

An effectuation approach to sustainable entrepreneurship

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Abstract

Effectuation has been established as a theory of entrepreneurship used to explain a number of entrepreneurial outcomes. We use this theory as a lens to understand how sustainable entrepreneurship occurs in an extremely resource constrained environment and thereby provide novel insights into the practices composing effectuation in conditions characterised by hardship and variability. The study sought to answer the following research question: “How do entrepreneurs use effectuation to realize sustainable entrepreneurship?” A qualitative research approach based on a multiple case studies was used.

Overall, we find the concept of effectuation to be well suited to capturing the processes through which individuals with limited means seek to engage in sustainable entrepreneurship.

However, we also suggest a need to add to the existing constructs of the theory to match the dynamics observed. Based on this empirical study, we identify three pervasive practices that are key to understanding effectuation in the developing country context: complementation of indigenous knowledge with modern science, compassion and pluriactivity.

Keywords

Effectuation, Sustainable entrepreneurship, sub-Saharan Africa, Qualitative research, Resource constraints

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1.0 Introduction

While entrepreneurs have long been recognized as a vehicle for exploiting emerging opportunities associated with societal need, we have little understanding of how entrepreneurs will discover and develop those opportunities that lie beyond the pull of existing markets. Derived from the two research areas of entrepreneurship and sustainable development (Shepherd and Patzelt, 2011), sustainable entrepreneurship is perceived as a form of entrepreneurship that ensures the current and future economic survival of the enterprise, the community and the environment. In this study we adopt the definition of sustainable entrepreneurship as “an innovative, market-oriented and personality-driven means of creating economic and societal value via break-through environmentally or socially beneficial market or institutional innovations” (Schaltegger and Wagner, 2011, p. 226).

Existing literature acknowledges that sustainable entrepreneurship research is still in its infancy (Shepherd and Patzelt, 2017) and consequently dominated by conceptual work (Dean and McMullen, 2007; Shepherd and Patzelt, 2011). A number of scholars have worked towards defining the phenomenon (Hockerts and Wüstenhagen, 2010; Shepherd and Patzelt, 2011); while others have tried to distinguish it from the related concepts of entrepreneurship, social entrepreneurship and environmental entrepreneurship (Dean and McMullen, 2007; Thompson, Kiefer, and York, 2011). Additionally, a few studies have focused on the broad motivations for engaging in sustainable entrepreneurship (Choi and Gray, 2008; Parrish, 2010). However, what is lacking is an understanding of how individuals engage in sustainable entrepreneurship.

Although the case for entrepreneurship as a panacea for transitioning towards a more sustainable society is alluring, there remain major gaps in our knowledge of whether and how this process will actually unfold. Further to this sustainable entrepreneurship research in contexts outside the developed world is still at a nascent stage (Nayak, 2022). In differentiating

the modes of opportunity recognition of social, environmental and sustainable entrepreneurship from those for commercial for-profit businesses, Thompson *et al.* (2011) argue that these enterprises employ distinct logics and strategies to attain their objectives. While catering to the social, environmental and economic objectives, sustainable entrepreneurship requires the involvement of a number of stakeholders. This multi-stakeholder approach obviates the applicability of a planning approach (Reuber, Fischer, and Coviello, 2016) rendering effectuation as an appropriate lens to examine this type of entrepreneurship. Similarly, the limited resources available to firms in developing countries lead to different forms of networking between entrepreneurs and others, including suppliers and government officials, to obtain needed resources (Le and Nguyen, 2009). In this regard it has been proposed that effectuation is a promising theoretical framework to answer questions regarding the conditions under which we expect to see entrepreneurs pursue sustainable ventures (Hall, Daneke and Lenox, 2010).

Effectuation is associated with resource constraints as catalysts for entrepreneurial action (Arend, Sarooghi and Burkemper, 2015). It explains how entrepreneurs use resources that are within their control—along with commitments and constraints from select stakeholders—to create new artifacts such as ventures, products, opportunities and markets (Sarasvathy 2001).

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Effectuation has gained recognition in sustainable entrepreneurship research, notably in its influence on accessing partners' resources (Gray et al., 2014). It has also been proposed as a valuable framework for understanding sustainability effects (Fichter et al., 2023). Recent studies affirm effectuation's relevance in sustainable entrepreneurship, illustrating how sustainability-focused firms may employ an exaptive approach, engaging in brief interactions with various value propositions and conducting cost-effective design experiments to assess

market potential (Keskin, Wever and Brezet, 2020). Further to this, research has demonstrated how effectual entrepreneurs transform market failures into sustainable solutions by selectively engaging stakeholders (Sarasvathy and Ramesh, 2019). Additionally, effectuation has been associated with sustainability-focused innovation (Coffay et al., 2022). While these studies provide nuance on the application of effectuation in sustainable entrepreneurship research what is absent is explanations of how effectuation manifests itself in the context of sustainable enterprises.

While some studies have acknowledged the significance of stakeholder involvement in sustainable entrepreneurship (Nguyen et al., 2023), there exists a need for a better understanding of the intricacies of engaging stakeholders in the collaborative creation of sustainable ventures. Secondly, there is a shortage of research in understanding how entrepreneurs effectively manage the process of balancing the multiple dimensions of sustainability that are inherent in sustainable entrepreneurship. Further more, research is needed to investigate how entrepreneurs operating in highly resource-constrained environments, such as sub-Saharan Africa, apply the principles of effectuation to overcome the unique challenges specific to their contexts.

Based on empirical case studies of sustainable entrepreneurs operating in Uganda we sought to answer the question “how do entrepreneurs use effectuation to realize sustainable entrepreneurship?” In answering this question, this study identifies three pervasive practices that are key to understanding effectuation in the case of sustainable entrepreneurship in the developing country context: compassion, hybridization of knowledge and pluriactivity.

Our research unveils how these practices influence the mechanisms through which entrepreneurs, particularly in resource-constrained contexts, employ effectuation strategies to achieve sustainable entrepreneurship. This paper offers unique insights into the cognitive and

affective dimensions involved in realizing sustainable entrepreneurship goals, presenting a valuable contribution to the entrepreneurship literature."

The paper proceeds as follows: subsequent to this introduction section the literature is reviewed and the theory is outlined. Following this is a discussion of the methods employed. The penultimate section is a presentation of the results framed by the themes that emerged from reflexive consideration of the data. Thereafter the findings are discussed. The final section presents limitations, implications and conclusions.

1.1 Uganda Context

The contextual range of research in sustainable entrepreneurship is limited to developed countries (Kuckertz and Wagner, 2010) which restricts our understanding of how this phenomenon unfolds in conditions of extreme resource scarcity. Uganda is a developing country that boasts of richly diverse flora and fauna. The country has consistently registered some of the highest entrepreneurial rates of 3 in every 10 individuals intending to start a business (Namatovu et al., 2013). However, this high entrepreneurial rates have implications on the natural ecosystems. Indeed a number of businesses are engaged in the unsustainable felling of trees to provide cooking fuel and timber for furniture (Uganda Ministry of Water and Environment, 2016). Fishermen, have limited regard for fishnet sizes and harvest young fish which threatens the fish population (Mette Kjær, 2012). Poachers connive with state agents to hunt animals facing extinction (Rossi, 2018). Beyond this, the absence of a national public transportation system has resulted in the importation of a large number of second hand cars whose emissions threaten the environment and health of the population (Mutenyo et al., 2015).

With government's limited ability to address a number of these issues, entrepreneurs have stepped in to fill the void (Mugabi, 2014). The role of entrepreneurship therefore extends beyond exploitation of economic opportunities to include addressing the pressing social and environmental issues. While a number of existing firms couch these efforts under the brand of corporate social responsibility, some are deliberately integrating the social, environmental and economic objectives through novel approaches (Nkundabanyanga, 2011). The entrepreneurs identify needs within the community and environment and establish entrepreneurial ventures that target these needs. These ventures have improved sanitation in the aggregate, address school absenteeism for girls and reduce dependence on firewood for cooking fuel.

2.0 Literature Review

2.1 Effectuation: an introduction

Effectuation is an enactment theory that has developed within the entrepreneurship literature. The theory describes how entrepreneurs use those resources that are within their control—along with commitments and constraints from select stakeholders—to create new artifacts such as ventures, products, opportunities and markets (Sarasvathy 2001; Wiltbank et al. 2009).

Effectuation involves an interactive process between the entrepreneur and stakeholders who together determine goals for the entrepreneurial venture (Sarasvathy and Dew, 2008).

Effectuation is drawn from studies in cognitive science. Framed around the works of March (1982), it is considered one of the approaches to the study of entrepreneurial cognitions.

Interest in the cognitive domain is drawn from interest in the individual's role in entrepreneurship with regard to how opportunities occur. Indeed, in a recent study it was found

that effectuation is used to describe three distinct but interconnected research directions that traverse different levels and units of analysis: effectuation as a form of behavior, as a form of reasoning, and as a process (Van Mumford and Zettinig, 2022). The current study is based on effectuation as a behavior.

Effectuation shuns business planning in favor of enactment, and it yields alternative explanations for individuals' behavior when they establish and run a business. The theory proposes control rather than prediction in the face of uncertainty (Sarasvathy 2008), and it suggests that opportunities are created rather than discovered (Chandler et al. 2011). The effectuator is therefore positioned as a co-creator (along with committed stakeholders) of opportunity (Read, Song, and Smit 2009).

Drawing from Sarasvathy (2008), effectuation can be explained through the four principles that follow. Firstly, it begins by considering means, rather than establishing end goals. In this context, 'means' refers to personal preferences, accumulated knowledge and experiences and person-specific network contacts. Secondly, it applies the criterion of affordable loss rather than expected return when evaluating options. This entails a decision maker estimating what they might be able to put at risk and determining what they are willing to lose to follow a course of action. Thirdly, it leverages relationships rather than applying competitive analysis when assessing relationships with other individuals and organisations. Finally, it entails exploiting rather than avoiding contingencies.

