UNIVERSITY OF CAPE TOWN
CONSTRUCTION ECONOMICS & MANAGEMENT

CHALLENGES IN THE IMPLEMENTATION OF COMMUNITY BASED ADAPTATION PROJECTS IN EASTERN AND SOUTHERN AFRICA

A Minor Dissertation presented to the Department of Construction Economics and Management
in partial fulfillment of the requirements for the degree MSc in Project Management

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i. Candidate declaration

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ii. Abstract

Community Based Adaptation (CBA) projects in Eastern and Southern Africa have difficulties in achieving long term benefits. There are challenges in the management of the implementation of these projects. This study aimed to determine the facts that contribute to this failure by identifying the main challenges CBA projects face, uncovering how benefits can be better addressed and naming alternatives to the methodology as potential areas of future research.

The research used the quantitative method, data collection was done through an online survey directed to professionals with experience in CBA. The analysis of the data showed that long term sustainability, financial factors and stakeholder coordination were the main challenges encountered in CBA projects in the region of study. It was also concluded that focus on stakeholder management, gathering sufficient funds, improving participatory techniques, and improving Project Management (PM) tools or designing a specific PM toolkit for CBA are possible strategies to improve benefits. Ecosystem-based Adaptation (EbA), Information and Communication Technologies Based Adaptation (ICTBA) and Risk Based Adaptation were identified as alternatives to CBA with potential for further study.

iii. Acknowledgements

A very big thank you to my wife Simone for all the love and support, especially during the last three years with my involvement in this degree. Hopefully it is over!

I would like to thank my son Iker for distracting me from all the work that needed to be done. You are the best medicine for stress.

I also want to celebrate my daughter Zoi, who will be born in a few months. Thinking about you always makes me smile.

I would like to thank my mother Nafissa and my father Abbas not only for supporting me in this course but most importantly for teaching me the value of acquiring new knowledge. I took my time, but I think I get it now.

I also thank my brother Asslam. It was thanks to you that I found out about this degree.

A special thank you to Solange, Evandro, Adriana and Caio. For two years you received me if your home and made me feel a part of the family. You guys made this journey so much easier.

Last but not least, I thank my supervisor Mark. Amidst all that happened in the world and in our lives with the pandemic you were able to guide me to the finish line on schedule. I am very grateful for that.

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vii. Definition of Key Acronyms

CBA – Community Based Adaptation

CCA – Climate Change Adaptation

DRR – Disaster Risk Reduction

EbA – Ecosystem-based Adaption

FMNR – Farmer Managed Natural Regeneration

ICTBA – Information and Communication Technologies Based Adaptation

IISD – International Institute for Sustainable Development

IPCC – Intergovernmental Panel on Climate Change

NGO – Non-Governmental Organization

PM – Project Management

RBA – Risk Based Adaptation

SV&S – Seed Voucher and Fair

UNDP – United Nations Development Programme

UNFCCC – United Nations Framework Convention on Climate Change

1 CHAPTER 1: INTRODUCTION

1.1 Chapter introduction

This chapter provides a background to the research work that was done. It introduces the concept of climate change and its repercussion within the African continent. Adaptation to climate change is also introduced in the chapter, with focus on community-based adaptation, which is the central part of the study. A background to the research problem is presented by expanding on community-based adaptation, its link to project management, and the value of researching the topic. The research problem, question, objectives and methodology are presented. The chapter ends with the limitations to the study.

1.2 Background to research problem

1.2.1 Climate change

The change in climate on planet Earth has intensified in recent times, mainly because of the direct and indirect actions of Humankind (United Nations, 2017). Climate change is not a new issue, it has been raised by the scientific community for more than fifty years. However, conclusive proof of its existence and impact took a long time to gather and it was only in the last decade that it was widely accepted as an unavoidable reality (Morris, 2017). Today, climate change is one of the most important challenges of our time (Richard, 2017).

The African continent is particularly vulnerable to the effects of climate change. As an example, several low-income communities are having unprecedented difficulties in surviving using their traditional way of life (Songok, Kipkorir & Mugalavai, 2011). While some action has been taken to face this problem, the results have been limited. The African continent still needs to increase its capacity to tackle the challenges caused by climate change (Diakhite, Avanzi & Oseku, 2011).

The first approach to climate change had pollution at the center stage and focused on global strategies to reduce emissions. The results from this approach were not consensual and, progressively, the strategy to adapt to the changes in climate gained more support (van Aalst, Cannon & Burton, 2008). Adapting to climate change is defined as adjusting social, economic and ecological systems to mitigate potential negative impacts and enhance possible opportunities (Adger, Arnell & Tompkins, 2005). Initially the adaptation strategies were exclusively top down because they carried the same global view of the climate problem. While this approach contributed to solving some of the issues, ultimately it was found insufficient (Smit et al., 2000). The models derived from this approach were over simplistic and did not provide enough guidance to solve problems at a smaller scale. A bottom up approach was adopted in order to find adaptation methodologies that were efficient at a local scale (Burton et al., 2005, Feenstra, 1998). It was within this change in paradigm that the idea of designing adaptation strategies that focused on the communities was introduced.

1.2.2 Community Based Adaptation to climate change

The community-based methodology for climate change adaptation, or Community Based Adaptation (CBA) for short, targets the poorer and more vulnerable communities. This methodology seeks to combine participatory methods of assessment, where the local communities are involved, with larger scale climate change assessments to design a consistent adaptation strategy for the affected community or group of communities (Forsyth, 2013a).

The implementation of CBA has several advantages and success stories. The main reason for the success of these methods is that they are centered in the local economic, political, and social environment. Adding to this, they also consider factors that are not directly related to climate change. There is evidence that interventions in poor communities that focus exclusively in climate related risks

rarely provide good results (Reid et al., 2009). Success stories of CBA use can be found in Bangladesh, Fiji and Nigeria (Ahmad, 2010, Dumaru, 2010, Woodley, 2011)

The CBA methodology is not without criticism. The ability to upscale the methodology has been raised, and some scholars defend that because of its contextual nature, CBA does not transit to a formal policy approach (Schipper et al., 2014). However, this point of view fails to realize that CBA is not exclusively based on local experience and data, it seeks to combine such information with larger scale environmental models and drivers to achieve more effective results. CBA assess environmental risks from different perspectives and uses that information to build a strategy (Forsyth, 2014, Tschakert & Dietrich, 2010).

Another criticism questions if CBA is actually able to capture the local knowledge and climate risk perception. Research shows that if participatory techniques are used carelessly and to achieve fast results they usually fail to represent the local perspectives for risk, ending up providing similar results as top down approaches (Sekine et al., 2009). CBA is a complex methodology that involves understanding social, economic, cultural, and political factors of a community, and framing them in a wider picture to produce effective actions for adaptation. The implementation of this methodology needs time and resources to yield positive results (Forsyth, 2013a).

1.2.3 Importance of CBA in the African context

Climate change is an essential challenge to overcome in the development of low-income countries. In Eastern & Southern Africa, many impoverished communities live in areas negatively impacted by climate change (Olowa, Olowa & Leal Filho, 2011). Evidence shows that most global scale climate change initiatives do not address the risks in these communities, therefore, are not the right tools to be used in these environments (Winkler et al., 2007).

The use of the CBA methodology in Eastern & Southern Africa is expected to be low, even though it has been used to some extent in Western Africa (Baudoin, 2014). However, there is evidence that this method can provide positive results (Bakengesa, Munishi & Navrud, 2011, Mustelin et al., 2011, Songok, Kipkorir & Mugalavai, 2011).

This shows that there is a need to gain more knowledge about the use of CBA in Eastern & Southern Africa. Acquiring this information will provide useful insight that can be used for improving the efficiency and effectiveness of climate change adaptation projects, directly contributing to increasing their success rate.

1.2.4 Link between CBA and Project Management

CBA is implemented in various contexts and in several ways and forms. It can be the application of simple measures such as a fisherman changing the time of the year he catches a certain type of animal, in order to improve his gains. It can be a comprehensive endeavor such as building a group of dams to stop the flooding of rivers. Or, it can be a regulatory change, for instance the creation of protected wetland zones in order to mitigate the effects of coastal erosion. CBA is a methodology for action, these actions are executed through projects and programs. This becomes clear when by analyzing how one of the examples above would be executed in practice. Taking the example of river flooding, a process of accessing risk and identifying potential solutions would need to be implemented, the results from this project would bring forth the solution of building a group of dams, from here another project would have to be undertaken to design and build the infrastructure. (Ford et al., 2018, Kwiatkowski, 2011, Manuamorn, Biesbroek & Cebotari, 2020, Morris, 2017, Woodley, 2011).

The definition of a project states that it is a time bound endeavor that is created to achieve a specific objective, or group of objectives. The definition of a

program is that it consists in a group of projects from which their singular results concur to the achievement of a greater common objective (PMI, 2013).

The practice that studies the design and implementation of projects is called Project Management (PM) (Kerzner, 2013). Each project has its set of unique characteristics, examples of this are the available resources, the objectives of the project or the location it will be implemented. This means that PM needs to cater to different types of challenges coming from very different projects (Hodgson & Cicmil, 2016, Jenner, 2015, Kiridena & Sense, 2016).

CBA projects are development projects because their ultimate goal is improve the target community's living conditions (Collier, 2008, Ika, 2012). Development projects do not have high success rates. These projects are usually undertaken in low-income countries, which present difficult circumstances to achieve success. This is the reality for development projects in the African continent. Limitations on availability of resources or the weaknesses of the institutional systems are a couple of examples of the challenges presented to the practice of PM in this context (Ika, 2012, Kwak, 2002).

There are however other factors to consider when examining the lack of success of development projects in Africa. In several cases projects are designed outside of the continent without appropriate assessment of the local conditions. This results in a situation where PM principles are adopted from different contexts, and then implemented rigidly in the African setting. Experience shows that PM flexibility provides better results than rigidness in the African context (Hulme, 1995, Ika, 2012). As a consequence, most projects tend to focus on immediate results with limited impact instead of aiming for long-lasting objectives that will have greater influence on the development of the society (Ika & Lytvynov, 2011).

This report explored two professional guides for designing and executing CBA projects:

- The Community-Based Adaptation Toolkit, and
- A practitioner´s guide to establishing a Community Based Adaptation Programme

The information presented before shows that CBA is a valuable climate change adaptation methodology that is appropriate to the African context, however there are difficulties in successfully implementing the methodology. It was also established that there is a strong link between PM and CBA, where PM provides the resources for the implementation of CBA. This further demonstrates the reasoning behind this research

1.3 Research problem

The research problem statement is the following:

- *CBA projects tend to focus on immediate results with limited impact instead of aiming for long-lasting objectives that will have greater influence on the development of the society.*

1.4 Research question

The research question is:

- *What are the factors that contribute to CBE projects not focusing on long term objectives (benefits)?*

1.5 Research objectives

This research had the following objectives:

- Objective 1: to determine what are the challenges of implementing CBA projects in Eastern & Southern Africa;

- Objective 2: to determine what factors can contribute to better addressing benefits in the implementation of CBA projects.
- Objective 3: to uncover what other project management methodologies can be used as alternatives to CBA, providing potential areas for further study

1.6 Hypotheses

This study tested two hypotheses:

- Hypothesis 1: There is a link between the ability of CBA projects to achieve their main goals and the use of PM tools
- Hypothesis 2: There is a link between the ability of overcoming challenges in CBA projects and the use of PM tools

1.7 Research Methodology

The above objectives were achieved by adopting the following research methods:

1. A literature review pertinent to the study was conducted using key words such as climate change adaptation, community based adaptation, project management, and benefits and value management in peer reviewed journals, books, professional guides, conference proceedings, and government documents.
2. Data collection was performed by using a survey questionnaire, distributed electronically.
3. The collected survey data was analyzed and interpreted.

4. Conclusions and recommendations were made based on the analysis of the collected data.

1.8 Limitations

This research focused on a single climate change adaptation methodology and potentially identified other adaptation methodologies. Further research on other climate change adaptation methodologies used in projects within Eastern & Southern Africa will complement this research and contribute to increasing the overall knowledge in the subject. This would provide more data that could be used to update or design PM tools for this type of project.

The results of this research were based on the perception of the surveyed professionals. There is value in conducting action research or case study investigation on the use of the methodology in actual projects in Eastern & Southern Africa. With this type of research, the information would be gathered directly from the field and with greater detail. This would allow for a deeper understanding on the use of the methodology and the level of PM maturity of its implementors.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Chapter introduction

This chapter presents a review of the literature considered relevant to the study. Definitions of climate change and climate change adaptation are suggested and the concept of adapting to climate change is explored from its origins to the current state. CBA is introduced as a methodology used to adapt to the climatic changes. This methodology is extensively reviewed by presenting the factors that enable its successful implementation, the factors that challenge positive results, and by providing examples where the methodology achieved good results. The chapter also describes how CBA links to the PM practice, and, provides examples of practical PM tools to implement CBA projects.

