Botswana Blood Commons[*]

Visualizing blood services as a public-commons partnership

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ABSTRACT

What role can the commons play in improving citizen trust in healthcare services? We explore this question in the context of the chronic blood supply shortage in Botswana, where the Indigenous kgotla village governance system operates alongside the republican state. To address barriers to trust in the blood services ecosystem, we review the public-commons partnership model as a commons ecosystem model that could support participatory design of blood services between the kgotla and state. We apply this model to the ecosystem mapping tool used in the Jigsaw framework, a method previously used in Botswana to support ecosystem visualization, to prompt state consideration of this alternative public-commons partnership as a solution to the blood supply shortage. We also explore the re-visualized ecosystem as a pluriversal commons, where the kgotla and state cosmologies must interact to solve the collective action challenge of blood supply.

CCS CONCEPTS

• Networks ~ Network architectures ~ Network design principles • Social and professional topics ~ User characteristics ~ Cultural characteristics

KEYWORDS

relational commons, public-commons partnership, pluriversal design, blood donation

1 Introduction

What role can the commons play in improving citizen trust in healthcare services? The Covid pandemic has underscored the critical role of citizen trust for successful healthcare service delivery. Most states have addressed "building vaccine confidence" [1] with programs that disseminate information through community networks, from community-based organizations to "health champions" [2]. Another approach, grounded in participatory design (PD), is to involve citizens in the design of healthcare services, which can increase citizen trust [3, 4] and reflect diverse citizen worldviews [5]. In contrast with Global North counterparts, Botswana possesses an Indigenous governance system, *kgotla*, which exists at both village level and national level as the House of Chiefs (Ntlo ya Dikgosi) in Parliament. The kgotla have long been recognized as a form of commoning [6, 7], making governance in Botswana, in principle, a dual state-commons system. Despite the formal recognition of the state-commons arrangement in Botswana, the state has not engaged the kgotla as a partner to address trust in healthcare services. In this paper, we focus on the issue of chronic blood supply shortage [8], for which prior research has found that lack of trust in various stages of blood donation and transfusion, which we collectively call "blood services," leads to low donation levels [9].

How can commoning, and particularly pluriversal commoning, support Botswana to address the chronic blood shortage? In particular, how can we create space for the Botswana state to re-visualize the blood services ecosystem as a pluriversal commons to address this shortage? We select two frameworks to answer this question: (1) the public-commons partnership model as an approach to visualizing a commons ecosystem with dual commons-state arrangements; and (2) the Jigsaw framework, a method previously used in

Botswana to visualize startup ecosystems. We adapt the public-commons partnership model for Botswana blood services and then consider how this re-visualized ecosystem might extend and inform the Jigsaw framework. The case of Botswana blood services is also a pluriversal commons, where the kgotla and state cosmologies must interact to solve the collective action challenge of blood supply, so we also reflect on how this exploration might inform future research into pluriversal commoning and participatory design.

2   Blood supply in Botswana

Blood supply in Botswana has been in chronic shortage for years and suffered an acute crisis in 2020 [10]. In 2021, Author co-conducted workshops with Gaborone city residents, entrepreneurs from a local incubator, and National Blood Transfusion Services (NBTS) staff to understand the reasons behind the chronic blood shortage [9]. These workshops identified the following barriers to trust in blood services:

- **Lack of trust in blood use**. Researchers found that the principal reason people gave for not donating blood was lack of trust in how their blood is used and where it is taken to. People feel less control over their blood after donation. People felt unclear about where their blood is stored, how it is managed, and to whom it is given.
- **Negative perceptions**. People were reluctant to donate blood for various beliefs and perceptions about blood donation, some of which are based on religious or cultural orientations. Most observant Christians in Botswana still associate blood donation with sinning.
- **Lack of incentive**. People in the workshops asked, "Why bother?" or "Why care?" Most people felt exploited by blood donation, and therefore expect something in return. Workshop participants felt incentives might motivate people to donate blood.
- **Bad hospital experiences**. Several workshop participants cited adverse hospital experiences where relatives had to extend their time in hospital to wait for blood to become available and/or transported. Some participants stated relatives died while waiting.