Boundary conditions for the theory have been proposed as follows: only those means that are relevant to the venture constitute effectual means; only those partnerships in which both parties share the risk and benefits of the venture constitute effectual partnerships; what matters in affordable loss is whether the entrepreneur manages that risk by attempting to measure upside opportunity potential or effectually considering the worst case scenario; the entrepreneur's

willingness to change when confronted with new information, means or surprises (Read, Song, and Smit, 2009).

The assumptions underlying effectuation are that the environment is dynamic, nonlinear, unpredictable and immeasurable, while entrepreneurial opportunities are subjective, socially constructed, and created through a process of enactment (Fisher, 2012).

2.2 Conceptual framework

The conceptual framework for this study draws upon Read et al's (2009) conception of the theory of effectuation, which posits that entrepreneurs employ specific principles, including means, leveraging relationships, affordable loss and exploiting contingencies, to create and develop entrepreneurial opportunities. These principles form the foundation for understanding how entrepreneurs use effectuation to realize sustainable entrepreneurship.

The first principle which is referred to as the means principle centers on the resources within an entrepreneur's control, such as personal preferences, knowledge, experiences, and network contacts (Sarasvathy, 2001). In sustainable entrepreneurship, means encompass the entrepreneur's ability to leverage their environmental or social expertise, accumulated knowledge, and personal networks to drive environmentally or socially beneficial innovations. This principle highlights the resourcefulness of entrepreneurs.

Leveraging relationships is another principle of effectuation. Effectuation underscores the significance of relationships in entrepreneurial endeavors (Sarasvathy, 2001). Entrepreneurs

build and nurture partnerships with various stakeholders, including suppliers, customers, and community members, to co-create value and opportunities. Yet the question of why stakeholders make commitments has so far been underexplored (Van Mumford and Zettinig, 2022). In sustainable entrepreneurship, leveraging relationships extends to collaborations with environmental organizations, social impact entities, and community leaders to advance sustainability goals. This principle emphasizes the role of collaboration in sustainable entrepreneurial processes.

A third principle is affordable loss which emphasizes that entrepreneurs consider what they are willing to lose rather than focusing solely on expected returns when making decisions (Sarasvathy, 2001). In the context of sustainable entrepreneurship, this principle may relate to the entrepreneur's assessment of risks associated with pursuing sustainability-oriented opportunities. It suggests that entrepreneurs are willing to invest resources, including time and capital, based on their risk tolerance and what they perceive as acceptable losses in the pursuit of sustainability. The spectrum of loss is wide to include compromising on one of the pillars of sustainable entrepreneurship in favor of others

The exploitation of contingencies is the fourth principle and suggests that entrepreneurs remain flexible and responsive to unforeseen developments (Sarasvathy, 2001). In the context of sustainable entrepreneurship, entrepreneurs adapt to changing environmental, societal, and market conditions. They seize opportunities that emerge as they work towards sustainability objectives. This principle highlights the agility and adaptability of entrepreneurs as they navigate complex sustainability challenges.

By applying these four effectuation principles within the context of sustainable entrepreneurship, this study aims to uncover the mechanisms and strategies employed by individuals to realize sustainable entrepreneurship. Given that effectuation is relevant to the uncertainty (Chandler et al., 2011; Sarasvathy, 2001) we will discuss the research framework in the context of a setting typified by weak institutions, extreme poverty and unique socio-cultural settings.

2.3 Effectuation in Entrepreneurship

Research on effectuation has already presented a broad range of applications that compare it to causation (Eijdenberg et al., 2017), to new market creation (Sarasvathy and Dew 2005), product diversification (Deligianni, Voudouris, and Lioukas 2017), research and development (Brettel et al. 2012), internationalization (Prashantham et al., 2019) and the multi-objective realm of social entrepreneurship (Corner and Ho 2010; Johannisson, 2018). There has also been a vibrant research stream confirming and contesting its applicability (Arend, Saroogi and Burkemper, 2015; Kitching and Rouse, 2020). More recent research has focused on exploring the underlying processes of effectuation (Jiang and Ruling, 2019; Pacho and Mushi 2021).

On the whole the number of studies on effectuation has increased exponentially in recent times. A number of authors (such as Arend et al; Kitching and Rouse (2020) have identified weaknesses in the theorizing while meta-analyses such as Chen, Liu and Chen (2021) and Read, Song and Smit (2009) have confirmed its applicability and predictive power on firm performance.

Other studies have integrated effectuation with related theories such as network theory (Kerr and Coviello, 2020), bricolage (Archer, Baker and Mauer, 2009; Welter, Mauer and Wuebker, 2016).

Recently a structured literature review to remedy a number of challenges related to the theory has been undertaken (Gregoire and Cherchem, 2020).

2.4 Effectuation in firms with diverse objectives

While effectuation has been used to explain the activities of firms with profit objectives, this study joins the few existing studies such as Corner and Ho (2010), Servantie and Rispal (2018), Johannison (2018) and Sarasvathy and Ramesh (2019) to explain the dilemmas and processes of firms with additional non-pecuniary objectives.

The Corner and Ho (2010) study suggested complementarities between effectuation and causation processes in the exploitation of social opportunities. They further showed that to realize social entrepreneurship a number of actors, engaged in interactions that nudged an opportunity into manifestation.

Johannison (2018) introduce the notion of ‘necessity effectuation’ in showing that a different kind of effectuation logic is exhibited in social enterprises.

Servantie and Rispal (2018) demonstrated that social entrepreneurs combine effectuation, bricolage and causation during the entrepreneurial process. They further assert that these three approaches partially overlap and can occur both sequentially and concurrently, depending on the context of action, the members of the entrepreneurial team, and the stakeholders.

The aforementioned studies highlight the unique nature of effectuation in firms pursuing diverse objectives. They show the prevalence of effectuation in these firms and the complementation between effectuation and related theories such as causation.

2.5 Effectuation in Sustainable Entrepreneurship

Sarasvathy (2001) has proposed that successful early entrants in a new industry are more likely to have used effectuation. Sustainable entrepreneurship is a relatively new phenomenon (Hockerts and Wüstenhagen, 2010) occurring in industries, both old and new, but spawning new firms and types of industrial activity (for example, the renewable energy industry).

A growing amount of sustainable entrepreneurship research emphasizes the creative approach to opportunity recognition (Hockerts and Wüstenhagen 2010; Parrish 2010; Schaltegger and Wagner 2011). Such research emphasizes the endogenous enactment of opportunities by entrepreneurs seeking to exploit them. This research also highlights the uncertainty of the environment where entrepreneurial outcome possibility and probability can't be known (e. g. Swan and Morgan, 2016).

Evidence of effectuation has been surfaced in sustainable entrepreneurship research where accessing partners' resources was identified as an external factor impacting the occurrence of sustainable entrepreneurship (Gray et al., 2014). Their study highlighted the lack of depth on previous studies in explaining how the firm incorporates externally sourced knowledge in opportunity identification and exploitation. It has also been proposed that effectuation theory may provide a useful lens to conceptualize sustainability effects (Fichter et al., 2023). In this study the authors ask how new ventures can be informed and influenced by their external stakeholders about diverging perceptions of value while these ventures are in the midst of effectual processes and whether such feedback leads to changes in the internal resource constellation. Another recent studies have confirmed the applicability of effectuation in sustainable entrepreneurship research including the proposal that sustainability-oriented firms may use an exaptive approach that is characterized by short-term engagement in various value propositions and low-fidelity affordable design experiments used to test market potential of

multiple value propositions through various stakeholder interactions (Keskin, Wever and Brezet, 2020). Other research has explored how successful partnership creation, typical in effectuation, can limit the success of sustainable entrepreneurship (Günzel-Jensen and Rask, 2021).

Closely related to the current study recent research using Ostrom's institutional analysis and development framework has explored how effectual entrepreneurs transform market failures into sustainable solutions by self-selecting stakeholders (Sarasvathy and Ramesh, 2019). In this study it was proposed that every interaction with a self-selected stakeholder coalesces into a commitment that structures the relationship between the entrepreneur and the stakeholder. As a result the study suggests that these commitments are a useful way to study intersubjective interactions in sustainable entrepreneurship. This therefore begs the questions; what causes and sustains these interactions; how is knowledge combined in these interactions to develop a shared understanding and develop new ideas. In another study it has been proposed that sustainability forecasting and assessment is an effectuated process that requires the co-creation of knowledge (Coffay et al., 2022). However the study does not go far enough to describe the nature of this co-creation process or the building blocks of the requisite knowledge.

2.5 Unexplored aspects in effectuation and sustainable entrepreneurship research

However, a number of things have been insufficiently explored within the context of effectuation and sustainable entrepreneurship.

While some studies touch upon the importance of stakeholder involvement in sustainable entrepreneurship (Nguyen et al., 2023), further research is needed to understand the intricacies of engaging stakeholders in co-creating sustainable ventures.

Additionally, there is a need to understand how entrepreneurs navigate the complexity of balancing the multiple dimensions of sustainability that present in sustainable entrepreneurship.

Further to this, more research is needed to understand how entrepreneurs in extremely resource scarce settings such as sub-Saharan Africa apply effectuation principles to overcome challenges peculiar to their contexts, including weak institutional support and cultural constraints. This study is important in addressing the above identified gaps as it advances the theory of effectuation by introducing three novel constructs namely, complementation of indigenous knowledge with modern science, compassion and pluriactivity. This addition enriches the understanding of how entrepreneurs leverage local expertise with contemporary insights to create innovative solutions. The study also sheds light on how entrepreneurs apply these constructs to address complex societal problems and it also illustrates how the application of effectuation principles can lead to positive, community-level change.

2.6 Conclusion

In this paper we use effectuation to explain the occurrence of sustainable entrepreneurship. The theory was used to develop data generation instruments and provided a framework for data analysis, and interpretation. An abductive approach was adopted where beyond use of the constructs of the theory that were used to code the data, the researchers identified other themes that were deemed important in explaining the sustainable entrepreneurship phenomenon.