2.2 Climate change definition

The definition of climate change can be analyzed from various perspectives. In the field of Geography, the climate is defined as the mean weather conditions in a period of 30 years or more. The mean weather conditions are calculated by averaging every weather condition available during such period, including the extreme conditions. When there are changes in the mean weather conditions, it is acknowledged that climate change has occurred. Therefore, there is a strong link between climate change and weather variance (O'Hare, 2002). There are other definitions of climate change.

The United Nations Framework Convention on Climate Change (UNFCCC) in the Kyoto protocol defined climate change has: *"a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods"* (UNFCCC, 1997).

The Intergovernmental Panel on Climate Change (IPCC) defines climate change has: *"any change in climate over time weather due to natural variability or as a result of human activity"* (IPCC, 1995).

Both definitions are not consistent. The IPCC definition is broad and defines climate change as changes in climate that have occurred or will occur regardless of their cause. In this definition, both natural and human influenced changes to the climate are considered climate change. On the other hand, the IPCC definition narrows the definition of climatic changes to variation in climate that was exclusively a result of human influence (Pielke, 2005, Zillman, 1997).

The difference between these definitions influences how the climate change problem is addressed. There are two main strategies to deal with climate change: mitigate and adapt. Mitigation is related to acting upon the factors that cause climate change, these strategies are usually linked to controlling the emission of greenhouse gases. Adaptation is focused on acting upon factors that cause vulnerability in society and the environment as a result of climate change. The adaptation strategies are most commonly linked to increasing the resilience to climatic changes of social and environmental systems (Pielke, 2005, Tol, 2005).

The UNFCCC definition leads to a situation where only mitigation is a solution for climate change. In simple words, the logic that follows this definition is that since Mankind causes climate change then Mankind has the power to halt its effects or even reverse them. This definition is biased towards mitigation (Pielke, 2005, Zillman, 1997). Evidence shows that the climate also changes naturally (Lempert & Schlesinger, 2000). This single fact is sufficient to conclude that mitigation only will not prevent every challenge that is caused by climate change. Research shows that the most effective strategies towards climate change combine mitigation and adaptation actions (VijayaVenkataRaman, Iniyan & Goic, 2012). Therefore the IPCC's broader definition provides more appropriate framing to

climate change and allows for a better understanding of the phenomenon (Pielke, 2005). In this research report, the IPCC definition of climate change is used.

2.3 Climate change adaptation

The concept of adaptation in the dictionary is linked to an action or process of change to suit a new function or circumstance (Hornby, 2006). Steward (1972) used this concept as a characteristic of human social systems. Butzer (1980) related the concept to climate change. Since then the IPCC has given significant importance to Climate Change Adaptation (CCA) in their reports (IPCC, 1995, IPCC, 2001, IPCC, 2007). They define CCA as the adjustment of human or natural systems, as a response to confirmed or anticipated climate change outcomes, with the objective of decreasing its negative effects and exploring potential benefits (IPCC, 2001).

CCA has a strong link to the aid and development field. Climate change has greater impact in low-income countries where it is a risk to the development achievements and goals (Ireland, 2012). CCA can be a response for these risks. On the other hand, the development industry can be a driver for enabling CCA. Integrating adaptation within the development framework can be an effective strategy for achieving goals in both sides (Leary et al., 2008). This however is not a consensual argument.

There is concern that the link between the development work and CCA is not a positive one. Some research argues that the development industry is donor driven, which means that the donors, who provide the resources, have full control over the activities that are implemented in the industry and often make decisions based on their interests instead of the interests of the beneficiaries (Escobar, 1992, Pieterse, 2010). Another criticism of the aid field is that since many initiatives have failed it is a common practice within the industry to create new methodologies

that only appear to be new but in essence follow the same basic principles as the methodologies that came before (Escobar, 1992, Sachs, 1992). CCA is considered by some to be the result of this sort of tactic, a simple arbitrary term or buzzword created by the aid and development industry to serve its own purposes (Dahl, 2007, Pieterse, 2010).

However, research on a group of professionals working with CCA in underdeveloped countries in Africa and Asia provides a different view. These professionals mostly understand CCA as something new. This novelty is perceived as a unique opportunity to improve the work that is done in development by challenging some of its core assumptions (Ireland, 2012). Other research supports the theory that emergent fields can be used as drivers to change in the development sector (Escobar, 1992, Gibson-Graham, 2005). The objectives of sustainable development in impoverished communities are highly impacted by climate change, therefore CCA has the ability to provide positive change to the sector and increase the success rate of its interventions (Adger et al., 2003).

Another discussion point of CCA is that it is perceived as equal to another practice from the aid field called Disaster Risk Reduction (DRR). There are examples of program managers simply renaming their initiatives from DRR to CCA without changing any of the activities or the approach, hoping to attract more funding (Ireland, 2012). Research shows that there are some similarities. Both methodologies have developed their methods and tools to assess risks and vulnerabilities in order to determine action opportunities. Both select poverty reduction and sustainable resource management as key factors to reduce vulnerability to the climate (Thomalla et al., 2006). Despite these similarities there are also differences. DRR is focused on rapid responses. It strives in supporting communities that are in the process of recovering from emergency events. CCA on the other hand gives emphasis to enabling communities to adapt. In this sense, CCA is more concerned with the future while DRR is concerned with the present.

Another aspect where the two differ is that DRR is perceived to have a bottom up approach, while CCA is perceived to have a top down approach (Mercer, 2010, Thomalla et al., 2006). This is one of the main criticisms of CCA and one of the reasons why the Community Based Adaptation (CBA) methodology was developed (McNamara & Buggy, 2016, Mercer, 2010, Palutikof et al., 2019).

2.4 Community based adaptation

CBA shifts the focus of CCA from global to local. CBA is a methodology for adaptation that focuses on communities with vulnerabilities to climate change. According to Ayers & Forsyth (2009) CBA has the following objectives:

- Identify development interventions that increase the ability of communities to live with less predictable climates;
- Design strategies for adaptation with strong participation of local stakeholders, development professionals and DRR specialists;
- Target the root causes of vulnerability in communities;
- Integrate the existing social norms in the development and implementation of interventions.

CBA originated because of a combination of factors. One of them was the necessity to implement adaptation in the level where the impacts of climate change are more severely experienced, the community level (Ayers & Forsyth, 2009, Berkes & Jolly, 2002, Heltberg, Siegel & Jorgensen, 2009, Rojas Blanco, 2006). In this way, it is also necessary to investigate vulnerability, resilience and adaptive capacity, all important elements of adaptation, at the same level (McNamara & Buggy, 2016). The initial CCA efforts were criticized for being over simplified and not integrating social, economic, political, and environmental aspects in their interventions. This resulted in a failure to provide suitable solutions for communities

(Rojas Blanco, 2006, Schipper, 2007, van Aalst, Cannon & Burton, 2008). As mentioned before, another criticism of CCA was its top down approach that developed its interventions based on global and regional climatic scenarios without taking in account local nuances. CCA is technical in nature and oriented to address climate change impacts (van Aalst, Cannon & Burton, 2008). CBA, with the focus on overcoming the social drivers of vulnerability and increasing the adaptive capacity at local level, emerged as a very suitable approach to address the shortcomings of CCA (Smit & Skinner, 2002).

Another aspect that contributed to the origin and dissemination of CBA was the change in perspective regarding the value of local knowledge systems. Research recognized the existence of climate change coping and adaptive mechanisms in many communities. These mechanisms are commonly related to environmental management and natural resource management practices that evolved locally (Barnett, 2001, Riedlinger & Berkes, 2001). This resulted in the recognition of local knowledge as a factor to consider when developing interventions with the scope of adapting to climatic change. The idea of increasing the integration of local knowledge in combination with scientifically developed methods to develop better adaptation strategies has been strengthen by research done in communities in different points of the world (Kwiatkowski, 2011, Roncoli, Ingram & Kirshen, 2001, Salick & Ross, 2009). Another aspect that increases the value of local knowledge is the uncertainty that characterizes the impacts of climate change at the local level. The analysis of impacted communities and their response to the changes not only provides insights on how the change in climate affects communities, it also indicates how these communities perceive the changes and how they react to them. This information is valuable to develop adaptation strategies and interventions (Ensor, Berger & Okubo, 2010, Rojas Blanco, 2006, Roncoli, Ingram & Kirshen, 2001).

The evolution of what defines some of the core components of adaptation has also benefited CBA. The definition of climatic vulnerability grew from basing itself on purely technical aspects, as exposure to natural hazards and geographic location, to including social variables as poverty, marginalization, social disadvantage, and access to capital or information (Kelly & Adger, 2000, Pelling, 2002, Smit & Wandel, 2006). Vulnerability is naturally linked to adaptation. Studying vulnerability provides the information required to determine the strategies for long-term adaptation. With the evolution of the definition of vulnerability it became critical to include the socio-economic and political context in its analysis (Heltberg, Siegel & Jorgensen, 2009, Kelly & Adger, 2000). The capacity to adapt to the changes in climate was another concept that evolved in a similar direction. Research shows that the adaptive capacity of a certain group of people varies with place, culture and context (Berkes & Jolly, 2002, Cannon, 2008, Thornton et al., 2009). This empowered the necessity to integrate local people and communities in developing specific adaptation solutions that are relevant to their context and capabilities (Ebi, 2009, Thornton et al., 2009). The change in the perception of these important adaptation concepts steered the field to bottom up approaches. Approaches based in the context, knowledge, and capacity of the community, entrusting increasingly more important roles to local people. CBA is a good fit for these requirements (Allen, 2006, Ayers & Forsyth, 2009, Ebi & Semenza, 2008, Rojas Blanco, 2006).

CBA is also praised for its ability to link with development initiatives. Climate change has a strong toll on the development industry's objectives and outcomes. The concept of CBA, that emphasizes issues such as adaptive capability, vulnerability, and resilience, connects very easily to the common sustainable development processes because they also focus on similar issues. An example of this is poverty reduction, a common development objective, which is also an important driver for improving the adaptive capability and decreasing

vulnerability (Burton et al., 2002, Ensor, Berger & Okubo, 2010, Kelly & Adger, 2000, Schipper, 2007). Research proposed that the integration of adaption within the larger scope of development work can assist with the uncertainty that surrounds the impacts of climate change in communities (Heltberg, Siegel & Jorgensen, 2009). It is also advocated that adaptation to climate change can be viewed as a new model for development where sustainable adaptation is achieved through vulnerability reduction and socio economic development rather than specific adaptation actions (Schipper, 2007). The most vulnerable communities are more susceptible to the risks of climate change. These communities, who are often poor and marginalized, experience more pressing difficulties such as access to water and sanitation, healthcare, or education. CBA is able to connect with the processes of the development work, which usually targets these communities, so that they can integrate adaptation initiatives within their work (Barnett & Campbell, 2010).

2.5 CBA and Project Management

CBA can be a singular action, for instance a farmer changing crops to maintain productivity. It can be a systemic change such as providing means for communities to diversify their livelihood. It can also be an institutional reform designed to improving resource management by reviewing the regulation on land and water ownership. For all these examples to succeed it is important to view CBA as a process. This process requires learning about climatic risks, assessing possible responses, creating an environment that enables adaptation, assembling resources, implementing the responses and generating knowledge to improve the response assessment (Leary et al., 2008). The process of developing and implementing CBA methodologies is materialized through projects and programs (Ford et al., 2018, Kwiatkowski, 2011, Manuamorn, Biesbroek & Cebotari, 2020, Morris, 2017, Woodley, 2011).

A project is defined as temporary venture launched to achieve a specific outcome. As non-permanent endeavors projects have a concrete beginning and end. Projects end when the desired outcome is achieved, or when the project is terminated by the inability to achieve the outcome or, because the outcome became irrelevant. Even tough projects are temporary this does not mean they are short-term. The duration of a project is only dependent on its objectives. The non-permanent nature of projects is usually not involved with the expected outcomes of the project, which are usually designed to be long lasting. A program can be defined as a group of projects that have complimentary objectives that serve to achieve the desired program outcomes (PMI, 2013).

PM is the practice that plans, organizes, controls, and directs the resources required to achieve the outcome of the project (Kerzner, 2013). The emergence of PM happened after the Second World War. At the time, the practice was designed as a tool for developing infrastructure and technology (Cicmil & Hodgson, 2006). From 1980, PM established itself in the contemporary professional market (Garel, 2013). From 1990, it grew exponentially with the arrival of professional PM associations that developed and disseminated standards for the practice (Hodgson, Paton & Cicmil, 2011).

PM originated as a homogeneous and overarching approach to achieve success. It focused on the development of a static model to implement projects that did not allow for any deviation or adaptation. At this time PM was mainly focused on the execution and delivery phases of projects, giving little to no attention to the conceptual phase. The iron triangle composed of quality, time and cost was the measure for project success (Atkinson, 1999, Morris & Pinto, 2007, Shenhar & Dvir, 2007).

As the PM practice evolved, new necessities became apparent. The need to move from a linear perspective to a broader point of view became inevitable

and several new concepts were introduced. Studying and understanding the complexity of projects at all levels was one of the novel principles. With the understanding that different projects have different complexities at different stages it is easy to conclude that a unified structure for managing projects is not effective. Each project is unique and therefore requires specific approaches and tools. Another important innovation was the introduction of the value of the project outcome as a success measure. This innovation expanded the measure of success from the iron triangle to a more holistic approach where the value added by the project defines how successful it was. The value created by a project relates to achieving the most positive and long-lasting outcomes as possible. The positive outcomes are commonly called benefits and the management of benefits became an important aspect of PM. This new perspective shifts the focus to achieving and improving the project's end goals, allowing for the exploration of the potential of projects at a greater scale (Breese et al., 2015, Derek & Beverley, 2016, Winter & Smith, 2006).

