



Social Entrepreneurs as Ecosystem Catalysts: The Dynamics of Forming and Withdrawing from a Self-Sustaining Ecosystem

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ABSTRACT Creating a long-lasting impact is one of the defining goals of social entrepreneurship. Yet, social entrepreneurs often face a dilemma between sustaining their organization and offering a permanent fix to a social problem. We question the assumption that organizational permanence and growth are intrinsically desirable for social entrepreneurs and propose an alternative, an inductively grounded model of ecosystem leadership, which we term ecosystem catalysis. Through a single case study of social entrepreneurs addressing the lack of access to diarrhoea treatment in Zambia, we conceptualize ecosystem catalysis as a process through which an organization forms an ecosystem around a new value proposition while gradually making itself redundant, ultimately withdrawing from the ecosystem without compromising its functioning. Our work contributes to ecosystem literature by contrasting the key aims and mechanisms of an ecosystem catalyst to those of an orchestrator and identifying the conditions under which catalysing may be a better choice than orchestrating an ecosystem. We contribute to social entrepreneurship literature by decoupling social impact from organizational growth and permanence and presenting a more dynamic model of social impact resulting from distributed contributions in ecosystems.

Keywords: catalyst, ecosystem, orchestrator, social entrepreneurship, social impact

INTRODUCTION

Creating a long-lasting impact is one of the defining goals of social entrepreneurship (Muñoz and Kimmitt, 2019; Nicholls, 2010). However, social entrepreneurs often shift their focus onto sustaining their organizations rather than solving the societal problem that originally motivated them (Santos, 2012). Studies show that even those driven to

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maximize social change through the widespread dissemination of social innovations risk the long-term resilience of their interventions due to their emphasis on organizational expansion and longevity (Perrini et al., 2010). An approach that has not been widely explored in the literature involves social entrepreneurs prioritizing a permanent institutional fix to an enduring problem by ‘making themselves dispensable’ rather than central to the solution (Shepherd and Patzelt, 2020, p. 9).

To explore how social entrepreneurs can achieve self-sustaining impact in this way, we turn to the literature on ecosystems (e.g., Adner and Kapoor, 2016; Jacobides et al., 2018) where scholars have explored how a value proposition can be forged, maintained, or expanded by several organizations of which none is fully responsible or accountable for the ecosystem’s value proposition (Autio, 2021; Moore, 1996). In this distributed view of impact, an organization may form and then leave the ecosystem, without necessarily compromising its resilience, so long as key ‘functions’ are performed by others (Adner, 2017). However, the literature on ecosystem intermediaries primarily focuses on ecosystems formed and orchestrated by traditional businesses and entrepreneurs with goals of organizational growth and permanence. This narrow focus on ‘orchestrators’ as key to forming and maintaining a healthy ecosystem (Autio, 2021; Busch and Barkema, 2022; Dhanaraj and Parkhe, 2006) fails to acknowledge the significance of ecosystems formed by social entrepreneurs who may aim to make themselves dispensable rather than central to the solution. To address this gap, we asked: *how do social entrepreneurs achieve long-lasting impact by forming an ecosystem and then withdrawing from it?*

To answer this question, we explored a single case of an ecosystem formed by ColaLife, a non-profit co-founded by two British social entrepreneurs, to provide access to life-saving treatment for diarrhoea in Zambia. We observed the process through which ColaLife formed a self-sustaining ecosystem while making itself gradually more dispensable until it left the country without compromising the ecosystem’s functioning. Grounded in this inductive account, our paper conceptualizes the role of an ‘ecosystem catalyst’; an actor whose intended strategy is to enact change in an ecosystem without becoming a permanent part of the solution. We demonstrate that ecosystem catalysis consists of a combination of mechanisms pursued at the organization and ecosystem levels to form an ecosystem, make it self-sustaining, and finally withdraw from it without disturbance.

Our construct of ecosystem catalysis contributes to the literature both on ecosystems and social entrepreneurship. We contribute to ecosystem literature (Adner, 2006; Moore, 1996) by revealing the role performed by an ecosystem catalyst, how it is distinct from an orchestrator (Adner, 2017; Autio, 2021; Jacobides et al., 2018), and the conditions under which catalysing may be a better choice for non-profits than orchestrating. For social entrepreneurship scholars, we show how a catalyst can prevent their pro-socially motivated actions from turning into ‘a sense of entitlement in themselves and a sense of obligations in others’ (McMullen and Bergman, 2017, p. 266). Our findings also address calls by scholars to decouple social impact from organizational permanence and growth (Bishop, 2013; Eikenberry and Mirabella, 2018; Nicholls, 2010; Santos, 2012), thus offering a more dynamic view of social impact resulting from partial and distributed contributions in ecosystems.

THEORETICAL BACKGROUND

Ecosystems and Orchestrators

Since Moore's (1996) introduction of the term in management studies, 'ecosystems' have garnered attention as a novel organizational form among scholars (e.g., Adner and Kapoor, 2016; Jacobides et al., 2018) and practitioners (e.g., Atluri et al., 2017). Ecosystems, defined as collectives of organizations creating value beyond a single one's capacity (Adner, 2017), thrive on collaboration (Baldwin, 2012; Javalgi et al., 2004) and can enhance organizational survival and performance (Adner, 2006), particularly in dynamic contexts (Eisenhardt and Schoonhoven, 1996; Ozcan and Eisenhardt, 2009).

Jacobides et al. (2018) categorize ecosystems into 'business' (e.g., Iansiti and Levien, 2004; Moore, 1993; Teece, 2007), 'platform' (e.g., Ceccagnoli et al., 2012; Gawer and Cusumano, 2014), and 'innovation' ecosystems (e.g., Adner, 2017; Isenberg, 2016; Kapoor and Lee, 2013). For our purpose, we focus on the latter, examining how 'a set of actors with varying degrees of multilateral, non-generic complementarities that are not fully hierarchically controlled' (Jacobides et al., 2018, p. 2264) coalesce around a novel value proposition (Jacobides et al., 2018) in the context of multi-faceted societal challenges (Armanios et al., 2017; Fernhaber and Zou, 2022; Goswami et al., 2018; O'Shea et al., 2021; Thompson et al., 2018).

Intermediary actors arguably play a crucial role in aligning actors to materialize and embed a new value proposition (Adner, 2017). Ecosystem literature puts particular emphasis on the role of ecosystem orchestrators, who help mediate ecosystem actors, and produce, reproduce, and strengthen enablers of entrepreneurial activity (Adner, 2017; Jacobides et al., 2018; Lingens et al., 2021; Shi and Shi, 2021). Orchestrators position themselves centrally (Giudici et al., 2018) to coordinate and stabilize the ecosystem (Kapoor, 2018), for example, by acting as gatekeepers, supporting organizations, and facilitating knowledge exchange (Busch and Barkema, 2022; Hurmelinna-Laukkanen and Nätti, 2018; Ritala et al., 2023). The mechanisms of orchestrating an ecosystem typically involve managing: knowledge mobility (i.e., promoting knowledge acquisition, deployment, and sharing); appropriability (i.e., fostering the ability of ecosystem actors to capture value); and stability (i.e., ensuring the ecosystem can grow dynamically through the entry and exit of network members) (Dhanaraj and Parkhe, 2006). Scholars have described, for example, how orchestrators employ these mechanisms to articulate competing and scattered demands in a region (Klerkx and Aarts, 2013); to support organizations in the ecosystem to cope with their respective challenges (Busch and Barkema, 2022; Gupta et al., 2020); and to recombine, broker and transfer knowledge (Dhanaraj and Parkhe, 2006; Ritala et al., 2023).

As orchestrators employ deliberate actions 'to create value (expand the pie) and extract value (gain a larger slice of the pie) from the network' (Dhanaraj and Parkhe, 2006, p. 659), a key assumption is that their permanence is needed for the joint value proposition to be maintained (Adner, 2017; Autio, 2021; Jacobides et al., 2018). Ecosystem literature does not describe a process whereby an orchestrator can withdraw from an ecosystem without compromising it. This gap is critical for social entrepreneurs, as explained in the section below.

Ecosystem Strategy for Social Entrepreneurs

Most empirical studies on ecosystems focus on financial value, with less attention given to actors' roles in cultivating and connecting distributed contributions around a social purpose (Shepherd and Patzelt, 2020; Thompson et al., 2018). We argue that, in these circumstances, the mediating role of social entrepreneurs in ecosystems may differ from for-profit orchestrators and that organizational permanence and growth should not be taken for granted.

A core assumption in social entrepreneurship has been that to expand impact a social venture must grow its business or sell it to a larger enterprise (Battilana and Lee, 2014; Bradach and Grindle, 2014; Dacin et al., 2011; Litrico and Besharov, 2019; Stevens et al., 2015). This emphasis on growth is underpinned by economics-based philosophies of market positioning and capture (e.g., Baum and Bird, 2010; DeTienne et al., 2015; Penrose, 1959; Sarason and Dean, 2019; Winter and Szulanski, 2001). More recently, however, scholars (e.g., Bishop, 2013; Eikenberry and Mirabella, 2018; Nicholls, 2010; Santos, 2012) have started to criticize this emphasis on growth in social entrepreneurship, and the pressures non-profits face from funders to adopt a marketplace logic and values (Eikenberry and Kluver, 2004; Mirabella, 2013; Sandberg et al., 2020). According to Nicholls (2010), the rise of organizational permanence and growth in social entrepreneurship is connected to foundations and grant givers increasingly drawing upon models from private capital that reflect the logic of commercial entrepreneurship.