Read, Sarasvathy, Dew and Wiltbank (2016, p. 5) are emphatic in stating that “effectuation is most useful where traditional notions of optimality and bias break down or simply do not apply”.

Effectuation therefore serves as an appropriate lens to clarify the underlying mechanisms in the realization of sustainable entrepreneurship.

3.0 METHODS

A multi-method qualitative approach based on multiple case study research was adopted in this study. Five cases were selected and they included a sustainable tourism firm, a firm that makes fashion and household accessories from used drinking straws, a manufacturer of energy efficient stoves, a manufacturer of bio-degradable sanitary pads and a manufacturer of solar powered stoves.

Multiple case studies are important in advancing theory development within the realm of qualitative research. This methodological approach allows researchers to engage in an in-depth exploration of a given phenomenon, affording them a deeper and more comprehensive understanding of its intricacies and multifaceted nature. By scrutinizing a phenomenon across various cases, researchers can extract richer insights, which illuminate the inherent complexity of the subject under investigation (Eisenhardt, 1989).

Moreover, the adoption of a multiple case study approach significantly bolsters the overall validity of research findings by mitigating potential sources of bias and error. This approach is particularly well-suited for complex and multifaceted phenomena where a singular perspective would be insufficient to capture the multifarious dimensions. It allows researchers to delve into the intricacies and nuances of these multifaceted subjects, further enriching the quality of data and analysis (Yin, 2009).

The effectiveness of multiple case studies in enhancing the credibility and reliability of research findings lies in the careful application of replication logic and triangulation. By rigorously comparing and contrasting patterns, themes, and insights across different cases, researchers can

establish a robust foundation for their conclusions, thus reinforcing the trustworthiness of their research outcomes (Patton, 2015).

As the research is on an area at the nascent stage of development a central concern is to create theoretical propositions that are deeply grounded in the experiences of the participants rather than detached, analytical abstractions. An abductive approach to theory development was pursued (Alvesson and Kärreman, 2007). This involves a combination of deductive and inductive styles of theorizing (Lee et al., 1999; Zahra and Newey, 2009). This approach is appropriate for a research area because it involves identifying the pre-existing conceptions about the study area and extrapolating such conceptions by means of empirical findings.

3.1 Case Selection

Purposeful sampling was used to select information-rich cases that facilitate theoretical inference (Eisenhardt and Graebner, 2007). Initially the researcher created a respondents' framework through first categorising the cases to ensure breadth of coverage of the phenomenon. Eventually five categories were distilled: energy conservation, plastics recycling, sustainable tourism, consumer products and air and water conservation. Unfortunately, the researcher was unable to get a firm in the air and water conservation category. After the firms were identified, the researcher contacted these firms telephonically. The founders of these firms were willing to participate in the research although for three firms, this was not possible. The researcher replaced each of these with firms that were equally as theoretically relevant.

The selected cases were similar on a number of criteria. First, they all were founded and operated in the same geographical region. This sub-Saharan African region is inherently unpredictable providing the necessary impetus for effectuation theory (Welter & Kim, 2018). In a previous study, this criterion has been used for selection of cases for study of sustainable

entrepreneurship study (Juma et al., 2017). Second, the ventures were all sustainable enterprises catering to diverse economic, social and environmental objectives. These multiple objectives imply that the firms are faced with enhanced levels of uncertainty as the multiplicity of goals stretch the resources and add complexity to the entrepreneurial endeavour (Belz & Binder, 2017). Sustainable enterprises by their nature involve a greater number of stakeholders which demands cognisance of diverse and ever changing opinions that greatly reduce the ability to engage in long-term planning and prediction of outcomes. Thirdly, the ventures permitted the collection of detailed information from within the firm and the firm's stakeholders. This enabled a multifaceted perception of the activities of the firm, first elucidating the effectuation constructs but also permitting triangulation of findings to enable internal validity. The inclusion of multiple partners in the study enabled qualitative reliability and validity (Golafshani, 2003; Juma et al., 2017). Fourthly, the firms selected had contended with marked resource deficits at start up. There is a need to understand the impact of severe resource constraints on entrepreneurial outcomes (Webb, Tihanyi, Ireland, & Sirmon, 2009).

Within the limits of these criteria, maximum variation was sought in selecting the firms. In this regard, size, age and representation of the whole gamut of sustainable enterprises were considered in order to identify shared features that cut across cases. The heterogeneous set of sustainable enterprises provided firmer grounding of theory (Santos & Eisenhardt, 2009).

By limiting our selection to sustainable enterprises that were operating in the same geographical region we were able to ensure that observed differences were not due to sectoral or regional differences. Addition of firms to the sample stopped after theoretical saturation was attained and no substantial new inferences were being made (Strauss & Corbin, 1998).

Table 1 below provides a summary description of each enterprise while a detailed description of each case is contained in the Appendices section.

“Insert Table 1 here”

3.2 Data collection

In depth interviews were carried out in 2014 through directly asking the entrepreneur, a supplier, a customer, an employee and community leader questions about the activities of the firm. Issues of sustainable entrepreneurship were discussed broadly in relation to the respondent, the firm and the business environment.

The interviews were pre-structured and remained highly flexible. The interviews with the entrepreneurs lasted between 60 and 90 minutes, and focused on the respondent’s experience of sustainable entrepreneurship.

The interviews with the other stakeholders lasted between 15 and 45 minutes and these focused on the participants’ view of the nature of the relationship the stakeholder had with the sustainable enterprise. They offered corroborative evidence to the interviews with the sustainable entrepreneur.

During the interviews, respondents were requested to provide documents pertaining to the enterprise including business plans, agreements of sale and purchase, memoranda of understanding, patents, newspaper cuttings and website pages. Photocopies of these were analysed to validate and augment evidence from the interview transcripts of the sustainable entrepreneur. A data table (Table 2) has been provided to show the different data that were used.

“Insert Table 2 here”

3.3 Methods for data analysis and synthesis

Data analysis and data collection were a simultaneous iterative process to avoid the risk of repetitious, as well as unfocused and overwhelming data (Merriam, 2014). This also enabled

the utilization of emerging insights to modify and improve the whole process. The process of data analysis began during the interview where the researcher took notes of what was perceived as information that bore potential and engendered follow up questions later in the interview. The analysis continued into the transcription stage which was done verbatim with the interviewer taking notes of first interpretations of what the data meant. The primary analysis was undertaken using Atlas.ti a computer assisted qualitative data analysis software.

In the analysis, a combination of deductive and inductive techniques was employed. To this end, the data-driven inductive approach of Boyatzis (1998) and the deductive *a priori* template of codes approach outlined by Crabtree and Miller (1999) were used. This combined approach complemented the research question. Patterns in the data were documented and tentative theoretical explanations constructed using each case as a replication (Eisenhardt, 1989; Yin, 2009).

3.4 Rigor in data analysis: The Gioia analytical method

Data was coded into a number of first order codes. These codes reflected the informants' language. The first-order codes were matched with the study constructs as 2nd order empirical indicators. The second order empirical indicators are researcher-centric concepts. This tandem reporting of both voices allowed for a qualitatively rigorous demonstration of the links between the data and the emergent theory. Finally, these indicators were integrated around core themes (Strauss and Corbin, 1998) to form a framework that helped validate the empirical indicators. Throughout this process, connections between the data, the emerging concepts and the resulting theory were demonstrated. A data structure shown as Figure 1 was developed from the analysis (Gioia, Corley and Hamilton, 2013). This data structure provides a representation of how progress was made from raw data to the themes used in conducting analysis. It also shows how the data links to the emerging insights.

It was therefore possible to move from the idiosyncrasies of a particular case, to produce transferable constructs. To achieve internal validity, the interview data were triangulated with observations and a review of documents such as memos, newspapers and website articles. The triangulation was augmented by obtaining information from a number of sources; the entrepreneurs, suppliers, customers, employees and members of the community. To achieve external validity, the processes undertaken were carefully documented to enable replication.

3.5 Ethics Declarations

Prior to data collection, ethics approval was sought from the Gordon Institute of Business Science Ethics committee. As specified in the ethics clearance a signed consent was sought from the research participants. Further to this all respondents in this manuscript have been anonymized.

4.0 FINDINGS

In this section we present the three key practices through which individuals involved in sustainable entrepreneurship ‘take a set of means as given and focus on selecting between possible effects that can be created with that set of means’. We present the novel constructs namely, complement indigenous knowledge with modern science, compassion and pluriactivity and how each of these constructs relates to the existing constructs of effectuation. Accordingly, we reveal how individuals complement indigenous knowledge with modern science to address complex societal problems. This complementation of knowledge streams constitutes a part of the means that are brought to bear on a generalized aspiration. We show how the entrepreneurs use this complementarity to exploit contingencies as they arise and

develop an acceptable solution for the community. The complementing of knowledge ultimately promotes the transformation of current realities into new possibilities.

Additionally, we also show the role of *compassion* in responding to unplanned opportunities and its influence on the individual's tolerance for unpleasant outcomes. Compassion, the results show also fosters the formation of alliances. Similarly, we show how through *pluriactivity*, the entrepreneur exploits emergent opportunities through starting and running a number of enterprises to contend with the challenging economic environment. Pluriactivity which is defined as the earning of income from multiple sources (Ronning and Kolvereid, 2006) also increases the means available to the entrepreneur through expansion of network contacts/resources. Additionally, pluriactivity influences the tolerance for unpleasant outcomes as the different income streams assuage the feelings that loss prone units may be experiencing.

4.1 Complementation of indigenous knowledge with modern science

Modern science and indigenous knowledge constitute different paths to knowledge. Indigenous knowledge refers to “a systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and an intimate understanding of the environment in a given culture” (Warren and Rajasekaran, 1993), while modern science includes the building and organizing of knowledge in the form of testable explanations and predictions about the universe (Wilson, 1999). Given the complexity of the world's problems, they may not be consistently solved with singular, mechanistic, science-centered solutions. Sustainable entrepreneurs tend to develop relationships with customers and other strategic partners to arrive at innovative value propositions aimed at changing industry norms and social beliefs (Gasbarro, Rizzi and Frey, 2018). We therefore propose that, the integration of a diverse knowledge set is necessary to cater for cultural and contextual issues related to these problems.