The evolution of PM provided the ability to add value to a much larger spectrum of projects, growing from only being relevant to infrastructure and technology projects to also include social change and development projects (Khang & Moe, 2008). CBA projects are mostly focused on social outcomes and therefore benefit from a broad view of PM (Burton et al., 2002, Schipper, 2007).

The main objective of PM is to achieve project success. In practice the PM strategy for achieving success is to use or develop the most appropriate tools for each stage of project. There are several terminologies for the different stages of projects, for example, the stages of initiating, planning, executing, monitoring, controlling, and closing the project. Another example is conception, definition, execution, and operation phases. However, these terminologies tend to have very similar meanings. The first stages relate to setting up the project, defining its objectives, planning the course of action and determining high-level challenges.

The next stages are linked to the implementation and monitoring of the work defined in the previous stages. These stages are normally looped since work execution and monitoring happen simultaneously. The final stages relate to closing the project and documenting relevant information for the future (Nicholas & Steyn, 2017, PMI, 2013).

The challenges PM faces are dependent on the specifications of each project. Factors such as complexity, social and political relations within the project, or the benefits it is attempting to achieve, give each project a particular set of challenges to overcome (Hodgson & Cicmil, 2016, Jenner, 2015, Kiridena & Sense, 2016). However, project failure in general has been the object of research. This research identified three project characteristics that have a proportional connection with failure: size, duration, and complexity. As any of these attributes increase, so does the probability of failure (Flyvbjerg, 2014, Jenner, 2015). Some of the most common identified causes for project failure are: a lack of connection between organizations strategic priorities and the projects they undertake; lack of leadership and ownership from senior management; lack of functional engagement with stakeholders; lack of project management skills; poor benefits management; and ineffective human resources integration (OFC, 2005).

Development projects, which CBA projects are a part of, have their particular set of PM problems leading to project failure. Bad governance, existence of conflict, lack of PM capacity or unstable political environment are some of the causes for failure in development projects (Collier, 2008, Ika, 2012). The issues driving development project failure are divided in three categories: structural and/or contextual issues; institutional and/or sustainability issues and managerial and/or organizational issues (Gow & Morss, 1988, Ika, Diallo & Thuillier, 2010, Kwak, 2002).

Development project undertaken in Africa are limited by all three categories of issues. Structural and contextual problems such as the incompatibility between

the political agenda and the developmental agenda, budget constraints, environmental complications and natural resource scarcity, or cultural shocks with local traditions (Ika, 2012, Kwak, 2002). Institutional and sustainability problems such as the lack of capacity in government institutions and project implementers leading to a lack of common vision by all stakeholders involved (Gauthier, 2005, Martens, 2005). And, managerial and organizational problems, that can be assumed as PM related problems. Lack of PM capable human resources, weak stakeholder management, inferior risk assessment and inefficient project monitoring and evaluation are some examples (Ika, 2012, Youker, 2003).

The PM problems are linked to a set of inappropriate strategies and scenarios that can be improved. There is a tendency to use unified methods to develop and implement projects. The one size fits all approach is rarely fruitful in PM and this context is not an exception. The use of more flexible and adaptable PM approaches is necessary in development projects in Africa (Hulme, 1995, Ika, 2012). Benefits management is also an improvement point. Most projects within this context have easily visible short-termed objectives and fail to capitalize in more sustainable and long-term benefits (Ika & Lytvynov, 2011). The lack of PM skills in development projects is a reality. Funders, developers and implementers of these projects have very low number of personnel with specific PM knowledge and experience resulting in unprepared project leaders (Gow & Morss, 1988, Ika, Diallo & Thuillier, 2010). The use of top down approaches is another inefficient strategy in this context. This type of approach sets back the local ownership required to achieve success. Bottom up and participatory approaches provide better results in this environment (Ika, 2012, Muriithi & Crawford, 2003).

The PM limitations mentioned above are not exclusive to development projects or to the African continent. PM research has focused on all these issues and there are several solutions available. The contemporary PM discussed in the previous section, that is more flexible and able to adjust to the requirements, benefits, and

implementation needs, can cope with the challenges of development projects in Africa. The methodology of CBA has principles that can protect it against these common faults. It is a bottom up methodology, that promotes local participation, focuses on long-term benefits, and attempts to adapt to local context. The use of PM knowledge and skills can improve the effectiveness of CBA projects by providing tools and techniques to overcome challenges and streamline development and implementation processes (Ika, 2012, Khang & Moe, 2008, Manuamorn, Biesbroek & Cebotari, 2020, Woodley, 2011).

2.6 Factors that enable the management of CBA projects

There are important factors to consider in order to understand how CBA has evolved, and what are the most important aspects to implement it effectively. These factors are called the enablers of CBA. Many factors contribute to the successful management of CBA projects, examples of these are: local knowledge; governance, policy and institutional support; management processes; capacity building, education and training; financial resources; research, technology and infrastructure; among others. However, this report will focus on the four factors considered to have the most impact on achieving success: the use of participatory techniques; viewing adaptation as a social process that depends on local context; supporting adaptation from multiple scales; and, the sufficient availability of funds. (McNamara & Buggy, 2016).

2.6.1 Use of participatory techniques

The use of participatory techniques goes hand in hand with another CBA enabler, the recognition and value of local knowledge and experience. The use of active participation of local people in the development and implementation of adaptation initiatives is well documented in research. Participatory tools such as community based participatory research, appraisals, and risk and vulnerability assessments are valuable to assist professionals and communities to develop

effective adaptation activities (Lasage et al., 2015, McClymont Peace & Myers, 2012, Robledo et al., 2012, Youssoufa Bele et al., 2013).

Using these tools enables communities to be an effective part of the processes of diagnosing, identifying, prioritizing, developing, and implementing adaptation strategies and activities that are pertinent to the local environment and the climatic changes experienced within it (Driscoll et al., 2013, Dumaru, 2010). This approach strives to acquire the unique set of conditions and knowledge base of a community to develop solutions that have the potential to be successfully implemented at the local level. Usually these solutions are built on preexisting ideas and activities (Campos, Velázquez & McCall, 2014, Gidley et al., 2009). Consequently, the local population becomes a medium for achieving change and improving their own adaptive capacity and resilience. This alters adaptation from a passive affair to an active process of joint evolution, resulting in the empowerment of the community to setup their vision of development within the scope of climate change (Gidley et al., 2009, Heltberg, Siegel & Jorgensen, 2009, Youssoufa Bele et al., 2013). The appropriate use of participatory techniques assures that the activities focus on the community's necessities and priorities, and that the current adaptive capability is recognized. In this way, by channeling the local knowledge and including the local decision making processes it is possible to achieve more efficient, inclusive and sustainable adaptation actions (Archer et al., 2014, Ebi, 2009, McNamara, 2013).

Another positive aspect of using participatory tools is it can improve the community's awareness and comprehension of the processes of climate change and the potential impacts that result from it (David et al., 2013, Khan et al., 2012, Robledo et al., 2012). Community awareness also enables adaptation. The use of participatory techniques increases the local awareness through the promotion of knowledge and experience exchange. This trade of information allows the adaptation practitioners to gain insight on the context of the community so that

they can transmit scientific and impacts based information in a more receptive manner. This approach facilitates the locals to access information, increasing their awareness around climate change, yielding better results in achieving positive social change (Dodman, Mitlin & Co, 2010, Lasage et al., 2015, Picketts et al., 2012).

There are, however, problems on the way that some participatory interventions are implemented. There are cases where the local stakeholders were only symbolically involved in the process, and in essence, a top down structure was used. For these techniques to yield good results it is crucial that there is genuine and sustained local stakeholder involvement in all stages of the project (Kwiatkowski, 2011, McNamara, 2013, Smit & Wandel, 2006). It is also important that the use of such techniques is able to potentiate the environment for the power shifts necessary to transit from a top down decision-making process to a bottom up structure. CBA can provide the opportunity to change socio political systems. For this to happen it is very important to consider another enabler of CBA, which is considering adaptation to climate change a social process (Dodman & Mitlin, 2013, Pelling, 2002).

2.6.2 Recognizing adaptation as a social process

Recognizing adaptation as a social process is a significant concept for CBA. Social capital, networks, cohesion, and collective action are fundamentals for grasping the ongoing adaptation processes and raising the community's adaptive capacity (Prior & Eriksen, 2013, Sovacool et al., 2012, Stott & Huq, 2014). The specific social context of each community influences the support, relevance, and sustainability of adaptation strategies both in short as in long term. In this way, if social cohesion and collective problem solving within the community are part of local culture there is substantial improvement in the channels of communication and in the ability to act and adapt. Therefore, social cohesion

and collective problem solving culture are also enablers of CBA (Adger et al., 2003, Campos, Velázquez & McCall, 2014, Prior & Eriksen, 2013). Some communities lose their ability to act collectively because of the way traditional structures evolve. In these communities, an increase in vulnerability is apparent. In this way, the lack of cohesion causes difficulties in the transmission of information and skills, and in the development of social norms (McNamara & Buggy, 2016, Prior & Eriksen, 2013).

Successful implementation of CBA builds the existing social capital by giving considerable attention to the improvement of social cohesion and capacity of collective action. It is important to achieve the active involvement of local stakeholders and to empower the community networks and groups in the process of negotiating priorities. The identification of community opinion leaders and local champions is a good strategy to facilitate the relationship bond between the community, adaptation professionals and government (Berquist, Daniere & Drummond, 2015, Keys, Thomsen & Smith, 2016, Roberts & O'donoghue, 2013).

The heterogeneity that is innate to every community and its impact in adaptation is a challenge to CBA. Socio political factors such as governance, wealth and income, access to technology, health, or education and finance, have a strong link to the root causes of vulnerability (Burton et al., 2002, Dodman & Mitlin, 2013, Ribot, 2014). These factors are inconstant and therefore differ not only between different communities but also within the same community, over time. This dynamic context shapes the way resources are distributed within communities and has an impact on how vested interests influence decision making processes (Cannon, 2008, Pelling, 2002, Smit & Wandel, 2006). It is important that CBA initiatives can avoid the alienation of certain groups within communities from access to information and resources. Research shows that community-based initiatives have the ability to empower or disempower, especially when the decision-making process actively includes community members. In some cases,

this process is biased towards the most influential individuals in the community, neglecting the interest of the most vulnerable (Allen, 2006, Archer et al., 2014). Community based action should not be approached with a one size fits all mentality. For this reason, it is critical that within the process of developing and implementing CBA interventions, the social and political environment of a community is comprehensibly investigated and understood (Forsyth, 2013b, Kelly & Adger, 2000, Stott & Huq, 2014).

2.6.3 Supporting CBA at multiple scales

Another enabler of CBA discussed in this report is supporting it at multiple scales. Extensive research defends that CBA requires support from networks of stakeholders, local and national institutions, and national level policy actors (Adhikari & Taylor, 2012, Conway & Mustelin, 2014, Ebi & Semenza, 2008, Regmi & Star, 2014, Reid, 2016). In addition to locally based adaptation there are two other types of adaptation that need reinforcement, infrastructural and organizational adaptation. Infrastructural adaptation is related to technology, equipment, or other material resources. Organizational adaptation is related to the governance and policymaking institutions (Sovacool et al., 2012). From a policy perspective CBA needs to be developed and implemented with coordination from different levels of government which must acknowledge the role of development agents, civil society associations, community leaders and all other stakeholders involved (Drolet, 2012). It is necessary that the policy framework allows for the inclusion of local decision-making processes and enables the empowerment of local institutions. It is also important that this framework is flexible enough that it allows the necessary adjustments required to serve the needs of singular communities (Adhikari & Taylor, 2012, Ashley et al., 2016, Regmi & Star, 2014).

An essential aspect of a multi scaled process is implementing efficient communication flows, principally the feedback channels that link the local level

knowledge and information to the national level policies. This link provides a better comprehension of community context and supplies the national level policy and planning institutions the necessary data to become more inclusive of local level needs (Archer et al., 2014, Barnett, 2001, Stott & Huq, 2014). The implementation of mechanisms that gather and transfer community feedback, or that allow the community to be included in the planning decisions, is a challenge. It is important that CBA incorporates advocacy for this issue so that it can increase its influence on national policies (Adhikari & Taylor, 2012). There is a similar challenge in the communication flow from the opposite direction, from top to bottom. There is a need to communicate more effectively in issues such as the scientific evidence relating to climate change and how it affects communities. A multi scaled approach encourages the inclusion of technical expertise in adaptation actions and promotes the implementation of capacity building activities at local level (Dumaru, 2010, Lasage et al., 2015, Middelbeek, Kolle & Verrest, 2014).