These barriers highlight the value of considering commoning to solve the blood supply shortage. To presume these barriers could be solved solely through better information dissemination means these concerns are invalid, in need of correction. Citizens may have valid reasons to be concerned about how their blood is used, e.g. What if blood transfusion is subject to bribery? If these barriers are presumed valid, then the design and management of blood services must change. While community engagement, such as "listening sessions" [11], is a common approach, this paper explores commoning as a constant form of participatory decision-making. Indeed, as commoning requires that stakeholders affected by the rules have the ability to change them [12], commoning is a constant form of PD by commons members. In the case of Botswana, the kgotla that operate in every village across the country form an ecosystem of commons that could be engaged to address the chronic blood shortage.

3   Botswana kgotla

The Indigenous kgotla system operates alongside Botswana's Parliamentary republican system and plays a particularly significant role in rural villages. Kgotla is the name for both the customary governance system in these villages and the physical space where meetings take place (Fig. 1). A kgotla is typically led by a chief with a group of ward heads, though structure varies. The kgotla is both a forum for discussing the developmental agenda of the village and a justice system for resolving community conflicts. The kgotla typically adjudicate civil cases rather than criminal cases, and cases are resolved using kgotla customary law rather than state penal law [13, 14].

Importantly, kgotla is a form of commons and commoning. Numerous commons scholars have researched kgotla as commons, dating back to at least the 1990s [15]; however, this research focuses on kgotla management of natural resource systems like grazing land [6, 7]. There is no known commons literature that extends kgotla practices beyond natural resource management to social policy areas like blood services. Since the kgotla can be considered an ecosystem of commons, we next turn to the commons literature to review

how commons scholars propose such ecosystems could function for public services like blood services. We are mindful that, in turn, the commons literature may learn from the kgotla governance system and evolve.

Figure 1: Typical Botswana kgotla meeting places [16, 17].

4   Commons ecosystems

Several commons scholars discuss commons relating to each other in more holistic ecosystems on a theoretical level, but few scholars posit how to translate this theory into actionable models. The most influential commons ecosystem literature at the theoretical level includes: Dyer-Witherford's characterization of the "circulation of the common" as a parallel to the circulation of commodities in capitalism [18, 19]; Helfrich's depiction of a "commons-creating society" with commons spawning more commons [20, 21]; and a handful of scholars who draw on social solidarity movements as a way to envision commons relating to each other [22, 23, 24].

The most well-articulated framework, which this paper uses, is the "public-commons partnership" (PCP) (Fig. 2) [25, 26]. Another ecosystem proposal is the "ecosystem of commons-based peer production" [27, 28]. Both ecosystem proposals offer a high-level taxonomy for components of the commons ecosystem that have been considered in this paper, particularly shared features. The most notable shared feature is an "association" that performs coordination functions among other commons, a form of nesting. Both proposals also present "enterprises," though these enterprises are composed differently — commons-oriented enterprises are combinations of digital communities and productive communities while a joint enterprise is a combination of the common association and the local authority. While both of these ecosystem proposals are schematic, incomplete, and situationally specific, they offer a starting point for developing commons ecosystems.
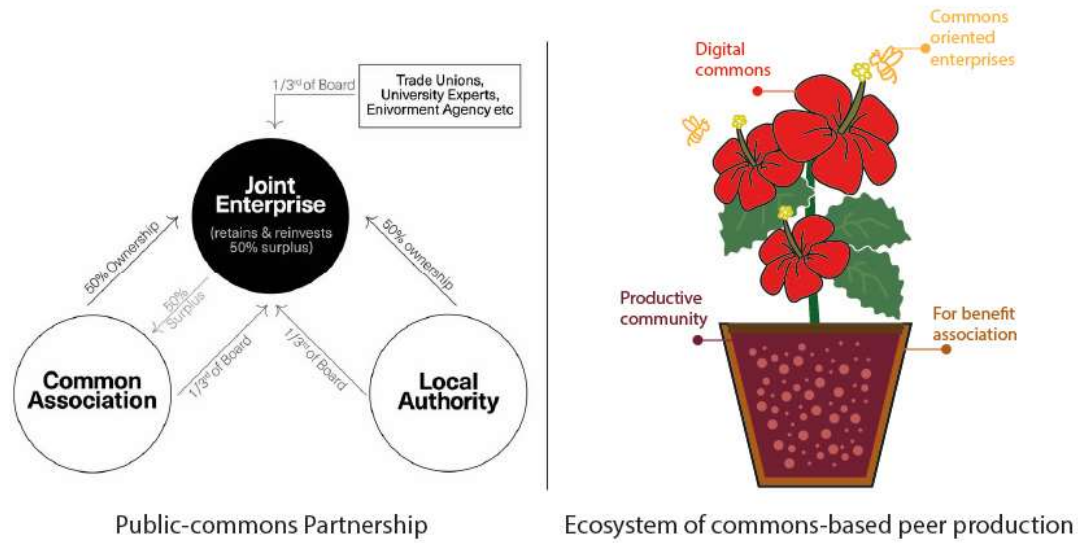
Figure 2: Commons ecosystem frameworks. Left: public-commons partnership (PCP) [26]; right: ecosystem of commons-based peer production [28].