The data showed that when the entrepreneur engages partners in the local community or in the scientific community they complement indigenous knowledge with modern science, which leads to the identification of opportunities. An example is *Tuma* who set up his firm in an area where the locals derive a livelihood from hunting as the area is not a wildlife protected area. Having grown up in this area, he understood the risk of over-hunting and destruction of the animal population and introduced a different approach where rather than hunt to kill animals, the locals would take tourists through their hunting routine and get paid for this as a service. By integrating the local hunting customs and food preparation with his modern conservation knowledge that entails marketing the area as an authentic tourism destination he is able to create a sustainable entrepreneurship opportunity.

This integration of knowledge has been identified as an appropriate approach to addressing ecological challenges in vulnerable locations (Harrison, Rybråten, and Aas, 2018) and as a means to tolerate, absorb, cope with and adjust to threats (Bohensky, and Maru, 2011).

Based on effectuation theory, the hybridized knowledge so formed constitutes a part of the means that change the product or service as the venture develops. The hybridization of knowledge demonstrates how dormant local resources may be reclaimed or revitalized in pursuit of entrepreneurial opportunities. The following quote shows how *Bira* used indigenous knowledge of weaving papyrus mats mixed with modern science to achieve her aim:

“To make artifacts from modern plastic straws, I depend on the weaving knowledge that is common place in my local customs... before the straws can be weaved they need to be flattened. To achieve this we use modern machines to heat and straighten the straws.” - *Bira*

Further to this, hybridization of knowledge helps in exploiting contingencies as the nature of the problems that sustainable entrepreneurship seeks to resolve are intractable. The nature of the problems tend to be context specific with cultural implications. A top-down approach is therefore not appropriate and there is a need to be flexible with goals and solutions. Flexibility in adopting a hybrid approach enables acceptance and ownership by the community. The following quote from *Kato* demonstrates how hybridization of knowledge facilitates the response to unplanned opportunities:

Our sanitary pad was initially developed in response to a call for an affordable feminine hygiene product. It was a requirement that we make the product using locally available materials. I first experimented with banana fibre, water hyacinth, elephant grass and other local vegetation that I knew were used by the locals for different purposes. These had low absorbent capacity, required longer processing and were not available in required quantities. I finally settled on papyrus because it's a good natural absorbent, grows abundantly and is very easy to process. I then developed modern manually operated machines to dry, crush and process the papyrus into a thick paste. - *Kato*

Complementing of indigenous knowledge with modern science occurs because sustainable entrepreneurs tend to take on seemingly intractable problems where uni-dimensional solutions are inappropriate. To tackle these problems they embrace the unexpected (Blauth, Mauer and Brettel, 2014) through relying on who they are and what they know, allowing goals and solutions to emerge.

The hybridization of knowledge was made possible by the training in modern science that the respondents had received. The respondents had advanced training in a number of fields including engineering, tourism and renewable energy. The respondents also enjoyed the benefit of possessing the indigenous knowledge having grown-up or lived in the affected area. The

resultant knowledge constitutes the means that the effectuator depends on. Further to this the entrepreneur uses this complementarity to exploit contingencies as they arise devising solutions that are based on modern science but grounded in local practices.

The outcomes of complementing these knowledge strands included accessible low tech solutions. In this regard, the artifacts tended to be affordable for the locals, as is the case with sanitary pads. Prior to the development of this sanitary pad, the price of sanitary towels on the market was prohibitive for many of the locals. Through use of readily available papyrus reeds, along with waste paper, a low-cost solution was developed. Additionally there was a demonstrated improvement in performance of the solution when a mix of indigenous and modern science were combined. This is demonstrated in the cooking stove where using experiential knowledge gained from living in the locale along with renewable energy training, a more efficient cook stove was developed. Furthermore, there was also increased acceptance of the solution. *Tuma's* knowledge of the way of life of the people in the community along with his university degree in tourism enabled him to understand local needs and devise a service that was acceptable to the community.

Sustainable entrepreneurship provides an interesting context to study the complementing of indigenous knowledge with modern science, because the problems sustainable entrepreneurship seeks to solve are multi-faceted and complex and this requires an unorthodox approach. Within the context of sustainable entrepreneurship, complementing indigenous knowledge with modern science leads to the creation of products/services that serve the local community and the indigenous knowledge holders.

4.2 Compassion

What distinguishes sustainable entrepreneurs is the strong connection between their business and personal passions and values (Silajdžić et al., 2015). Compassion is a powerful emotion that enables the entrepreneur move beyond understanding and empathizing with partners to action. It arises when individuals become aware of environmental failures, whether at the personal or organizational level, which stimulates an emotional response aimed at mitigating the harm caused by these failures (Robina-Ramirez et al., 2020). In this study, compassion was identified as; a bridge between the means and action in effectuation, exerting influence in the formation of partnerships and supporting the sustenance of the entrepreneur's response to unexpected events.

Compassion was a key practice in enabling the creation of alliances as it facilitated the interactions that resulted in actual commitments. It was shown to encourage individuals to search for solutions that promise collective gains rather than cater to singular economic interests. The emotional connection between the respondents and the community influenced their actions in favor of the beneficiaries. Take the example of *Kato* who felt 'sorry' for the millions of girls who were forced to miss school because they could not afford sanitary towels. In fact *Kato* further stated that he was hesitant to sell his patent to Unilever because he was worried that the objective of making the pads affordable would be eclipsed by the profit motive to the detriment of the girls he initially sought to help. Compassion therefore promoted connections between the respondents and the beneficiaries.

In relation to the effectual principle of affordable loss, compassion may also influence the amount of resources the entrepreneur will commit to the venture. It has been stated that compassion motivates actions to alleviate others' suffering even at a cost to oneself (Batson

and Shaw, 1991). An understanding of the need, urgency and pain facing beneficiaries will increase the tolerance for costs associated with the pursuit of more satisfactory results. This is observed in *Subi's* determination to solve a functional issue with the stove that involved the need to gently fan the ignited stones to encourage the embers to glow. Rather than a focus on expected financial return the respondent's interest was based on a broad range of criteria that included social and environmental concerns.

Having developed the stove we realized that we needed a mechanism to fan the stones. Manual fanning was the cheaper option but I dismissed that idea because I did not want the women to suffer with such a labor intensive activity. We then considered using a motor driven by power from the mains, but that too would not be helpful during electricity black-outs. It was then that we worked towards the development of the solar fan option.

From the above we observe that the respondent declined the easier and cheaper options in favor of the more complex and appropriate choice which was made with consideration of the wellbeing of the users.

In another effectual scenario, compassion influenced the exploitation of contingencies by sustaining the entrepreneur's response to unexpected events.

This is because compassion causes greater receptivity to diverse information, which facilitates recombination of new ideas or approaches for solving problems.

An example from the data is drawn from *Kato*:

When Katopads was developed the plan was to sell the product directly to the government of Uganda to ensure that it reaches as many poor girls as possible. However this did not succeed as they were informed by government officials of the lack of funds. We then opted to sell directly to the public. Reaching distant rural areas was a big task and unfortunately, the poor that the pads were designed for could not afford. We then accepted to enter a partnership with UNHCR who sought to buy the product for refugees on condition we setup a factory in the refugee camps. With the revenues from UNHCR we have continued to market the product to the public and get it on supermarket shelves. - *Kato*

The above shows the respondent encountering and surmounting a number of challenges driven by his emotional connection with understanding the plight of the girls.

Compassion bolsters this trial and error approach by providing immediacy to the issue and driving the individual. Previous research has shown that compassion increases willingness to continue in the face of negative feedback (Meglino and Korsgaard, 2004).

The following quote shows how the emotional connection to the community enabled repeated attempts despite failure.

“I used to straighten the used drinking straws manually but as the volume increased I looked for a machine. I felt that we were not removing enough used straws to improve the area and protect the children who were getting sick. I also wanted more unemployed women to get involved in the weaving but straightening the straws was a challenge. I engaged a young fabricator at a trade show. The machine he made worked well but for a short time and so the volume of straws we collected did not change. Then I got the Uganda Export Promotion Board to finance an Indian company to make a machine. It worked but for a short time too and so we were not able to get many more women involved. I have recently received a machine from a US NGO but it too is inadequate and yet the problems associated with straw disposal still exist.” *Bira*

Compassion enables one to get a deeper understanding of the vulnerable circumstances others face (Dutton et al., 2006; Frost et al., 2000). This aligns with the means dimension of effectuation and is captured in the following quote:

I am a woman. I know what it is like to walk long distances looking for firewood. - *Subi*

This identification with the plight of the suffering acts as a spark for action.

I could not accept that (action of physically fanning the stones). That would mean more work for that woman in the kitchen. - *Subi*

Compassion provides the impetus, enhances dedication and facilitates the collaboration with partners in the undertaking. Therefore, it acts as a bridge between the entrepreneur's means and the ends so sought.

4.3 Pluriactivity

Another significant way in which the respondents acted to create new market artifacts in the form of a sustainable enterprise in an environment characterized by uncertainty and resource scarcity was through running multiple income generating activities. Explanations for its occurrence include the need to increase income, the chance to exploit emerging opportunities, the desire to spread risk and ultimately the desire to survive failure.

Pluriactivity is prevalent in the sub-Saharan Africa context (Langevang, Namatovu and Dawa, 2012; Langevang and Namatovu, 2019) where a number of contextual explanations have been advanced for its occurrence including the need to grow the individual's returns, flexibility of the regulatory regime and the prevalence of successful pluriactive entrepreneurs as role models.

In this study, pluriactivity manifests itself in the form of a business with multiple income streams for example *Apio* who owns a firm that makes energy saving stoves, another that constructs chicken houses and another involved in publishing. Pluriactivity also manifests itself in the form of addressing multi-faceted problems. Take the example of *Kato* who seeks to provide sanitary towels to school going girls. Relatedly, he is involved in the construction of latrines and sanitary towel incinerators for schools.