2.6.4 Availability of funds

The availability of funds is very important for implementing adaptation initiatives. It is common that international Non-Governmental Organizations (NGO) are the source of funding for adaptation projects in low income countries. This however has its challenges because donor and NGO funding has a tendency of being short termed in its essence (Ahammad, 2011, Dumaru, 2010, McClymont Peace & Myers, 2012). A multi stakeholder approach mitigates this challenge, therefore a combination of international funds with locally sourced capital, both from private or government agencies, provides the best results (David et al., 2013, Fenton et al., 2014). Several funding mechanisms support activities relating to adaptation. Examples of this are the Green Climate Fund, the Adaptation Fund, or the Small Grants Program from the Global Environment Facility. These programs have a strong contribution in developing and implementing adaptation initiatives,

however, there are challenges involved. Ensuring that the funds are steered towards the community level is one of the challenges. The other challenge is ensuring that the most vulnerable people in the community benefit from the funds (Dodman, Mitlin & Co, 2010, Regmi & Star, 2014). It is important for effective CBA implementation that community level organizations have direct access to these funds and that initiatives with a strong local approach have priority (Fenton et al., 2014).

Community working groups and associations, NGOs, donors, and local, regional, and national government agencies are of the utmost importance in constructing adaptation initiatives. These institutions have the ability to access the necessary resources to implement such initiatives. In the community level, influential organizations can strengthen the local social capital, improve the community participation and support the local perspectives (Adhikari & Taylor, 2012, Archer et al., 2014, Dodman, Mitlin & Co, 2010). These institutions also have privileged knowledge of the current context and in this way can respond quickly and effectively. Nevertheless, this is only possible if good governance practices are in place. Understanding the vested interests that can be present at all levels and how they influence the adaptation initiatives is a starting point for determining if the more vulnerable are being benefited or marginalized (Ayers, 2011, Campos, Velázquez & McCall, 2014, Younus & Harvey, 2013). It is very important that all institutions are accountable, inclusive, and transparent. A co-management process covering different scales can facilitate the implementation of good governance practices, as well as, support the access to technology, knowledge, and finance. Therefore, better partnerships between every stakeholder at every level are indispensable for the effective development and implementation of CBA actions (Amaru & Chhetri, 2013, Dodman, Mitlin & Co, 2010, Regmi & Star, 2014, Stott & Huq, 2014).

2.7 Challenges in managing CBA projects

2.7.1 Introduction

This section will discuss the most common challenges faced when implementing CBA projects. There is extensive research on the challenges of implementing adaptation actions, however the vast majority of these studies were performed in high income countries (Biesbroek et al., 2013). This review will channel the focus to low income countries, which are the object of the research. There are three broad types of challenges affecting CBA: social, resource, and physical challenges (Spires, Shackleton & Cundill, 2014). It is important to highlight that while this typology is practical for the understanding of the challenges CBA projects face, there is interaction and convergence between all three types described. They do not occur in isolation (Spires, Shackleton & Cundill, 2014).

2.7.2 Social challenges

Social challenges are important because of their influence in the transformation of adaptive capacity to adaptation action. These challenges tend to have an intangible nature as opposed to the resource and physical challenges, and influence the development and sustainability of adaptation initiatives (Adger et al., 2009, Grothmann & Patt, 2005). Social challenges are under researched and relate to beliefs, thought processes, perceptions, and how formal and informal social norms, both individual and institutional, have an impact on adaptation actions (Adger et al., 2007, Jones, 2012). Social challenges are also linked to governance and policy and how institutional posture can constrain adaptation. These can be subdivided in political, institutional, cultural, normative, or behavioral challenges, among others (Adger et al., 2007, Leck et al., 2012).

The poor coordination of government agencies in low-income countries and their lack of ability to manage the combination of strategies, laws, and partnerships is

one of the most commonly discussed social challenge in literature (Cambers, 2009, D'Agostino & Sovacool, 2011, Gero, Méheux & Dominey-Howes, 2011, Rawlani & Sovacool, 2011). Documented cases, such as a failure of coordination between the providers of climate change information and the recipients of such information that resulted in the non-achievement of the objectives of an initiative in India (Srinivasan, Rafisura & Subbiah, 2011). Or, the lack of harmonization between initiatives implemented by a South African municipality which led to the lack of monitoring of such initiatives, resulting in wasted investments (Roberts et al., 2012) are examples of these challenges.

Discourse challenges are another identified social challenge to CBA. The approach used by adaptation funders and professionals regarding the relationship between traditional development actions and CBA initiatives creates difficulties in monitoring the success of CBA, as well as determining its best practices. This difficulty relates to the fact that it is not possible to assess the success of adaptation initiatives immediately, only in medium to long-term (Ayers & Forsyth, 2009). Another hurdle is the ability to upscale CBA. The process of upscaling CBA involves the insertion of local climate change adaptation strategies in the objectives of national level development plans (Middelbeek, Kolle & Verrest, 2014). Both these problems have a connection with the type of discourse used. A discourse based from top to bottom is not able to tackle these issues (Spires, Shackleton & Cundill, 2014). As an example, research in Uganda showed that the incompatibility between the local and external view of what was acceptable discourse for participation resulted in divisions in the whole processes, hindering the development of the adaptation action plans. It became clear that it is important to acknowledge local culture and social norms when defining the type of discourse that determines the style of participation (Roncoli et al., 2011).

Normative and cognitive challenges are also social challenges to CBA. Tradition and culture incentivize disbelief in climate change and its impacts. Within these

environments, people are inflexible to change because they view it as a risk. Communities have a tendency to continue doing the same things in the same way (Simões et al., 2010). Cambodian farmers refusing to change crops or using new information and technology is an example (D'Agostino & Sovacool, 2011). These challenges are not exclusive to low income communities. For example, in the Caribbean region a reforestation initiative to tackle coastal erosion was not accepted by community members because they would lose direct access to the beach and the sea view (Cambers, 2009). Another example is the lack of engagement of a South African community with a climate change education initiative (Roberts, 2010). In both of these examples, the communities had no experience with the impacts of climate change and therefore were unable to understand the value of the initiatives (Spires, Shackleton & Cundill, 2014).

2.7.3 Resource challenges

Resource challenges relate to assets that facilitate the implementation of CBA. Thus, the lack of availability of such assets constrains CBA initiatives. These assets are commonly linked to: financial resources, lack of funding for example; the lack of access to a certain technology; or to the lack of human resources, for example the unavailability of knowledgeable and skilled personnel. An individual or an organization can procure these assets to equip adaptation initiatives (Jones, 2010, Pressend, 2012, Simelane, Mutanga & Kaggwa, 2012). Challenges in communication are also part of resource challenges. However, it is arguable that they are placed in the connection between the social and the resource challenges. These challenges can rise from the social norms, perceptions, or the discourse adopted by persons and organizations. They can also be related to the absence of sufficient resources to accomplish appropriate communication (Moser & Dilling, 2007). In this review communication challenges will be typified as resource challenges.

Knowledge and communication challenges are well-researched resource challenges. Information at a local scale is scarce. Some communities and local agencies are not aware of climate change and its impacts. In several cases where there is awareness, the access to information about climate change is very poor. When information is available it is common that communities do not understand how to use such information (Ahammad, 2011, Dumaru, 2010, Meenawat & Sovacool, 2011). An example of this comes from Indonesia where the dissemination of seasonal climate information, that is developed at a timescale that is not compatible with the communities decision timeframe, is rendered irrelevant in the communities point of view (Srinivasan, Rafisura & Subbiah, 2011).

Another side of the communication challenges is the approach used for distributing scientific information and knowledge. The format and language style used in transmitting this communication is often too technical and complex for the average community member (Roncoli et al., 2011). A community in Bangladesh choosing to use traditional knowledge to predict floods instead of the information provided by the adaptation professionals is a good example of this challenge (Adhikari & Taylor, 2012). Language in itself is also a challenge for communicating. The illiteracy levels in communities are often high leading to a very slow communicative process (Meenawat & Sovacool, 2011). The translation of information to local languages is also a channel for misunderstandings. As an example, in the Fijian language the same word is used for "climate" and "weather", also, there is no word for "vulnerability" so the word "weakness" is used in its place (Dumaru, 2010). The limitations in language have an influence in the effectiveness of communication (Gero, Méheux & Dominey-Howes, 2011).

Financial challenges are also a key CBA resource challenge. In low-income countries financial resources are scarce and necessities are high. There is an established tendency to prioritize actions that can provide short-term results.

Climate change initiatives are viewed as a long-term issue therefore they stand low on the agenda (Sovacool et al., 2012). The scarcity of funds not only influences if CBA actions are implemented but also how well they are implemented. As an example, a CBA initiative implemented in Fiji with a strong awareness-building component had insufficient funds for the provision of learning materials. A later assessment of the results showed that more than half of the participants were still not acquainted with the concept of climate change (Dumaru, 2010).

Another set of CBA resource challenges relate to human resources. The institutional capacity and skills required to handle climate change are limited in developing countries. This is especially relevant in regards to the government agencies both national and local (Rawlani & Sovacool, 2011, Roberts et al., 2012). The skills required to materialize participatory engagement are crucial for CBA but often deficient (Ceccato, Giannini & Giupponi, 2011). An example of a human resource challenge is the inability to recruit implementation professionals by an initiative in Bhutan that was set in a working environment that presented unappealing conditions such as tough weather, high altitudes and remote locations (Meenawat & Sovacool, 2011).

2.7.4 Physical challenges

Physical challenges take place when the existing natural environment or the current infrastructure systems are unable to manage the consequences of climatic change (Adger et al., 2007).

Physical challenges to CBA usually relate to insuperable problems. These challenges represent the limit to what can be achieved by adaptation to climatic changes, and if present, they require a shift of strategy. There are several cases where action is taken to adapt to a certain level of natural phenomenon and this level keeps rising over time, yielding the adaptation efforts unsustainable. An

example of this is the cyclical increasing of coastal erosion and consequential reinforcing of embankments in Bangladesh. This strategy is not sustainable in the long-term (Rawlani & Sovacool, 2011). An example of overcoming a physical challenge comes from Zimbabwe, where after a dam constructed as an adaptation measured was destroyed by a cyclone, the decision was not to rebuild the infrastructure. The funds were channeled towards activities that generated profit for the community, therefore increasing the individual adaptive capacity of the community members (Adhikari & Taylor, 2012).

2.8 CBA success

There are several examples of successful CBA initiatives in low-income countries. Below a couple of such cases are explored.

2.8.1 Farmer managed natural regeneration

The first success case comes from Burkina Faso. From 1980, farmers in the province of Yatenga began experiencing extreme droughts that limited their agricultural production. This necessity caused the farmers to experiment, and they began using planting pits. From experience, they increased the size of the pits, began using the pits in a grid system, and, started to add compost to the pits (Kaboré & Reij, 2004). This technique provided very positive results, with increased yields, tree growth between pit rows, and regeneration of degraded soil (Ouedraogo & Sawadogo, 2001). Scientists named this technique as Farmer Managed Natural Regeneration (FMNR). FMNR is a simple technology that brings improvement for the environment, by mitigating the effects of wind and heat, and for farmers, that have more resources for their livelihood (Hertsgaard, 2011). FMRN is one of the most successful environmental adaptation cases in Africa. Local farmers developed and used the technique without any external guidance or contribution and managed to rehabilitate an estimated 12.5 million acres of land (Reij, Tappan & Smale, 2009). Today, more than 30 years after, it is still a very

successful strategy among communities, and, with the support of national and international organizations, the technology is being scaled up by implementing teaching networks to train farmers to use it in other locations (Ouedraogo & Sawadogo, 2001).

2.8.2 Seed voucher and fair

Another success case is found in Kenya. Since 1950 the country suffers from serious droughts that caused extensive loss of crops and livestock. The country also experiences other extreme environmental threats such as floods, sea level rise, and an increase in mean temperatures. These issues combining with other social and economic difficulties resulted in the implementation of several initiatives by aid and development agencies. Some of these initiatives had the objective of providing seeds to farmers (Amaru & Chhetri, 2013). The conventional method of seed aid is to acquire and distribute seeds using institutional and government mechanisms. This process is slow and does not include the participation of the aid beneficiaries. As a result, farmers received inappropriate seeds that provided very low or inexistent yields in their specific locations (Omanga, 2002). In 2000, after two years of drought, aid practitioners experimented with a new distribution system, the organization of seed fairs and voucher distribution. The Seed Voucher and Fair (SV&S) system was developed with the objective of increasing crop tolerance to drought using local seeds. The creation of a local seed market gave the farmers the opportunity to choose the crops they needed and exposed them to new crops in an engaging manner. The fairs have also secondary benefits, they became very effective bridges between government agencies and communities, allowing for a better transmission of educational information. They have also promoted the labor market in the area by connecting potential employees with potential employers (Orindi & Ochieng, 2005). The decentralized nature of SV&S proved to be more effective than the conventional method of

seed distribution, and its implementation resulted in better crop yields (Sperling, 2002).