The pluriversal commons is raised by Escobar [29] and is especially relevant to commons ecosystems. Escobar argues for "a world in which many worlds fit" by accommodating multiple ontologies and epistemologies in design [30] and specifically the commons. Moving from singular commons to commons ecosystems means crossing cultural boundaries, at minimum because no two commons are identical. Most explorations of pluriversal design in the commons literature look at pluriversality within a singular commons rather than a commons ecosystem, such as ethnographic research of the more-than-human commons in an Irish lobster fishing community [31], and situational analysis of three European community radio communities [32]. The case we explore in this paper presents an important challenge: How do we design in diverse ways of being [33] into commons ecosystems that privilege Indigenous worldviews rather than subordinate these worldviews to Global Northern or "one-world world" [34] worldviews?

5 Jigsaw framework

The frameworks in the previous section provide useful schematic models for visualizing a commons ecosystem; however, they do not provide infrastructure for materializing or assembling these ecosystems. To support the creation of a commons ecosystem, we have selected the Jigsaw framework as a starting point because it has been used recently for ecosystem mapping with small and medium-sized enterprises (SMEs) and entrepreneurs in Botswana [35].

Over a period of 18 months, the framework creators engaged manufacturing incubators, focusing particularly on leather, ceramics, and visual arts (Fig. 3). During this testing phase, the framework creators ran three workshops with: 15 leather manufacturing SMEs; 65 representatives from research, industry, and policy environment across seven countries in Africa; and 20 entrepreneurs from the Botswana Innovation Hub.
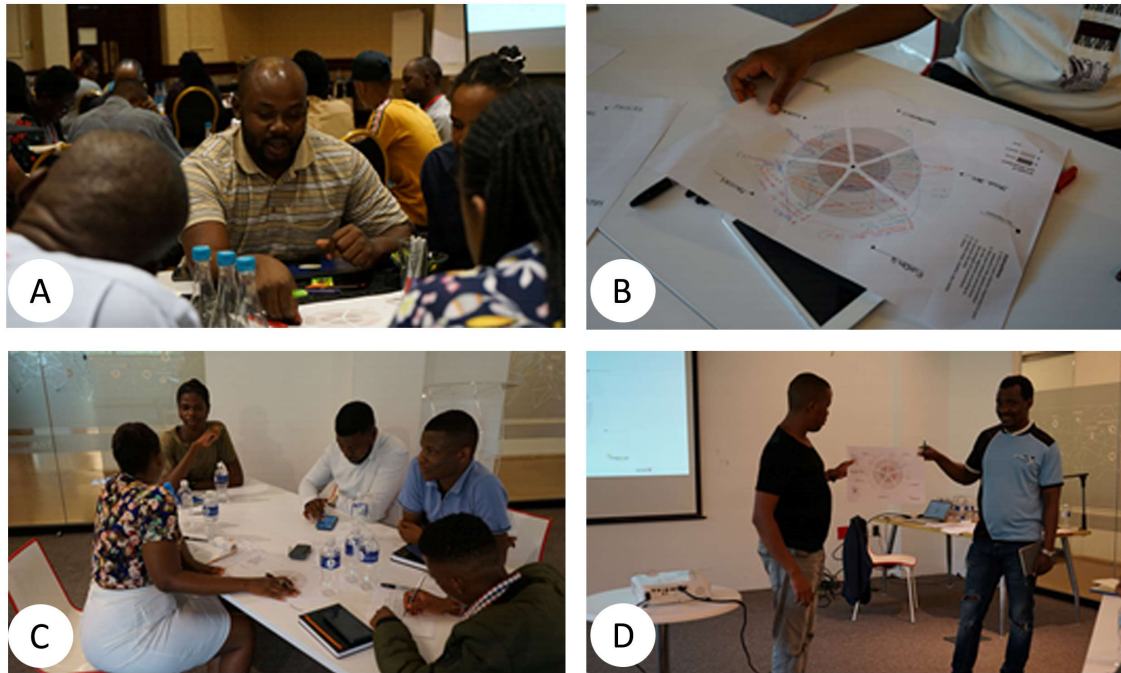
Figure 3: Entrepreneurs using the Jigsaw framework to understand entrepreneurial ecosystems: (A) initiative dialogue; (B) design activities; (C) review, activate, and sustain discussions; (D) presentations. [35].

