning dynamics where the government first experiences policy learning which then leads into interventions that fulfil innovation functions that spur learning in the private sector. Future research will need to obtain larger sample sizes, engage in comparative analysis, and continue interdisciplinary and transdisciplinary dialogue in order to fill the research gap on innovation through collaborative governance and understand how people work together to innovate, learn, and grow.

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1. Introduction

Innovation is increasingly becoming a normal part of any government's agenda. It refers to the creation of new technologies as well as the adoption of currently existing ones (Godin 2009; Zanello et al. 2016) mainly for economic production and commercialization (Hausmann 2016; Whitfield 2012). By spurring continuous technological change, innovation creates new goods, transforms production processes, and allows productivity to be raised beyond what existing pools of resources can do (Hong, Oxley, and McCann 2012; Whitfield 2012). With roots originating as far as the 1960s (Godin 2009; Lakitan 2013), innovation or technology policy emerged as a way to influence the rate of innovation within a country which, in turn, is a means towards various political objectives such as national security (Godin 2009), global competition (Miettinen 2013a), and economic development (Lakitan 2013). The connection between innovation to economic development, in particular, has been recognized by developing countries which have begun instituting innovation policies where there previously were none (Zanello et al. 2016).

However, the problem with innovation policy is that there is no clear pattern on how to proceed. A wide range of policy instruments have been identified and classified for policy-makers to consider (Caiazza and Volpe 2017; Cherif and Hasanov 2019). However, connecting individual policies to specific barriers to innovation is difficult to do because these policies effectively operate as a "policy mix" rather than individually (Guerzoni and Raiteri 2015). These policies are also highly context-dependent and not applicable for different environments (Borrás and Edquist 2013; Fagerberg 2017; Hong, Oxley, and McCann 2012). Analyzing the environment is already a difficult task in itself given that multiple barriers to innovation may exist simultaneously (Zanello et al. 2016) which further complicates causal tracing and the ability of the policy-maker to decide on the right policy. Since all of these make listing generalizable policies too difficult, discussions on innovation policy should have shifted from studying policy instruments to studying policy processes, i.e. the conditions in which innovation policies are made and implemented successfully (ibid.), yet little has been said in innovation studies literature about innovation policy's implementation and origins.

One such policy process worth studying is collaboration between the government and non-state actors, i.e. collaborative governance, in innovation policy. While the government's role in solving market failures has been recognized within economics (Chang and Andreoni 2020; Hausmann 2016; Rodrik 2004; Whitfield 2014), the discipline notes that the private sector often has more information regarding the needs and problems in the field than policy-makers do (Rodrik 2004). As such, the government is recommended to collaborate with the private sector in policy-making in order to minimize government failures during the intervention while raising the policy's relevance and effectiveness (ibid.). In political science, specifically the sub-field of public administration, the previously described collaboration is captured by the concept of collaborative governance, an approach where the government and non-state actors work together in policy-making and implementation to solve complex or "wicked" problems (Ansell and Gash 2007; Sørensen and Torfing 2020).

Despite the conceptual overlap between the two disciplines, there has been little to no exchange between collaborative governance and innovation studies literature. On the one hand, collaborative governance literature studies how public-private collaborative arrangements work despite the transaction costs involved (Ansell and Gash 2007), but it cannot explain how

innovation happens. On the other hand, innovation studies literature explains how the combination of certain roles or functions from multiple collaborating actors leads to innovation (Klerkx, Mierlo, and Leeuwis 2012), but it cannot explain how the collaboration emerges in the first place. Therefore, there is a research gap in how public-private collaboration in policy-making leads to innovation, and filling in this gap requires interdisciplinary integration between innovation studies in economics and collaborative governance in public administration.

This study will be done within the context of the agricultural sector in a developing country. Innovation in the agricultural sector forms the backbone of economic development in developing countries. The general narrative is that the increased productivity of food production provides extra income; enables more labour and capital to be invested in new economic activities; provides the opportunity to create new goods, services, and sectors; and eventually leads to the accumulation of resources, creating value for society (Johnston and Mellor 1961; Lewis 1954). Evidence for agriculture's role in development can be seen in history when the Agricultural Revolution raised food productivity, enabled job specialization, sparked urbanization, and eventually led to social, economic, and technological changes (Bentley and Ziegler 2011). Such evidence can also be found in more recent times when looking at the experiences of various developing economies experiencing agricultural productivity and transformations before proceeding to diversification and economic growth (Grabowski, Self, and Shields 2015a; Whitfield 2012; Whitfield and Buur 2014; Tyce 2019; van Marrewijk, Brakman, and Swart 2020).

This study aims to answer the research question *how does collaborative governance contribute to agricultural innovation*? The research question has two sub-questions. The first sub-question is *what are the innovation functions performed by collaborating actors within the context of collaborative governance*? The second sub-question is *what factors enable the collaboration to appear and perform in the first place*? The study combines insights from innovation studies and collaborative governance literature in order to answer the first and second sub-questions to understand how collaborative governance contributes to agricultural innovation.

The study aims to answer the research question by performing qualitative research within a single case study using semi-structured interviews and document analysis. The research will be inductive and exploratory in nature due to the lack of research on the topic of how collaborative governance leads to innovation. The research involves identifying which functions of innovation can be found within a collaborative governance arrangement and the factors that reduce the transaction costs of the collaboration, enabling it to perform well.

The selected case study is the implementation of collaborative governance in Wanagiri Village, an agricultural village community located in the island province of Bali in Indonesia. The country, in collaboration with the World Bank, had run a 15 year-long (Pollock and Kendrick 2015) community empowerment program aimed at achieving poverty reduction, strengthening Indonesia's decentralization movement, and promoting local participation in governance and monitoring transparency (Friedman 2014; McCarthy et al. 2017; Slikkerveer and Saefullah 2019). This program was later scaled-up in size and scope (Friedman 2014) before eventually becoming institutionalized as a law in 2014. The law's implementation in rural communities, including Wanagiri Village, fits the study's research focus on collaborative governance and agricultural innovation. It also serves as both a documentation of Indonesia's

community empowerment initiative after its phase as a program which are still few in comparison to the studies done during the program's tenure (McCarthy et al. 2017).

2. Literature Review

The Problem: Information and Coordination Barriers to Innovation

Innovation contributes to economic development. Without innovation, economic growth is solely based on the accumulation of production factors such as capital and labour to produce more goods (Grabowski, Self, and Shields 2015b; Whitfield 2012). Left alone, this process eventually leads to diminishing returns which means adding more capital or labour will lead to less marginal productivity for each additional unit of the resource, ending in stagnated growth. However, innovation allows the same pool of capital and labour to produce much more than it previously could by creating new technologies, i.e. new ways to use, mix, and organize production factors, that transforms the production process and its outcomes in terms of quantity or quality. It could also create new production processes entirely, for example when new economic sectors, goods, or services appear (Hausmann 2016; Whitfield 2012). When productivity increases, material living standards, if not wages *per se*, rise (Grabowski, Self, and Shields 2015b; Whitfield 2012). In summary, innovation is responsible for productivity increases in old sectors, the creation of new sectors, and technological change which all contributes to economic development.

However, despite its potential benefits, two types of barriers broadly make innovation a difficult process. The first barrier is the information barrier or discovery costs (Rodrik 2004). Innovation is an inherently uncertain process (Chang and Andreoni 2020). Entrepreneurs do not know beforehand whether a new business model or technology is lucrative in their environment, and this information can only be discovered by making permanent, irreversible investments in creating the technology or R&D (Rodrik 2004), initiating production, and selling the product to the market (Hausmann and Rodrik 2003). If the discovery is a failure, the entrepreneur carries the sunk costs alone (Rodrik 2004), and this realization creates a disincentive to innovate.

If the discovery is successful, two things may occur. If the innovation is easy to imitate, competitors will enter the market at lower cost by simply building on the entrepreneur's experimentation costs and then siphon away any economic rents the entrepreneur could have enjoyed from the innovation (Hausmann and Rodrik 2003; Rodrik 2004). In this scenario, entrepreneurs may not recoup their discovery costs and have few incentives to innovate, making innovation a rare occurrence. If the innovation is difficult to imitate (Hausmann 2016), the entrepreneur will enjoy a first-mover's advantage due to less competition, and competitors that do enter the market are forced to potentially operate at a loss because of the high costs of imitation and subsequent learning which takes time (Chang and Andreoni 2020). In this scenario, entrepreneurs have incentives to innovate but face great difficulties doing so due to the innovation's inherent nature. Moreover, given that imitation or adoption is also considered innovation, the entrepreneur's success will be limited to their vicinity, and adoption elsewhere is limited. This particular problem can be illustrated by looking at developing economies (Whitfield 2012) who could benefit from entering lucrative economic activities with increasing returns to scale but choose not to do so and remain in familiar but less rewarding activities

(Hausmann 2016). In short, the information barrier provides a disincentive for entrepreneurs and imitators to innovate, and this makes innovation a naturally rare occurrence.

The second barrier is the coordination barrier or transaction costs. Not all innovations or activities are the same in nature, and the most promising ones are those that can generate economies of scale (Hausmann 2016; Whitfield 2012). However, such innovations also require other large-scale investments elsewhere to be profitable which are beyond the control of an individual entrepreneur (Rodrik 2004). These large-scale investments are commonly identified as environmental factors to innovation, and they range from an unstable political or economic environment, lack of purchasing power, scarcity of financial institutions, no industrial clusters, poor education systems, and lack of infrastructure are all factors that discourage innovation and cannot be solved without some coordination (Zanello et al. 2016). Some of these environmental factors are influenced by the government (Rodrik 2004) while others are influenced by individuals or other businesses (Chang and Andreoni 2020), but very few of them are influenced by a single entrepreneur alone. Since coordinating all these actors can be difficult, the environment changes slowly, and innovation, especially promising ones, becomes a naturally rare occurrence.