There are many other examples of successful use of CBA. In several provinces in India CBA initiatives provided good results in mitigating the effects of floods and droughts (Adhikari & Taylor, 2012). Research demonstrates the ability of CBA to increase knowledge, understanding, and awareness about climate change and its impacts (Coughlan de Perez et al., 2015, David et al., 2013, Picketts et al., 2012). Improvement in the development of local strategies and in the decision-making by members of the community was also found, together with the enhancement of networks between local, regional and national levels (McClymont Peace & Myers, 2012, Reed et al., 2015). These examples support the necessity of exploring CBA projects through research and practice.

2.9 Management of CBA projects in practice

Analyzing how CBA projects are implemented in practice is useful to determine if PM principles are used in real life scenarios. Below, two practitioners guides for the development and implementation of CBA projects are broadly explored.

2.9.1 Community-based adaptation toolkit

This practitioners guide was designed by the NGOs CARE and International Institute for Sustainable Development (IISD). This guide divides the CBA project cycle in three stages: analysis, design, and implementation. It also proposes an information and knowledge management process that occurs repeatedly across all stages (CARE & IISD, 2010).

The analysis stage has the objective of understanding the context involving the project. Gathering data is the main task of the stage. Social, political, environmental, and economic data are some examples of necessary information. This data is used to establish the current situation and to determine

what will be the change that the project aims to achieve. Next is the design phase. Here a detailed plan of what will be done and how it will be done is developed. Project scope, results, timeframe, and budget are defined. This guide promotes flexibility in this stage because of the emergent nature of CBA projects. The design should not be rigid so that it can adapt to changes in context and priorities. The final stage is implementation. Here all the necessary resources are mobilized and planned activities are executed. The information and knowledge management process is done across all stages, as mentioned before. This process encompasses acquiring, organizing, documenting, storing, and distributing important project information and knowledge, with the objective of transferring it beyond the project scope. It also encompasses the tasks of monitoring and evaluation. These tasks seek to observe and assess all the work done across the project cycle with the objective of detecting and correcting flaws (CARE & IISD, 2010).

2.9.2 A practitioner´s guide to establishing a Community Based Adaptation Programme

This manual was developed by the United Nations Development Programme (UNDP). As the title suggests, this guide provides information on how to develop CBA programs. As previously stated, a program is a group of projects that have complementary objectives. Because of this, the guide provides information on how to develop portfolios of projects that can then be packaged into programs. Project portfolios are groups of projects that are not necessarily connected to each other. Organizations use the portfolios to select projects that suit their current strategic goals. These projects can be managed individually or collectively, as programs. This information is not particularly relevant to the current research therefore it will not be further discussed. However, the guide also provides insights on how to manage CBA projects. This guide divides CBA projects in two phases: concept and implementation (PMI, 2013, UNDP, 2015).

The concept phase is the beginning of the project and setups the plan of what it will attempt to achieve. The project context and relevance are defined, the main objectives and outcomes are determined, and the target benefits are specified. In this phase the project risks are also studied, along with their respective counter measures. The budget for the project is also developed. All this information is gathered and documented in preparation for the next phase (UNDP, 2015).

The implementation phase is where the activities are executed. This guide is very focused on the monitoring and evaluation tasks during the implementation phase. The monitoring and evaluation strategy must be able to build local capacity, enhance local ownership to the project, and provide a basis for financial and technical accountability. It should also follow the principles of stakeholder participation and knowledge transference. This strategy must also be capable of assessing project successes and failures. All this information has to be documented and available for consultation by the relevant stakeholders (UNDP, 2015).

2.9.3 Analysis

These two guides have their similarities and differences. The main differences are related to the position each organization is more likely to assume. UNDP will generally be a higher-level stakeholder that funds CBA projects. Their PM methods are directed to assure a strong project concept, and to monitor and evaluate implementation that will be executed by third parties. CARE and IISD have a more "hands on" guide because they are more likely to implement the projects themselves. This toolkit provides more detailed information on how to execute project activities.

The guides have also several similarities, and these similarities are linked to main PM principles. Both guides focus on the basic PM objective that is to achieve project success. Defining benefits, planning scope and budget, and determining

monitoring and evaluation processes are all standard PM processes. This leads to the conclusion that the PM practice is relevant to CBA projects. The determination and analysis of the challenges of a project allows to identify development points for the PM practice, thus contributing for its evolution and success (Nicholas & Steyn, 2017, Pinto & Slevin, 1987).

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Chapter introduction

This chapter details the methods used in this research. The chapter begins with a literature review about research philosophy that provides the framing for the methods chosen to undertake the study. A justification for the used methods is presented in the chapter, along with a description of each of these methods. The research ethics are also discussed in the present chapter, including a presentation of the procedures undertaken to ensure the research is done in compliance with all the required ethical considerations.

3.2 Research philosophy

The philosophical foundation of social research is based on two basic approaches: the positivist and the interpretive paradigms. The groups of quantitative and qualitative research techniques are originated from these two approaches (Corbetta, 2003).

In contemporary knowledge, a paradigm is defined as a conceptual network from which scientists view the world. It is a guide that gives scientists not only a map but also the tools for making maps. A paradigm embodies theory, methods and standards (Corbetta, 2003, Kuhn, 1962).

The positivist and the interpretivist paradigms are two contrasting perspectives of reality and how it should be understood. These opposed visions have given rise to two consistent sets of research techniques. To compare these paradigms, it is important to understand their philosophical origins. This is done by answering three questions: the ontological, the epistemological and the methodological questions (Corbetta, 2003).

Ontology is defined as the study of being. The ontological question is the question of "what". It inquires if the observed phenomena is real and objective, if it exists outside the human mind and if it is independent of the subjects interpretation (Byrne, 2017, Corbetta, 2003).

Epistemology is the study of knowledge. The epistemological question explores the relationship between "who" and "what" and the result of such relationship. The interrelation between the observer and the observed is at the center of this question. The answer to the epistemological question is dependent on the answer to the ontological question. If a phenomenon exists independent from human action it is then legitimate to aspire to study it in an objective manner. The knowledge forms, which span from deterministic to more probabilistic laws, are firmly linked to the answer to this question (Byrne, 2017, Corbetta, 2003).

Methodology is the plan that justifies the use of a specific technique, linking the choice and use of such technique to the desired outcome. The methodological question inquires "how". It seeks to define the instruments that will be used in the research process. The answer to this question is also linked to the previous two. A vision of reality as independent from the scientist influence is better served by manipulative research techniques than a vision of reality that emphasizes the interaction between the scientist and the studied phenomenon (Byrne, 2017, Corbetta, 2003).

A summary of the paradigms and their characteristics is presented in Table 1.

Table 1 - Characteristics of basic paradigms (Guba & Lincon, 1994)

	Positivism	**Post positivism**	**Interpretivism**
Ontology	Naïve realism: social reality is "real" and knowable (as if it was a thing).	Critical realism: social reality is "real" but knowable only in imperfect and probabilistic manner.	Constructivism: the knowable world is that of meanings attributed by individuals (multiple

			realities): these constructed realities vary in form and content among individuals, groups and cultures.
Epistemology	Dualism-objectivity.	Modified dualism-objectivity.	Non-dualism; non-objectivity.
	True results.	Results probabilistically true.	Researcher and object of study are not separate, but interdependent.
	Experimental science in search of laws.	Experimental science in search of laws. Multiplicity of theories for the same fact.	Interpretive science in search of meaning.
	Goal: explanation.	Goal: explanation.	Goal: comprehension.
	Generalizations: "natural" immutable laws.	Generalizations: provisional laws, open to revision.	Generalizations: opportunity structures; ideal types.
Methodology	Experimental-manipulative.	Modified experimental-manipulative.	Empathetic interaction between scholar and object studied.
	Observation.	Observation.	Interpretation.
	Observer-observed detachment.	Observer-observed detachment.	Observer-observed interaction.
	Mostly induction.	Mostly deduction (disproof of hypotheses).	Induction (knowledge emerges from the reality studied).
	Quantitative techniques.	Quantitative techniques and some qualitative.	Qualitative techniques.
	Analysis "by variables".	Analysis "by variables".	Analysis "by cases".

3.3 Research methodology

Quantitative and qualitative research are very commonly used terms in research methodology literature. In a simple definition, the quantitative research method

uses structured numerical data and statistical analysis techniques, while the qualitative method is based on the substantial analysis of unstructured data and not on numbers. The nature of data and the procedures used to gather it is emphasized in this definition, however, some literature considers that the two have deeper differences. This argument states that the quantitative and qualitative methods are part of different paradigms. Within the paradigms presented before, the quantitative methods belong to the positivist paradigm, while the qualitative methods fit within the interpretivist paradigm (Niglas, 2010).

More recently, a new argument emerged; the quantitative and qualitative methods are not mutually exclusive. From this premise a third methodological approach was developed, the mixed methods research. This approach denies the dichotomy in research methodology and defends a research continuum that can span from predominantly quantitative to predominantly qualitative, depending on the requirements of the specific study (Bryman, 1984, Newman & Ridenour, 2008, Niglas, 2010).

3.4 Justification of research approach

The approach for any research depends on several factors. The scientists ontological and epistemological views of the object of study, what problems the study is expected to solve, and what methods are available for the scientist are examples of these factors (Easterby-Smith, 1991).

This research adopts the philosophical foundation of social research. This foundation was adopted for two main reasons. The first and more general reason is that PM, in its essence, can be viewed as a social endeavor (Winter & Smith, 2006). The second, specific to the object of this research, is that CBA projects are designed to achieve social change. They can be considered social projects (van Aalst, Cannon & Burton, 2008).

The research problem in this work is based on the fact that CBA projects implemented in the region of Eastern and Southern Africa have limited impact, because they do not focus on long term benefits. As mentioned before, the use of this methodology for adaptation projects is not very common in the region, however there is evidence that it brings positive results when implemented successfully (Baudoin, 2014). This justifies increasing the knowledge about the factors that promote the insufficient attention to creating long lasting value in CBA projects within the region. One way of acquiring information about a type of project and how it is implemented is to gather this data from the professionals that have worked in such projects. This research has used this approach to better understand the management of CBA projects in order to achieve the research objectives.

The paradigm used in this research is closer to positivism than interpretivism. Ontologically it assumes that reality exists, and it can only be known imperfectly. Epistemologically it adopts a research goal of explanation and assumes results are probabilistically true. Methodologically it uses quantitative methods, and a deductive approach is used as it is usual with the positivist paradigm.In this sense two hypotheses are presented and tested..

The quantitative research method was selected not only by the philosophical reasons stated above, but because it is an efficient method to gather data from people, and, for practical motivations. The quantitative method uses observed or measured data to explain a phenomenon that is apparent to a particular population. It allows to draw conclusions on a large population by gathering and analyzing information from a sample of such population (Allen, 2017). The most widespread social research quantitative technique is the survey. In very simple terms a survey asks people questions about the object of study. The survey responses are designed so that they can be numerically quantifiable with the objective of using statistics to analyses them. The survey was considered the ideal

method to gather data in this research. The online survey was the type of survey selected, mainly because of practical reasons. The online survey is a fast, reliable, and inexpensive tool to gather data from a considerable number of participants (Allen, 2017, Corbetta, 2003, Dillman, 2011). This tool is discussed in more detail below.

3.5 Data collection

There are two basic ways of gathering information: observing and asking. Observing is a direct and immediate way of studying a phenomenon. However, if this phenomenon is open to interpretation, asking becomes the better solution. One of the most common data collection techniques to ask questions is the survey (Corbetta, 2003). A survey can be defined as a method for gathering information by questioning a representative sample of individuals that are relevant to the object of study, through a standard questioning procedure, with the objective of studying the relationships among the variables (Corbetta, 2003).

A survey can be done using different procedures, depending on the freedom, or lack of it, used in the questions and answers (Corbetta, 2003). There are three main procedures:

- The questionnaire, where both question and answer are standard;
- The structured interview, where the question is standard, but the answer is open;
- And, the unstructured interview, where both question and answer are open.

This research uses the questionnaire procedure, because this procedure is considered the best fit for a quantitative analysis of the data. However, with standard answers there is a risk that the respondents preferred answer is not

presented. Another risk is that the respondent has more information to share than the available options. To mitigate this risk an open-ended response option was added to a group of answers. This will be discussed in detail ahead.

3.5.1 Online surveys

There are several means to administer a survey, telephone questionnaires, postal mail questionnaires or face-to-face interviews. With the development of information technologies, the online survey became another way of conducting surveys. This method has become increasingly popular because it provides several benefits. It is low cost, fast, and efficient. It has a wide geographical reach and provides direct data entry. In addition, it provides a very simple setup process. However, there are also disadvantages, the method is used extensively and there is an overload of online surveys, which diminishes participation. Also, it is a method that is totally reliant on software, meaning that a software problem can render the survey useless (Dillman, 2011, Sue & Ritter, 2012).

This research uses an online survey because of the time savings the method offers. Setting up the survey, distributing it and beginning data collection can be done faster than in any other available method. The feature of direct data entry was also considered very valuable as it reduces the time spent during the process of data analysis.

There are several online survey services widely available. In this research the SurveyMonkey service was used because of its popularity and reputation (Monroe & Adams, 2012).

3.6 Unit of analysis and Unit of observation

The research unit of analysis is the object of study, or in other words, the focus of the study. The unit of analysis is the entity from which the research aims to gather

some sort of information, and it is directly linked to the research question (Vogt & Johnson, 2011).