Various scholars argue that an emphasis on profit maximization may lead to mission drift, as the goal of value capture may supersede and ultimately compromise the pro-social value creation (Agafanow, 2015; McMullen and Bergman, 2017). In addition, Santos (2012, p. 346) argues that social entrepreneurs may struggle to focus on a permanent institutional fix to an enduring problem as they 'often get emotionally attached to their organization and may focus on sustaining the organization'. The problem can be even more dramatic when social entrepreneurs come from a foreign context to address the challenges of vulnerable communities (Mair and Marti, 2009), as they often depict themselves as 'heroes' or 'white messiahs', reproducing 'colonial models of power exertion' and creating more dependency (Moyo, 2009; Muñoz and Kimmitt, 2019; Nicholls, 2013; Villanueva, 2018). In these cases, the growth of social ventures may translate into improved performance indicators in the short term, but it can also make local actors more dependent (McMullen and Bergman, 2017), rendering them more susceptible to changes in the social entrepreneur's priorities, strategies, or funding. What is first seen as a solution may thus create new problems (Pritchett and Woolcock, 2004).

We concur with these critiques and argue that, in addition, equating better performance for social entrepreneurs – and, more particularly, for non-profits – with organizational permanence and growth ignores the potential of reaching impact through distributed ecosystems. As described by Shepherd and Patzelt (2020, p. 9), 'a social venture can be terminated, yet other actors may continue to widely disseminate its social solution such that the social venture was successful in scaling social impact'. Santos (2012) similarly depicts 'true social entrepreneurs' as ones whose primary objective is offering a permanent institutional fix to an enduring problem. This means that social entrepreneurs

should plan to make themselves dispensable rather than central to the solution. However, accounts of *how* social entrepreneurs can achieve this goal are absent in the literature. A rare study by McMullen and Bergman (2017) demonstrates the case of Safe Water for Africa, a program that intended to create such a permanent institutional fix, but where a suboptimal development trap emerged instead. As the entrepreneurs felt they sacrificed too much to help others, they developed a sense of entitlement, while others in turn developed a sense of obligation and gratitude toward the social entrepreneurs. Accounts of social entrepreneurs successfully achieving long-lasting societal impact without organizational permanence and growth are absent in extant literature, which aggravates the need to separate social and commercial entrepreneurship in terms of key mechanisms and success factors.

Proposing ecosystems as a mechanism to achieve long-lasting social impact, our study investigates how social entrepreneurs can form and then withdraw from a self-sustaining ecosystem. Grounded in our inductive account of social entrepreneurs addressing diarrhoea treatment in Zambia, we conceptualize the role of an ‘ecosystem catalyst’^[1] and investigate its characteristics and relation to social impact.

METHODS

Our research is a single case study of a multi-stakeholder initiative led by a small British non-profit, ColaLife, founded with the mission of making diarrhoea treatment accessible across Zambia. ColaLife took a localized view of ecosystems – one that values the existing resources and communities within a local ecosystem (cf. Audretsch, 2015). We aimed to reveal how the organization planned and approached the formation of a functioning and self-sustaining ecosystem for diarrhoea treatment in Zambia before withdrawing from it. We inductively explored the process, which we named ecosystem catalysis, through an in-depth longitudinal single case study (Eisenhardt and Graebner, 2007; Ozcan et al., 2017).

Data Collection

The first author^[2] conducted and recorded 65 semi-structured interviews between May 2017 and January 2023 in Zambia and the United Kingdom. Interviewees included a mixture of public, private, and government organizations in addition to the ColaLife team. These were supplemented with secondary materials covering the period that ColaLife worked in Zambia, from 2011 to 2018, and primary and secondary materials covering approximately four years after its exit (January 2019 until January 2023).

As depicted in Table I, the interviews were carried out over several rounds as ColaLife’s activities in the ecosystem unfolded over time. They revealed what ColaLife’s approach consisted of and what motivated them to take this approach; how local actors perceived ColaLife’s role; and how locals described their motivations to engage in the ecosystem.

Most interviews were conducted in person in Zambia in 2017. The longest and most frequent interviews were with ColaLife’s founders, as we were primarily interested in

Table I. Overview of our primary qualitative data

| <i>Method</i> | <i>Stakeholder category</i> | <i>Actor(s)</i> | <i>Acronyms used</i> | <i>Location</i> | <i>N° of interviews / meetings</i> | <i>Total time (hrs)</i> |
|--|--|---|---------------------------------|---|------------------------------------|-------------------------|
| Semi-structured interviews | Ecosystem catalyst | ColaLife | CL1 and CL2 | Lusaka, London and Zoom | 6 | 10.4 |
| | Local non-profit | Keepers Zambia Foundation (KZF) | KZF1... KZF5 | Lusaka, Chipata | 8 | 6.6 |
| Community-based retailers | Community-based retailers | Rural and peri-urban shopkeepers | CR1... CR16 | Lusaka, Chipata, Lundazi, Chirundu, Kafue, Chilanga | 16 | 1.7 |
| | Community members | Community Health Workers and Caregivers | CM1 and CM2 | Chipata, Chirundu | 2 | 0.6 |
| Public health officials | Public health officials | Administrative staff, Doctors, Midwives, Nurses and Technicians of Clinics, Hospitals and Health posts | PBO1... PBO11 | Lusaka, Chipata, Lundazi, Chirundu, Kafue, and Chilanga | 11 | 1.6 |
| | Wholesalers and large retailers | Pharmacies, Supermarkets and Wholesalers | W1... W10 | Lusaka, Chipata, Chirundu and Kafue | 10 | 1.8 |
| Govt organizations | Govt organizations | Ministry of Health, Zambian Regulatory Agency (ZAMRA), Centered for Infections Disease Research in Zambia (CIDRZ), and Medical Stores Limited | GO1... GO4 | Lusaka and Chipata | 4 | 4.5 |
| | Pharmaceutical company | Pharmanova | P1 and P2 | Lusaka and online call | 3 | 2 |
| Participant observation (group meetings) | Catalyst and local non-profit | ColaLife and Keepers Zambia Foundation | Not referenced | Lusaka | 1 | 4.5 |
| | Pharmaceutical company, ecosystem Catalyst, and local non-profit | Pharmanova and ColaLife Pharmanova, ColaLife and Keepers Zambia Foundation | Not referenced | Lusaka Lusaka | 1 1 | 2.5 2.5 |
| International organization, ecosystem catalyst, and local non-profit | International organization, ecosystem catalyst, and local non-profit | UK Department for International Development and ColaLife USAID, ColaLife and Keepers Zambia Foundation | Not referenced and not recorded | Lusaka Lusaka | 1 1 | 2 1 |

the role of the non-profit in building the ecosystem. Among the other interviews, those with Keepers Zambia Foundation (KZF hereafter), the non-profit that helped train and monitor retailers selling diarrhoea medicine, with Pharmanova, the local pharmaceutical company that produced the diarrhoea medicine, and with public health-care agencies (e.g., Ministry of Health and Zambian Regulatory Agency) were longer and more in-depth than with retailers, community health workers, or wholesalers. We started the long interviews with open-ended questions, such as ‘Can you tell me about your work?’, ‘Why do you engage with this project?’, ‘Whom do you engage with and how?’, ‘What are the key challenges that you face?’. The follow-up questions for these actors were informed by their answers to the open-ended questions. The short interviews aimed to supplement or validate claims made by actors who worked with the design of the intervention. For example, to shopkeepers or pharmacies, we asked when they started selling the medicine, whether they were making a profit, whether they had medicine in stock and how planned to restock, and how they communicated with caregivers. We also interviewed ColaLife’s founders in the UK in 2021 and 2022 to fill gaps in our data, and Pharmanova’s CEO in 2023 to find out what happened to the ecosystem since ColaLife exited Zambia.

In addition to interview data, the first author gathered field notes in Zambia in May–June 2017. The interview data and field notes were supplemented with extensive private and public archival documentation. The authors collectively used these different data sources, as depicted in Table II, to triangulate insights (Yin, 2003) on the events that occurred within the ecosystem from multiple perspectives. This data was particularly important to understand the evolution of the ecosystem, including after ColaLife’s exit, for which we needed to rely on accounts and statistical data from organizations other than ColaLife.

Data Analysis

We started by transcribing our interviews and compiling archival data and participant observation notes. Our analysis followed a stepwise approach regularly deployed in management studies (see Tracey et al., 2011). The first step was to build an event history database (see Garud and Rappa, 1994), which allowed us to work across the different data entries on the context, problems, and scale of the system transformation, as well as the roles performed by ColaLife and other stakeholders. We were careful to represent a balanced portrait of the perspectives of multiple stakeholders, not only those of ColaLife’s founders. We subsequently analysed our data with the assistance of NVivo software through the coding of relevant extracts and the identification of patterns and themes (Weber, 1990).

We then employed the method described by Gioia et al. (2013) to synthesize our coded data into more aggregate themes. Searching for relationships between first-order categories (Strauss and Corbin, 1990), we grouped them into second-order categories. At this stage, we sought out theoretical precedents in the literature, oscillating between data, interpretations, and existing theory, to inform the development of our grounded understanding of the aggregate dimensions that emerged from our case study (Strauss and Corbin, 1990). We noted that some second-order categories, i.e., ColaLife’s efforts to