In this context, the lack of innovation makes external interventions an attractive undertaking, but the discussions so far are mainly centered on policy instruments. A wide range of policies ranging from public R&D to subsidies and regulations have been identified (Rodrik 2004). These policies have been classified in many ways, the most common being demand-side and supply-side policies (Caiazza and Volpe 2017; Guerzoni and Raiteri 2015), but other classifications also exist (Cherif and Hasanov 2019). In theory each policy type addresses its own barrier to innovation whether it be a specific type of information or coordination, so they are distinct from one another (Borrás and Edquist 2013). In practice, connecting individual policies to solve specific problems is difficult to do because these policies effectively operate as a "policy mix" rather than individually (Guerzoni and Raiteri 2015). These policies are also highly context-dependent and not generalizable for different environments (Borrás and Edquist 2013; Fagerberg 2017; Hong, Oxley, and McCann 2012).

As such, attention is slowly shifting from policy instruments to policy processes, i.e. the conditions in which "the right" innovation policies, regardless of their variations, are made and implemented successfully (Chang and Andreoni 2020; Rodrik 2004; Zanello et al. 2016; Whitfield and Buur 2014). At the same time, focus has been shifting away from governments and entrepreneurial firms acting alone towards the two parties collaborating together to learn and generate innovations (Chang and Andreoni 2020; Hausmann 2016; Rodrik 2004). In economics, this idea of collaboration as a solution to innovation is given better exploration in the innovation systems literature.

The Solution to the Information Barrier: Innovation Functions within the (Agricultural) Innovation System

The innovation system (abbreviated as IS) refers to all the actors and institutions that interact to create, use, and diffuse innovations (Godin 2009). It originally only referred to four sectors: the government, universities, industry, and non-profit sectors (ibid.). It also focused on the government as the system's main player with research centers such as universities as the

main source of innovations (ibid.). As the concept was further developed and circulated through the OECD (Miettinen 2013a), the IS now includes a much broader array of sectors or institutions depending on the research topic and disciplinary approach being used (ibid.). It has also since shifted the government's role from a player to a facilitator while replacing universities with firms as the main source of innovations (Godin 2009; Miettinen 2013b).

The IS frameworks serves as this study's grounding for collaboration. No matter what variation it is, IS frameworks share the common definition that innovation is the result of all parts of the systems acting together (Miettinen 2013b), beyond the core research and user community or the economic sector being studied (Klerkx, Mierlo, and Leeuwis 2012; Lakitan 2013). As such, regulatory and societal institutions also play a role in promoting and diffusing innovations from the core, mainly by affecting environmental factors such as technological demand, human capital for innovation, research infrastructure or networks, etc. (Lakitan 2013). One particular issue that has emerged in IS studies, particularly in agricultural innovation system (AIS) studies (Klerkx, Mierlo, and Leeuwis 2012; Touzard 2015), is the need for linkages between the different actors and institutions of the IS (Lakitan 2013). These studies have shown that the lack of linkages leads to missed learning, research, and innovation opportunities between actors that have potential synergy (Hermans, Klerkx, and Roep 2015; Lakitan 2013). It may also lead to the replication of research efforts or even render innovations ineffective, especially in the case of actors from different knowledge communities such as farmers and university researchers (Alaie 2020).

AIS studies focused on networks and functions have provided some insight on how to foster such linkages (Klerkx, Mierlo, and Leeuwis 2012). Network studies on AIS in particular have promoted innovation intermediaries, in the form of brokers (Klerkx et al. 2012) or platforms (Kilelu, Klerkx, and Leeuwis 2013), as useful for strengthening collaboration and linkages. Innovation intermediaries refer to actors, organizations, or institutions that serve to articulate demand for innovation, form networks, manage the innovation process (Klerkx et al. 2012), disseminate knowledge or information, build institutions, and spark institutional change (Kilelu, Klerkx, and Leeuwis 2013). Although AIS or IS studies focused on functions is a distinct approach from the studies on networks, much of the activities that a functions approach identifies as crucial for the AIS overall is overlapping with the aforementioned intermediary activities (Klerkx, Mierlo, and Leeuwis 2012). Seven functions have been identified: entrepreneurial activities, knowledge development, knowledge diffusion in networks, guidance of the search, market formation, resource mobilization, and creation of legitimacy/overcoming resistance to change (Hekkert et al. 2007). These function categories can be applied for both large-scale and smaller-scale analysis of IS (Bausch 2020), so there is room for integrating the function and process approaches by simply combining the activities identified by the two approaches into one list and applying them for the study of collaboration regardless of whether the scope of analysis is a specific network or a wider innovation system.

The Solution to the Coordination Barrier: Factors Influencing Collaborative Governance

While the economics or innovation literature has identified multi-actor collaboration as the answer to innovation problems, it says very little about how such a collaboration would emerge. Indeed, the need to answer coordination problems has been identified in the discipline, for example the challenges for intermediaries to be recognized (Klerkx and Leeuwis 2009), for

networks to be built (Klerkx, Aarts, and Leeuwis 2010; Kilelu, Klerkx, and Leeuwis 2013), and for governments to cooperate in the first place (Whitfield and Buur 2014; Tyce 2019). However, the discipline does not systematically list the factors explaining how collaboration occurs, and it also assumes that the system solely aims for innovation when in fact motivations can be much more diverse (Alaie 2020; Lakitan 2013; Whitfield and Buur 2014; Tyce 2019). Moreover, few of the studies in innovation literature, especially network studies, explicitly include the government in the picture when more general economics literature, including industrial policy literature, is interested in the involvement of governments in the process (Rodrik 2004; Chang and Andreoni 2020). Therefore, in order to understand how a collaboration functions and emerges in the first place, there is a need to incorporate insights from outside economics. Political science, specifically the subfield of public administration, is capable of filling in this research gap because it studies how political actors and the government interact and organize themselves.

A fruitful avenue for interdisciplinary integration to occur is the concept of collaborative governance. In public administration, governance or collaborative governance (to distinguish it from the more general usages of the former term governance) refers to instances in which the government collaborates with non-state actors in policy-making and enforcement in order to solve problems that cannot be handled alone (Ansell and Gash 2007), and it is an approach that is distinct from traditional regulation when governments act alone and free-market liberalization when the private sector is delegated the tasks of regulation or acts alone (Gunningham 2009; Hartley, Sørensen, and Torfing 2013). Understandably, the time and effort needed to work with many actors is high, and the literature is clear that collaboration is not the ultimate solution but merely one approach amongst many (Ansell and Gash 2007; Gunningham 2009; Hartley, Sørensen, and Torfing 2013). Collaborative governance is best suited for complex, long-term problems that require specialized knowledge or capacities distributed across a wide range of actors (Ansell and Gash 2007).

Collaborative governance literature provides multiple factors explaining why collaboration between state and non-state actors starts. A collaboration is more likely to occur when power asymmetries are limited, incentives to collaborate exist, and a history of cooperation exists between the parties involved (Ansell and Gash 2007). When these factors are not present, contingency plans can be implemented to promote the emergence of a collaboration. For example, when there is too much power asymmetry between parties due to differences in knowledge or resources, the stronger party must have the will to represent the interests of weaker parties during the collaborative process (ibid.). In regards to relationship history, antagonistic relations may not necessarily hinder a collaboration when steps are taken to mend the relationship or when a high degree of interdependence forces antagonistic actors to join a collaboration in order not to miss out (ibid.).

After starting a collaboration, the literature also lists multiple factors needed to continue the collaboration and to do so successfully. Trust between the collaborators needs to be built; an agreement, recognition, and commitment to the collaboration's procedures needs to be shared; and a common understanding of the collaboration's goals needs to be reached (Ansell and Gash 2007). Trust in particular is an important factor to consider because it determines not only the continuation of the collaboration process (Ansell and Gash 2007) but also the quality of participation (Lopes, Vaz, and Farias 2020) and policy learning (Siddiki, Kim, and Leach 2017). Trust can be built through dialogue (Lopes, Vaz, and Farias 2020), displays of competence by

achieving “small wins” (Ansell and Gash 2007) and continuing the collaboration over time (Siddiki, Kim, and Leach 2017). Flexibility in the collaboration’s procedures is also important since policy implementation, evaluation, and accountability dynamics can be stifled by excessive bureaucratic procedures (Lopes, Vaz, and Farias 2020) but enhanced when actors prioritize communication and problem-solving (Sørensen and Torfing 2021). Indeed, the structure of the collaborative governance itself can take the form of flexible networks instead of forums or venues (Sørensen and Torfing 2021).

Another aspect of collaborative governance that needs to be mentioned is facilitative leadership. A leader, facilitator, or mediator is commonly identified as an important role within a collaborative governance arrangement (Hartley, Sørensen, and Torfing 2013; Lewis, Ricard, and Klijn 2018; Siddiki, Kim, and Leach 2017). These actors promote the combination of backgrounds, knowledge, and resources of the different collaborating parties effectively (Douglas, de Noort, and Noordegraaf 2020; Hartley, Sørensen, and Torfing 2013; Lewis, Ricard, and Klijn 2018) while simultaneously minimizing the conflict or tensions that occur due to the diversity between them (Siddiki, Kim, and Leach 2017). Facilitators from government bureaucracies play a particularly important role of connecting the discrepancies between the collaboration network or forum to the government administration and shifts in political will (Brorstrom and Norback 2020; Krogh 2020). These facilitators are most effective when they prioritize dialogue and locally adapted actions to bureaucratic procedures (Krogh 2020), but they do retreat towards their more bureaucratic roles when there is conflict within the collaboration or political turmoil and ask for politicians to take direct action in place of the facilitator (Brorstrom and Norback 2020).