This research has the objective of gathering additional knowledge about the implementation of CBA projects within Eastern & Southern Africa. Therefore, the units of analysis are the CBA projects implemented in the region.

The research unit of observation is the object from which the data is gathered. It is the item, or group of items, that are measured, surveyed, or collected in order to comprehend the unit of analysis (Lavrakas, 2008).

This study collects information about the implementation of CBA in Eastern & Southern Africa projects by surveying professionals that have worked in the implementation of such projects. Accordingly, the units of observation are professionals that have worked in the implementation of CBA projects in the region.

3.7 Sampling procedure

The term population in a survey is the overall finite group of units of observation. Usually, and because of practical reasons as time and cost of the research, only a sample of the population is selected to be actually observed (Lavrakas, 2008).

The size of the sample is an important factor for the precision of a survey. The type of research and the methodology it uses are the main elements to determine the sample size. There are several approaches proposed by different literature to determine the size of a sample (Easterby-Smith, 1991, Robin, 2012). Some authors suggest the use of tables for the purpose (Kotrlik & Higgins, 2001) , while others propose the use of equations (Cochran, 1977, Yamane, 1967).

Roscoe (1975) proposes that a minimum sample size of 30 is sufficient for most surveys. Easterby-Smith (1991) proposes a formula for determining the sample size. This formula is as follows:

$$n = \frac{2500}{\mathrm{E}^2}$$

Where:

- n = sample size
- E = standard error (%)

The standard error measures the sampling error in estimates. This error occurs because of the random variations in samples. The standard error diminishes as the sample size increases, which usually means that as the sample size grows larger, so does the probability of the sample representing the reality of the population. In this study, a standard error of nine percent (9%) was considered acceptable as it satisfies the majority of management studies (Saunders, Lewis & Thornhill, 2012). Using the formula with the adopted standard error gives a sample size of 31. As this number is consistent with the minimum sample size proposed by Roscoe (1975) it is adopted as the minimum sample size for this study.

The dissemination of this researches survey was done by randomly selecting individuals who potentially had experience in CBA projects. The individuals were gathered from publications on CBA, both academic as technical, conference and workshop proceedings, and CBA working groups. This strategy presented the risk of surveying individuals without experience in implementing CBA projects and therefore gathering irrelevant data. At this time, it is important to state that a minimum sample of 31 relevant participants was adopted.

3.8 Questionnaire design

The questionnaire was designed with the main objective of collecting data that is relevant for the response of the research questions. The questionnaire also had the objective of assessing a participant's relevance to the research, and, the general opinion about the CBA methodology. The questions can be clustered in three sections. The full questionnaire is provided in Appendix A.

3.8.1 Section 1: Questions 1 – 4

These questions confirm the consent for participation in the survey and examine the participant's relevance to the study. The consent for participation was addressed in the first question of the survey and it required that respondents either accepted or rejected participation. Respondents that did not consent to participate were disqualified. The relevance was assessed by asking if the participant has professional experience in CBA projects in general, and, specifically in the region of Eastern and Southern Africa. The countries in which the participants have worked were also gathered so that a geographical reach of the study could be known. Participants who did not have professional experience in CBA were disqualified. Participants who have professional experience in CBA, however not in the region of the study were not disqualified for two reasons: one of the research objectives was not focused on Eastern and Southern Africa; and, their contributions were still valid for a general assessment of CBA.

3.8.2 Section 2: Questions 5 – 11

This section was developed to address the first and second research objectives: the identification of challenges that are encountered in the implementation of CBA projects, and, determining what factors can contribute for better addressing the benefits these projects. Respondents were asked to supply information on the

way PM is conducted in this environment and the challenges it presents. Respondents were asked which PM methodologies and/or tools they have used, the challenges faced in implementing CBA projects, the actions taken to overcome such challenges and their success, and, the overall success of the projects.

3.8.3 Section 3: Questions 12 – 13

This section was designed to address the third research objective: to uncover alternative methodologies to CBA, providing potential areas for further research. The question related to alternatives to CBA was made broadly and not specifically to the region of study. This choice results from the assumption that the alternatives to CBA can originate from anywhere in the world, following the example of CBA itself that did not emerge in the region. A broad question about the suitability of CBA to the Eastern and Southern African context was presented to get a sense of the general respondent opinion about the methodology within the area of study.

3.9 Survey quality assessment

It is a valuable procedure to conduct a pilot test of the survey questionnaire. It is important to check if the survey functions well and is appropriate, to know if the questions are manageable and realistic, and, to confirm that the questions are valid and their wording is clear (Bell & Bryman, 2007, Matthews & Ross, Van Teijlingen et al., 2001).

The survey questionnaire in this research was pilot tested by three participants. The conclusion from the test was that some questions would benefit from improved wording. After the wording corrections no other issues were found with the questionnaire. The pilot participants considered the questionnaire clear and

concise in its format. They also considered it valid and relevant to the research objectives.

3.10 Data analysis

The data collected in this research through the survey is nominal. Nominal data is defined as group of variables that are non-parametric and that cannot be placed in any type of order. The fact that the data is not parametric means that it is not assumed that the data belongs to a prescribed probability model, such as the normal distribution (Lewis-Beck, 1993).

The most common data analysis is based on frequency distribution and central tendency. The frequency distribution represents the number of observations for each outcome. The central tendency measures where most of outcomes lie. With nominal data, the central tendency can only be measured by the mode. The mean and median do not apply for nominal data. The mode identifies the most frequent recurring outcome (Lewis-Beck, 1993). In this research, the frequency distribution and mode measurement were extracted from SurveyMonkey, the online survey service used.

A very useful statistic for nominal data is the Maximum Likelihood Ratio Chi-Square test, hereafter called likelihood ratio test. This was the selected tool to test the two hypotheses. The test provides insight on the significance of the differences observed between variables. The likelihood ratio test provides good results on small datasets, which is the case of this research. The test computes the results from two outcomes to determine the possibility of interdependency between them. Performing the calculation returns the ratio value (P). As the value P gets closer to zero (0) the chances of existing a dependency between factors increases. Generally, it is assumed that there is dependency when the P value is smaller than 0.05, this will be the assumption in this study (McHugh, 2012, Özdemir

& Eyduran, 2005). The likelihood ratio test presented in this report was calculated using the SPSS Statistics software.

3.11 Research ethics

Ethical issues are very important in every research (Mertens & Ginsberg, 2009). In this research the data was gathered anonymously, the participants are referred to as respondents and given a number, for example, respondent 1, respondent 2, and so on. Every participant was provided a consent form where the researcher's strategies for anonymity, confidentiality, data storage and access, implication of participation, and the voluntary nature of the endeavor were explained. Only participants who gave consent were involved in the research. The consent form can be found in Appendix B.

In more detail, the research ethical issues were dealt in the following manner:

- Anonymity: the research was anonymous.
- Confidentiality: the research was confidential. No personal information (i.e. name, age, gender, profession, employer, etc.) was asked. The data collected does not have any identifying detail.
- Data access: the data collected was analyzed by Faizal Osman and Mark Massyn. Access to the data is limited to Faizal, Mark and academic colleagues that might collaborate on the research.
- Implications and consequences of research: there is no risk of negative impact or consequences to the research participants.
- Conflicts of interest: there are no conflicts of interest in this research.
- Informed consent: the first question of the questionnaire required potential participants to accept or deny participation. Enough information about the research was provided to assure potential participants were able to take

an informed decision. If potential participants selected the option to not participate the survey was terminated.

4 CHAPTER 4: RESULTS AND ANALYSIS

4.1 Introduction

This chapter presents the data gathered from the survey and the analysis undertaken with such data. The results and analysis are presented according to the three sections defined previously. The analysis of the data was directed by the research objectives. The conclusions that lead to the achievement of the objectives are also presented in this chapter.

4.2 Respondents demographics

The questionnaires were sent to 65 individuals. A total of 50 completed questionnaires were returned, 6 respondents from this group were disqualified because they did not have any professional experience in CBA projects, and one did not consent to participate in the survey. There were 15 respondents that did not complete the questionnaire. The incomplete questionnaires were not considered in the analysis. Only questionnaires from respondents that read the entire survey and chose either to answer or skip every respective question are part of the results and analysis. This means that there were 43 usable respondents, which represents 66% of the total of individuals that received the survey. An example of an individual questionnaire response is provided in Appendix C.

4.3 Research Results

4.1 Question Section 1 – Consent and relevance to the research

4.1.1 Question 1 – Consent of participation in research

This question asked for the informed consent of the respondents to the participation in the research. From the 44 complete responses one did not

consent to participating while the remaining 43 accepted to be a part of the research. This results in approximately 98% of consent amongst respondents.

4.1.2 Question 2 & 3 – Experience in CBA in Eastern and Southern Africa and in other regions

These questions aimed to filter the participants by their experience in CBA projects both inside and outside of the area of study. As mentioned before, participants without any professional experience in CBA projects were disqualified. There were 43 respondents who had previous experience with CBA projects. From this group, 35 participants had experience in the region of study and eight did not. This means that 81% of respondents had professional experience with CBA in Eastern and Southern Africa. Table 2 shows a summary of this information.

Table 2 - Relevance of participants

Experience of respondent	Number of respondents
With CBA experience	43
With CBA experience in the region of study	35
Without CBA experience in the region of study	8

4.1.3 Question 4 – Geographical reach

This question asked respondents who had experience in region of study to mention the countries where this experience was attained. Out of the 21 countries considered in the region of study, six were not represented in the responses: Angola, Burundi, Comoros, Eswatini, Lesotho and Madagascar. There was at last one respondent with professional CBA experience in the other 15 countries. Kenya was the most represented country with 16 respondents, followed by Mozambique with 14 and Ethiopia with 12. Table 3 presents these results in detail.

Table 3 - Geographical distribution of participants

Country	Number of respondents	% of total respondents
Angola	0	0.0%
Botswana	2	5.7%
Burundi	0	0.0%
Comoros	0	0.0%
Eritrea	1	2.9%
Eswatini	0	0.0%
Ethiopia	12	34.3%
Kenya	16	45.7%
Lesotho	0	0.0%
Madagascar	0	0.0%
Malawi	5	14.3%
Mozambique	14	40.0%
Namibia	1	2.9%
Rwanda	3	8.6%
Somalia	2	5.7%
South Africa	7	20.0%
South Sudan	2	5.7%
Tanzania	9	25.7%
Uganda	4	11.4%
Zambia	5	14.3%
Zimbabwe	4	11.4%

4.1.4 Section 1- Data Analysis

Consent and relevance to the study – The results of this section show that there were sufficient relevant participants to the study. The minimum sample of 31 relevant participants was exceeded and there were 35 relevant participants for the first and second research objectives, and 43 relevant participants for the third research objective.

The geographical reach of the survey was considerable with results from 15 countries, which means that the survey gathered at least one respondent from 71% of the region of study.

4.2 Section 2 – The challenges to the implementation of CBA projects and how benefits can be better addressed

4.2.1 Question 5 – Use of specific PM methodologies or tools in CBA projects

The results for the use of specific PM methodologies or tools in CBA projects within the region of study show that 20 participants from the 43 that answered have used them. This is approximately 47% of respondents. PM methodologies or tools were not used by 12 participants, which is around 28% of respondents. While 11 respondents, close to 26%, stated that this question did not apply to them. Figure 1 show the results.

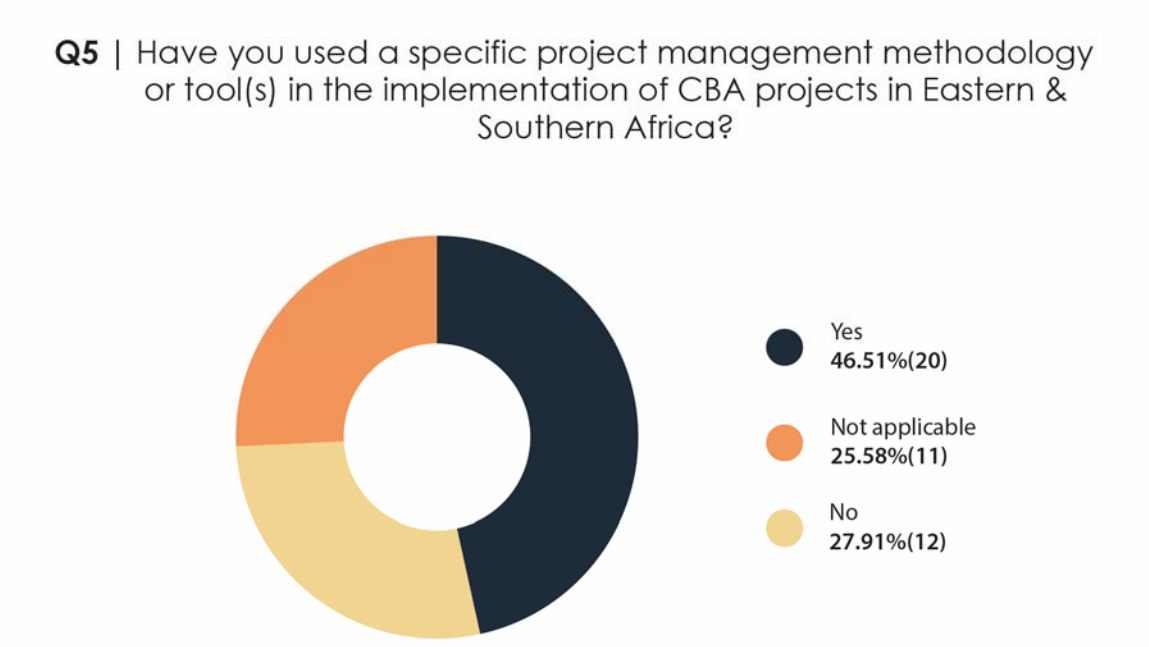

Figure 1 - Use of PM methodologies in CBA projects

4.2.2 Question 6 – Which methodologies or tools were used to manage CBA projects

The most used methodologies and tools were the Logical Framework Analysis (LFA) and the Community Based Adaptation Toolkit, both with 10 responses each,

which amounts to approximately 53% of the responses. Results Based Management gathered seven responses which are close to 37%, while UNDP practitioners guide for CBA had two responses corresponding to roughly 11%. The Project Management Body of Knowledge (PMBok) based methodologies were the least used with only one response, representing 5% of total responses. Other tools are mentioned in the open-ended answers as the Community based Risk Screening Tool Adaptation and Livelihoods (CRiSTAL) or the Capabilities approach. The results are presented in Figure 2.