Within the theory of effectuation, any specific firm is only one of many possible viable and contingent combinations of a given set of means with which the entrepreneur begins (Sarasvathy, 2001). In response to unplanned opportunities the entrepreneur may create firms in disparate industries to take advantage of emerging opportunities. This is shown in the quote below from *Tuma*, founder of a sustainable tourism business, proprietor of a consultancy firm and a University lecturer.

Through my tourism consultancy work, I encountered instances where there were opportunities to exploit the area's tourism potential without disrupting the locals' life. I therefore started a firm to offer sustainable tourism products. - *Tuma*

The unplanned opportunities result in the need for blended value generation as the grand challenges sustainable entrepreneurship seeks to address deserve an integrated approach.

I was involved in building latrines for schools. However a challenge the schools were facing was that they filled up very fast. It was discovered that the sanitary pads that were being used, absorbed a lot of moisture and expanded causing the filling up. As we were contemplating solutions to this, the opportunity to design an affordable sanitary towel to address the issue of absenteeism of school going girls was presented to me. – *Kato*

Within effectuation theory the creation of another firm represents an increase in available means through growth of networks of contacts and expansion of resources.

When I added the sanitary pads manufacturing to my portfolio, not only was I able to market sanitary pads to clients such as the City Council who I built latrines for, but I was able to market the latrine building business to sanitary pads customers. - *Kato*

Ultimately this expansion of means through pluriactivity results in the development and exploitation of synergies between the firms in an effort to control the future.

The respondents stated that they engaged in pluriactivity to increase their likelihood of success in business. Related to the effectual principle of affordable loss, the respondents committed limited resources to a single firm as they explored emerging opportunities. This is shown in the quote below as *Tuma* explains how he started his tourism business using resources from his consultancy firm:

“To start tourism business, we invested \$2,000. We had just concluded a consultancy job and this was not a lot of money for me. We spent the money for product development, engaging the communities and engaging a few suppliers. We were feeling out the market, looking for ideas and contacts.” *Tuma*

Affordable loss entails imagining possible courses of action with unpredictable consequences and taking action based on the loss the entrepreneur is willing to bear (Dew, Read, Sarasvathy, and Wiltbank, 2008).

The quote above shows that while starting the second firm the respondent elected to invest minimally and effect control

Pluriactivity entails the constant identification and exploitation of opportunities along with the development of synergies across the formed ventures. While pluriactivity has not been widely researched within the context of effectuation, in our findings it features as a source of means, basis for affordable loss and an approach to contending with contingencies. In essence, it is a crucial practice in re-imagining the outcomes, expanding resources and exerting control on the future.

Successful effectuators abandon unfruitful ventures in favour of others (Chandler et al., 2011), and leverage resources across multiple capabilities (Deligianni et al., 2017). Pluriactivity therefore allows firms to invest less time and fewer resources in activities with the aim of minimizing risk while embracing opportunities.

5.0 DISCUSSION AND CONCLUSION

This paper has examined the dynamics of effectuation in sustainable entrepreneurship in a developing country setting. This qualitative study shows the appropriateness of effectuation as a lens to understand how sustainable entrepreneurs in developing countries seek economic benefits while catering for social and environmental concerns. We found that the practices of utilizing available means, affordable loss, formation of alliances and exploitation of contingencies noted in the existing effectuation literature are pervasive. Additionally the study

uncovered three distinct practices of effectuation: ‘complementation of indigenous knowledge with modern science’, ‘compassion’ and ‘pluriactivity’.

These novel practices are prominent because of the conditions occasioned by weak institutions, fragile ecosystems, peculiarity of the social challenges and enhanced resource constraints.

The rapidly growing population, high unemployment rates and poor economic performance creates a situation of scarcity without recourse to any safety nets. The uncertainty occasioned by these factors make it hard to employ predictive approaches to entrepreneurship.

The study shows that effectuation was employed in the face of these challenges. This resonates with previous studies that proposed that effectuation is most likely to occur under conditions of adversity (Shirokova et al., 2020). In contrast to previous studies, we emphasize the multifaceted nature of crises that impact not only economic resources, but also social and environmental resources. Therefore, effectuation in this context requires catering to a more diverse group of stakeholders than one would typically expect from a profit-driven firm. This approach encourages greater stakeholder participation and engagement with institutional structures, which can invigorate decision-making and have positive consequences for sustainable entrepreneurs.

The *complementation of indigenous knowledge with modern science* was prevalent among the sustainable entrepreneurs interviewed. Research has shown that the management of complexity and uncertainty in social-ecological systems can benefit when diverse types of knowledge are combined (Folke et al., 2005). The balancing of man’s needs with the wellbeing of the environment is a grand challenge that the world is contending with. One of the recommended approaches to address the world’s grand challenges relating to society and the environment is the need to incorporate the socio-cultural values and interests of the local population in the proposed technological solutions (Billiot et al., 2019). This has resulted in

the combination of modern scientific knowledge with locally available resources and approaches (Smith et al., 2014). The current finding is corroborated by the literature, which has demonstrated that sustainable entrepreneurship is comprised of key dimensions such as deeper levels of knowledge pertaining to values and worldviews (Biberhofer et al., 2019). The result of this approach not only yields more efficient outcomes but also increases the acceptability of the solutions.

Recent research has stated that effectuation theory ignores the cultural positioning of entrepreneurs, yet this affects the practices and interactions that interest effectuation researchers (Kitching and Rouse, 2020). The complementation of knowledge constitutes the means that the effectuator relies on to instantiate the process. Solutions to the problem are based on what the respondents knew about the problem. The set of these means change as the entrepreneur taps into modern scientific knowledge to buttress their indigenous knowledge. The complementation of indigenous knowledge with modern science therefore represented access to divergent information which facilitated recombination of new ideas.

From the effectual standpoint, the complementation of local knowledge and modern science is also used to exploit contingencies as they arise. These contingencies which arise due to interaction between the entrepreneur and partners may be sparked by cultural mismatches or inapplicability of modern scientific approaches. The contingencies tend to cancel out the outcomes of existing knowledge (Arend et al., 2015). The complementation of indigenous knowledge and modern science may surmount these contingencies and lead to the realization of efficiency and acceptance of the implemented solution. The finding is important as it advances our understanding of the affective factors that contribute to effectuation theory.

Entrepreneurs who adopt a sustainable business model seek to achieve two complementary objectives: first, to generate profits and create economic value; second, to address societal problems by implementing environmentally and socially responsible practices (Shahid et al., 2023). *Compassion* was prevalent among the respondents and it served as a driver of the interactions and a motivator of action. As the management literature has grown to embrace firms with objectives beyond profit making, compassion has emerged as a formidable explanatory variable within firms and between firms and stakeholders. Because compassion motivates entrepreneurs to pursue goals beyond individual interests it enhances the willingness to incorporate other people's ideas in the process. Admittedly, previous research has demonstrated compassion's role as a predictor of sustainable decisions in entrepreneurship (Engel, Ramesh and Steiner, 2020). Altruism a related and outcome construct of compassion construct has been identified to strengthen attitudes towards sustainable entrepreneurship (Thelken and de Jong, 2020). In essence, through feeling and responding to another person's needs, compassion motivates entrepreneurs to pursue broad gains as opposed to singular interests.

As a result of compassion a relationship develops in which the individual is more readily available to appreciate the other's context and to feel the other's experience of suffering in a similar way (Nussbaum, 1996), which strengthens shared values of interconnectedness (Atkins and Parker, 2012). Related to formation of partnerships in effectuation theory, compassion creates a connection between the entrepreneur and the suffering communities.

Consideration of the plight of others and embracing the views of others may result in the co-creation of opportunities. This is supported by research that states that compassion enables greater acceptance of diverse information, which facilitates development of new approaches for solving problems (Miller et al., 2012).

The respondents developed compassion for the beneficiary community having either lived in the community or had a chance of engaging with community members to develop an understanding of the beneficiaries' plight. On the one hand, compassion was expressed to benefit others so that it could ultimately benefit the respondent. On the other hand compassion was exhibited so that it wholly benefitted the others. Compassion therefore influences the nature and extent of interaction with stakeholders and how the entrepreneur responds to the challenges encountered.

Related to the effectual principle of overcoming contingencies, compassion helps in crafting of acts to mitigate the vulnerability and provides the motivation to respond practically to a situation another person is facing. Previous research has highlighted the role of compassion in inspiring action and sustaining action to mitigate the suffering of vulnerable people (Batson and Shaw, 1991). Compassion increases commitment to a task facilitating a trial and error approach to problem solving.

Compassion encourages one to explore the nature of pain others are experiencing as well as its causes. (Miller et al., 2012) which in-turn motivates actions to alleviate others' suffering even at a cost to oneself (Batson and Shaw, 1991). This focus on others increases the sense of purpose and meaning while making the individual less pre-occupied with the possible downside.

This relates to the effectual principle of affordable loss which is a subjective assessment of the entrepreneur's acceptance of less than ideal results.

In the realm of sustainable entrepreneurship, the concept of affordable loss extends beyond economic loss to encompass uncertainty pertaining to social and environmental factors. Consequently, the criterion for affordable loss is further complicated to account for trade-offs

among these diverse objectives. Based on a commitment mechanism (Dew et al., 2009), affordable loss relies on emotions as a commitment device that enables individuals to behave consistently over time (Nesse, 2003). Emotions serve as a motivator for action or as a deterrent (Elster, 2000), thereby facilitating commitment, a phenomenon that is particularly pronounced in sustainable entrepreneurship (Ploum et al., 2018). Our study suggests that compassion plays a critical role in managing these trade-offs by fostering commitment to broader goals. The study's findings on the role of compassion are significant as they enhance the affective basis for theorizing in effectuation research.