The framework creators synthesized this process into the Jigsaw framework, comprised of five "pieces." The framework refers to pieces rather than steps because this process may be recursive rather than linear. Figure 4 outlines how the pieces of the Jigsaw framework are used to align different goals into a new value proposition and value creation.

- **Initiate**. Promoting dialogue and formulating criteria for engaging other actors. The Initiate piece was used to align actors' varied goals, interpretations of the ecosystem value, and interests.
- **Design**. Visualizing key actors and roles in the network using important ecosystem attributes, such as: main actors, bridges, structural holes, and weak ties. The Design piece was used to help actors externalize their networks in terms of actors, connections, and roles.
- **Review**. Searching for emerging opportunities in the configuration of actors. This piece was used to help actors analyze and synthesize emerging connections and missing network attributes.
- **Activate**. Prompting actors to use their collective resources. The fourth piece was used to assess what each actor could contribute towards creating shared value.
- **Sustain**. Visualizing the future scenarios of ecosystems and coming up with new ideas to sustain networks. The last piece was used to help actors formulate strategies for collaborations based on new ideas.
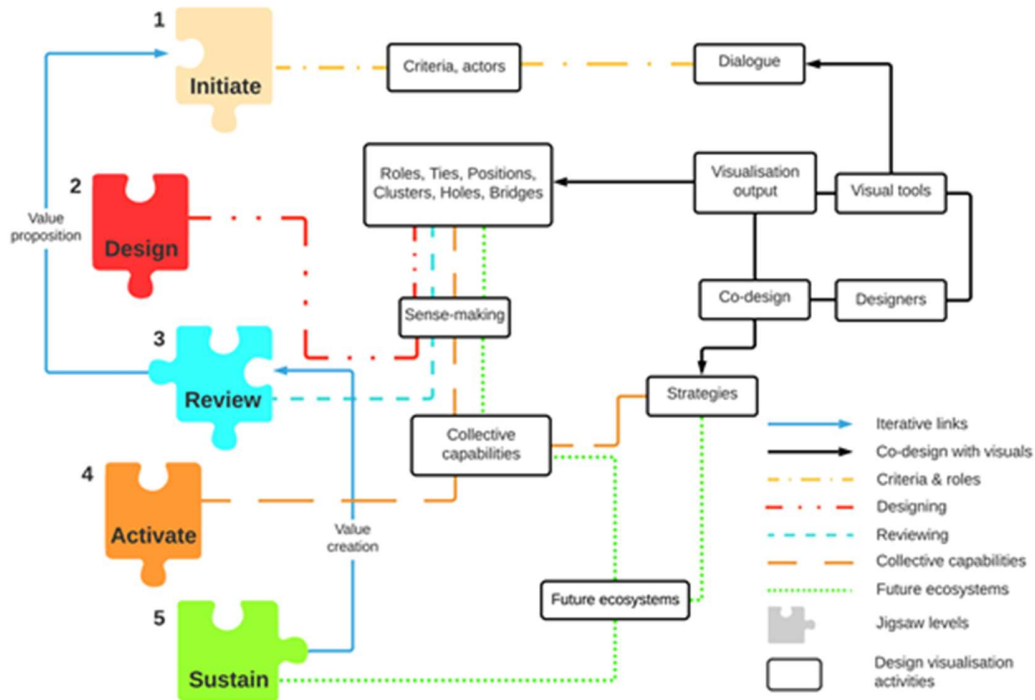
Figure 4: Jigsaw framework for understanding innovation ecosystems [35].

In the next section, we review the ecosystem visualization tool used with Botswana workshop participants for the Initiate and Design pieces of the Jigsaw framework. We also identify outcomes from this process that influenced how we later adapted this tool for use with the public-commons partnership model.