Table II. Direct observation and archival data

| <i>Data source</i> | <i>Use in the analysis</i> |
|---|--|
| Direct observation | <ul style="list-style-type: none"> • Identify organizational guiding principles • Identify possible untold tensions and controversies • Understand how they relate with each other and with key stakeholders • Establish a timeline in events |
| Archival data | <ul style="list-style-type: none"> • Triangulate information obtained from interviews • Obtain complementary information which could lead to follow-up interviews • Establish a timeline of key events • Understand how they publicly portrayed themselves • Understand how they are publicly seen and endorsed • Identify whether (and how many) diarrhoea kits were sold after ColaLife left Zambia • Understand other efforts and trends in diarrheal deaths and access to the correct treatment • Identify whether the ecosystem was maintained after ColaLife left Zambia |
| <ul style="list-style-type: none"> • Observations and participation in the activities of key staff in multiple districts of Zambia • Meetings with key stakeholders (e.g., health officials, community members, non-profits, wholesalers, retailers, intergovernmental organizations, pharmaceutical company and Ministry of Health) • Presentations given to relevant stakeholders, both in Zambia and in the United Kingdom | |
| <ul style="list-style-type: none"> • Website description (www.colalife.org) • Approximately 50 blog posts with updates, written by the founders • A wide range of internal documents prepared by ColaLife or other key stakeholders (e.g., spreadsheets of medicines dispensed by district, memos on meetings and workshops, and slide decks) • Sample of products and description of features • Media coverage on CNN, BBC, and other media • Documentary The Cola Road • PhD thesis by Ramchandani (at John Hopkins School of Public Health) written on CL's quasi-experimental trial • Documents describing the systemic problems of diarrhoea and the Last Mile, prepared by international organizations and by the Zambia Ministry of Health • Awards and recognitions (e.g., from Save the Children, GlaxoSmithKline, and Johnson and Johnson) • The ColaLife Playbook, elaborated by the founders, and made openly available to contributors • Sales reports of diarrhoea kits from Pharmanova until December 2022 • Surveys commissioned by ColaLife – the first comparing results before and after its trial, published in 2014 (only for 2 intervention districts and 2 comparators), and the second in 2017 (for 2 of the 14 intervention districts) • Longitudinal data on diarrheal deaths by UNICEF • Two latest survey results from the Demographic and Health Survey (DHS) with data collected in 2012–13 and in 2018 (DHS, 2012–13; DHS, 2018) • Academic articles published in reputable healthcare journals | |

observe and repurpose local ecosystems, were consonant with literature on ecosystem orchestration (e.g., Autio, 2021; Busch and Barkema, 2022; Dhanaraj and Parkhe, 2006; Jacobides et al., 2018). We grouped them into a macro-category named ‘local ecosystem formation’. The other second-order categories stood out as they consisted of ColaLife’s efforts to make the ecosystem self-sustaining and make themselves redundant. We grouped these into our second macro-theme: ‘withdrawal from a self-sustaining ecosystem’. Figure 1 depicts the 11 first-order codes, categorized into four second-order themes, which we subsequently synthesized into two aggregate dimensions that speak to larger empirical and theoretical issues (Eisenhardt, 1989). Having completed the analysis of the processes of forming a local ecosystem and withdrawing from a self-sustaining ecosystem, we subsequently analysed the outcomes of the intervention during the years after ColaLife’s withdrawal to provide proof of the long-lasting impact the entrepreneurs intended to make.

Before delving into our findings, we find it useful to describe our research setting and provide background on the problem that the focal entrepreneurs aimed to solve.

Research Setting

Diarrhoea is one of the leading causes of death of children under five years of age. In 2015, before the intervention we studied, it accounted for 8.6 per cent of under-five deaths worldwide (Liu et al., 2015). The treatment recommended by the World Health Organization (WHO hereafter) since 2004 is oral rehydration salts and zinc (ORS + zinc). ORS replaces lost fluids and essential salts, while zinc decreases the length and severity of diarrheal episodes and the risk of subsequent infections. Despite the medicine being cheap and sold over the counter, 95 per cent of diarrhoea cases in children under-five in sub-Saharan Africa were not treated with the life-saving ORS + zinc by 2015 (WHO, 2017).

According to World Bank data, in 2015, over 60 per cent of Zambia’s population lived on less than \$2 per day and the country had one of the highest child mortality rates in the

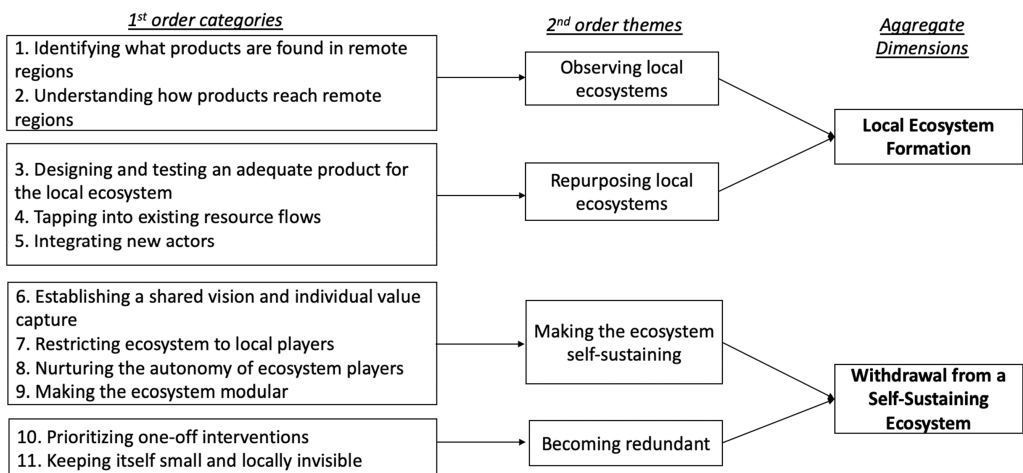


Figure 1. Resulting structure of data axial coding

world. A litany of government and market failures hampered access to diarrhoea treatment (Getahun and Adane, 2021). Even when funding was available, poor logistics and infrastructure severely prevented over-the-counter medicines from reaching remote areas (Ramchandani, 2016). The DHS survey for 2013–14 (ZDHS, 2014) showed that approximately 30 per cent of the country's population lived within 5 km of a health facility. The country's Ministry of Health recognized that access to treatment through the public sector is constrained by insufficient infrastructure, a sparsely distributed population in rural settings, and inadequate resources and scheduling of services (Zambian Ministry of Health, 2013). The Institute for Health Metrics and Evaluation (2015) found in 2014 that 23 per cent of rural health centres in Zambia had stock-outs of ORS + zinc. Even when available in healthcare facilities, utilization rates of zinc were less than 5%. The situation was worse in the 'Last Mile': the most challenging areas to deliver aid and social services due to geographic inaccessibility and lack of infrastructure (USAID, 2015). These regions are rarely reached by international aid, public sector delivery tends to be intermittent, and market failures hinder access through the private sector (Linnander et al., 2017).

Around the time ColaLife was founded, access to treatment in the private sector was also minimal. Of the 59 pharmacies in Zambia, 40 were in the capital, Lusaka (Ramchandani et al., 2022). Since every pharmacy must employ a registered pharmacist, the growth of these outlets was constrained. Local pharmaceutical companies were weak in producing medicine adapted to low-income settings (Ramchandani, 2016). It was in this dire setting that ColaLife entrepreneurs sought to make an impact, as described below.

FINDINGS

In this section, we first reflect on the results of the axial coding: we reveal ColaLife's efforts in forming the ecosystem and then exiting the country leaving behind a self-sustaining ecosystem. We then detail the outcomes of the intervention and what happened to the ecosystem in the years since ColaLife's exit from Zambia.

Local Ecosystem Formation

ColaLife was founded in 2011 to improve access to diarrhoea medicine in Zambia. The British founders, Simon and Jane Berry, had worked with international development and charities for decades. While Simon worked with a British aid program for rural farming communities in Zambia in the 1980s, he was surprised to see that Coca-Cola was available everywhere, but affordable over-the-counter medicines were not. The couple wanted to understand why and identify how they could build on the flows of Coca-Cola to make diarrhoea treatment widely and perennially available. These two intertwined goals guided every decision ColaLife made for ecosystem formation.

ColaLife was built on the ethos that social entrepreneurs should create local autonomy: 'There are lots of programs that start, 5-year programs, and they transform the landscape for 5 years, and then they go, and things get back to what it was before, if not worse than before because it was a temporary initiative' (CL1). The couple also believed that initiatives had to build on local potentialities: 'people from outside the

country coming into the country with THE solution, never, ever, ever, works! But it's still what happens to this day' (CL1). Based on their vision, ColaLife's approach involved forming a local ecosystem by observing and repurposing existing local ecosystems, as explained below.

Observing local ecosystems. ColaLife aimed to act as the 'initial custodians' (CL2) of the vision of making the correct diarrhoea medicine perennially available in Zambia; 'as facilitators enabling buy-in to the vision, enabling its implementation' (CL1). To ensure the vision could be shared and built on local capacity, ColaLife *identified what products are found in remote regions and why*. For that, they had to understand the context better: 'If you're an "outsider" coming into a country "to help", beware, and know your limitations; listen to those who already have a good grasp of conditions on the ground' (CL1). In a trial from August 2012 to September 2013, they investigated why Coca-Cola was sold in the remotest places in Zambia, while a life-saving medicine was not. A co-founder explained:

People say you can't get stuff into these remote places, but yes you can, because in every single village in Zambia, there's a shop, and in that shop will be all the things that those people want, so if you can do that for cooking oil, or eggs, talk time [pre-paid mobile phone top-ups], Coca-Cola, that can even manage to get the bottles and the crate back, surely you can do it for medicine. (CL2)

This idea had great potential, as described by a government official, '[a caregiver] doesn't have to walk 5 km to a clinic if in her community there is a shop, if she finds this treatment available in that shop' (G02). A Ministry of Health official similarly said, 'We are still far from realizing the vision of bringing people as close as possible in an area of 5 km... If you're talking about a health clinic, like Kasenengwa, it is [about] a 27 km radius' (G03).