The uncertainty in the environment resulted in highly emergent revenue generation which depended in part on a number of income generation activities. *Pluriactivity* emerged as a ubiquitous practice among the respondents. The contingencies of rising financial needs, increasing environmental destruction and evolving social problems led the respondents to engage in a range of income-generating activities in addition to their primary business venture which collectively contribute to their overall economic, environmental and social success. The existence of a portfolio suggests the informal sharing of resources similar to strategic alliances that typify effectuation. Previous research has suggested that in effectuation any given firm is part of the means that the entrepreneur begins with (Sarasvathy, 2001). As a result, the entrepreneur can build different types of firms in completely disparate industries.

Pluriactivity is considered a deliberate strategy to stretch and make the most of scarce resources (Langevang and Namatovu, 2019). Indeed previous research has shown a bias towards a promotion focus as a sustainable entrepreneurial firm pursues its growth goals (Fischer, Mauer and Brettel, 2017). The broad mandate of firms involved in sustainable entrepreneurship tends to increase the level of adversity they contend with. However this broad mandate also exposes

these firms to opportunities to boost incomes that may not have been possible if they had pursued the exploitation of only economic opportunities. Consequently, the practice of concurrently engaging in a number of income generating activities may be regarded as a strategy to facilitate business entry (Carter, Tagg and Dimitratos, 2004).

Sustainable entrepreneurship seeks to address diverse objectives which involves a multitude of stakeholders and demands an interdisciplinary approach. In such scenarios the trial and error approach that typifies effectuation is bound to yield numerous artifacts such as firms. In the interest of improving impact and unaware of the ultimate aspirations, the entrepreneur may develop these artifacts further as separate entities. Subsequent to the operationalization of a number of firms, the entrepreneur is able to enjoy an increase in revenue and therefore contend with resource scarcity. Further to this the entrepreneur is able to tolerate less than acceptable results from a particular firm when other firms are meeting his aspirations. Therefore, through the lens of effectuation theory, pluriactivity is manifest in increasing the means available to the entrepreneur, exploiting emergent opportunities and influencing the entrepreneur's reaction to hardships.

The concurrent operation of a number of income generating activities increased the means available to the respondents. Previous research has shown that multiple incomes are a means to ensure financial survival (Carter, Tagg and Dimitratos, 2004). Additional income, greater access to a diverse network of customers and suppliers all improved access to resources and abilities of the respondents. Through inter-firm collaborations new knowledge is acquired and access to critical resources is made possible. Within the portfolio there is more frequent and higher quality interaction (Carter and Ram, 2003) which enables the exchange of valuable resources.

Engagement in multiple income generating activities is a long-term and relatively stable way to ensure business survival or expansion (Carter, Tagg and Dimitratos, 2004). It entails the identification and exploitation of synergies across the firms that can be used to address challenges that a single firm may not have been able to. Consequently, it may lead to the emergence of agile organizations that have the potential to quickly adjust to new market conditions and focus in order to strengthen their competitive advantage (Baert et al., 2016).

Running multiple ventures exposes the sustainable entrepreneur to greater risk. However spreading this risk across the portfolio makes failure in a single endeavour bearable. Accordingly, previous research has emphasized the importance of multiple incomes in explaining the continuation of apparently unprofitable enterprises (Carter, Tagg and Dimitratos, 2004). The decision to engage in these enterprises is driven in part by the low initial investment and the ability to share available resources among the firms within the portfolio. Taken together these criteria obfuscate the need for a careful assessment of rates of return. Instead the entrepreneur chooses to pursue additional income streams that he subjectively assesses. Consequently, by providing supplementary income, underperformance by part of the portfolio may be tolerated.

In summary, our empirical evidence suggests three refinements to effectuation theory within this particular context. First, we propose that the “complementation of indigenous knowledge with modern science” serves both as a means and a way to foster the exploitation of contingencies. Secondly, we also propose that “compassion” can serve as a response to unplanned opportunities, influence an individual's tolerance for unpleasant outcomes, and

foster the formation of alliances. Thirdly, we propose that “pluriactivity” can be used to exploit emergent opportunities, increase the available means, and influence the tolerance for unpleasant outcomes. We do not believe our findings in this specific domain undermine or lessen the validity of effectuation theory, rather we suggest that our findings offer a refinement to the ideas of effectuation by providing a special theory of effectuation of greater relevance for the sustainable entrepreneurship context.

CONCLUSION

In conclusion, this study has delved into the dynamics of effectuation in the context of sustainable entrepreneurship in a developing country setting. Through a qualitative approach, we have illuminated the applicability of effectuation as a valuable framework for understanding how entrepreneurs in such settings navigate the complexities of balancing economic gains with social and environmental responsibilities.

The key findings of this study point to the prevalence of effectuation principles such as utilizing available means, accepting affordable losses, forming alliances, and exploiting contingencies. However, what makes this study particularly significant is its identification of three distinct practices of effectuation: 'complementation of indigenous knowledge with modern science,' 'compassion,' and 'pluriactivity.' These practices have emerged as essential strategies in a context characterized by weak institutions, fragile ecosystems, and resource constraints.

The study highlights that sustainable entrepreneurs in developing countries often face significant adversity due to factors like rapid population growth, high unemployment rates, and economic fragility. In such challenging conditions, the predictive approaches commonly associated with entrepreneurship may not be practical. Effectuation, with its focus on

leveraging existing resources and responding opportunistically to contingencies, proves to be a suitable approach.

The 'complementation of indigenous knowledge with modern science' strategy is particularly intriguing as it underscores the value of combining diverse types of knowledge to address complex problems related to society and the environment. By integrating local wisdom with modern scientific expertise, entrepreneurs not only achieve more efficient outcomes but also ensure the acceptability of their solutions.

Compassion, a fundamental human quality, is found to be a significant motivator for sustainable entrepreneurs in this context. It goes beyond the pursuit of individual interests and instead drives them to consider broader societal needs. Compassion fosters relationships, enhances the acceptance of diverse information, and encourages the co-creation of opportunities. It also plays a vital role in responding practically to the challenges faced by vulnerable communities.

Finally, 'pluriactivity' emerges as a crucial strategy, allowing entrepreneurs to engage in multiple income-generating activities alongside their primary ventures. This not only spreads risk but also enhances resource access and overall business success. Pluriactivity is particularly beneficial in the context of sustainable entrepreneurship where entrepreneurs often pursue diverse objectives involving numerous stakeholders.

In summary, the study's findings offer valuable refinements to effectuation theory specific to the sustainable entrepreneurship context in developing countries. These refinements include the importance of 'complementation of indigenous knowledge with modern science,' the role

of 'compassion' as a motivator and relationship builder, and the strategy of 'pluriactivity' for resource diversification and risk reduction. While these findings provide greater insights into how effectuation principles manifest in such contexts, they do not diminish the relevance or validity of effectuation theory. Instead, they contribute to a more nuanced understanding of the theory's application in diverse entrepreneurial settings.

This study's outcomes carry implications for policymakers, practitioners, and researchers interested in sustainable entrepreneurship and its role in addressing societal and environmental challenges, particularly in the context of developing countries.

6.0 LIMITATIONS

Field study data collection in this type of study is normally conducted retrospectively and is therefore subject to recall biases. Further to this, the responses are based on self-reporting, raising the possibility of a potential social desirability response bias which is commonplace in developing countries. To mitigate these limitations additional extensive use of historical materials through the document review was undertaken. The triangulation process that entailed the reliance on multiple data points served as a tool to limit the effect of these limitations.

7.0 IMPLICATIONS

The study was undertaken in a sub-Saharan African setting seeking insights into how entrepreneurs use effectuation to realize sustainable entrepreneurship.

Previous research has grown from defining effectuation to specifying the theory's constructs. Effectuation has been used to explain a growing number of phenomena and entrepreneurial outcomes. However, these studies do not go beyond addressing the cognitive influences of effectuation. Correspondingly, recent critiques of the theory have revealed that effectuation

research tends to ignore context (Arend, Saroogi and Burkemper, 2015; Kitching and Rouse, 2020) providing a partial and contestable explanation of a number of entrepreneurial outcomes. The inadequacies of effectuation are a reflection of some of the criteria specific to theorizing about entrepreneurship (Arend et al., 2015). This study tackles these inadequacies by incorporating contextual and emotional explanations in effectuation theory. The study's findings extend theorisation in effectuation research to move beyond the focus on the cognitive factors to include contextual and emotional factors that the study shows to bear tremendous influence.

Theoretical implications

The empirical findings of this study hold significant theoretical implications for both the field of entrepreneurship and specifically the growing domain of sustainable entrepreneurship. Through the lens of effectuation, this research advances our understanding of how entrepreneurs utilize specific practices to realize sustainable entrepreneurship, particularly in resource-constrained settings, such as sub-Saharan Africa. Following are the theoretical implications of this study:

The study contributes to the ongoing enrichment of effectuation theory as the findings underscore the adaptability of effectuation to extremely resource-constrained environments, providing nuanced insights into how entrepreneurs employ effectual principles. The study also delves into the finer dynamics of how effectuation is employed in the context of sustainable entrepreneurship in underdeveloped regions.

The study's empirical investigation identified three pervasive practices within the effectuation framework that are essential for understanding sustainable entrepreneurship in underdeveloped contexts:

Firstly, complementation of indigenous knowledge with modern science reinforces the importance of blending different types of knowledge and socio-cultural values, enhancing the efficiency and acceptability of solutions. Secondly compassion encourages entrepreneurs to incorporate diverse viewpoints and co-create opportunities, making it a powerful driver of sustainable entrepreneurship. Thirdly, pluriactivity increases the means available to entrepreneurs, helps them exploit emerging opportunities, and influences their tolerance for unfavorable outcomes.

In line with these findings, the study contributes to entrepreneurship theory by suggesting the integration of cognitive and affective dimensions within the effectuation framework. By emphasizing the role of compassion and its impact on motivation, empathy, and shared values, we broaden the theoretical basis for effectuation research, particularly within the context of sustainable entrepreneurship.