6 Ecosystem visualization in the Jigsaw framework

The ecosystem mapping tool developed for the Jigsaw framework process in Botswana aimed to help entrepreneurs identify and evaluate their networks to support their innovation process. The ecosystem mapping tool was developed based on the longstanding position generator method [36] to identify stakeholder positions and measure connection strength between stakeholders. This approach was selected and adapted to address gaps identified in previous ecosystem mapping workshops with Botswana SMEs, namely, the need to align diverse ecosystem worldviews [35]. The ecosystem visualization process comprised of four activities (Fig. 5):

1. Identify segment criteria. Participants received the tool with blank spaces for each segment. Participants identified the criteria important to them to their ecosystem formation. The tool template starts with five segments, but participants can identify greater or fewer segments.
2. List contacts. Participants generated a list of contacts for each criterion named.
3. Map contacts. Participants mapped the contacts, using distance from center as an indicator of the strength of that connection (strong versus weak).
4. Collaboratively analyze outputs. Participants were divided into groups to create shared visualizations using their individual ecosystem maps.

6

Weak ties Are plotted on the outer segment away from the focal participant/centre

Medium ties Are plotted between the weak and strong ties

C

B

Strong ties Are plotted closer to the focal participant/centre

D

Criteria between ties
The spaces are used to help make decisions about the most important criteria for exchange and fill in the gaps

A

Measure of closeness Used the three point likert scale ranging from strong, medium to weak. participants discussed ties and assessed the strength of ties based on sharing resources(information, decision making, research, capital,equipment, other spaces)

E

Strength of Connections

■ Strong
■ Medium
□ Weak

Organisation

Ecosystem name Write your organisation name here or your newly formed innovation ecosystem

Instructions to Users

● Fill in main criteria important in your ecosystem in the spaces provided (A-E)
● Plot your network connections (using nodes) on the segments according to the strength of ties
● Connect the actors (dots) with lines, use different line colors to identify different actors
● Identify strong and weak ties, key nodes and explore opportunities
● Share

Figure 5: Ecosystem mapping tool [35].

The challenge addressed in this process was to materialize divergent ecosystem worldviews and identify opportunities to align these worldviews to support leather SMEs and entrepreneurs. A good example of such divergence is the ecosystem maps of leather SMEs versus government representatives. The collaborative ecosystem map produced by leather SMEs featured many strong ties with peer SMEs, but they placed public authorities at the very outer edge of their ecosystem map, even though they identified these actors as having supreme control over their ecosystem. This visualized divergence provided an opportunity for government representatives to explore how to improve ties with leather SMEs and create greater agency for leather SMEs, which could be visualized as ties moving from the outside towards the center of the ecosystem mapping tool.

The blood supply shortage in Botswana poses a different challenge. The state has not engaged the kgotla to co-design blood services despite the decade-long blood shortage. This lack of engagement suggests that a configuration like the PCP might not naturally emerge from the Jigsaw process. Instead, we might consider how to re-visualize the ecosystem mapping tool to prompt stakeholders to consider a blood services PCP ecosystem, a political process some scholars call "institutioning" [37].

7

7 Visualizing the blood services ecosystem as a PCP

The way we visualize, frame, or think about an ecosystem is politicized. As Author [38] shows, even the use of labels like "inputs" for nonhuman species conveys an ecosystem ontology that represents a Global Northern or scientized way of thinking rather than pluriversal thinking, e.g. traditional ecological knowledge [39]. While the ecosystem mapping tool in the Jigsaw framework appears value-neutral, what version of an ecosystem, or mental model, are participants drawing on as they move through the process? How does this process accommodate multiple mental models? We now consider a different visualization of the blood services ecosystem that could be used in the Jigsaw framework.

In Figure 6, we present a visual reframing of Botswanan blood services based on the public-commons partnership model. We have remained close to the original PCP model as this model remains theoretical.
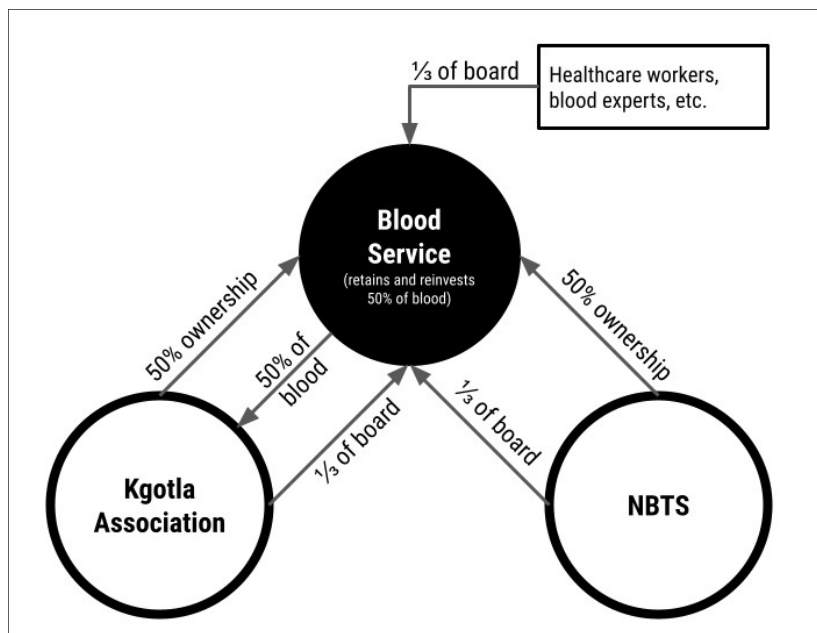
Figure 6: Botswanan blood service as public-commons partnership.