Thus, ColaLife's early idea was to 'use that same framework [from Coca-Cola] to move the [diarrhea treatment] product' (KZF1). Most local actors who would dispense the medicine through the private sector, such as wholesalers, supermarkets, and rural shopkeepers, could be the same as those in the distribution of fast-moving consumer goods (FMCG, hereafter). Critical at this moment was ColaLife founders' engagement with Coca-Cola's bottler in Zambia, SABMiller, to understand the FMCG ecosystem, as described below:

I remember a little bit further on the relationship with Coca-Cola, the guy was saying 'ok you can put the medicine in the crate, but what about the value chain?' and we were sitting there thinking 'What is a value chain?' (CL2)

A government official described ColaLife's efforts to observe the local system as follows:

ColaLife did a bit of homework... If you start by questioning the paradigm of how a product gets from A to B, what lessons can we learn from that system? What lessons

can we learn from the private sector's enterprise which we can apply to a general public good like providing healthcare products? (G01)

ColaLife acknowledges on its website that SABMiller helped them 'understand their distribution and value-chain thinking'. They learned for instance that the value chain of Coca-Cola was very decentralized. A government official described,

If you ask Coca-Cola, they'd probably say, hey we don't even know how our Coca-Cola gets to that outlet, all we know is the guy there demands our product, how it gets from us to them is really their decision, their choice. (G02)

ColaLife's approach at this stage was thus based on the identification of what products were available in remote regions, and *how they were made available*, including questions of which actors integrated the FMCG ecosystem, how they interacted with each other, what role they each played, what (and whose) resources they employed, and how they each benefited from this ecosystem. In doing so, ColaLife analysed how value flowed backward, from the end-users of FMCG to the companies that produced them. This analysis mapped how they could emulate a similar ecosystem for diarrhoea treatment, repurposing what already existed.

Repurposing local ecosystems. The efforts to repurpose local ecosystems involved three core approaches: designing and testing an adequate product for the local ecosystem; tapping into existing resource flows; and integrating new actors.

Since caregivers needed to purchase and dispense diarrhoea medicine close to their homes, ColaLife had to pay attention to the product's availability, affordability, and assimilability, as they *designed and tested the product for the local ecosystem*:

You have to start by designing something people will value, and you don't know what people will value until you ask them. You cannot build a value chain for a product or service based on what you think people need. You have to start with something that you know they want. (CL1)

The process involved examining the characteristics, behaviours, and expectations of caregivers through focus groups; designing products and packages desirable by end-users; providing information (e.g., labels and instructions) that could be easily assimilated; and designing medicines and packages that met the contingencies of the supply chain and regulatory needs. Learning from the context, ColaLife designed Kit Yamoyo – an anti-diarrhoea treatment kit co-packaging ORS and zinc, as recommended by the WHO.

ColaLife experimented with what worked best for all actors and adapted the product to the needs, aspirations, and limitations of end-users and the contingencies of the distribution chain. This was particularly tricky as it required searching for 'the balance of maintaining affordability among end-users – many of them poor – while maintaining a profitable product for the manufacturer, all along the value chain, without

subsidy and while maintaining high quality' (CL1). For instance, they asked the manufacturer to reduce the size of the ORS sachets, which were originally designed for dispensation in healthcare facilities to a large number of patients, as explained below:

When ColaLife approached us to make ORS in the smaller sachets to be dissolved in 200 ml of water, [we noticed there were] a lot of benefits. People will waste the material after they consume it... or storage will be a problem, contamination will be another problem. This 200 ml pack is very user-friendly. (P2)

ColaLife also tried new treatment packages which could simultaneously bring the price down, make it fit better for transportation, and provide a vessel for correct dispensation. For example, ColaLife's first design fit between bottles of Coca-Cola in a crate. But in a trial, they realized that only 4 per cent of the medicines travelled this way as drivers often strapped the medicine packages onto other things they transported. In addition, Coca-Cola was not always the most widely available product in remote regions; other FMCG were cheaper and easier to transport. Therefore, restricting the design to fit inside Coca-Cola crates meant sacrificing opportunities to use a wider ecosystem. A wholesaler noted:

The problem with Coca-Cola is that if somebody [i.e., a distributor or retailer] does not have the empty case [i.e., a crate for glass bottles] available, he can't get Coca-Cola... Nowadays, there are a lot of other fizzy drinks in the market [in plastic bottles] ... People have gone on from Coca-Cola to these ones because they're cheaper and they're easily transportable. (W1)

The entrepreneurs also noticed that caregivers were not using the measuring function:

They're not using it as much as we would have liked them to use it because it is not really as intuitive as using a vessel with the mark on it. It's marked, but, a lot of time, whichever nationality you are, people don't read the packaging, it says open here, and you don't open here. (CL1)

ColaLife then changed the package to a cheaper version, a plastic cup with a screw top, as it was better understood and valued by caregivers (who kept and re-used the package as a cup after the treatment) and did not impact the distribution negatively. Through trial and error, ColaLife designed the product to fit the local ecosystem, choosing between features that were optimal for transportation and for final use. As described by a government official,

The driving thing here is... the demand for innovative treatment of childhood diarrhoea, readily available, easy to use... all of these things that are present in the kit. That is what families are looking at. And that's why this product is a no-brainer in terms of selling. (G01)

Due to the knowledge and networks developed throughout the trial, ColaLife systematically *tapped into the existing capabilities and resource flows* of a wide range of local players (wholesalers, supermarkets, distributors in urban and peri-urban areas, shopkeepers that sell FMCG in remote regions) to expand access to treatment. In the words of a cofounder:

You're not fighting against something chaotic; you are playing along with it. It's like if there's a flood, water will go where it goes, and you can build a dam, or you can dig a riverbed, but it will go where it goes, and you actually far better off observing where it goes, and then trying to arrange to go and work with it. (CL2)

As part of repurposing the local ecosystem, the non-profit also *integrated some necessary actors into the ecosystem*, so the newly designed diarrhoea treatment could be made perennially accessible through local actors. Through engagements, they not only learned who should be integrated but also leveraged each meeting to be introduced to possible new players. As described by ColaLife's cofounder:

Every time we went to meetings, ... they would say 'you should see such and such person', and people would get on the phone and say 'I've just got these people from the UK, can they come and see you?'. (CL2)

At the beginning of the distribution chain, instead of Coca-Cola and its local bottler, SABMiller, ColaLife brought in a local pharmaceutical actor, Pharmanova, who started producing the newly designed diarrhoea treatment. ColaLife also approached pharmacies, which were not typically part of the ecosystem of FMCG. These were, however, very limited in number, particularly in rural regions of the country, and were, therefore, not prioritized.

Having trialled the intervention in two districts, the entrepreneurs gained sophisticated and experiential knowledge of which actors to engage, which skills to provide them with, how to connect them, and which authorities and regulations to comply with. Next, to expand across the country, they identified that it was critical to use both public and private channels. While the private sector was essential to reach those living far from healthcare facilities, a higher number of children could be treated through the public sector.

In the private sector, the kits were sold by trained urban and rural shopkeepers, in addition to more traditional outlets, such as pharmacies and supermarkets, by benefitting from the ecosystem of FMCG that reached the remotest regions. This was the same approach from the trial but with a wider geographical coverage. In the public sector, similar kits were freely offered in health posts, clinics, hospitals, and by community health workers (who liaise with populations in villages with healthcare facilities for primary care), thus benefitting from the existing healthcare infrastructure in the country. The kit offered through public facilities was adapted for home dispensation (caregivers receive the kits to dispense to children at home until their recovery). Furthermore, the kit co-packaged ORS and zinc, thus reducing the chances of incorrect treatment for diarrheal infections (as health officers often prescribed ORS without zinc or did not have one of the two components in stock).

The newly designed, co-packaged diarrhoea treatment was now locally produced and procured from Pharmanova both for the private and public sectors. ColaLife and local partners also collected data from various actors along the flow of medicines (e.g.,

healthcare facilities, doctors, nurses, staff responsible for logistics, etc.) to inform policy-makers on how to improve the flow and dispensation of the correct treatment.

Through the efforts described above, ColaLife formed a local ecosystem where all actors were mobilized around the shared vision of making diarrhoea treatment widely and perennially accessible in Zambia. We drew Figure 2 to depict this ecosystem and its key actors, including the ones who are directly involved in the flow of medicines and the ones in the periphery who shape the ecosystem (e.g., medicines regulator). ColaLife is not in this figure as it did not aim to make itself part of the ecosystem. From the outset, it sought to withdraw without disturbing the ecosystem.

Data from a household survey conducted by ColaLife shows that with this locally formed ecosystem, the use of ORS + zinc to treat diarrheal cases of children increased abruptly in intervention areas: from 1 per cent to 53 per cent between 2015 and 2017. At the end of 2018, after 7 years in Zambia, ColaLife left the country believing it had formed a self-sustaining ecosystem. We now describe how the non-profit planned to withdraw from Zambia.