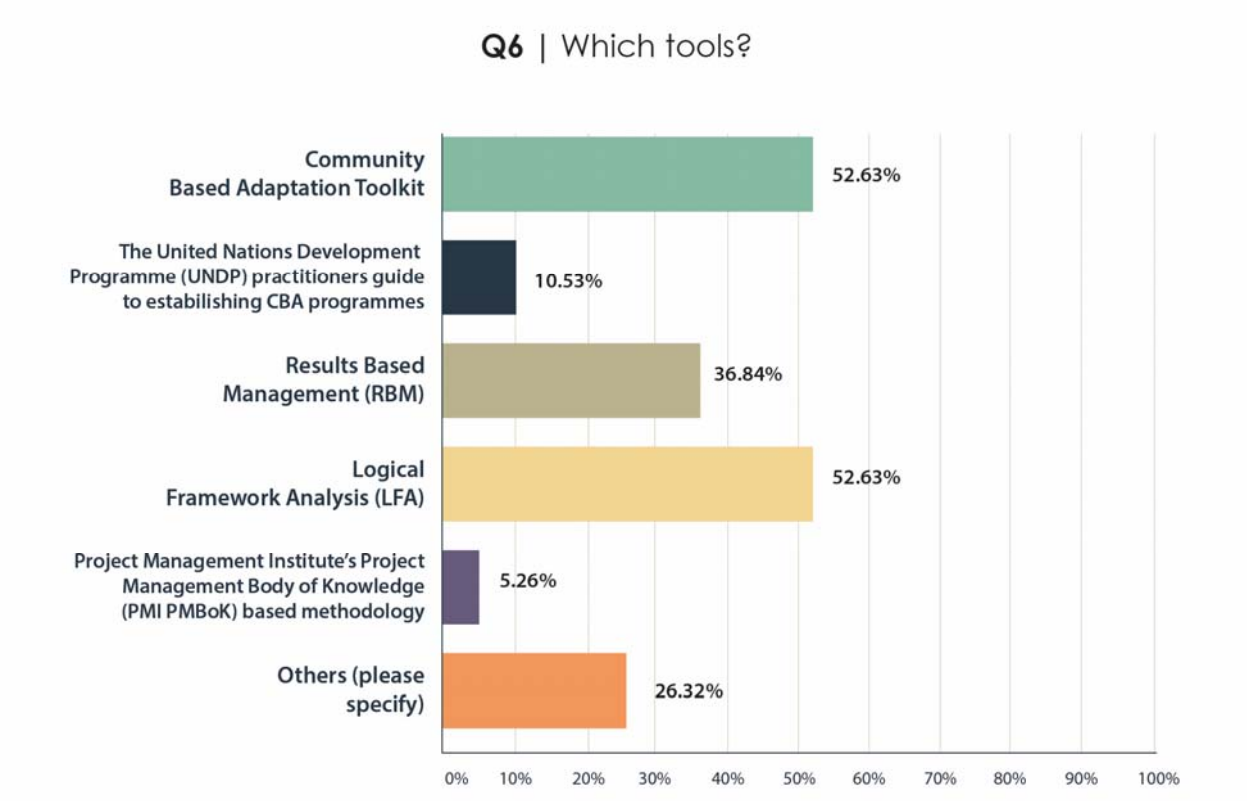

Figure 2 - Methodologies and tools used in CBA projects

4.2.3 Question 7 – Main challenges in implementing CBA projects in Eastern & Southern Africa

The top three challenges identified were long term sustainability, financial challenges, and stakeholder coordination, with 27, 24 and 18 responses respectively which represent approximately 63, 56 and 42% of the respondent's choices. Human resource challenges gathered 16 responses corresponding to roughly 37%. Communication barriers and resistance to change had 11 and 10 responses amounting to close to 26 and 23% respectively. Local culture and social norms were the least selected challenge with 8 responses which is 23% of the total. Other challenges were selected by 14 respondents, representing close to 33%. From the opened ended responses in this category a tendency to governance challenges was identified, indicating that this could also be a significant challenge. A summary of these responses is presented in Figure 3.

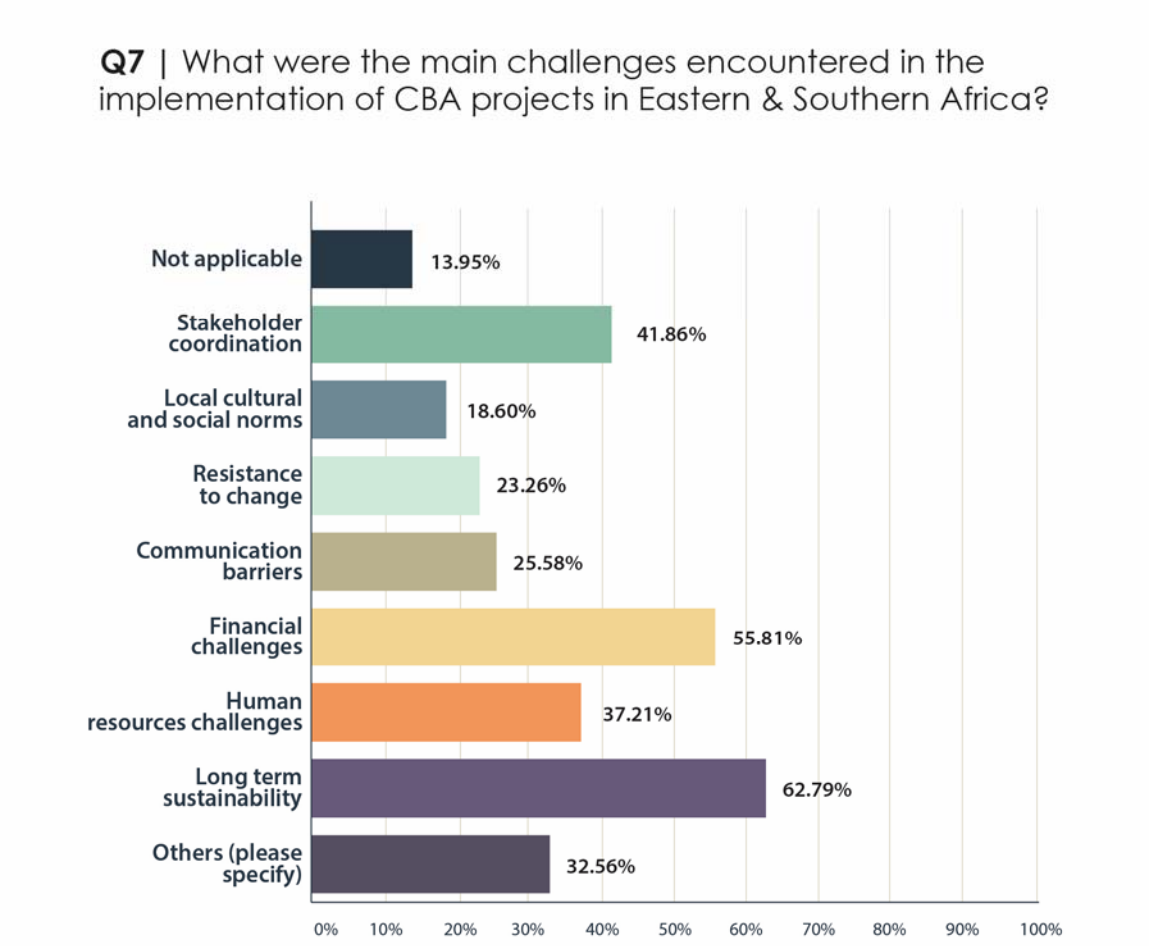

Figure 3 - Main challenges in implementing CBA projects

4.2.4 Question 8 – Actions taken to overcome challenges

The modification or updating of participatory techniques was the highest selected option, it gathered 30 responses which is almost 72% of the total. Modifying or updating the knowledge and information transmission system and updating project timeframe were the second and third most selected options with 18 and 15 responses, representing close to 43 and 36% of responses, respectively. Deploying additional financial or human resources and changing the scope of the project gathered 10 answers each, amounting to close to 24%. The others category was selected by 11 respondents, which are approximately 26% of the total. From the open-ended answers more than one respondent

mentions the implementation of capacity building actions. The results of this question are presented in Figure 4.

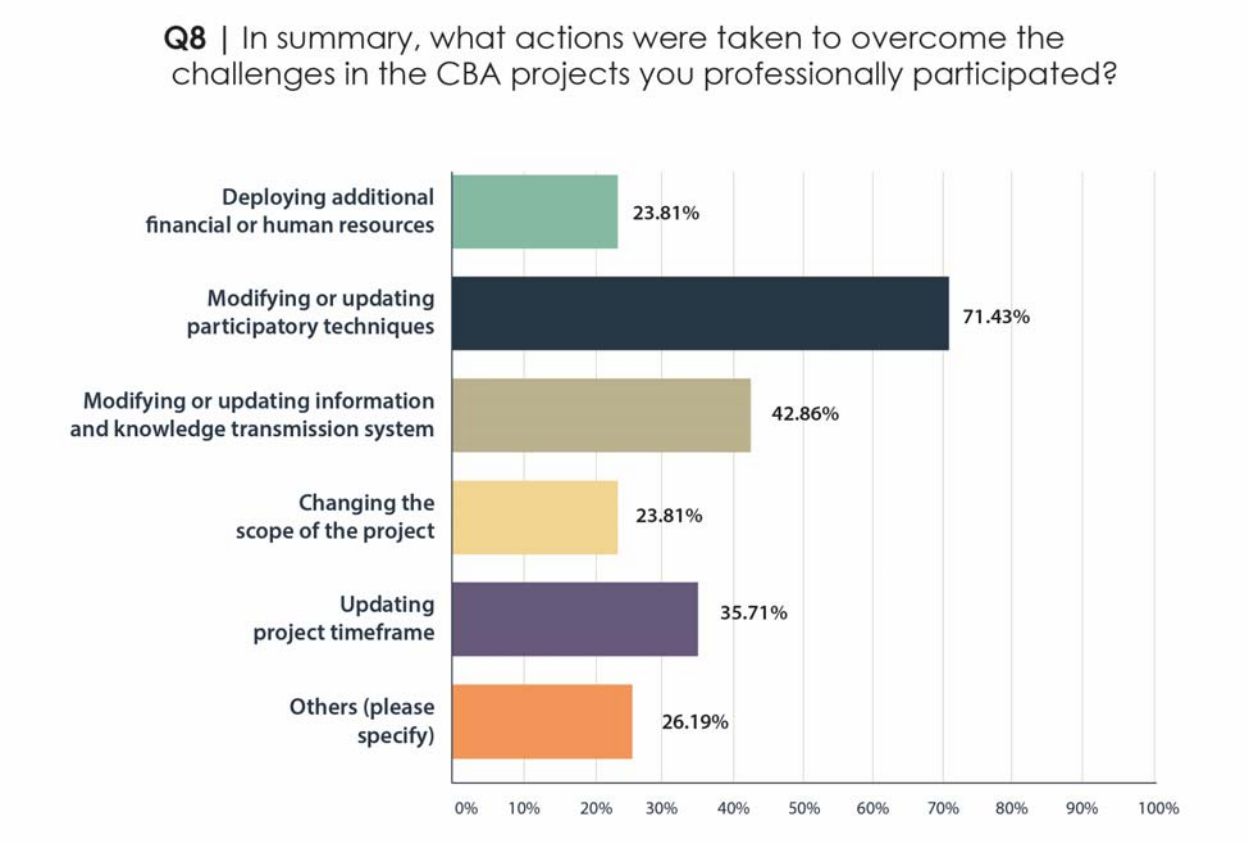

Figure 4 - Actions taken to overcome challenges

4.2.5 Question 9 – Success of actions to overcome challenges.

Most of the respondents, 25 of them, representing around 58%, believe that the success was only partial. Approximately 33%, which corresponds to 14 respondents, state that the actions were successful while 4 participants constituting of roughly 9% answered that the actions were not successful. The results are presented in Figure 5.