While we are using the PCP as a way to reframe the blood service ecosystem, our aim is to adapt the PCP and commons language for the Botswanan context rather than force commons language onto the existing system. These are the adapted components of blood services as a PCP:

- **Kgotla Association**. The Kgotla Association is the equivalent of the Common Association in the PCP. The PCP offers no schematic for how a Common Association governs the collective of commons. Likewise, there is no prescription for how the Kgotla Association will coordinate the many kgotlas. The purpose of this entity, in both the PCP and the ecosystem of commons-based peer production, is about reducing governance transaction costs. The rest of the Jigsaw framework process could be used to flesh out how kgotla members envision working collectively.
- **NBTS**. The National Blood Transfusion Services (NBTS), the state agency that oversees the blood supply, is the equivalent of the Local Authority in the PCP.
- **Blood Service**. Blood Service is the equivalent of Joint Enterprise in the PCP. The intention of the PCP authors in using the word "enterprise" may have been to challenge the UK government's public-private partnership program. Blood services in Botswana are considered a public health service, and we wanted to preserve that discourse. Joint initiative might be a better term for the PCP.

- **Other stakeholders**. The top right box includes stakeholders who may be important to commons governance but are not members of the Kgotla Assocation or NBTS. In the PCP example, these stakeholders included actors like trade unions and university experts. The Jigsaw framework process would need to identify how these other stakeholders should be.

The components are connected by arrows that indicate both ownership and service flows. These terms may be inappropriate in this context, but we preserved them for discussion and further adaptation.

- **Board membership**. The Blood Service might be governed by something other than a board, such as a council, and each stakeholder's share may differ too. This is a design decision that can be incorporated into the Jigsaw process.
- **Ownership**. The issue of ownership may or may not be relevant here. In the case of the Blood Service, governance by the "board" may be sufficient. In the original PCP, the board and ownership are different. The board oversees decisions while ownership relates to who retains the benefits or surplus created. It is possible that there are benefits or profits created by the Blood Service, e.g. if Botswana has a blood surplus perhaps they will choose to sell this surplus to a neighboring country.
- **Surplus**. We retained surplus because it represents an important governance question about how blood is distributed. For example, one way to resolve some of the barriers raised earlier is to guaranty the Kgotla Association, and each kgotla within this association, that some share of blood donated by the community will flow back to the community. In commons parlance, this might address fears about the "free rider" problem [40], where some communities receive blood from the commons while donating nothing.

We next consider how to apply this ecosystem configuration to the existing ecosystem mapping tool in the Jigsaw framework.

8 Adapting ecosystem visualization in the Jigsaw framework

How do we translate the blood services PCP model into a tool that supports ecosystem visualization and ecosystem mapping? We performed a close adaptation of the mapping tool used in the Jigsaw framework as a starting point (Fig. 7). First, we positioned Blood Services in the center, where the leather SME was previously. Second, we divided the circle into three sections that mirror the PCP model in Figure 6: Kgotla Association, NBTS, and Other Stakeholders.
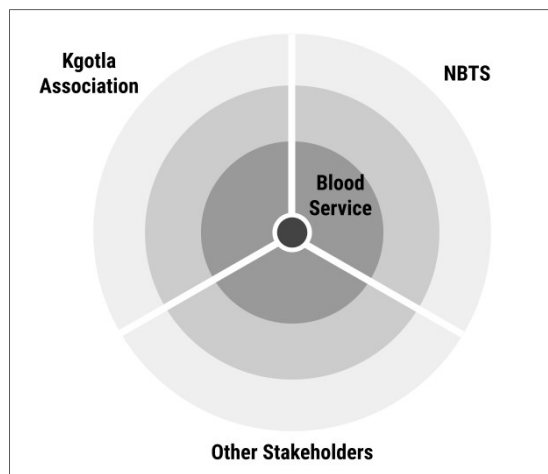

Figure 7: First iteration of the Jigsaw framework visualization tool adapted for the PCP model.