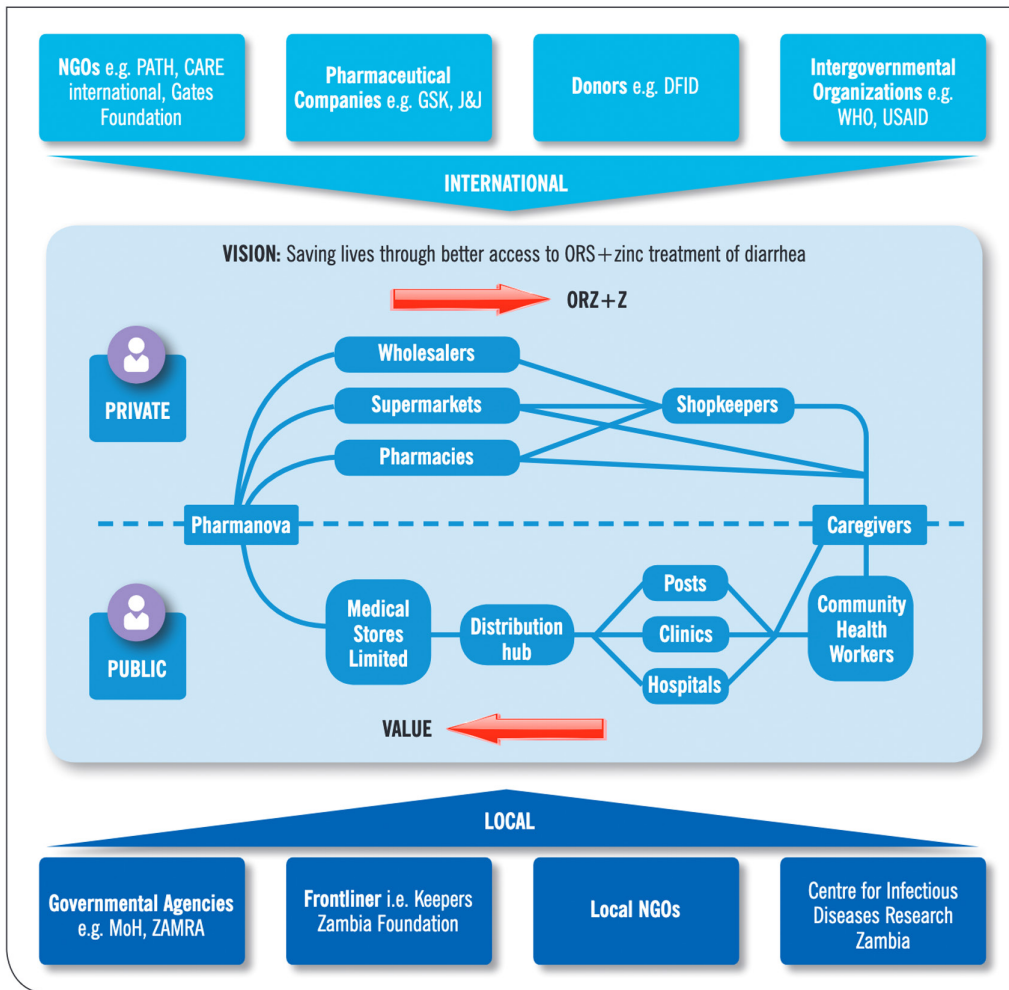


Figure 2. The ecosystem for diarrhoea treatment in Zambia. Source: Savaget et al. (2019)

Withdrawal from a Self-Sustaining Ecosystem

From the beginning, ColaLife's founders knew they wanted to withdraw from the ecosystem:

We wanted to make sure our exit strategy builds in our own redundancy, and make sure partners know that this was our plan from the outset... You can do it as a temporary actor and then withdraw. We believe that every single problem in developing countries can be solved by the people and the systems that are already there... We knew from the beginning that we wanted to leave Zambia in a self-sustaining way. We've built in our own demise. (CL1)

This meant that, throughout their entire ecosystem formation efforts, ColaLife prepared itself for withdrawal from the ecosystem and equipped the actors to keep up with their respective roles in the ecosystem afterward. Their efforts consisted of working on making the ecosystem self-sustaining and making ColaLife redundant in it, as we detail below.

Making the ecosystem self-sustaining. This effort contained several strategies: establishing a shared vision and ensuring individual value capture, restricting the ecosystem to local players, nurturing the autonomy of ecosystem players, and ensuring ecosystem resilience through diversity, redundancy, and modularity of actors.

ColaLife was created with the ethos that the organization could not be a permanent part of the solution. Therefore, the entrepreneurs had to mobilize local actors around a *shared vision* rather than around themselves like an ecosystem orchestrator would:

The concept of convening people around a vision rather than around a particular lead organization or a project is powerful: it means people are empowered to participate and contribute within the role that they are already supposed to be doing. It gives them a voice, to be listened to, to deploy their responsibility – rather than the funded project taking over that responsibility from them, for a time-limited and action-prescribed period. (CL2)

At the same time, the entrepreneurs *ensured that individual value was captured* in the ecosystem. First, they had to recognize that 'value' to each player varied. Value for community health workers was the satisfaction of promoting healthcare in their communities. However, they could also be incentivized to become more committed through campaigns, promotional t-shirts, and engagement that made them feel they belong to a broader initiative:

[It is critical to make] the community health workers more accountable and maybe giving them a bit of an incentive... so that they feel that they should be able to do it because they're getting something out of it. If they don't get anything out of it, it is very difficult for them to commit to doing it. (KZF2)

For a public clinic, it was meeting the targets from the Ministry of Health: 'If you look at Ministry of Health, it is actually within their mandate to ensure they provide this primary health care services to the community and ensuring that things like ORS and zinc are always found at the center' (KZF3). Most wholesalers and retailers

were interested because they profited, but some, especially those that engaged early on, were there for social impact: ‘When Simon approached me, it was not so much profit based. It was like “how I can assist to get this thing going [and save lives]”’ [W2]. Motivated by social responsibility, the largest supermarket reduced the kit’s profit margin: ‘[we] wanted to reduce the profit margin for as little as possible in order to help out the community’ (W3). For the pharmaceutical company, it was profit: ‘[If] the whole value chain is satisfied... making healthy profits... and it is 100% controlled by local partners, [we know that] sustainability will definitely be there’ (P1).

ColaLife ensured that each local ecosystem actor had the opportunity and knowledge to capture value. This was relatively straightforward for the most robust actors (e.g., supermarkets, pharmaceutical companies, and wholesalers). However, retailers had less formal training. The entrepreneurs used KZF, the frontline non-profit working with ColaLife, to give retailers business advice on stocking as well as ‘tactics on how to be a good salesperson’ (KZF3). KZF also gave instructions to caregivers about diarrhoea treatment and its posology (i.e., how the medication should be prepared and taken).

ColaLife and partners refrained from telling ecosystem actors how much profit to make and pegging the retail price. Similar to fast-moving consumer goods, there was a variation in how much customers paid for the medicine:

Most businesspeople know for each product what kind of profit they should decide to make, and I think that is the same for Kit Yamoyo. In fact, this is what helps them decide at what price to put Kit Yamoyo because they have been selling the other things... and they have not closed down because somehow they are making some sort of a profit [for the products they sell]. So, when we come there, and introduce Kit Yamoyo to them, and they know at what price they would be ordering it, then they will already decide to say, ‘Okay, then I can put it at this much, maybe I will make a profit of so much’. (KZF3)

This meant that caregivers in the remotest places often paid the highest price as more actors were involved in moving the medicine. In urban regions, there were few or no intermediaries. As described by a supermarket manager: ‘Pharmanova sells directly to us. We don’t have middlemen, we cut off the middlemen. So we always get it for a lower price’ (W4). Although this was not seen as ideal from a social impact perspective, ColaLife believed that allowing retailers to price the product autonomously ensured that they captured financial value and would be propelled to remain part of the ecosystem.

The entrepreneurs also consciously *restricted the ecosystem to local players* for three reasons. First, they strongly believed that non-profits and development agencies had contradictory and irreconcilable aims. This is evident in their claims, such as:

Most NGOs are working on a solvable problem, and yet they have no intention whatsoever of not existing in 10 years, and that is a contradiction. Is what you are working with solvable or never to be solved? If it is solvable, where is your plan for your own demise? (CL1)

Second, they claimed aid often creates dependency:

At the end of development projects, teams are usually disbanded, with skills and knowledge residing in individuals who simply move on to the next funded project, while systems created disappear or fall apart. (CL1)

Third, they believed that social entrepreneurs and development agencies often overlooked the valuable assets of local ecosystems, trying to impose solutions from abroad:

It's not a question of bringing in new people or parallel systems... [it is about] building capacity and using the local system; not about a system that comes from overseas that you try to enforce locally... They already have policymakers, who might need to be advised, and capacity might need to be built, but they are already there; that's their job, their responsibility, and they are going to be there for decades, in fact, for all their lives, you're not. (CL1)

The exclusive focus on local actors was particularly relevant to ColaLife and key stakeholders in the withdrawal process to ensure the continuity of the supply and the adaptation of the medicine to new contexts and contingencies. A Pharmanova staff explained: 'The beauty is that now everything is locally produced' (P2). Other actors likewise showed pride in the medicine being Zambian.

Keeping the ecosystem restricted to local players meant sacrificing funding from global and large-scale players; yet, the entrepreneurs felt that this sacrifice was necessary to ensure a self-sustaining ecosystem (as reported below):

A prospective funder said 'We want to give you a million'... but then there was some kind of policy change at the last minute when they really wanted it to be some kind of Canadian corporate beneficiary as a partner... It was like, 'Can you have the Zinc produced in Canada' and we were, 'No, we are about local production'. And they said, 'Well, we would prefer it if you had more control over your private sector partner in Zambia, the manufacturer'... We were not going to do that!... So, the assessor said: 'It is what it is; we are not funding it then'. So, we said: 'Yes, it is what it is'. They wanted us to abandon our idea of working with local organizations and not to become part of the solution. (CL2)

Another key attribute of ColaLife's withdrawal was *nurturing the autonomy of ecosystem actors*. ColaLife organized and presented itself locally as a trusted and non-threatening intermediary that built the autonomy of ecosystem actors. From the beginning, they made 'clear to the partners their roles and how we could assist them to step up into these roles, and made it clear that we would step back' (CL1). ColaLife thus focused on cultivating the autonomy of its members, so that all actors delivered on their responsibilities, benefited from their participation in the ecosystem, and felt ownership.

Besides ensuring actors were content with their participation in the ecosystem in terms of value appropriation, capacity building was crucial to ensure perennial access; otherwise, the ecosystem could collapse when ColaLife was gone. In the words of one of

ColaLife's co-founders, 'It is much harder to build capacity than just come and do it yourself' (CL1). ColaLife worked in tandem with KZF to nurture the most fragile actors within the ecosystem. Rural shopkeepers and community health workers were trained on basic skills from stocking medicines to understanding their posology to ensure they captured value and delivered enough value to other ecosystem members. ColaLife also identified and addressed bottlenecks within Pharmanova's production to ensure quality and quantity in local production. Besides providing a free, non-exclusive IP licence of Kit Yamoyo to Pharmanova, ColaLife helped them with the product's design, marketing, and packaging. In the words of one Pharmanova employee: 'ColaLife supported all that, for that matter, even [importing] sealing machines [for us]' (P2). Besides Pharmanova, many local actors started taking more ownership and seeing themselves as change actors themselves as opposed to treating Kit Yamoyo as 'a gift from the people of X aid agency' (CL2).