Theoretical Framework

An interdisciplinary approach combining the collaborative governance literature and innovation literature is justified because there is a distinct need to do so and common ground for it. The type of collaboration and learning identified in industrial policy studies is distinct from the collaboration identified in IS studies because, while the ultimate outcome for both studies is innovation, the former’s collaboration involves private-sector input within policy-making (Rodrik 2004) and implementation (Chang and Andreoni 2020) whereas the latter’s collaboration mainly concerns private-sector collaboration with minimal policy-making. With the interdisciplinarity technique of extension (Menken and Keestra 2016. 44), the multi-actor collaboration of innovation systems can be identified as a form of collaborative governance by recognizing that the former can involve policy-making activity. In this manner, the findings within collaborative governance becomes applicable to innovation studies insofar as the collaboration involves both policy-making elements and innovation as an outcome. Common ground serves as an important foundation for such an integration (Menken and Keestra 2016, 80), and there is much common ground between the two disciplines’ concepts of collaboration since both identify the need for multi-actor linkages (Ansell and Gash 2007; Klerkx, Mierlo, and Leeuwis 2012; Touzard 2015), involve learning processes (albeit one for policy and one for production) (Hekkert et al. 2007; Hermans, Klerkx, and Roep 2015; Siddiki, Kim, and Leach 2017; Sørensen and Torfing 2021), and acknowledge the importance of intermediary functions within their frameworks (Kilelu, Klerkx, and Leeuwis 2013; Klerkx et al. 2012; Lewis, Ricard, and Klijn 2018; Siddiki, Kim, and Leach 2017).

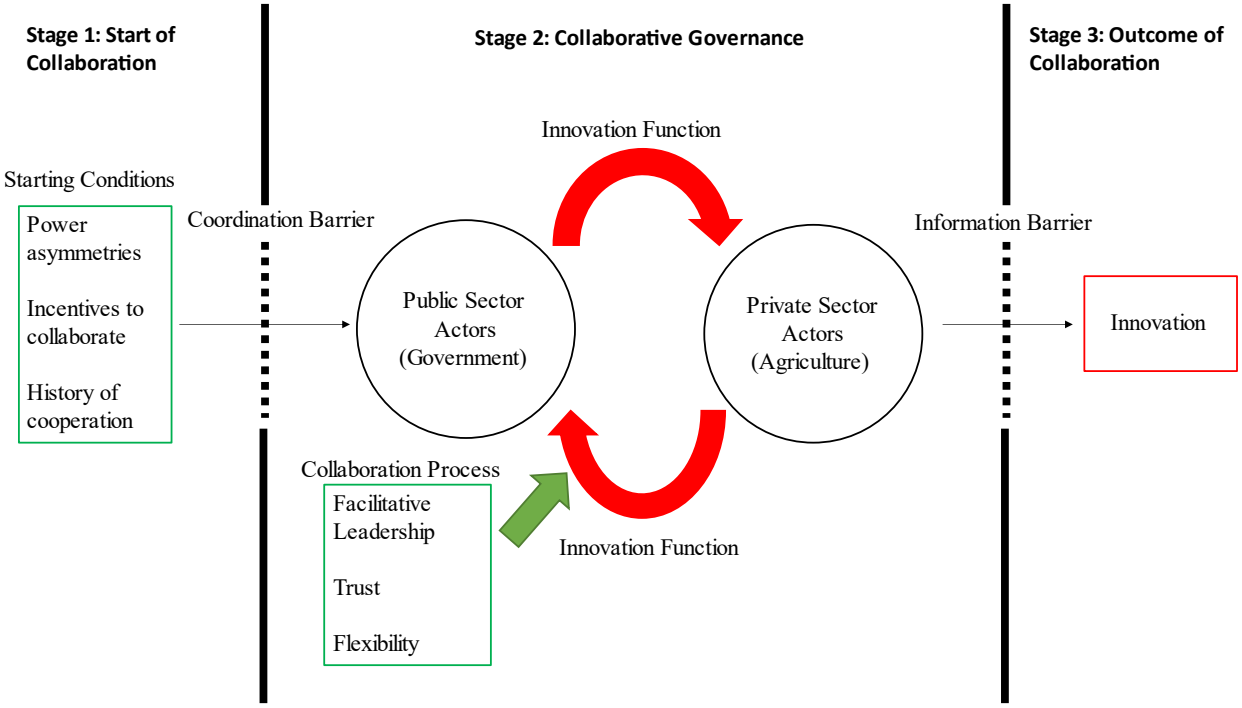

Figure 1 *"Innovation through Collaborative Governance." Contributions by innovation studies and collaborative governance literature are marked red and green respectively. Source: author's construct adapted from (Ansell and Gash 2007, 550)*

The two disciplines make different contributions in studying collaborative governance for innovation. Returning to the concept of barriers of innovation, the IS literature is capable of answering the first barrier on information. As shown by stages 2 and 3 in Figure 1, when the collaboration by actors fulfills certain functions identified in the IS literature, the discovery costs for entrepreneurs are reduced, promoting the emergence of innovative activity. However, represented by stage 1 in Figure 1, the IS literature is incapable of answering the second barrier on coordination which precedes the information barrier and must be solved beforehand. IS literature partly answers the coordination problem by referring to institutional reforms by governments that occur in the background, but it cannot systematically explain why private sector innovation networks become involved in institutional reforms or policy-making for innovation with the government. Instead, this question is answered by collaborative governance literature which identifies the transaction costs involved in starting a collaboration and continuing it, but it cannot systematically answer why innovation as an outcome of collaborative governance occurs. By combining the two, both answers can be achieved, and a study can be conducted on how collaborative governance contributes to agricultural innovation.

3. Methodology

The study aims to answer the research question *how does collaborative governance contribute to agricultural innovation*? by performing qualitative research within a single case study using semi-structured interviews and document analysis (Bryman 2012). The research method was chosen because there is little to no literature on the topic of collaborative governance arrangements for innovation, including innovation specific to the agricultural sector. The gap in the literature, necessitates that the research be an inductive, exploratory study, and the

chosen research methods are well suited for such an approach (Bryman 2012; Thompson 2000). This approach includes the contributions of past theoretical literature (i.e. innovation functions and collaborative governance frameworks) while simultaneously making room for new insights that may appear due to the novelty of the research topic.

The theoretical framework from the literature review section will be used as the basis for answering the research question. The research question is divided into two sub-questions, mainly *what are the innovation functions performed by collaborating actors within the context of collaborative governance*? and *what factors enable the collaboration to appear and perform in the first place*? The first and second sub-questions can be answered by looking at the innovation functions and collaborative governance factors (such as starting conditions, facilitative leadership, trust, and flexibility) that were present in the chosen case study. The hypothesis of this study is based on Rodrik (2004) and predicts that collaborative governance enables policy-makers to identify innovation problems in the private sector, issue the appropriate policies, and implement these policies which eventually spur innovation.

The case study will be a case of collaborative governance with agricultural innovation as its goal or outcome. The case study fits the definition of a collaborative governance if it involves a government consulting the private sector for policy-making. The form of the consultation itself does not matter, so it can take either the form of a formal consultative forum or an informal relational network. The collaborative governance's goal must also involve instances of agricultural innovation, so cases where the outcome involves policies (e.g. regulations, the construction of infrastructure, or resource provision) that do not lead to agricultural innovation are not eligible as a case study. The selected case study was the implementation of collaborative governance within Wanagiri Village (*Desa Wanagiri*), an agricultural community in the province of Bali in Indonesia. The collaboration itself was part of a wider governance policy known as the Village Law (*Undang-Undang Republik Indonesia Nomor 6 Tahun 2014 Tentang Desa*) whose aims include economic development through agriculture or technology (Republik Indonesia 2014). Therefore, Wanagiri Village fits the above case study criteria as a case of collborative governance with agricultural innovation as its outcome.

The semi-structured interviews were focused on identifying the innovation functions and collaboration-promoting factors within the selected case study. The interviews were directed towards the actors and organizations involved within the case study's collaboration. Using the IS as a framework, the actors to be interviewed were planned to be primarily from the government (ministries or bureaucrats), research and knowledge institutes (public or private), NGOs, and the agricultural sector (mainly farmers). During the study, only actors from NGOs, the agricultural sector, and public R&D responded to an interview. The general interview topics and the rationale behind them are listed in Table 1. Six interviews were conducted for this study. All the interviews were done remotely in the Netherlands through videocalls with the interviewees who were in Bali. All these interviews were conducted in 2021. The interviews are listed in Table 2 for reference.

Line of Inquiry	Rationale
• The actor's general occupation	This line of inquiry aimed at encouraging the actor to provide detailed examples of their experience collaborating or innovating in the context of their work.
• How the collaboration first originated	This line of inquiry aimed at uncovering the transaction costs behind *starting* a collaborative governance arrangement and the factors that overcame these costs.
• What exactly does the collaboration entail and its outcome	This line of inquiry aimed at identifying the functions of innovation that were present during the collaboration and how they led to a specific agricultural innovation.
• What the interviewed actor's part was within the collaboration	This line of inquiry aimed at identifying which specific functions of innovation the interviewed actor performed.
• What the contributions of the other collaborators were from the interviewed actor's perspective	This line of inquiry aimed at revealing how the collaboration fulfilled any other functions the interviewed actor did not or could not perform.
• What the challenges the interviewed actor experienced during the collaboration	This line of inquiry aimed at revealing the transaction costs occurring *during* the implementation of a collaborative governance arrangement and how it may have affected any functions of innovation performed within the collaboration.
• Whether the interviewed actor think the collaboration matters and why	This line of inquiry aimed at identifying the transaction costs behind *continuing* a collaborative governance arrangement using the actor's willingness to continue the collaboration as a measure and the factors that overcame these costs.

Table 1 *"List of Interview Inquiries and their Rationale." Source: author's construct.*

Reference	Description
Interview 1	One interviewee was involved. The interviewee was the director of Maha Bhoga Marga (MBM), an NGO active in Wanagiri Village. The interview discussed general MBM operations from the director's perspective.
Interview 2	Two interviewees were involved. Both interviewees were MBM staff members in the advocacy and economic development departments of the NGO. The interview discussed general MBM operations from a field perspective.
Interview 3	One interviewee was involved. The interviewee was a goat farmer and member of the Sami Mupu goat farming group in Wanagiri Village. The interview discussed how the goat farming group was founded, how it operated, and how it received help from MBM.
Interview 4	One main interviewee was involved with multiple people present and consulted by the main interviewee. The interviewee was the head of a public R&D organization in Bali. The interview discussed the general operations of the organization and how it interacted with the villages.
Interview 5	One interviewee was involved. The interviewee was a goat farmer and member of the Sami Mupu goat farming group and also the village secretary of Wanagiri Village. The interview discussed how the goat farming group was founded, how it operated, and how it received help from MBM.
Interview 6	Two interviewees were involved. The first interviewee was the same village secretary in the fifth interview, and the second interviewee was an MBM staff member in the advocacy department of the NGO. The interview discussed how Wanagiri Village experienced making development plans under the Village Law.