This diagram schematically represents the ecosystem, but the Kgotla Association and NBTS are also comprised of ecosystems of their own, each of which might need to be mapped in more detail first. In the original application of the Jigsaw framework, different ecosystem member groups mapped the same ecosystem through their different lenses. In this blood services PCP model, two distinct member groups are mapping different ecosystems and identifying how to weave them together through the Blood Service. A second iteration of this visualization tool shows the relationships of this nested ecosystem (Fig. 8). In this iteration, we anticipate performing an ecosystem mapping process akin to the previous Botswana case, where we provide a tool but leave the segmentation of the ecosystem open to participant adaptation.
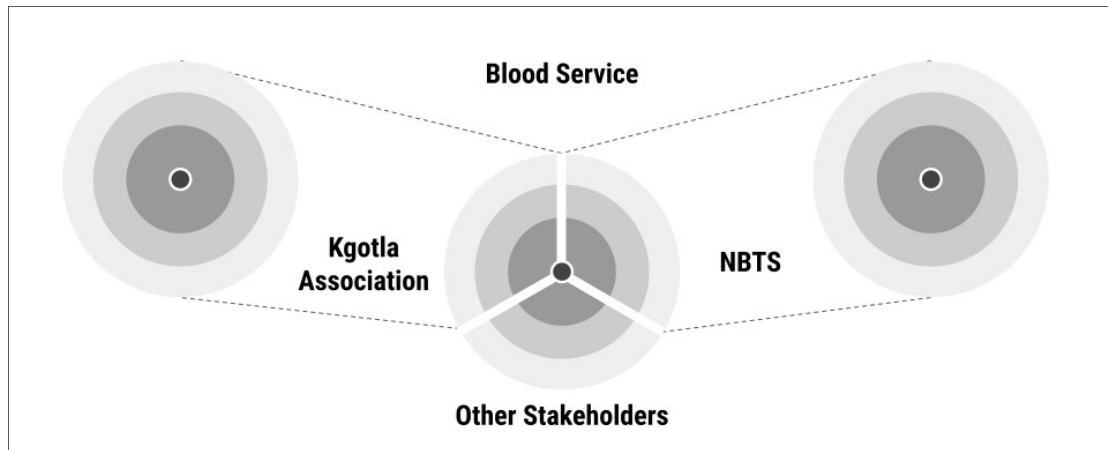
Figure 8: Second iteration of the Jigsaw framework visualization tool adapted for the PCP model, in which separate mapping processes for Kgotla Association and NBTS then map to the Blood Services ecosystem map.

The intention of this iteration is to generate not only the ecosystem members that belong to the Kgotla Association and NBTS segments of the Blood Services ecosystem but also to identify the members who belong to the Other Stakeholders segment. How do participants decide if someone belongs in Other Stakeholders? The original Jigsaw framework uses distance from the center to determine strong versus weak ties. How do participants qualify strong and weak ties? To address this question, we introduced another feature of commons literature: choice levels.

Choice levels describe the roles people play in different types, or levels, of decision-making [12]. The three choice levels are:

- Constitutional-choice rules determine who can participate in managing a commons,
- Collective-choice rules determine how decisions are made, and
- Operational-choice rules address everyday management.

These three choice levels are nested because constitutional-choice rules affect who can participate in making collective-choice rules, and collective-choice rules affect who can modify operational-choice rules. In this example, each kgotla (constitutional-choice level) might elect a group of people to participate in the Kgotla Association (collective-choice level), and one person from this group may then participate in regular Blood Service meetings (operational-choice level). In other words, choice levels help us concretely identify who is involved in which decisions. We applied these choice levels to the ecosystem mapping tool as a preliminary attempt to guide the ecosystem mapping process (Fig. 9). We then added a fourth circle to the tool, "External," to represent ecosystem members who do not constitute the institution, e.g. they are not members of the Kgotla Association.
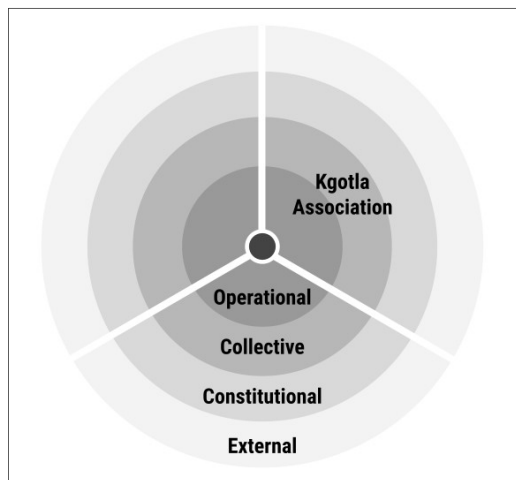
Figure 9: Application of choice levels to the visualization tool.