ColaLife's approach resonated with local actors who perceived it as a non-threatening partner who would not compete with them for market or funds. In this process, ColaLife occasionally collaborated with local and international players peripherally located in the ecosystem for funding and other resources until the local actors became fully autonomous:

[We have] a different institutional model. We harness philanthropic funds and expertise and channel them through the envelope that is ColaLife. But it goes through; the intellectual property doesn't stick to us; the knowledge and the data don't stick with us... We've stuck to that principle that made us a non-threatening partner; we talked right from the beginning about being a trusted intermediary. (CL2)

A final core feature of making the ecosystem self-sustaining was to *ensure resilience through redundant, diverse, and modular actors*. If the ecosystem relied heavily on a few actors to perform a critical function, the flow of medicines would become more susceptible to undesired events. ColaLife thus wanted *diversity* – as many relevant players involved as possible – and worked to increase the number of involved ecosystem players, like wholesalers, retailers, pharmacies, shopkeepers, and community health workers. This involved a great effort to reach out to many actors. A KZF employee described, for example, how they typically identified and approached retailers:

When we decide to move into one area, we go to the health center... [to] get their community health workers who have knowledge about the geography of the community... they know the corners of the compounds, so they are able to identify which retailers we can be dealing with... We literally go shop by shop. (KZF3)

ColaLife also built *redundancy* into the ecosystem by signing on several actors of the same kind, particularly for the most vulnerable ones. In December 2017, for example, they engaged and trained 1421 small retailers in rural regions. They engaged the two largest supermarket chains in the country to sell the product and approached the most relevant wholesalers and pharmacies in the intervention areas. However, they only engaged one pharmaceutical company to produce the diarrhoea kit, which worried some stakeholders. For instance, a government official described:

There is a manufacturer who has taken ownership of this product and say: 'I can manufacture as long as there is a demand from public and private sectors and retailers'. But when we met last night, I asked Simon, 'Is your concession solely to Pharmanova or to anybody else? Because if it's for anybody else, then that's one thing they should do, is to open it up to any manufacturer and say, you are free to do this'. (G01)

ColaLife aimed to offer a free licence to any pharmaceutical company interested in producing the medicine to increase redundancy in the country. However, there were not many local pharmaceutical companies that could produce the medicine. Thus, ColaLife prioritized Pharmanova and considered it robust enough to resist shocks and maintain production. They ensured that Pharmanova found it lucrative to keep the production of treatment both for the public and private sectors. While demand in the public sector was much higher than in the private sector, the latter offered a more stable revenue stream as in the words of the Pharmanova CEO: 'I could have an order [from the public sector] of 1 million next year or I could have nothing. Private sector is consistent' (P1).

Furthermore, ColaLife systematically mapped and approached wholesalers. The entrepreneurs explained: 'We used existing wholesale channels (starting with Coca-Cola wholesalers), as well as supermarkets, to plug the gaps we found at the wholesale level'. This was important to implement modularity by enabling local actors to have multiplex ties to avoid dependency – if connections were not modular enough, value flows could be interrupted. For example, if a supermarket were to go bankrupt, retailers needed to be able to purchase the treatment from other supermarkets and wholesalers.

Together, diversity, redundancy, and modularity in the ecosystem ensured that there was 'excess capacity' and alternate connections between actors.

Becoming redundant. In addition to working on a self-sustaining ecosystem, ColaLife deliberately worked on becoming redundant in the ecosystem by prioritizing one-off interventions and by keeping itself small and locally invisible while the ecosystem grew.

Prioritizing one-off interventions was essential to avoid local actors becoming dependent on ColaLife, as described by one of the founders below:

The basic rule is this: do nothing that makes an individual, an outside agency, or a short-term project, a permanent part of the solution... If you create dependency on your funded project or time-limited intervention, then you risk weakening existing local systems and organizations you set out to improve. (CL1)

We observed that many local actors shared this view. An employee of KZF highlighted:

We don't really try to interfere that much so that we allow it for sustainability purposes... when we're training them we'd contact a wholesaler, maybe get some kits from a wholesaler and sell on his behalf. For the very first time they're getting, we help them stock up. After that we expect them to be able to sell, to go and buy on their own. (KZF2)

As described by a Pharmanova employee, healthcare interventions in Sub-Saharan African countries recurrently failed because medicines came from NGOs who owned the product and the data; hence, ‘after the funding finish[ed] the products cease[d] to exist’ (P1).

To avoid such dependency, the entrepreneurs believed that their actions were ‘only justified because they weren’t permanent features’ (CL1). For example, they were involved in launching the diarrhoea product because ‘a product has to be launched only once’ (CL2), but a local manufacturer had the permanent responsibility of offering it afterward. Similarly, ColaLife invested in promoting the product to caregivers to ‘kick things off so it [could] become self-sustaining’ (CL1). Once caregivers knew about the product, they could start purchasing it. Once the manufacturer profited from the sales of diarrhoea treatment, it would keep promoting the medicines in more regions across the country to improve its profits. These one-off interventions not only boosted a local and self-sustaining ecosystem but also built credibility with local actors: they understood that ColaLife’s founders ‘weren’t taking other peoples’ jobs’ (CL2), but rather stimulating new opportunities for them.

The final element of ColaLife’s withdrawal through redundancy was *keeping the organization small and locally invisible*. ColaLife was kept small by intentionally operating without accumulating human and financial assets of its own. This was particularly critical because they believed that the ‘bigger you get, the heavier the organization becomes, and you end up spending all your time working to feed the beast’ (CL2). A co-founder described:

For DfID [UK Department for International Development, one of the donor agencies of ColaLife], we have to show how you’re gonna grow... and we say, ‘we don’t want to grow, and we don’t want to exist in 10 years, if we are successful, we won’t be here in 10 years’. I have to do a budget every year projected 5 years into the future for the auditors and charity commission. But it’s fiction. They want us to have a reserve to grow our organization, but we don’t want to grow our organization! (CL2)

This principle also impacted how the founders structured their organization: ColaLife did not have employees; it only contracted people, including the two founders. They registered for the intellectual property of Kit Yamoyo so it could ensure that the product would best reflect the critical characteristics they learned from their trial with caregivers. Yet everything was freely licensed and offered to the local pharmaceutical company. The training materials were made open source for anyone to access and use. A co-founder explained that every time people asked, ‘What if someone copies it?’ they would answer: ‘hooray!’ (CL2).

The principle of making ColaLife dispensable also impacted how the organization presented itself locally: it intentionally suppressed its brand in Zambia to be ‘as invisible as possible’, so ‘none of the customers ever heard of ColaLife’ (CL1), as below:

Our vision was to improve access to ORS and zinc through improved access to a better-designed product. It was not to become a manufacturer of that product, a buyer or distributor of that product, a social marketing agency in Zambia, or a health services training organization. Those organizations, along with other key actors, already exist. And we

needed them to be part of the change. Our solution was to suppress our own brand in the public eye and promote the product: it is the product's brand that the public needs to see and remember for that product to be successful and self-sustaining. (CL1)

Conversely, at an international level, the entrepreneurs promoted their brand heavily to gain 'soft power and reputation' (CL1) to disseminate their intervention models to intergovernmental organizations and non-profits. This juxtaposition of remaining locally invisible and globally visible was key in ensuring that they could pursue international impact after they withdrew from Zambia. A co-founder described:

On a global scale, things were different. We needed to promote our brand and the vision behind it to give us the power to engage key global stakeholders either because we needed their collaboration, expertise, or funding. The provocative nature of our name really helped with this. If we'd called ourselves 'Hope for Africa' we wouldn't have got out of the starting blocks. (CL2)

At the end of 2018, six years after the start of the trial in Zambia, the entrepreneurs believed that they had made ColaLife redundant and the ecosystem self-sustaining. They stopped intervening in the ecosystem and exited Zambia. Their organization did not cease to exist; but they started working on other initiatives outside Zambia such as in advocacy with the likes of the WHO to make co-packaging of ORS and zinc a global recommendation, as well as with other low-income countries to inform local policy.^[3]

Outcomes of Intervention during and after ColaLife's Presence

In this section, we discuss what can be inferred as outcomes of Cola Life's intervention during its time in Zambia and what has happened to the ecosystem since the withdrawal.^[4]

During ColaLife presence in Zambia. We interpret that the most significant impact was the perennial sales of the correct and locally produced diarrhoea treatment kits. Sales grew rapidly since ColaLife's pilot: in 2012–13, 40,775 kits were sold; in 2014–15, 128,013; in 2016–17, 410,137 and in 2018–19, when ColaLife exited Zambia, 615,826 kits were sold. Kit Yamoyo became a top-selling medicine in Zambia. A Pharmanova employee described: 'We are proud that we are able to come out with a brand, Kit Yamoyo, which is almost reaching the level of Panadol [paracetamol] which is our most popular brand' (P2). Healthcare officers also described that the administration of the correct treatment may prevent overwhelming healthcare facilities. A midwife in a health centre said:

Kit Yamoyo is working because when you give to children, especially for the ones under 1 year, they don't come back with diarrhea. As a result, it even minimizes the admission, and instead of admitting them, caregivers can administer Kit Yamoyo at home. (PB02)

According to UNICEF data, diarrhoea-related deaths in Zambia (including all ages) reduced by 28 per cent between 2012 and 2018, compared to the 20 per cent reduction in other Sub-Saharan African countries in this period.^[5] Furthermore, the DHS survey for 2018 (ZDHS, 2020) showed that the rate of use of ORS + zinc to treat diarrheal cases was 53 per cent in rural districts targeted by ColaLife and 30.9 per cent elsewhere. Finally, in 2018, the organization successfully influenced the Zambian Ministry of Health to incorporate co-packaged ORS + zinc into the country's essential medicines list. These indicators provide evidence for the impact of ColaLife.