Table 2 *"List of Conducted Interviews." Source: author's construct.*

Document analysis was done to supplement the interview results. The documents consulted provided information of governance during two time periods: (1) the duration of the pilot project prior to the Village Law and (2) the duration when the Village Law was put into effect. Documents that provided information of the pilot project were World Bank documents (Friedman 2014; Pollock and Kendrick 2015) and research papers (McCarthy et al. 2017; Oktarina and Furuya 2015; Slikkerveer and Saefullah 2019; Zulfida and Fauzi 2017). These documents did not reference specific villages or context, but they provided general information regarding the origins of the Village Law and its implementation, including in the case study's village. Documents that provided information when the Village Law was put into effect were mainly university reports and some public R&D reports regarding innovative activities conducted in Wanagiri Village. The university reports consulted covered various activities such as coffee production, animal farming, agrotourism, and policy-making. Meanwhile, the public R&D reports consulted only covered coffee production (Sukadana and Widjanarko 2020; Sukadana and Widyaningsih 2020). The university reports are listed and categorized by activity being in Table 3 for reference. Like the interview, the documents were consulted to identify the innovation functions and collaboration-promoting factors within the selected case study. The specific points that were studied and the rationale behind them are listed in Table 4.

Type of Activity	**University Reports**
Animal Farming	Mardana 2013; Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan
Coffee Production	Gunadi, Suwindra, and Widiarini 2020; Shantiawan et al. 2020; Telagawathi, Mayasari, and Atidira 2020; Tika and Agustiana 2020
Agrotourism	Marsiti and Sukerti 2020; Mulyadiharja, Wijana, and Julyasih 2020; Rahmawati, Trianasari, and Widiastini 2020; Sukerti, Marsiti, and Musmini 2020; Wijana and Mulyadiharja 2020
Policy-Making	Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020

Table 3 *"List of Consulted University Reports." Source: author's construct.*

Line of Inquiry	Rationale
• How the collaboration first originated	This line of inquiry aimed at uncovering the transaction costs behind starting a collaborative governance arrangement and the factors that overcame these costs.
• What exactly does the collaboration entail and its outcome	This line of inquiry aimed at identifying the functions of innovation that were present during the collaboration and how the functions present led to a specific agricultural innovation.
• What the challenges identified were during the collaboration	This line of inquiry aimed at identifying any functions of innovation that were not fulfilled by the collaboration and the factors behind them. It also aimed to identify any transaction costs not covered by the collaboration and why they were not overcome.
• How the collaborating actors perceived or participated in the collaboration	This line of inquiry aimed at identifying the transaction costs occurring *during* the implementation of a collaborative governance arrangement and the transactions costs behind *continuing* the arrangement.

Table 4 *"List of Document Inquiries and their Rationale." Source: author's construct.*

4. Case Study Observation

This section will introduce general information on the case study. It will first discuss the general framework of the collaborative governance in the pilot project and the Village Law. It will then begin detailing the experiences of Wanagiri Village and the actors involved. The analysis of the case study based on the research sub-questions, as stated in the methodology, is done in the next section on findings.

National Program for Community Empowerment

The World Bank and the government of Indonesia officially launched the National Program for Community Empowerment (*Program Nasional Pemberdayaan Masyarakat*, abbreviated as PNPM) in 2006. The PNPM's design was based on pre-existing community development policies in the country which were relatively successful, the *Kecamatan* Development Program and the Urban Poverty Program, which had also received World Bank funding (Friedman 2014; Slikkerveer and Saefullah 2019). The PNPM gave local communities the power to draft their own development plans based on local needs, send the proposal to the Ministry of Home Affairs for confirmation, receive funding directly without intermediaries like the local government, and implement the proposal accordingly through locally formed committees (Friedman 2014). The participating communities were assisted by certified program facilitators throughout the process (ibid.). The PNPM was envisioned not only as a more effective poverty reduction program but also a means to promote democratic participation, local

accountability, and local governing capacity (Friedman 2014; McCarthy et al. 2017; Slikkerveer and Saefullah 2019). The PNPM was also seen as an alternative to Indonesia's bureaucracy which was discredited as corrupt after the 1998 Asian Financial Crisis (McCarthy et al. 2017).

The PNPM became the precursor for the 2014 Village Law. The PNPM originally only had two programs catering to rural and urban communities, but it was later expanded to include pilot projects to cater specifically to sustainability, health, marginalized communities, and the province of Papua (Friedman 2014). The scope of the main program itself was also steadily upscaled across the country (ibid.), becoming the world's largest community-driven development program (McCarthy et al. 2017) before it was transformed into an official policy in 2014. Since then, however, not much studies have been done on the implementation of the Village Law in comparison to the previous interest with the program (ibid.), and the majority of the studies on the PNPM were mainly conducted internally by the World Bank's PNPM Support Facility (Pollock and Kendrick 2015). These studies reported that the implementation of the PNPM in local communities resulted in reduced poverty, well-targeted programs, effective transparency, and quality infrastructure at lower cost compared to the average local government efforts (Pollock and Kendrick 2015, 15, 24, 27, 30; Slikkerveer and Saefullah 2019). However, the program was also known for having heavy administrative workload (Jakimow 2018; Pollock and Kendrick 2015, 14, 21-22), excessive focus on infrastructure programs (Pollock and Kendrick 2015, 29; Oktarina and Furuya 2015; Zulfida and Fauzi 2017), varying qualities of community participation, and little spillover of democratic values or transparency to governance outside of the program (Friedman 2014; McCarthy et al. 2017; Pollock and Kendrick 2015, 14, 29-30; Slikkerveer and Saefullah 2019).

The Village Law

The Village Law is a policy covering the administration and governance of villages. It defines how villages are administratively formed, how village elections are run, ownership of village assets, rules regarding village-owned enterprises, indigenous rights, and so on (Republik Indonesia 2014). In short, it allows villages to become self-governing communities and specifies how they will be organized and function. One important point to note is the fact that a village's administration typically consists of a democratically elected village chief with a six-year tenure, executive staff responsible to the chief, and a democratically elected village council reminiscent of a parliament which also has a six-year tenure (ibid.). Another point to note is that the law also covers the village development process from planning, execution, and monitoring (ibid.).

The creation of a village development plan in particular continues the process of local community empowerment done during PNPM. Upon election, a new village chief has three months to create a six-year village development plan (*Rencana Pembangunan Jangka Menengah Desa*, abbreviated as RPJMDes) together with the village council and the general community (Interview 6 2021; Republik Indonesia 2014; Suwendra, Suwena, and Sujana 2020). The process begins when the chief forms an eleven-member team to visit the village territories, consult with the people, and make a report on the village's general circumstances (Interview 6 2021; Suwendra, Suwena, and Sujana 2020). This report is then brought to the village council which then forms a draft RPJMDes together with the eleven-member team (ibid.). Once this is done, the draft RPJMDes is announced to the village, and a forum meeting is initiated in which the village chief and the village council and other community figures work together to refine the final document and legalize it (ibid.). The RPJMDes or village development plan then identifies the

problems or priorities in the village and the programs that need to be taken to address them, and the programs that emerge are categorized into five types of activities: public service, infrastructure, agricultural production, technology, and public order (Republik Indonesia 2014). This process overall is very reminiscent of the PNPM with the exception that the PNPM made use of facilitators and a competitive bidding system for funding program proposals (Friedman 2014).

The creation and implementation of the village development plan includes some involvement from the local district/regency government, making it a case of collaborative governance. First, the construction of the RPJMDes must be in line with the policies or plans of the local district government (Republik Indonesia 2014). Before the eleven-member team begins its consultation, the village administration has a meeting with the district government to coordinate the village development plan with the district's own development plan (Interview 6 2021; Suwendra, Suwena, and Sujana 2020). Second, the RPJMDes serves as an input for officials at the district level in planning or revising the district's own development plans and policies (Republik Indonesia 2014). The district government is expected to readjust their plans based on the information they receive from villages in their regency. Third, a village may request the local district government to help fund the programs in their RPJMDes from the local district budget or other sources of national funding (Republik Indonesia 2014; Interview 6 2021). Fourth, the local district government must assist the village in, amongst other things, planning the RPJMDes, providing funds, providing technical assistance, providing training, etc. (ibid.). In short, the local district government cooperates a lot with the villages even as these villages are given much independence.