Finally, we applied this revised tool with the four choice levels to our previous model connecting the Blood Service ecosystem with the Kgotla Association and NBTS ecosystems (Fig. 10). The intention of this iteration is to provide a mechanism to map Other Stakeholders. In effect, the ecosystem mapping process for Kgotla Association and NBTS serves to identify who the Other Stakeholders should be.
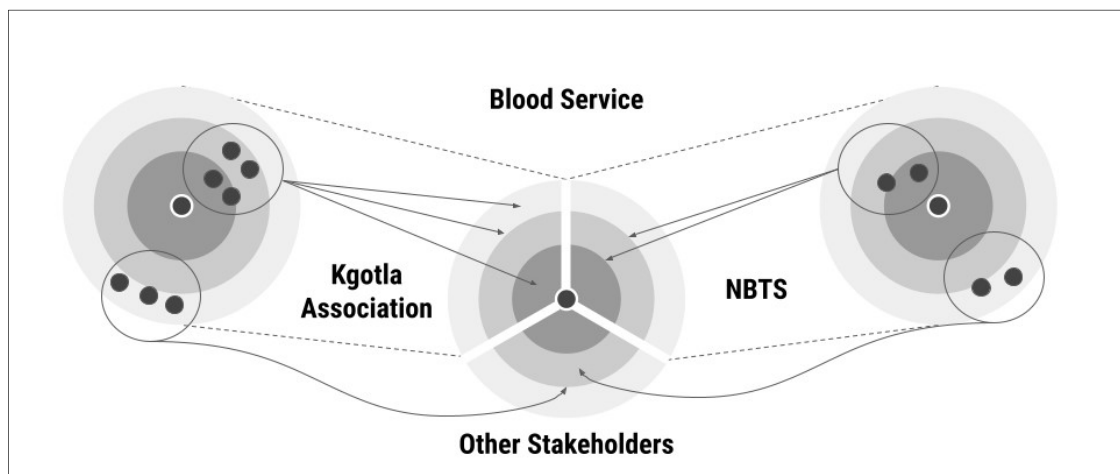

Figure 10: Second iteration of the Jigsaw framework visualization tool adapted for the PCP model, in which separate mapping processes for Kgotla Association and NBTS then map to the Blood Services ecosystem map.

9 Conclusion

The Botswana blood supply crisis presents an opportunity to consider alternative approaches to building citizen trust in public services beyond community engagement and information dissemination strategies. Unlike most Global Northern counterparts, Botswana possesses an Indigenous governance system, kgotla, that already function as a national ecosystem of commons. While the kgotla system is formally recognized by the state, the kgotla system has not been engaged to address barriers to trust in blood services. To explore solutions to this challenge, we have presented the public-commons partnership as a schematic visualization for building a commons ecosystem that supports deep PD by the kgotla system in blood services. To address the process of ecosystem building, we have reviewed the Jigsaw framework that has been previously used with stakeholders in the Botswana startup ecosystem. We have focused on the Jigsaw framework's ecosystem

11

mapping tool as a means of visualizing a commons ecosystem for the blood services. We identified how blood services could be re-visualized as a public-commons partnership and applied this visualization to the ecosystem mapping tool to understand how it might be used in future stakeholder engagement. We have considered how the proposed re-visualization of blood services might support pluriversal commoning, particularly the weaving of different worldviews held by kgotla and the state. We plan to further engage the state actor, NTBS, using this visualization to open space for consideration of a PD approach to blood services. Finally, reflecting on this exploration's implications for the commoning literature, we have identified a need to expand consideration of the kgotla beyond natural resource management to social policy. While other states do not possess an Indigenous commons ecosystem like the kgotla, the lessons learned from Botswana could be adapted for other states.

ACKNOWLEDGMENTS

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