Post ColaLife withdrawal. The intervention we studied focused on forming an ecosystem for diarrhoea treatment that could function autonomously without the presence of ColaLife. We discuss to what extent this could be observed between 2019 and 2023.^[6]

Sales numbers indicate that the ecosystem is functioning four years after ColaLife's exit. Sales grew both in the public and private sectors until 2019. Our interview with the Pharmanova CEO revealed that in 2020–21 there was a decline in sales due to COVID-19, exchange rate deterioration, and economic crisis in Zambia following reduced copper (the country's main export) demand from China. Sales in the private sector decreased by 28 per cent while government purchases were halved in 2020. The government did not purchase a single kit in 2021 as Pharmanova refused to supply them due to 'a lot of outstanding debts' (P1). By the end of 2022, however, private sector sales had reverted to pre-Covid levels, and public sector sales had grown considerably. He explained:

In early 2022, we've got a beautiful order from the government for close to 300,000 [kits]... And we have just been given another order of 900,000 kits to the government... [this is] much higher than previous years when we would get an order of 100,000 kits a year. (P1)

We interpret the sales of local, co-packaged diarrhoea kits as evidence of a self-sustaining ecosystem that resisted the pandemic as well as political and economic instabilities. Access to the correct treatment increased both in numbers and geographical coverage since ColaLife's exit. Although Pharmanova does not trace where the kits go, the company has indications based on the orders they receive that the kit is now 'going to all the regions' and to 'stores countrywide' (P1). Our data also shows that Pharmanova aims to increase local capacity in Zambia with the help of the US Government and to expand the export of diarrhoea kits to other countries. The CEO explained:

I'm looking at Swaziland, Zimbabwe, Angola, and DRC... [For that] we need to first and foremost establish the product in the private sector... Once the product is in the private sector, then it makes for a nice conversation [with the public sector]. That's a strategy we use in Zambia. (P1)

These expansion plans provide evidence that the ecosystem is currently functioning and growing further in impact in the years after the withdrawal of ColaLife.

SYNTHESIS: ECOSYSTEM CATALYSIS AS A PROCESS

In this paper we provide evidence for a new process we term ecosystem catalysis. Through the case of ColaLife, we studied how an organization formed an ecosystem around a new value proposition while gradually making itself redundant, ultimately withdrawing from the ecosystem without compromising its functioning. Building on our findings, we note that these efforts can be categorized as actions to form a local ecosystem and actions to withdraw without disturbing the ecosystem. Figure 3 conveys a process model with the key focus areas that permeated the case of ColaLife.

At the ‘ecosystem level’, a catalyst first works to form a local ecosystem around a new value proposition. The first emphasis is on observing what already exists in an ecosystem that can be leveraged. In ColaLife’s case, this consisted of efforts to identify products that were already available due to multiplex interactions of local actors. This allowed the organization to understand how an ecosystem of local actors exchanged and captured value. This was followed by the repurposing of the local ecosystem to materialize a new value proposition. In ColaLife’s case, this involved designing and testing an adequate product for the local ecosystem (reflecting the expectations and contingencies of all actors) as well as tapping into existing resource flows and integrating new actors to produce the medicine.

After actors were mobilized and interconnected, most efforts consisted of making the ecosystem self-sustaining. For this, individual buy-in and shared vision were critical: all actors had to capture value as each contributed partially to the materialization of the value proposition. Autonomy was identified as necessary for embedding the value proposition: If actors relied too much on outside (international) resources, the ecosystem could collapse whenever funding organizations changed priorities or funded projects expired. To ensure actors could deliver on their functions in the ecosystem, building capacity and transferring knowledge and technologies were critical.

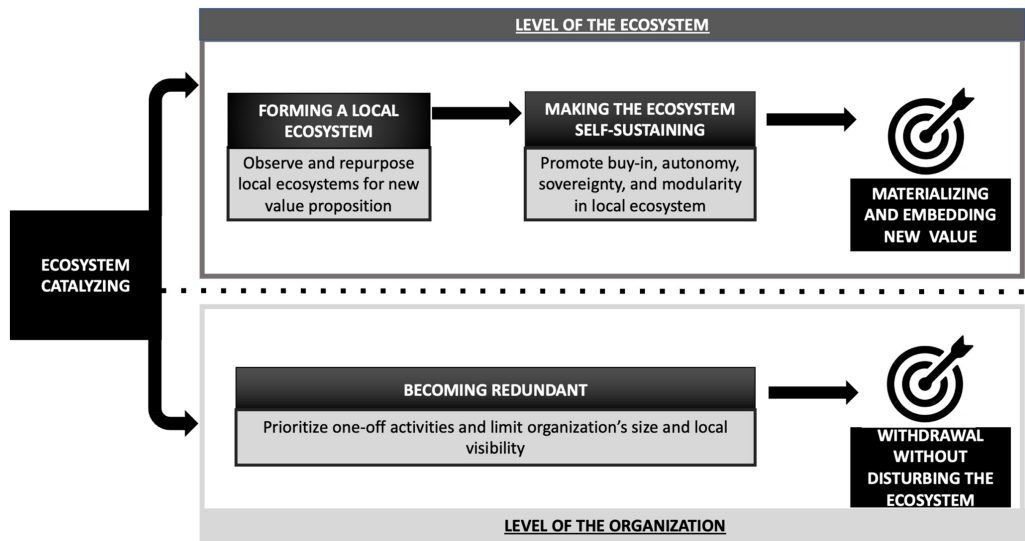


Figure 3. The ecosystem catalysis process at the ecosystem and organization levels

Finally, to make the ecosystem resilient, actors' modularity, diversity, and redundancy (whenever possible) needed to be prioritized.

We posit that at the ecosystem level, the objective of the catalyst is not only to materialize but also to embed a new value proposition so that the ecosystem can become dynamically stable. We identified four underpinning principles in these efforts. First, the ecosystem should be composed exclusively of local actors. Second, as each actor only contributes partially to the materialization of the value proposition, the catalyst should pay attention to a distributed field of actors with different capacities, affordances, and vulnerabilities. Third, ecosystem actors would only be interested in maintaining their respective functions if they benefited directly from it. Thus, the value capture of all ecosystem members is critical to ensuring permanence. Fourth, in case of undesirable and unexpected disruptions (e.g., an actor going bankrupt or rising inflation), ecosystem actors should have enough capacity to maintain their offering and/or enough incentives to adapt and ensure the continuity of the ecosystem.

Following these principles, at the 'organizational level', the catalyst can prepare and organize itself to become redundant and withdraw without disturbing the ecosystem. We observed several mechanisms that are key to this process. First, the catalyst prioritizes one-off interventions to avoid the dependency of local actors on itself. Second, the catalyst keeps itself small and locally invisible to resist normative pressures, such as from funders to grow, from employees to keep their jobs, and from local actors to keep receiving external support. Conversely, we find that it is beneficial for the catalyst to keep itself highly visible internationally to disseminate the learnings and widen impact globally.

DISCUSSION

Our research investigated how social entrepreneurs pursue long-lasting impact by building a self-sustaining ecosystem and then withdrawing from it. Our inductively grounded process of *ecosystem catalysing* is particularly suitable for an actor who intends to enact change through an ecosystem without becoming a permanent part of the solution. In this section, we discuss our contributions to the literature on ecosystems and social entrepreneurship, respectively.

Ecosystem Catalysts Versus Orchestrators

Our work builds on literature on innovation ecosystems (Adner, 2017; Jacobides et al., 2018). We find that like orchestrators, ecosystem catalysts mobilize actors around a value proposition (Adner, 2017; Jacobides et al., 2018; Shi and Shi, 2021). However, the mechanisms and aims of the two roles differ in various ways.

First, orchestrators and catalysts have different approaches to organizational permanence and growth, which fundamentally affect how they strategize and organize themselves. Orchestration has been described as a set of deliberate, purposeful actions undertaken by a hub organization as it creates and extracts value from a network (Adner, 2017; Autio, 2021; Dhanaraj and Parkhe, 2006; Jacobides et al., 2018). While an orchestrator typically aims to make itself bigger and more relevant, a catalyst does

not seek to extract value from the network or make itself a hub. It focuses instead on ensuring that ecosystem actors capture value independently of its presence and, for that, actively makes itself small and locally invisible. By depicting the process and mechanisms through which a catalyst intentionally forms a local and self-sustaining ecosystem, we contribute to the literature on ecosystems. Specifically, we show how organizations can mediate and facilitate a new value proposition in distributed ecosystems (Thompson et al., 2018) to address multi-faceted societal challenges (Fernhaber and Zou, 2022; O'Shea et al., 2021; Volkmann et al., 2021) in low-income regions (Armanios et al., 2017; Goswami et al., 2018; Sottini et al., 2022).

Second, ecosystem catalysis and orchestration involve different activities and priorities in forming an ecosystem. Literature has reported three core mechanisms of ecosystem orchestration (Dhanaraj and Parkhe, 2006): managing knowledge mobility, appropriability, and stability. We note that ColaLife has also influenced mobility and appropriability, as it performed an essential role in connecting and empowering actors with disparate capabilities in the local ecosystem and ensuring they all captured value. The key difference in how they form an ecosystem is that the catalyst does not 'manage' stability; it creates the enabling conditions for dynamic stability in an ecosystem (Feldman and Francis, 2004; Willis, 1997). While an orchestrator typically maintains dynamism as a sort of gatekeeper that allows the entry or exit of network members (Autio, 2021; Busch and Barkema, 2022; Giudici et al., 2018; Hurmelinna-Laukkanen and Nätti, 2018; Jacobides et al., 2018), a catalyst focuses on letting the ecosystem develop more organically, through multiplex interactions of distributed actors without requiring intermediation. Key to this strategy are priorities that go against the well-known logic of organizational permanence and growth (Shepherd and Patzelt, 2020): redirecting resources to the ecosystem rather than to itself and keeping the ecosystem local rather than attracting maximum funding and support from global and large-scale players.