Wanagiri Village

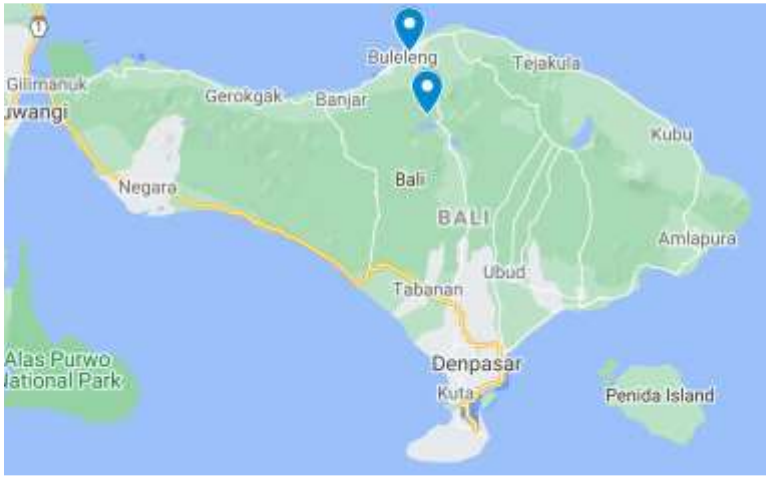

Figure 2 *"Location of Desa Wanagiri." Wanagiri Village (lower point marker) is located within the Buleleng regency north of Lake Buyan and is close to Singaraja (upper point marker), a hub city within the regency and where a collaborating university, Universitas Pendidikan Ganesha, is located. Source: (Google Maps 2021b)*

Wanagiri Village is a traditional agricultural village. It is located in the middle of northern Bali. It is part of the Sukasada sub-district (*kecamatan*) which is under the Buleleng regency (*kabupaten*). The village landscape is dominated by forests, and nearly half of the population work as farmers (Desa Wanagiri n.d.a; Mardana 2013). The village is particularly well-known in the sub-district for its livestock (Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan 2014; Dinas Pertanian 2018), but it has also recently developed coffee plantations (Telagawathi, Mayasari, and Atidira 2020) and an agrotourism sector (Rahmawati, Trianasari, and Widiastini 2020). However, the education levels of the community are low (Interview 3 2021; Interview 5 2021). As shown in Figure 3, the majority of the population received up to primary and secondary education (Desa Wanagiri 2017; Desa Wanagiri n.d.b). About 25% of the population received no formal schooling (Desa Wanagiri n.d.b), but these numbers are an improvement compared to six or seven years ago when up to 40% of the population did not receive formal schooling (Desa Wanagiri 2017).

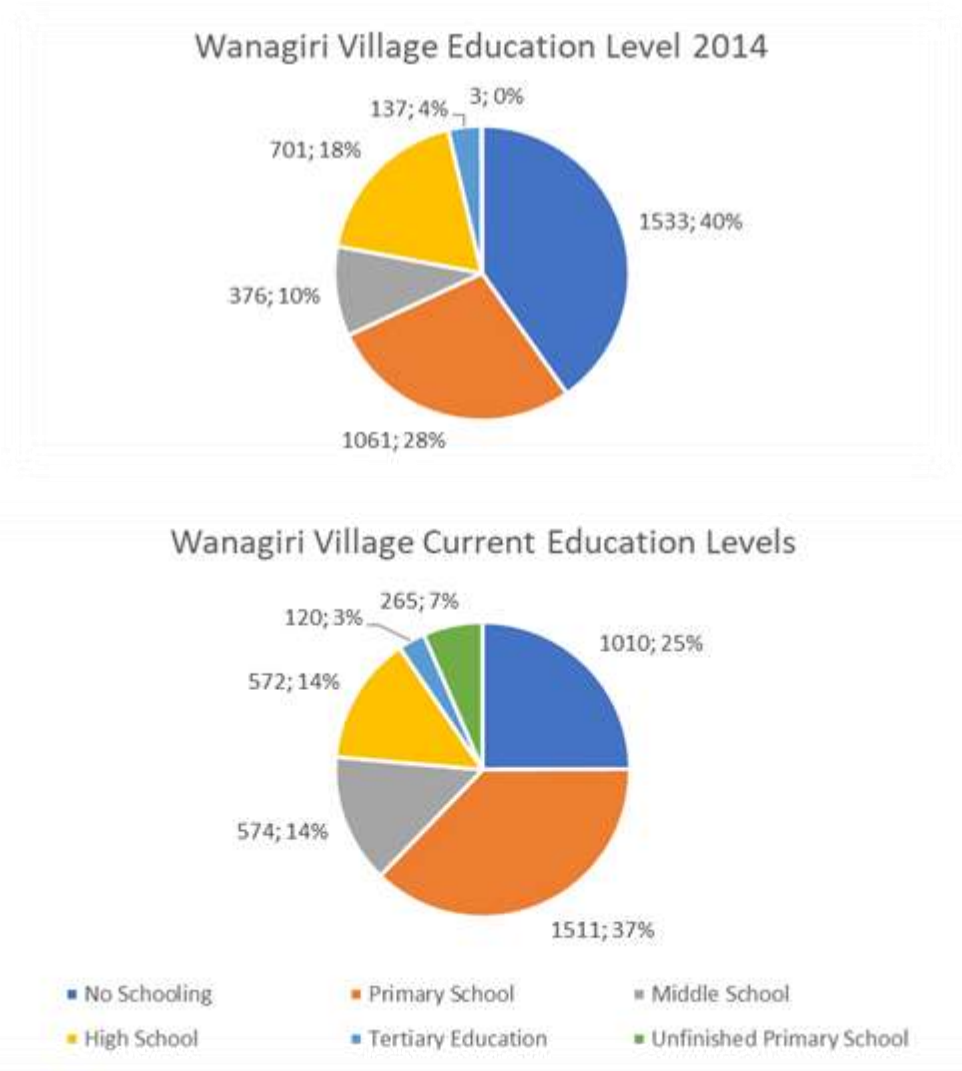

Figure 3 *"Wanagiri Village Education Levels." The majority of the population in Wanagiri Village received up to primary and secondary education. Source: author's construct with data from (Desa Wanagiri 2017; Desa Wanagiri n.d.b)*

The village self-organizes itself into small groups (Interview 5 2021). These small groups are formed by groups of villagers sharing the same occupation with the goal of working together in their jobs, sharing resources, distributing aid, and learning together (Interview 3 2021; Interview 5 2021). Group sizes range from ten to fifty people on average (Interview 3 2021; Dinas Pertanian 2018; Gunadi, Suwindra, and Widiarini 2020; Telagawathi, Mayasari, and Atidira 2020; Tika and Agustiana 2020), and the groups range from coffee farmer groups (Telagawathi, Mayasari, and Atidira 2020) to animal farmer groups (Interview 3 2021; Interview 5 2021; Dinas Pertanian 2018), female farmer groups (Marsini and Sukerti 2020; Tika and Agustiana 2020), tourism supporter groups (Mulyadiharja, Wijana, and Suyasih 2020; Wijana and Mulyadiharja 2020), and so on. Each sector can have multiple farming groups, for example one village can have two or more distinct coffee farming groups each with their own names (Gunadi, Suwindra, and Widiarini 2020; Shantiawan et al. 2020). Third parties such as NGOs (Interview 1 2021; Interview 2 2021; Shantiawan et al. 2020) and businesses (Telagawathi, Mayasari, and Atidira 2020) can work and interact directly with these small groups. These groups also play some role by providing input during consultations for the village development plan and sending representatives to the deliberative forum (Interview 6 2021). Notable groups in Wanagiri Village are Leket Sari, an organic coffee farming group with Rainforest Alliance certification (Shantiawan et al. 2020), and Sami Mupu, a goat farming group working with Maha Bhoga Marga, an NGO active in the village (Interview 3 2021; Interview 5 2021).

Maha Bhoga Marga NGO

Figure 3 *"Location of Gunung Agung." Gunung Agung is an active volcano located to the east of Bali. It is Bali's peak point and have caused major eruptions, including the 1963 eruption which marked MBM's beginning. Source: (Google Maps 2021a)*

MBM is an NGO working for poverty-reduction in local communities. It was founded in Bali after a volcanic eruption in Gunung Agung in 1963 disrupted the farmland and homes of some members of a local church in the vicinity (Maha Bhoga Marga 2021). The church assisted by providing assistance in modern farming techniques to help the affected members, but the service continued long after the eruption until it led to the founding of MBM as an NGO in 1982 (Maha Bhoga Marga 2021). Since then, the NGO's programs have branched into four broad

departments: economic development, advocacy, health, and disaster response. The economic development department's activities include agricultural assistance services, and the advocacy department's activities include providing consultation assistance in village administration, explaining village rights and obligations, and voicing village interests with the local government (Interview 1 2021; Interview 2 2021).

MBM works as a partner to local communities. They first identify which villages fit the parameters for MBM to work in and the development potential or resources of these villages (Interview 1 2021; Interview 6 2021). Then, MBM will visit the village and offer programs that best fit the village's needs and profile (Interview 1 2021; Interview 2 2021). From that point on, MBM staff visit the village on a regular, usually monthly, basis and provide assistance, resources, and training according to the request of the program participants (Interview 2 2021). The NGO usually works by organizing small groups of people who then become program recipients, but MBM mostly play a supporting role and let the villagers they work with take the lead (Interview 1 2021; Interview 2 2021; Interview 6 2021). More recently, MBM has shifted its attention to working with villages as a whole instead of just small groups in order to reach out to more people through their work (Interview 2 2021; Interview 6 2021).

University Public Service

Universities in Indonesia engage in public service activities. Although the details change depending on government regulations, Indonesian universities in principle are expected to engage in public service activities (*Pengabdian pada Masyarakat*) alongside research and education (Republik Indonesia 2003). These public service activities are done with the goal of applying research and technology in higher learning institutes to meet the needs of society (Direktorat Riset dan Pengabdian Masyarakat, Direktorat Jenderal Penguatan Riset dan Pengembangan, and Kementerian Riset, Teknologi, dan Pendidikan Tinggi 2018). These activities and the process behind them must be reported in some form with various examples of publication being journals, research proceedings, news articles, television, etc (ibid.). The activities themselves are funded from government or non-government sources (ibid.). In this case study, Universitas Pendidikan Ganesha (Undiksha) is the main university engaged in public service activities in Wanagiri Village (see Table 3), but some activities are done in cooperation with another university, Universitas Panji Sakti (Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan 2014; Shantiawan et al. 2020).

Public R&D

Balai Pengkajian Teknologi Pertanian (BPTP) are a form of public R&D organization in Indonesia. These organizations are organized under the Ministry of Agriculture. Their work involves researching, developing, adapting, and disseminating agricultural technology to the local vicinity (BPTP 2021b). In principle, most of the technology is available or recommended by the central government, so local public R&D organizations mainly work to adapt technologies such as seeds, animal breeds, or machinery to the local environment before disseminating them (BPTP 2021c; Interview 4 2021). One public R&D activity within Wanagiri Village is providing assistance in processing coffee waste products littering the village into organic fertilizers for farming (BPTP 2021a; Sukadana and Widjanarko 2020; Sukadana and Widyaningsih 2020).