The study further emphasizes the importance of considering the contextual factors that affect how entrepreneurs employ effectuation. In resource-constrained and complex environments, the meaning and application of effectual principles may differ from more conventional contexts. This highlights the need to adapt the understanding of effectuation to account for the nuances of specific contexts.

This study offers critical insights into how effectuation functions within the unique context of sustainable entrepreneurship in underdeveloped regions. By identifying these pervasive practices and their integration with effectuation theory, the research contributes to both entrepreneurship theory and the emerging field of sustainable entrepreneurship, offering theoretical refinements and context-specific insights.

Practical implications

One of the practical implications of this study is that it encourages opportunities for co-creation between locals and the entrepreneur through participation in local networks to facilitate access and understanding of indigenous approaches to existing problems.

Another practical implications of this study is that it recognizes multiple revenue sources as a strategy to optimize capabilities, a process to identify opportunities and an avenue to fulfil the multiple objectives that describe sustainable entrepreneurship.

One other practical implication of this study is that it highlights that entrepreneurial training should include a focus on emotions to foster high quality relationships in order to promote the wellbeing of the stakeholders.

In conclusion, this study underscores the importance of co-creation, diversification of revenue sources, and the role of emotional awareness and interpersonal skills in entrepreneurial endeavors. By fostering collaboration with local communities, exploring diverse income streams, and prioritizing emotional awareness in training, entrepreneurs can enhance their capacity for sustainable, socially responsible, and economically viable ventures that benefit both their stakeholders and the broader society.

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APPENDICES

Table 1: Description of cases

CASE	Entrepreneur	Nature of Business	Number of Employees	Years in Operation	Main outputs	Business Category
Tuma Africa Ltd Case 1	Tuma	Sustainable tourism firm	6	2	Tours	Sustainable
BWI Case 2	Bira	Maker of fashion and household accessories from used drinking straws	42	6	Mats, shoes, belts	Sustainable
ABC Renewable Energy Case 3	Apio	Manufacturer of energy efficient cooking stoves and briquettes	4	7	Energy saving stoves, briquettes	Sustainable
SubiStove Case 4	Subi	Manufacturer of solar stoves	15	5	Solar stoves, chicken brooders, ovens	Sustainable
Katopads Case 5	Kato	Manufacturer of biodegradable affordable sanitary towels	242	6	Sanitary pads, incinerators	Sustainable

Source: Authors own work

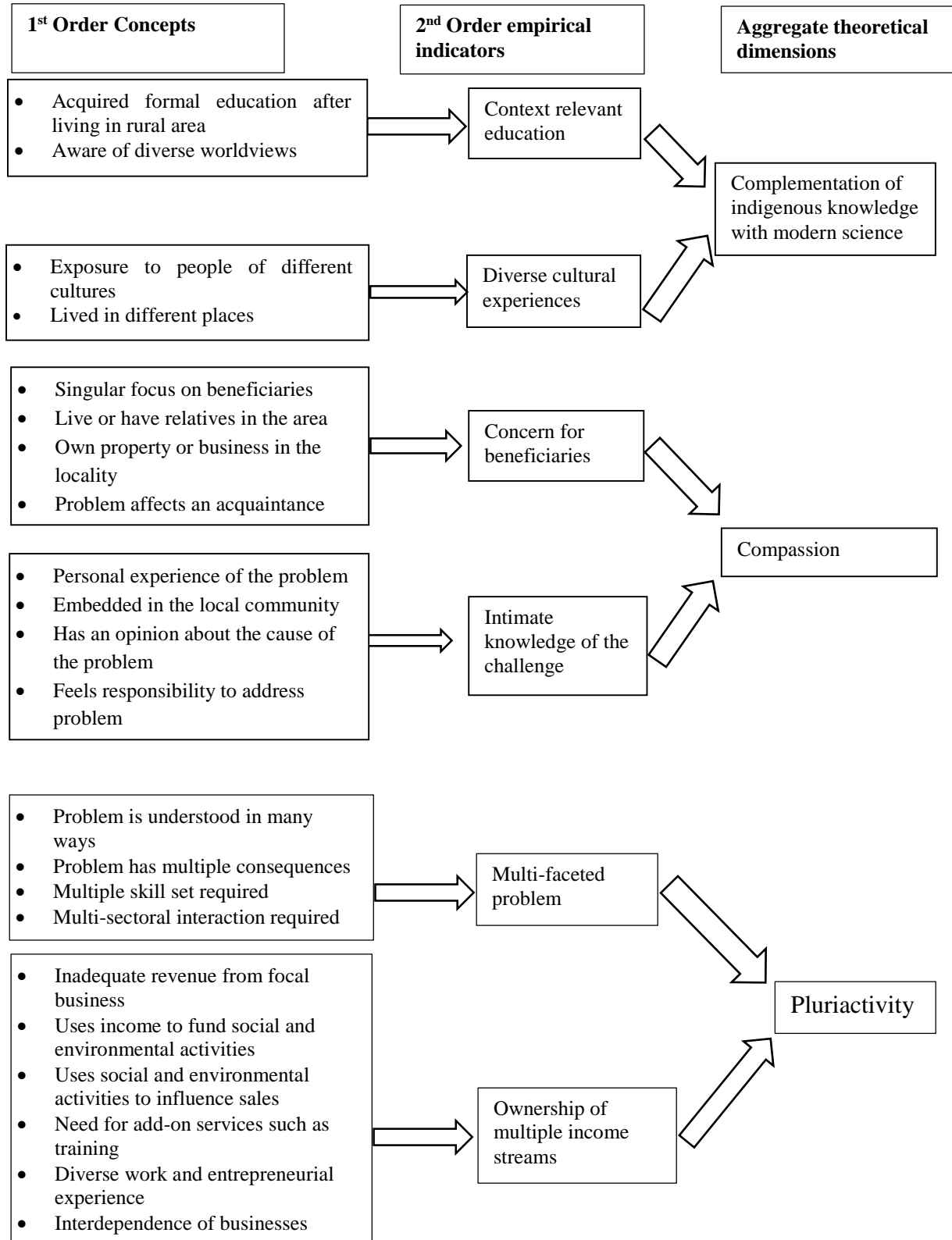
Table 2: Data table

	No. of interviews	Respondents	No. of pages of transcripts	Documents	Sources
Case 1	5	Entrepreneur	28	Promotional material	Employee
		Employee	3	Awards, BBC news article	Entrepreneur
		Customer	2	Memorandum of understanding	Entrepreneur
		Supplier	2	Certificate of registration, patent	Entrepreneur
		Community resident	2	Newspaper clippings	Entrepreneur
				Website pages	Internet
Case 2	5	Entrepreneur	28	Awards, patent	Entrepreneur
		Employee	2	Website pages	Internet
		Customer	3	CNN article	Internet
		Supplier	3	Newspaper articles	Newspaper
		Community resident	2	Promotional flyers	Employee
Case 3	5	Entrepreneur	13	Website	Internet
		Employee	3	Newspaper articles	Newspaper

	No. of interviews	Respondents	No. of pages of transcripts	Documents	Sources
		Customer	3	Agreement	Entrepreneur
		Supplier	2	Awards	Entrepreneur
		Community resident	2	Promotional flyers	Employee
Case 4	5	Entrepreneur	22	Newspaper clippings	Newspaper
		Employee	2	Memorandum of understanding	Entrepreneur
		Customer	3	Website pages	Internet
		Supplier	3	Promotional flyers	Entrepreneur
		Community resident	2	Business plan	Entrepreneur
Case 5	5	Entrepreneur	14	Promotional flyers	Entrepreneur
		Employee	3	Website	Internet
		Customer	3	Photos	Entrepreneur
		Supplier	2	Newspaper article	Internet
		Community resident	3	Business plan, sales agreement	Entrepreneur

Source: Authors own work

Figure 1: Data Structure



Source: Authors own work

Description of cases

Subistove

The Subistove is a cooking stove that uses volcanic stones as cooking fuel. Having grown up in rural Uganda where she had to walk long distances to gather firewood, Subi, the founder of Subistove relied on local knowledge regarding the use of these stones, her experience of the village woman's hardships and her education in renewable energy to develop this stove. The stove is heated using volcanic stones. However, these stones need to be fanned for the fire to burn. Initially her team suggested that the stove be manually fanned. Out of consideration for the work load of the rural woman she rejected this idea because she sought to liberate the village woman from the laborious activity associated with cooking. Another suggestion was that the stones be fanned by a motor drawing power from the main power grid. She again rejected this idea because of the unstable power supply in Uganda and the limited access to grid power by a large part of the population. She then settled for a solar solution, in which a motor connected to a fan was driven by solar power. She teamed up with engineers and designers in the UK and China to develop the stove which has since been improved as feedback is retrieved from customers. Today the stove has a USB charging port and a radio. A major advantage of using this stove is that there are hardly any smoke emissions that would be harmful to the cooks as was the case when firewood or charcoal were used. Overall the stove has contributed to the natural environment by reducing deforestation. A social benefit of the stove is that it does not emit smoke as was the case for charcoal and firewood cooking methods. Additionally, the ease of operating the stove frees up time for the female users to spend more time with their families and safely cook indoors. Further to this, the company works with a number of women groups, training their members in the installation of stoves and production of the volcanic rocks.

Beyond selling the Subistove and stones, Subi is also involved in a number of other businesses. She is involved in the importation and sale of consumer electronics and communication equipment and computer software.

Katopads

KatoPads are a low-cost sanitary pad made from papyrus and recycled waste paper. Kato developed this pad in response to a USAID grant call. School absenteeism was very high for female students due to a lack of sanitary towels. While the urban supermarkets stocked up on the imported products they were expensive for the poor families. Kato, a university Professor had been designing latrines and sanitary towel incinerators for institutions. Driven by the possibility to reduce school absenteeism for young girls, he was persuaded by a contact in USAID to attend a meeting where the call for a sanitary towel that would cost less than 4 US Cents, be made of local materials and employ locals in the manufacture was made.