Third, we note that the mechanisms pursued by ColaLife to make the ecosystem resilient before its withdrawal are also different from what is typically portrayed in orchestration. An orchestrator is often portrayed as aiming to increase efficiency and therefore value creation and capture in the ecosystem while making itself a key and permanent node (Dhanaraj and Parkhe, 2006; Giudici et al., 2018). ColaLife, as an ecosystem catalyst, prioritized resilience over efficiency: it worked toward adaptability to shocks and stresses rather than short-term financial gains accrued from cost optimization. This finding resonates with scholars studying social-ecological systems who identified modularity, redundancy, and diversity as key attributes of resilience, and pointed out the trade-offs between making a system resilient and increasing its efficiency (Biggs et al., 2015; Martin-Breen and Anderies, 2011). It also provides a path forward from Tom Friedman's words in his now-famous New York Times column article *How We Broke the World* (2020):

Over the past 20 years, we've been steadily removing man-made and natural buffers, redundancies, regulations, and norms that provide resilience and protection when big systems – be they ecological, geopolitical or financial – get stressed... We've been recklessly removing these buffers out of an obsession with short-term efficiency and growth, or without thinking at all.

Finally, and exclusively from the perspective of non-profit organizations, we recognize that ecosystem catalysis is not the only one nor the best approach for every social impact organization or context. Our case study shows that ColaLife's objective was specific: it aimed to enable perennial access to a medicine that has been promoted for many years by the WHO. It is cheap and over-the-counter, does not require refrigeration, and does not entail great technological capabilities to manufacture. Their approach assumes that the problem is tractable and can be solved with local resources and capabilities. This model may not be suitable for tackling wicked problems (Ney and Verweij, 2015; Reinecke and Ansari, 2016; Rittel and Webber, 1973), such as poverty or climate change. For wicked problems, organizational permanence may be more critical, as complex problems may change over time, and ecosystem actors may not be able to respond accordingly. We suggest that in those circumstances, an ecosystem orchestrator may be more adequate than an ecosystem catalyst.

Ecosystem Catalysis and Social Impact

ColaLife was founded with the explicit intention of forming a self-sustaining ecosystem that would not depend on the organization. The non-profit's motives were consonant with scholars who criticized: (a) the transposition of marketplace values and logic to non-profits (Eikenberry and Kluver, 2004; Mirabella, 2013; Sandberg et al., 2020); (b) the use of organizational permanence and growth as proxies for 'impact' by philanthrocapitalists (Bishop, 2013; Eikenberry and Mirabella, 2018); and (c) the inflation of the 'agency' by hero-like entrepreneurs (Nicholls, 2010), especially from the West (Muñoz and Kimmitt, 2019), working in low-income countries (Mair and Marti, 2009). It also resonates with Santos' (2012) critique of social entrepreneurs whose primary aim is to grow by growing a service provision instead of offering a permanent institutional fix to an enduring problem.

Despite these various critiques of social entrepreneurship in the literature that permanence and growth of social ventures may not be intrinsically desirable, scholars have not explained how social entrepreneurs can dissent from these pressures to achieve long-lasting impact in other ways. With an emphasis on local ecosystem formation, instead of growing service provision, our process model provides a 'way out' for 'true social entrepreneurs' (Santos, 2012): a different *raison d'être*, which focuses on creating the enabling conditions for an ecosystem to develop itself around a new value proposition, while the organization renders itself obsolete in the location and exits.

More specifically, our work depicts how ColaLife, differently from the case of Safe Water for Africa reported by McMullen and Bergman (2017), successfully withdrew without creating dependency on others. McMullen and Bergman (2017) described how the social entrepreneurs of Safe Water gained a sense of entitlement, and local actors throughout the program gained a sense of gratitude and obligation toward the social entrepreneurs, thus leading to suboptimal development. In the case of ColaLife, we note that the social entrepreneurs prepared themselves from the outset to avoid this paradox. As indicated in our process model, ColaLife promoted the autonomy of local actors at the ecosystem level, while at the organizational level, the social entrepreneurs

intentionally prioritized one-off activities and limited both the organization's size and local visibility. These mechanisms we identified build on extant work (e.g., McMullen and Bergman, 2017) by providing a way for social entrepreneurs to avoid falling into paths that lead to suboptimal solutions.

Our study also shows that, as ecosystem catalysts, social entrepreneurs improve their chances of gaining support from local actors, but this approach may pose challenges when engaging with funders and other influential players. ColaLife repelled institutional pressures from funders for its permanence (e.g., when they refused a grant from Grand Challenges Canada) and for its growth (e.g., when they ignored pressures from the UK Department for International Development to grow their organization). These tensions between local focus and global funding opportunities showcase trade-offs that social entrepreneurs experience but that have not been extensively explored by extant literature (Bishop, 2013; Eikenberry and Mirabella, 2018; Nicholls, 2010; Sandberg et al., 2020).

Finally, by tracing how social entrepreneurs achieved long-lasting impact through mechanisms at the organization and ecosystem levels, our study contributes to decoupling social impact from the primacy of organizational permanence and growth (Shepherd and Patzelt, 2020) in two ways.

First, we show that the assumption that a non-profit must grow to expand its impact overlooks the effect non-profits may have on distributed ecosystems, unpacking a new possibility for purposeful action that builds on ecosystems' self-organizing, mutually reinforced, and self-sustaining dynamics (Willis, 1997). The primacy of organizational growth is underpinned by economics-based philosophies of market positioning and market capture (e.g., Baum and Bird, 2010; DeTienne et al., 2015; Penrose, 1959; Sarason and Dean, 2019; Winter and Szulanski, 2001) but overlooks impact beyond the boundaries of single organizations. We propose that thinking of impact as relational and resulting from the connection of an organization and an ecosystem opens a myriad of possibilities for non-profits to offer a permanent institutional fix to a tractable problem (Santos, 2012). Instead of organizational growth, we propose that non-profits aiming for a permanent fix should focus on creating a self-sustaining ecosystem. This contributes to a more dynamic view of social impact for non-profits; one that seeks value in distributed activities and takes into account different layers of constraints and possibilities in ecosystems.

Second, by unpacking the withdrawal process from a self-sustaining ecosystem, we answer calls from scholars who criticized the primacy of organizational growth in social impact organizations and pointed to alternatives involving exit without compromising a social mission. In describing future research avenues for social entrepreneurship literature, Shepherd and Patzelt (2020, p. 9) highlighted that 'a social venture can be terminated (and thus experience no or "negative" organizational scaling), yet other actors may continue to widely disseminate its social solution such that the social venture was successful in scaling social impact'. Our findings offer evidence of how this can be pursued, providing a fresh, process-based perspective that reconciles ecosystem impact with organizational finitude.

To conclude, organizational growth may have been appropriately conceptualized as a solution for commercial entrepreneurs whose primary objective is to capture economic value (Baum and Bird, 2010; DeTienne et al., 2015; Winter and Szulanski, 2001) and to a certain extent, for hybrid organizations that combine commercial institutional logics

with social ones (Battilana and Lee, 2014; Litrico and Besharov, 2019). We posit that it has irreconcilable limitations for non-profits whose primary goal is to offer a permanent fix to a tractable social problem. Our findings show that the goal of social entrepreneurs to materialize and embed a new value proposition may be better achieved through a process of ecosystem catalysis instead.

CONCLUSION

In this single case study, we examine a theoretically puzzling case study of an organization that enacted a permanent value proposition in a distributed ecosystem without becoming part of it. Based on our findings, we provide an inductively grounded process model of ecosystem catalysis. Our study has the familiar limitations of a single case study (Ozcan et al., 2017). Exploring the generalizability and replicability of our findings requires further rigorous and systematic research in an array of contexts to determine whether context changes the nature of the process or if distinct processes emerge in addition to (or contrary to) the ones we have identified. Our longitudinal data until January 2023 suggests that the ecosystem that ColaLife left behind in 2018 was still up and running. However, if it will remain self-sustaining in the longer term is to be seen. We also have not investigated if or how this ecosystem could span beyond its original value proposition (e.g., to offer other medicines or healthcare products).

We invite entrepreneurship researchers to explore different organizational models that offer permanent solutions to tractable social problems and that give primacy to resilience over efficiency. We particularly encourage social entrepreneurship researchers to investigate other ways for entrepreneurs to dissent from institutional pressures for organizational permanence and growth. For ecosystem researchers, we propose identifying different motives or processes of ecosystem catalysis through multiple case studies and examining the circumstances under which ecosystem catalysis is more effective than other approaches to facilitating or enabling change through ecosystems.

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NOTES

- [1] We do not use the term ‘catalyst’ with the exact chemical connotation, but rather the secondary meaning of ‘an agent that provokes or speeds significant change or action’ (Merriam-Webster Dictionary).
- [2] The first author was not paid nor worked with ColaLife or any other investigated organization at any time. Funding for the project came from independent sources. The agreement between ColaLife and the authors was that the knowledge arising from this investigation would be made publicly available.
- [3] For instance, ColaLife’s founders learned that governments tended to procure and dispense ORS and zinc separately, even though both are needed to treat diarrhoea. In 2016, they collected data to

show that even when packaged separately, only 44% of cases received ORS and zinc, as opposed to 87% when packaged together. They have then worked with the Zambian Ministry of Health to ensure co-packaged ORS and zinc would be part of Zambia's essential medicines list – a public list that guides the prioritization in public procurement of medicines in the country – and, subsequently, to influence the same change from the WHO.

- [4] For this section, we used: (1) longitudinal data on diarrheal deaths by UNICEF; (2) survey results from the Demographic and Health Survey, from 2012–13 and 2018; (3) surveys commissioned by ColaLife and managed by UNICEF, published in 2014 and 2017 (for two intervention districts), (CLS, henceforth); (4) annual sales data of diarrhoea treatment from Pharmanova; (5) qualitative data from 2017 to 2023, incl. an interview with Pharmanova's CEO in January 2023; (6) academic articles published in reputable healthcare journals.
- [5] The reduction in diarrheal deaths were also impacted by the increase in access to treatment and improved sanitation (e.g, toilet infrastructure, clean water) and vaccination (Bosomprah et al., 2016; Chilengi et al., 2015).
- [6] Our analysis in this section is based primarily on data from Pharmanova as data from international organizations (such as USAID) have not yet been published for this period.

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