Activities in Wanagiri Village

Multiple instances of agricultural innovation were observed with the earliest examples dealing with animal farming. Mardana (2013) introduced the switch from monoculture to polyculture farming, allowing the farmers to stabilize their cash flow by growing crops and animals with varying degrees of maturity (Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan 2014). Mardana (2013) also reported the introduction of integrated farming systems where farmers coordinate crop and animal farming, using crop waste to feed animals and using animal waste to fertilize crops. In 2015, MBM entered Wanagiri Village and worked with Sami Mupu farming group to start farming goats which was uncommon in the village due to its history of monoculture farming (Interview 3 2021; Mardana 2013). Indeed, goats were the least farmed animal in the village (Mardana 2013; Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan 2014), and MBM training helped farmers learn new techniques for feed preparation, medication, and waste management which was particularly different compared to the other animals that the farmers were more familiar with (Interview 5 2021).

Other examples of agricultural innovation were in coffee production and agrotourism. At least three coffee farming groups were referenced in university reports. Female coffee farmers in the "Giri Sari Amerta" group received a tailor-made coffee roasting machine (Gunadi, Suwindra, and Widiarini 2020) and training in making in-vitro fermented coffee (*kopi luwak*) (Tika and Agustiana 2020). Leket Sari organic coffee group received training in management, budgeting, and marketing techniques for their coffee (Telagawathi, Mayasari, and Atidira 2020). On a separate occasion, Leket Sari coffee group together with Bhuana Sari received training on farming best practices, management techniques, and coffee waste management (Shantiawan et al. 2020) which has not been utilized as fertilizer and also polluted the environment (BPTP Bali 2021a; Sukadana and Widjanarko 2020; Sukadana and Widyaningsih 2020). The innovation efforts in coffee production were synchronized with and part of a bigger agrotourism development plan in the village in which Wanagiri-produced coffee became one of the village's attractions (Shantiawan et al. 2020). A similar project was done with the production of flavoured banana chips as a tourist product (Marsiti and Sukerti 2020; Sukerti, Marsiti, and Musmini 2020). The initiative was unique for utilizing *pisang sasih*, a common variety of banana that was ignored due to low-demand but proved surprisingly popular once it was processed as chips (Marsiti and Sukerti 2020; Sukerti, Marsiti, and Musmini 2020). Another notable initiative included documenting Wanagiri village's ecosystem and creating an agrotourism development strategy that accounted for local traditions and environmental sustainability (Mulyadiharja, Wijana, and Julyasih 2020; Rahmawati, Trianasari, and Widiastini 2020; Wijana and Mulyadiharja 2020).

The last activity noted in this study was the creation of Wanagiri's village development plan or RPJMDes. Wanagiri Village had conducted their village chief elections in 2019, but the newly elected chief had missed the 3-month deadline for finishing their RPJMDes (Interview 6 2021; Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020). This resulted in the district government, Undiksha, and MBM providing training and facilitation for the new village administration to draft the document successfully (Dinas Pemberdayaan Masyarakat dan Desa 2020a; Dinas Pemberdayaan Masyarakat dan Desa 2020b; Sujana et al. 2020; Suwendra,

Suwena, and Sujana 2020). The reports (Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020) and interview (Interview 6 2021) noted that the delay was due to lack of competence (e.g. budgeting, planning, administration, IT awareness, etc.), lack of data from the previous administration, lack of awareness regarding rules or procedures, and Covid-19 which hindered the gatherings needed for drafting the document.

5. Findings

This section will provide an analysis of the case study using the theoretical framework as previously mentioned in the methodology section. The first sub-section will discuss the innovation functions performed by the collaborating actors in the case study. The second sub-section will discuss the collaborative governance factors observed during the interactions of the collaborating actors in case study from the beginning (stage 1) to the present (stage 2) until the end (stage 3) before the process loops back again.

Research Sub-Question 1: Innovation Functions

Entrepreneurial activities are mainly dominated by the farmers. The interviews and document analysis show that the farmers are the ones who engage hands-on in trying new breeds of animals or seeds (Interview 3 2021; Interview 5 2021; Mardana 2013), processing coffee waste into fertilizer (BPTP Bali 2021a; Sukadana and Widjanarko 2020; Sukadana and Widyaningsih 2020), processing fruits into snacks (Marsiti and Sukerti 2020; Sukerti, Marsiti, and Musmini 2020), etc. Some of these cases represented not just improvements in current production but also diversification into new production activities such as goat farming (Interview 3 2021; Mardana 2013) and fermented coffee (Tika and Agustiana 2020). In some cases, farmers' experimentations are done on behalf of others, for example when BPTP Bali reveals in an interview that it works with certain villages to study new crop seeds before they were certified and disseminated in the province (Interview 4 2021), but these cases were not found in Wanagiri Village during the study. These farmers are also the ones who enjoy the rewards of the entrepreneurship with sales from their products and activities becoming their main source of income which are then used for personal consumption, investment, or funding their children's schooling (Interview 1 2021; Interview 2 2021; Interview 3 2021; Interview 5 2021). In short, the farmers are the ones who engage directly in modifying and diversifying agricultural production during the study.

However, this display of entrepreneurship is supported by knowledge, resources, and training from other parties. The government is by far the main provider of resources either directly through providing funds for the village administration (Interview 6 2021) or indirectly through universities (see Table 3), public R&D organizations (Interview 4 2021), and even NGOs (Interview 4 2021; Interview 1 2021) in the form of production technology or training often funded from government sources. MBM is also a provider of resources sometimes in the form of loans but mostly in the form of capital (Interview 1 2021), for example goats for farming groups to own and breed (Interview 3 2021). An interview with a member of Sami Mupu revealed that most farmers lacked their own assets and work as labourers for landowners, so the provision of production capital by MBM and other parties are really important for earning an income, let alone innovate (ibid.). Moreover, lack of education and poverty further hinders entrepreneurship since farmers do not want to risk making mistakes in trying new methods which

will disturb their flow of income (Interview 4 2021). Indeed, the farmers were trained not only on agricultural production such as how to process coffee or treating sick goats (Interview 3 2021; Interview 4 2021; Shantiawan et al. 2020; Tika and Agustiana 2020) but also on managerial functions such as how to plan a budget or performing a SWOT analysis (Sujana et al. 2020; Telagawathi, Mayasari, and Atidira 2020; Wijana and Mulyadiharja 2020). Therefore, the entrepreneurship and concrete innovation performed by farmers are strongly supported with knowledge and resources external to the village community.

Even so, farmers play an important role in directing where innovation will occur. Using the RPJMDes, farmers are able to articulate to the government, universities, NGOs, and public R&Ds about the situation and needs of the village (Suwendra, Suwena, and Sujana 2020). Indeed, MBM first conducts a study of a village's situation before deciding to collaborate, and the government also provides funding and support based on the programs and priorities specified in the village development plan. University reports also sometimes references Wanagiri Village's RPJMDes (Direktorat Penelitian dan Pengabdian kepada Masyarakat, and Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan 2014; Mardana 2013; Shantiawan et al. 2020), but in almost all the reports, the preparation of a public service activity involves a session in which the university team consults with the villagers or their representatives before or during the activity (see Table 3). Meanwhile, the public R&D station in Bali is influenced much more directly as they explain that they operate on request from local district governments who are informed of the development plans of the multiple villages in their regency and specific sub-districts (BPTP Bali 2021a; Interview 5 2021). Overall, the best evidence for the farmers' directing influence over innovation is the fact that most of the agricultural innovation occurring is already in line with Wanagiri Village's existing economic sectors, and the farmers in interviews or documents always remark that the support they received were suited to their needs (Interview 1 2021; Interview 2 2021; Interview 3 2021; Interview 5 2021; Marsiti and Sukerti 2020; Mulyadiharja, Wijana, and Julyasih 2020; Sukerti, Marsini, and Musmini 2020; Tika and Agustiana 2020; Telagawathi, Mayasari, and Atidira 2020).

Other notable functions in this study are knowledge diffusion and creation of legitimacy. While agricultural knowledge is mostly developed by BPTP Bali, MBM, and universities, the diffusion of their knowledge is a joint process with farmers. With illiteracy and busyness hindering farmers from reading their publications (Interview 3 2021; Interview 5 2021; Interview 6 2021), public R&D organizations or NGOs often have to conduct direct visits to provide information or demonstrate an agricultural innovation (Interview 1 2021; Interview 2 2021; Interview 5 2021). In other cases, most notably in MBM, farmers themselves are invited to go outside the village for a training program or a visit to demonstration plots owned by the institution (Interview 1 2021; Interview 3 2021; Interview 5 2021). Through these methods, agricultural knowledge is passed on to individual farmers, and after experiencing success in the entrepreneurial stage, they will later attract the attention of other farmers and spread the information using their own words, experience, and understanding (Interview 3 2021; Interview 4 2021; Interview 5 2021). In summary, once outside initiative from parties like MBM and BPTP Bali was taken into account, peer-to-peer learning amongst farmers is an important means of knowledge diffusion and legitimacy.

Legitimacy can also refer to the innovation and governance process as a whole. Farming groups, for example, play an important role as a platform through for peer-to-peer learning (Interview 3 2021; Interview 5 2021). Through these exchanges, the value of an innovation or

knowledge can be confirmed by farmers who share their successful experiences or lessons from the field. However, the village secretary notes that small groups do much more than that and actually address concerns that the village's development, including any agricultural innovation that comes with it, may result in inequality (Interview 5 2021). Since resources are shared within these groups, farming groups also receive and distribute outside funds, including those from the government, amongst its members (ibid.). The presence of farming groups, then, enable the benefits of the innovation process to be shared widely, and they also represent the interests of their members during the creation of the village development plan (Interview 6 2021). Indeed, the overall consultation and deliberation process during the making of the village development plan is also a source of legitimacy in itself by making sure that the development efforts and agricultural innovation in the village reflects the village's interest as a whole (Interview 6 2021; Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020).