Kato successfully designed the Katopad that met the set conditions. He got permission from the Capital City Authority to harvest papyrus reeds in a sustainable way from the swamps near Lake Victoria. He set up his factory in a low-cost neighborhood and employed a number of urban poor women in the neighboring slums to harvest the papyrus. Makerere University his employer offered him all the waste paper that he used as part of the pad. He also got additional paper from the diplomatic corps when a number of foreign missions agreed to his request. He packaged the product and began selling it in the supermarkets. However, he was not able to reach the rural poor through this distribution channel. Figuring that government would be an ideal partner in getting his product to poor village families, he tried to market the product to the government in vain. Thankfully, UNHCR declared interest in purchasing pads for refugees. Having a sizeable budget for the importation of sanitary towels the USAID offered to buy the Katopads on condition that Kato setup a production plant in the refugee camps and employed the refugees. He agreed to this and sold a lot of his pads to the UNHCR in this way.

Kato hails from Buganda which is located on the shores of Lake Victoria where the papyrus reeds grow. Papyrus have been used for a number of purposes. In Buganda culture it was used to make mats, baskets, house ceilings. He was aware of the absorptive capacity of papyrus. He then used his mechanical engineering knowledge to develop machines to cut and process the papyrus reeds to achieve the texture and consistency adequate for the making of a sanitary pad.

Kato is involved in a number of other businesses. On the one hand he manufactures road pavers. He also has a firm that constructs latrines and sanitary towel incinerators, water tanks, cooking stoves and interlocking bricks. The firm is involved in training groups on how to process the papyrus reeds. Currently they are in partnership with a firm that chops and processes papyrus for them.

Tuma Africa Ltd

Tuma Africa Ltd is a sustainable tourism firm operating in Uganda. Their main activities are around the Mityana area in Central Uganda. The firm's mission is to "contribute to conservation of nature and culture while helping the needy to earn a living".

Tuma the founder has a strong educational and work background in the tourism sector which provided him a deep understanding of the workings of the industry. A holder of a PhD, he currently lives in the outskirts of the capital city and owns land in Mityana. He has had the opportunity to visit Rwanda's Ibyiwacu cultural village upon which he has bench-marked his firm's activities.

The area he hails from has high levels of poverty with few economic activities. Hunting of wild animals provides food and income from the sale of wild game meat. However, being it that this is not a wildlife protected area, the lack of regulation threatens the animal population.

To remedy this situation he has had to draw on his community organizing skills as well as his business acumen and conservation training. To implement his business model he devised a number of cooperative strategies. He entered into agreements with the area local leaders to discourage the hunting practice and embrace the tourism potential of the place. He conducted training and sensitization workshops for the locals in which he explained the potential of the area and the risks of their uncontrolled hunting practices. He also engaged with a friend of his to develop a professional website with tools to drive traffic to the site. Furthermore, he partnered with a number of industry players and policy makers to understand the market and feed new ideas to his business.

Tuma Africa Ltd engaged the community leaders and proposed a tourism model that entailed letting visitors come and witness their hunting skills and participate in the activities but on condition they do not make the kill. The tourists participate in the tracking of the animals and laying of non-lethal traps. At the end of a successful hunt, the trapped animals are freed. In return the tourists pay for the experience and buy local artifacts. In this way the locals earn more money than they would have earned from selling wild game meat and the animal gets to live providing the opportunity for future tourism.

To start this business, Tuma used \$2,000 that he had earned from his consultancy firm. He was not afraid of losing this money since it was a profit and was really his money.

Tuma says that he has had to engage with a number of stakeholders to further his business interests. "That is the model we use especially with employees and other people we work with. I will tell employees that I don't have a lot of money and I have to pay them so they have to be patient with me. They should be able to accept the little that we have but on the promise that should things get better there are also going to get more. So the bottom line was selling them the vision, the idea that we are moving in the right direction and things will get better."

To realize his business objectives he has tried a number of things that have not been successful. For example, at the start of the business he attempted to transport the tourists to the sites but the hiring of vehicles was very expensive and so he dropped the idea.

He is currently trying out new products after entering agreements with the tourism police. These include night tours and walks that may not have been possible without the security provided by his partners.

Tuma has a tourism degree, a Master of Business Administration degree and a PhD. For more than 10 years he has participated in the tourism industry as an employee, consultant and an advisor to a number of stake holders, including government, tour operators and hoteliers.

BWI

BWI is a small firm that deals in making products from used drinking straws. Bira the proprietor lives in a slum area where these straws used to be disposed of. After retirement from formal employment in the Central Bank she was struggling to make a living. In one of the neighborhood sanitation drives she intuitively picked a pile of straws. She took the straws home, bought a small amount of detergent and washed the straws. She had spent 500/= to buy the detergent, a small amount of money she was not bothered about losing. Up to this point she wasn't sure about what exactly she wanted to do with the straws. She then started weaving them into a mat. Weaving is part of her local culture and typically women tend to weave mats and baskets using papyrus reeds. While the practice is not as widespread because of the use of imported mats, a number of individuals continue to engage in this tradition. An individual passing by her place of abode admired her handiwork and booked the product. On finishing the mat it was bought at 7,000/=. A few days later she shared this story with an acquaintance who encouraged her to continue in this as a job. As she talked to a number of people, suggestions were forwarded including the making of earrings, belts and modification of shoes emerged. From then on she realized that she could do this as a business. She then made a number of products that she displayed at trade shows and through this she attracted the interest of a number of individuals and firms that sought to partner with her. Some offered her training, others machinery while others offered her access to international markets.

Bira observed that children in her neighborhood were using the dirty straws as play objects to drink water. She also observed that at the time the area had regular outbreaks of cholera and diarrhea which may have been transmitted to the children in this way. She then realized that ridding the environment of these straws would also set aside these health hazards. Further to this, there was a high level of unemployment mainly among the women in the area. Through engaging a number of her neighbors in the same exercise she realized that she could employ them and have others start their own enterprises. She is now happy to be employing 42 people mainly women.

In all her endeavours she says she has been trying a number of things, learning as she goes how to do the business and involving her community as suppliers and employees in her business. Today the area that she lives in is devoid of the drinking straws as she has agents that collect and supply her firm with the straws.

In her quest to improve her product she has had to experiment with a number of machines and partnerships. Developing a machine to straighten the straws has been a challenge. She has partnered with NGOs, government departments, universities and artisans to develop a workable solution. All this has been in vain. But with every failure she has learnt more and what a better machine should do. Bira has traveled to a number of countries show-casing her products, and canvassing for support to develop machinery. In these trips she has interacted with a number of people and adopted ideas that she has merged with her original skills to improve her products.

Revenues from BWI's straw products is small. To increase income, the firm is involved selling of Quail eggs that are known to have a number of medicinal benefits. She is also involved in training women groups around the country in the disposable straws business.

ABC RENEWABLE ENERGY

Apio is the founder and chief executive officer of ABC Ltd, a business that focuses on renewable energy technologies mainly concentrating on bio mass and solar energy. The firm which was founded in 2004 and formally registered in 2007 manufactures solar driers for small scale farmers and cookers and ovens for both households and institutions.

Apio is directly involved in the design aspects of the equipment. They also do modifications according to client specifications. Having grown up in the village she has experience with different traditional cooking techniques and cooking fuels and equipment. She uses this knowledge with her formal

education to create improved stoves. She has training in Industrial Ceramics. After her studies she worked for a company called Black Powers which was trying to improve the local cooking stoves. She was responsible for improving the liners of the stoves and constructing the kiln for firing the liners and carbonizing briquettes. Since then she has remained in the energy field where she has thrice received training from the government's Ministry of Energy and Mineral Development in the improvement of cooking stoves. When she joined YWCA she was also trained in energy, appropriate technology and the environment and she was taken to the island of Crete in Greece for further training for a year. Later GIZ the German Development organization also got involved when they wanted to develop a new stove that could fit the cultures of the Ugandan communities. She was one of the pioneers to be trained in the rocket and shielded stove technology. She then continued in the manufacture and improvement of these technologies and is able to modify them to the client's needs. They have reduced the amount of smoke and soot and are able to make them light faster and burn longer catering for the local foods that are in this setting.

While she entered this line of business because it was what she studied she also attributes her participation in this sector to fate given that she could have done so many other things and yet she continuously got opportunities to train and work in energy related establishments.

She attributes her starting this business to wanting to help the community. To this end she asked a number of community members to join her at the start of the business. Most declined, a few joined her but dropped off when there was no remuneration. She ended up with two gentlemen who agreed that extra effort was needed. Later one retired and she was left with the other who was instrumental in registering the firm. At the time she was still formally employed and provided the funds to facilitate the process. They continued their operations relying a lot on the good relationships they had with other people the ministry and development organizations. They received assistance in form of trainings, attended workshops and were implementing partners for projects.

Apio says that the products they sell today have changed greatly, the mechanisms and designs of the stoves, ovens and water heaters have changed to improve efficiency and meet client needs.

Apio believes that the partnerships she has struck along the way have been a main source of opportunities. Being a member of a number of organizations, local and regional has provided access to knowledge and opportunities of different types. Partnering with development organizations like SNV, WWF, GIZ and GIVEP helps promote the company.

The company currently has 4 permanent employees with a lot of the work being outsourced and temporary staff of up to 20 being hired when they have so many orders.

Apio believes that her technologies have greatly improved the lives of many people through improving kitchen hygiene and making the boiling of water affordable. She also says the absence of smoke and soot makes for a healthier environment permitting women to undertake a number of activities like looking after their children while cooking.

She says from the economic standpoint her stoves reduce on the amount of fuel and the time it takes to cook. She says they light up very fast and use less charcoal or firewood and yet generate a lot of heat which is insulated within.

Apio also makes charcoal briquettes. She says it is her daughter a university student who is directly responsible for this line of her business. She says she used to do it herself when she had just started the firm. She says she involves the women in the neighborhood in briquette making because she worries about the rising charcoal prices. She gives them skills and encourages them to sell the briquettes.

She says starting the business was not easy. There was not enough money. She had just been laid off her job and used her termination benefits to start the business. While she had competing demands she decided to focus on investing in the business.