Market formation and knowledge development are also present in this study, but they are relatively weak in presence compared to the other functions previously mentioned. University reports note that farmers still struggle to gain access to markets and are at a disadvantage to their business partners in negotiations especially due to their lack of capital, management capabilities, and small-operating scale (Interview 1 2021; Interview 3 2021; Mardana 2013; Rahmawati, Trianasari, and Widiastini 2020; Telagawathi, Mayasari, and Atidira 2020). The study does find cases where these issues were addressed, albeit not always systematically. Examples include an MBM e-commerce program for farming groups (Interview 1 2021), the local district government competitions between farmers products (Interview 3 2021), and infrastructure investments that are done by the government and villages during the village development process (Interview 5 2021; Interview 6 2021; Rahmawati, Trianasari, and Widiastini 2020). Meanwhile, knowledge development mostly involved taking available technologies from the market. MBM studies the latest agricultural technologies available in the market (Interview 1 2021), and BPTP Bali receives its technologies from public R&D centers in Indonesia outside Bali (Interview 4 2021). As such, knowledge development was mostly about studying how to adapt agricultural technologies or techniques to the local context, and this was often done in collaboration with farmers and villages who act as the entrepreneurs.

Research Sub-Question 2: Factors Influencing Collaboration

The origins of the case study's collaboration could be traced back to the factors present since the PNPM. Economic development and nation-building was always an important agenda in Indonesia (Robertson-Snape 1999), so the aims of a collaborative governance for poverty reduction and empowering local communities, i.e. the PNPM, were already in line with the political discourse. Moreover, the Asian Financial Crisis and the subsequent democratic transition in the country introduced transparency, political participation (if not participatory governance *per se*), and government decentralization into the political agenda, so the World Bank's PNPM proposal seemed even more attractive when it was introduced (McCarthy et al. 2017; Robertson-Snape 1999). Although there was a great power and resource asymmetry between the government and local communities, the Indonesian government overall was eager to commit to granting more power and autonomy to the other parties because of the need to gain

political legitimacy (McCarthy et al. 2017). The communities, on the other hand, were happy with the opportunity to receive help in tackling poverty, control the development process in their home, and contribute to the nation-building process (Jakimow 2017). While the history of cooperation or conflict is unclear prior to the PNPM proposal, it is clear that the operation of the PNPM and its successes helped normalize the collaboration process between the government and local communities as a whole (McCarthy et al. 2017; Pollock and Kendrick 2015, 6, 14). By the time collaborative governance became state-mandated in 2014, both parties had a history of cooperation and had bought into the values of bottom-up governance. In short, the incentives, political commitment, and good cooperative history needed to start a collaboration was already present prior to the functioning of the Village Law.

Within the study, trust in the competence of collaborating partners played an important role in keeping the collaboration in motion. MBM as an NGO particularly struggled with earning the trust of villages due to not only farmers' reliance on experience but also the NGOs religious origins, and they also struggled with governments because NGOs, according to them, tend to be viewed as government critics (Interview 1 2021; Interview 2 2021). In the interview, they note that being transparent, engaging in face-to-face dialogue through visits, and showing success through their demonstration plots and later through their work with farming groups built their reputation and secured the trust of the parties they worked with (ibid.). Although the public R&D group faced less pressure, trust in BPTP Bali's products and work in general is similarly earned through the success of demonstration plots and farming groups cooperating in BPTP experiments (Interview 4 2021). BPTP Bali notes that the district governments and their villages are now eager to ask for the organization's help and participate in testing any experimental seeds or technology that the organization has (ibid.). Early displays of success or small wins garnered the trust to further the collaborative process.

Farmers also experienced the dynamics of trust based on competence. Although the position of villages in the collaboration is secured by a state mandate (Republik Indonesia 2014), the farming groups within each village can potentially network directly with other actors if their reputation is good enough. For example, MBM notes that there are differences in the groups that they collaborate or mentor with some farming groups still focusing on getting aid from MBM while others looking towards production or innovation within the bounds of MBM's programs or even go beyond (Interview 2 2021). The latter groups are apparently the ones that contribute more in village development planning or implementation and can network with the government and other third parties on their own (Interview 2 2021). The Sami Mupu goat farming group is an example of a growing group that gained attention from the district government for winning an animal competition within the Buleleng regency, and since then they occasionally receive information on training or aid programs from the district government through personal contact on top of the usual announcement systems (Interview 3 2021). The Leket Sari coffee group, which is unrelated to MBM, is also notable for gaining certification from the Rainforest Alliance and is another example of the differing degrees to which farmers can be trusted (Shantiawan et al. 2020; Telagawathi, Mayasari, and Atidira 2020). Although all farmers are included in the collaborative process by default, when certain farming groups show more results, collaborating actors may intensify their interactions with these groups.

This competence and the subsequent trust that is garnered by these farmers, however, is part of a learning process that takes time, and this is noted not only by MBM but also by BPTP Bali. The public R&D group notes that some farmers who had participated in early studies or experiments were able to continue experimenting with the given seeds on their own and even share their findings to the organization (Interview 4 2021). However, this process started only because BPTP Bali walked with them throughout the experimentation phase (ibid.). The interviewed director noted that farmers in general have very limited plots of land, so they would only try new crops when given coverage guarantees by the government in case of failure (ibid.). Once they become familiarized, however, the farmers would become more courageous and start acting on their own (ibid.). As such, the collaborative governance process over time also influenced the growth of the farmers which are learning from or learning through the collaborating parties.

Trust in the goodwill of the collaborating partners is slightly different and mostly a result of political discourse and the inclusive design of the policy. Although the power imbalance between farmers and the government could lead to some skepticism, the fact that the farmers are included in deliberations and feel that their voices are heard seems to have convinced them of the government's interest in them (Interview 6 2021). During an interview on the the RPJMDes creation process, the village secretary remarked that, while the administrative procedures are difficult for the villagers to learn and the requested funds are not always available, the village understands that the government has done their best and that the laws are being enforced to avoid misuse (ibid.). MBM also shares this setiment and notes that while they do have to advocate for the government to be more proactive, their very basis for advocating so is based on the Village Law that the government has instituted (Interview 2 2021; Interview 6 2021). In short, the skepticism coming from power imbalance within the collaboration seems to be counteracted by the perception that there is a shared commitment towards common goals, i.e. development, and community empowerment which is a result of the collaborative process's design to include the voices of the partners with less power.

The biggest challenge experienced during the collaboration by far was the knowledge gap, a form of resource asymmetry, between the villagers and the other actors, and this gap was bridged through facilitation, training, and some flexibility. The university reports on working in production, management, and policy-making activities consistently identified lack of knowledge and capabilities as a problem that needs to be addressed during their various public service activities (Mardana 2013; Rahmawati, Trianasari, and Widiastini 2020; Sujana et al. 2020; Suwendra, Suwena, and Sujana et al. 2020; Telagawathi, Mayasari, and Atidira 2020), and the interviews with both farmers and MBM confirmed that the village in general recognizes these problems (Interview 3 2021; Interview 5 2021; Interview 6 2021). This knowledge gap hinders the ability of the villagers to share what they know with the other collaborating actors, the most notable example being the delay in drafting the RPJMDes (Interview 6 2021; Sujana et al. 2020). However, it is overcome in the short-term when external actors facilitate (but not lead) villagers during difficult activities like the RPJMDes process (Interview 6 2021; Sujana et al. 2020; Suwendra, Suwena, and Sujana et al. 2020) and purposefully involve them in problem solving, e.g. combining local knowledge about fauna with university's knowledge of environmental

preservation (Mulyadiharja, Wijana, and Julyasih 2020; Rahmawati, Trianasari, and Widiastini 2020; Wijana and Mulyadiharja 2020), or implementation, e.g. learning-by-doing process in coffee production (Sukadana and Widjanarko 2020; Sukadana and Widyaningsih 2020; Telagawathi, Mayasari, and Atidira 2020; Tika and Agustiana 2020) or goat farming (Interview 3 2021; Interview 5 2021). Thus, the knowledge gap limited farmers' ability to share their knowledge in the collaboration, and this barrier was counteracted by other collaborating actors facilitating farmers and involving them in the process.

The continuation and sustainability of the collaboration seem to be strong. All participating actors continue to share a commitment towards empowering villagers and including them within the development process. The villagers are especially willing to invest time and effort in participating despite their busyness and learning both the policy-making procedure as well as new innovations in agriculture (Interview 1 2021; Interview 2 2021; Interview 3 2021; Interview 5 2021; Interview 6; 2021; Marsiti and Sukerti 2020; Mulyadiharja, Wijana, and Julyasih 2020; Sukerti, Marsini, and Musmini 2020; Tika and Agustiana 2020; Telagawathi, Mayasari, and Atidira 2020). The incentives to participate were similar to the PNPM situation with government-parties looking for legitimacy (Republik Indonesia 2014), farmers participating to improve their livelihoods (Interview 3 2021; Interview 5 2021), universities and public R&D participating due to government regulation (Republik Indonesia 2003; Direktorat Riset dan Pengabdian Masyarakat, Direktorat Jenderal Penguatan Riset dan Pengembangan, and Kementerian Riset, Teknologi, dan Pendidikan Tinggi 2018), and NGOs or other third parties joining in due to the collaboration's nature as the only platform to work in rural development, i.e. forum exclusiveness (Interview 6 2021; Republik Indonesia 2014). Long-term facilitative leadership, however, will be crucial in the long-run. Although the village's position in the collaboration is secure as long as current political discourse or values persists, the villager's knowledge gap could still undermine the collaboration's ability to achieve its outcomes, and until then the collaboration requires actors who will take the time to assist farmers in learning and making their views heard. However, MBM notes that the facilitation provided by the local government can vary, and it may depend on the district government staff whose assignments are regularly switched every few years (Interview 1 2021).

6. Discussion

The case study's findings have answered the research sub-questions. The farmers in Wanagiri Village are the main performers of entrepreneurial activities, guidance of the search, and creation of legitimacy. Meanwhile, the other collaborating actors perform resource mobilization (the district government) and knowledge development roles (MBM, BPTP Bali, the university) to support the farmers with knowledge development being restricted to adopting existing technologies rather than creating new ones. Knowledge diffusion functions is somewhat shared between farmers through their self-organized groups, the NGO MBM, and the public R&D organization BPTP Bali, and market formation is weakly noted in MBM and BPTP Bali's activities. The overall collaboration itself is vulnerable to the power and knowledge asymmetry between the government-affiliated and non-government-affiliated actors, but it is mostly

overcome through incentives to participate or commit, a common political discourse, trust-building dynamics based on successful outcomes and inclusive governance procedures, and forum exclusiveness. However, long-run facilitative leadership is still needed to address the knowledge gap that hinders farmers from performing their aforementioned roles, but it is unclear whether such leadership has been consistently present or not.

These findings are mostly in line with the economics literature. It supports the initial hypothesis based on Rodrik (2004) that public-private collaboration allows both sectors to share information, identify innovation barriers in the sector, and create targeted policies to solve these barriers. Rodrik's (2004) policy learning dynamic seems to, however, have become a part of the innovation learning dynamics identified by the IS literature. Policy, i.e. government support for specific agricultural activities in Wanagiri Village (e.g. coffee production, agrotourism, etc.), ended up fulfilling innovation functions such as resource mobilization, knowledge development, and knowledge diffusion as identified by Hekkert et al. (2007). Policy, specifically the RPJMDes process, also fulfilled network functions such as demand articulation (Klerkx et al. 2012) and the establishment of a platform (Kilelu, Klerkx, and Leeuwis 2013) since information and resources were exchanged based on what was written in the village development plan. This understanding of innovation policy goes beyond the traditional supply-pull and demand-push classifications, suggesting that there is room for further integration of learning dynamics within economics (Chang and Andreoni 2020). Nevertheless, the essence is clear that the case study's findings are in line with the economics literature.

The findings also generally confirm collaborative governance literature. Power and resource asymmetries can become a disincentive to collaborate (Hartley, Sørensen, and Torfing 2013), but it can be counteracted when there is a commitment for weaker parties to be represented and empowered either through procedural design or specific actions (Ansell and Gash 2007). The source of this commitment was not specified in the literature, but the case study suggests it can emerge through political discourse (Schmidt 2008) and incentives to participate which was originally treated as a starting condition separate from power asymmetry (Ansell and Gash 2007). Once things have started, trust and participative commitment were crucial to keep the collaboration going successfully by enabling actors to share information or resources, learn from each other, and do their part to achieve the collaboration's objective, in this case agricultural innovation (Lopes, Vaz, and Farias 2020; Siddiki, Kim, and Leach 2017). These factors emerged through small wins and dialogue which naturally appear over time if the collaboration is working well (Ansell and Gash 2007). One difference to note, however, was that knowledge asymmetry was not restricted to a starting condition and became a hindrance during the collaboration process itself. Although there was no clear indication of leadership in the case study (Douglas, de Noort, and Noordegraaf 2020; Lewis, Ricard, and Klijn 2018), facilitation, i.e. the inclusion of farmers' information or experience with expert perspectives (Hartley, Sørensen, and Torfing 2013), and problem-solving flexibility (Krogh 2020; Sørensen and Torfing 2021) did appear from the collaborating actors as a whole in reaction to the hindrance, and it was generally effective.

Interesting connections can also be found with past PNPM studies. First, infrastructure building remains an important part of rural development in Indonesia. Past PNPM studies have

noted that infrastructural projects tended to dominate over other alternatives like economic development, health, education, etc. (Pollock and Kendrick 2015; Oktarina and Furuya 2015; Zulfida and Fauzi 2017), and while the developments in Wanagiri seem much more diverse, infrastructural projects were still mentioned offhand in the interview (Interview 5 2021; Interview 6 2021) and were identified as a barrier to market access (Interview 1 2021; Rahmawati, Trianasari, and Widiastini 2020). Second, the transaction costs for villages to participate in the collaborative governance process essentially remains the same. Although participation in Wanagiri Village does not seem to be merely instrumental, villagers still face time-constraints similarly observed during PNPM (McCarthy et al. 2017; Pollock and Kendrick 2015, 4, 15; Slikkerveer and Saefullah 2019) in attending the village development plan meetings due to the need to work and secure their limited incomes (Interview 6 2021), and they still rely on representatives to voice their input and make the RPJMDes information accessible to the village (ibid.). One difference, however, is the fact that the management of paperwork and organization of meetings has moved from PNPM facilitators (Jakimow 2018; Pollock and Kendrick 2015, 14, 21-22) to the villagers themselves (Pollock and Kendrick 2015, 4, 6, 11) which has become the newer, more pressing challenge for Wanagiri Village (Interview 6 2021; Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020). It should be reasonable to imagine that another village with worse participation than Wanagiri Village will have an even more difficult time if they also struggle adjusting to the bureaucratic burden as well.

Third, political discourse plays an important role in the effectiveness of the collaborative governance arrangement. PNPM participants, especially local community members, were strongly motivated to overcome resource, time, bureaucratic, and organizational challenges because they identified themselves as contributing to a bigger national development endeavour through the program (Jakimow 2017). A similar attitude could be observed in the case of Wanagiri Village where the villagers and the village administration feel a sense of responsibility for how their limited education is hindering them in implementing the Village Law and their community's development. On the one hand, this transfer of responsibility is criticized in the literature because local communities rather than governments are now expected to solve structural problems such as education, poverty, and market access on their own even though they have limited capabilities to do so (Jakimow 2018; McCarthy et al. 2017). On the other hand, even if collaborative governance arrangements have limited structural impact (McCarthy et al. 2017), changes in political discourse and ideas can go beyond legitimizing government actions and actually spark long-term institutional or policy changes by influencing the range of policies political actors can debate or pursue (Schmidt 2008). Moreover, how this discourse shapes the motivation of program participants, despite the structural challenges they face, and how they envision roles for themselves should not be dismissed given how they influence policy implementation processes in the field (Zacka 2017).

Several limitations are apparent in this study. First, the results of this study have limited generalizability. The obvious reason for this conclusion is because the findings are based on a single case study and are specific to agricultural sector dynamics which can be even more fragmented depending on the crop the study is specializing on (Touzard 2015). The less obvious but equally important reason is that the Village Law and the collaboration that is part of it is a very unique form of state-mandated, collaborative governance due to its large size, nation-wide scope, and status as a policy (McCarthy et al. 2017). Micro-level, actor dynamics within a

collaborative governance arrangement may differ depending on the funding, security, and expected lifespan of the collaboration.

Second, district government's perspectives were limited in the study due to lack of interviews and available reports. The district government seems to play a role in informing Wanagiri Village concerns to university and public R&D interventions (Mardana 2013; Mulyadiharja, Wijana, and Julyasih 2020; Rahmawati, Trianasari, and Widiastini 2020; Shantiawan et al. 2020), for example when directing the university to help with the drafting of the RPJMDes (Sujana et al. 2020; Suwendra, Suwena, and Sujana 2020). Moreover, district government is also expected to provide long-term facilitation for the village (Republik Indonesia 2014). Thus, the district government seems to play a coordinating role between the village and other actors, but these interactions were not properly illustrated due to the lack of findings from the district government perspective.

Third, the literature consulted did not fully capture the impact of farmers' personal growth in the collaboration. During the interview, three types of farmers emerged: farmers who ask for material aid, farmers who ask for production capital, and farmers who start their own initiatives and network with people independently (Interview 2 2021). While the collaborative governance literature notes that participants grow at different paces during a collaboration (Hartley and Rashman 2018), it was never particularly clear how this growth is operationalized, how its origins are explained, and how this phenomenon transformed the collaboration process itself, e.g. farmers perform new roles and change collaboration dynamics. This might require delving deeper into literature on learning dynamics (Miettinen 2013b) or experimental economics, particularly studies about decision-making in the context of development or poverty (Banerjee and Duflo 2011).

7. Conclusion

Wanagiri Village is an example of innovation achieved through state-mandated collaborative governance. Multiple instances of innovation were observed in animal farming, coffee production, and agrotourism, and these innovations were driven by the drafting of a village development plan explaining the conditions and needs of the village. Collaboration actors external to the village contributed developed knowledge and resources while village farmers performed the entrepreneurial activity, directed where innovation happens, and secured local support for the resulting innovation. Knowledge gaps and power asymmetries threatened to hinder the exchanges necessary for the collaboration to produce innovation, but it was overcome by incentives to participate and empower weaker actors, supportive political discourse, trust-building dynamics based on successful outcomes and inclusive governance procedures, and forum exclusiveness of the Village Law.

The case study suggests that collaborative governance in general contributes to agricultural innovation by providing a platform for learning dynamics between the public and private sectors. The exchange of information, knowledge, and resources between actors in the two sectors leads to policy learning for governments which then, through policy implementation, feeds into innovation learning for private sector actors. Policy implementation influences innovation learning by fulfilling certain functions identified in innovation system studies which

eventually spur innovation as an outcome. This synergy, however, depends on the relational and political conditions between the collaborating actors. Mechanisms to balance power asymmetry, build trust, and facilitate differing backgrounds are important in supporting the exchanges needed to help the collaboration achieve innovation. As such, collaborative governance arrangements must first overcome coordination barriers to innovation before it can generate the learning dynamics necessary to overcome information barriers to innovation.

This study suffered limitations in generalizability, obtaining government perspectives directly, and explaining the personal growth of the observed farmers in the case study. Future research should observe more cases of innovation-inducing collaborative governance to obtain a larger sample size and engage in comparative analysis. Indonesia's Village Law alone, as a state-mandated governance with nation-wide scope and long track record, should provide many samples and good opportunities for comparative analysis. Other bottom-up, community empowerment initiatives can also provide further opportunities depending on their characteristics. A research gap remains not just in studies on innovation through collaborative governance but also in collaborative governance within developing countries in general. Thus, there is much room for collaborative governance and innovation system studies to engage in interdisciplinary, and even transdisciplinary (Menken and Keestra 2016, 22), dialogue in order to understand how people in various environments work together to innovate, learn and grow.

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