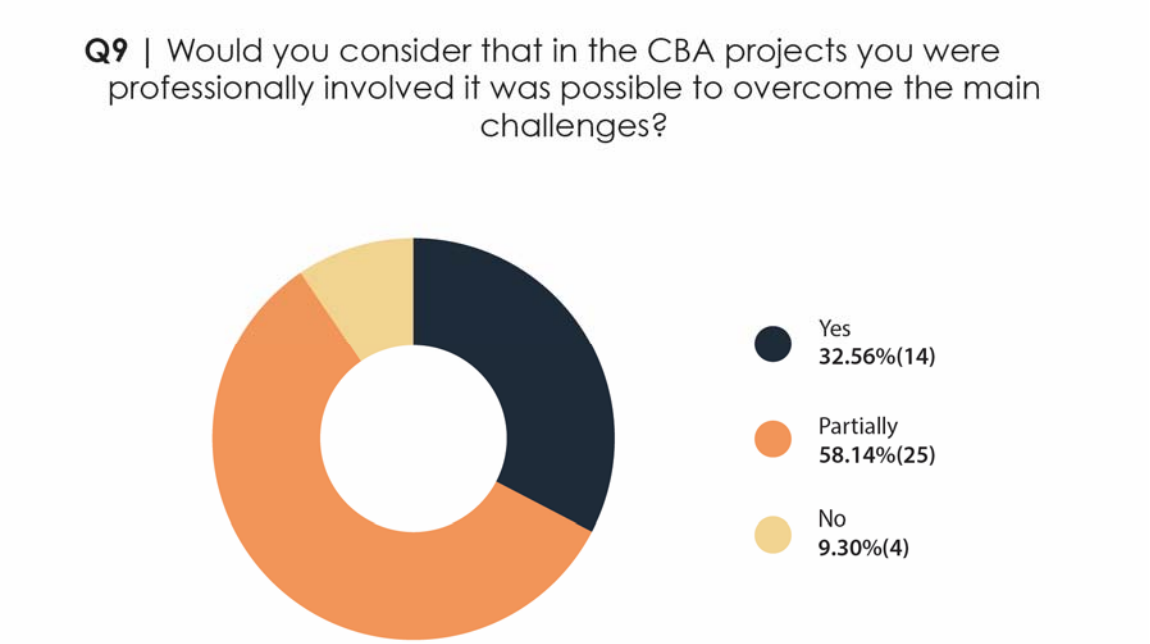

Figure 5 - Overcoming challenges in CBA projects

4.2.6 Question 10 – Success of CBA projects

In this question, 27 respondents said that the success of CBA projects was partial, these respondents represent close to 63% of the total. Approximately 33% resulting from 14 respondents answered that the projects were successful, whereas three respondents corresponding to around 5% responded that the projects were not successful. Figure 6 shows these results.

Figure 6 - CBA project achieving main objectives

4.2.7 Question 11 – CBA and improvement of communities living conditions

The answers to this question showed that 25 respondents corresponding to approximately 58% considered that CBA projects could only improve communities living conditions partially. Nine respondents amounting to close to 21% stated that the projects were able to improve the community's conditions, while three participants which is close to 7% answered that they could not. The open-ended answers indicate a concern about the long-term sustainability of the project results. The results as presented in Figure 7.

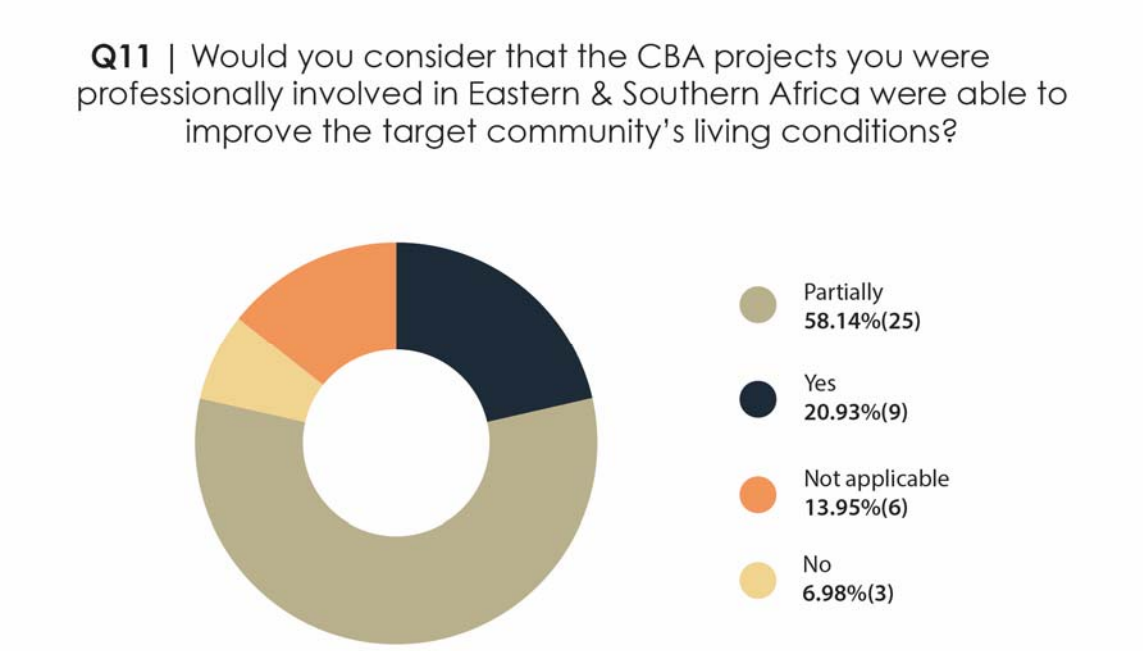

Figure 7 - CBA and improvement of target community conditions

4.2.8 Section 2 – Data Analysis

The main challenges in implementing CBA projects in Eastern & Southern Africa – Analyzing the results shows that the main challenges in implementing CBA projects in the region of study are long term sustainability, financial challenges, and stakeholder coordination. This achieves the first research objective.

The results show that all challenges presented as options in the survey were actual challenges in the projects that the respondents were involved. This indicates a strong link between the research findings and the literature that was reviewed. The most selected challenge was achieving long-term sustainability, this is consistent with the results of other studies that show that long term benefits are an issue in CBA projects (Ayers & Forsyth, 2009, Rawlani & Sovacool, 2011). Long-term sustainability in this environment can be considered both a social challenge, it is

dependent on the receiving community's ability to maintain the project benefits, as a resource challenge, since the lack of resources can impair the design and implementation of the projects, in this way affecting its sustainability. Social and resource challenges were the most selected options between respondents. Stakeholder coordination, Local culture and social norms, and resistance to change are all social challenges and were consistently selected. The open-ended answers suggest that another social challenge is common in this type of project, governance challenges, this challenge should be included in further research in the subject. Resource challenges such as communication barriers, financial challenges, and human resource challenges also had considerable responses. From these finding it is concluded that social and resource challenges are most common in CBA projects.

What factors can contribute for better addressing benefits in CBA projects – The analysis demonstrates that CBA projects are challenging. Several constraints were pointed out by respondents, and despite acting upon these difficulties the success of this action was only partial. Examining the actions undertaken displays that in a vast majority of projects the participatory techniques were modified or updated. Therefore, it is concluded that improving the use of participatory techniques might increase the benefits of CBA projects. This finding is consistent with the literature, the appropriate use of participatory techniques was identified as factor that enables the management of CBA projects (McNamara & Buggy, 2016). Updating the knowledge transmission system and deploying additional resources were other examples of actions taken to overcome challenges. These actions also link to another identified enabler, lack of resources. It is then concluded that gathering enough resources is another potential factor to improve benefits in CBA projects. The open-ended question presented responses that also suggest a link to a CBA enabler, the support of CBA at multiple scales. Several respondents mentioned that improving the link between stakeholders at

the community, the implementing and government levels was undertaken in order to overcome challenges. This leads to the conclusion that improving stakeholder management at all levels would have a positive impact on the benefits of CBA projects.

A likelihood ratio test was performed to test the hypotheses of dependencies between the use of PM methodologies or tools and, the success of CBA projects, as well as the ability to overcome challenges in these projects. The results tables from the test can be found in Appendix D.

The first test was done between the use of PM tools (survey question 5) and the ability of CBA projects to achieve their main objectives (survey question 10). The test returned a P value of 0.493. Meaning that the possibility of dependency between the two factors is very low. As a result, Hypothesis 1 is disproved.

The second test was done between the use of PM tools (survey question 5) and the ability to overcome the main challenges encountered in CBA projects (survey question 9). The test returned a P value of 0.141, this means that the possibility of dependency between these two factors is also very low. Therefore, Hypothesis 2 is disproved.

The test results disprove both hypotheses and show that there is no link between using PM tools and achieving success or overcoming challenges. This leads to the conclusion that either the PM tools used in the projects are not appropriate, or that they were not correctly implemented. This information indicates that updating the PM tools used in these projects could be a way of improving benefits. Alternatively, the design of a specific PM toolkit for CBA projects could also be a solution for better addressing benefits.

In summary, the analysis concludes that improving the use of participatory techniques, assuring the availability of sufficient resources, and focusing on

stakeholder management at all levels are strategies to improve the benefits of CBA projects. It also concludes that updating the PM tools used, or, designing a specific PM toolkit for this type of project could also contribute to addressing the benefits. These conclusions meet the second research objective.

4.3 Section 3 – Alternatives to CBA and future research

4.3.1 Question 12 – Appropriateness of CBA to Eastern & Southern African context

In this question, 37 respondents representing around 86% stated that CBA is suitable for the region of study. One respondent stated that it was not suitable, representing approximately 2% of the responses. Figure 8 shows these results

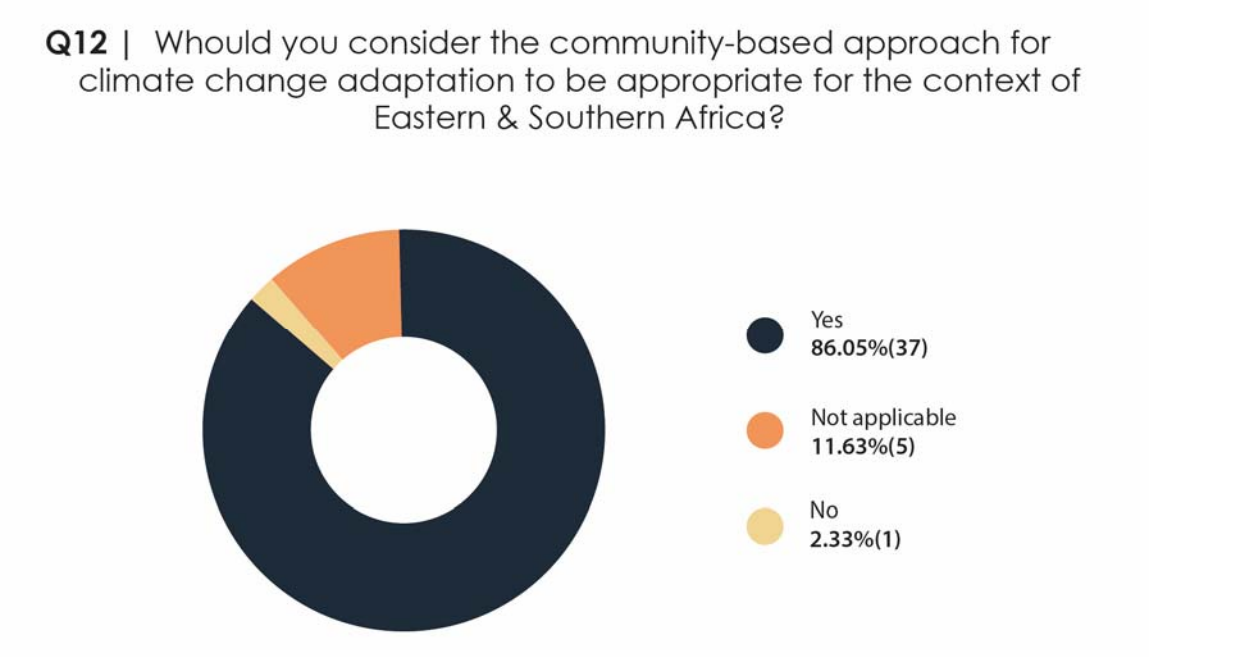

Figure 8 - CBA appropriateness to Eastern & Southern context

4.3.2 Question 13 – Alternatives to CBA

The answers to this question show that Ecosystem-based Adaption (EbA) was selected as the main alternative for CBA, it gathered 31 responses corresponding to around 78%. Risk based Adaptation (RBA) was the second choice with 18 responses representing 45%. Information and Communication Technologies (ICT) based adaptation had 12 responses which is 30%. From the open-ended answers one respondent points out to the lack of clarity in the differences between CBA and EbA. The results are presented in Figure 9.

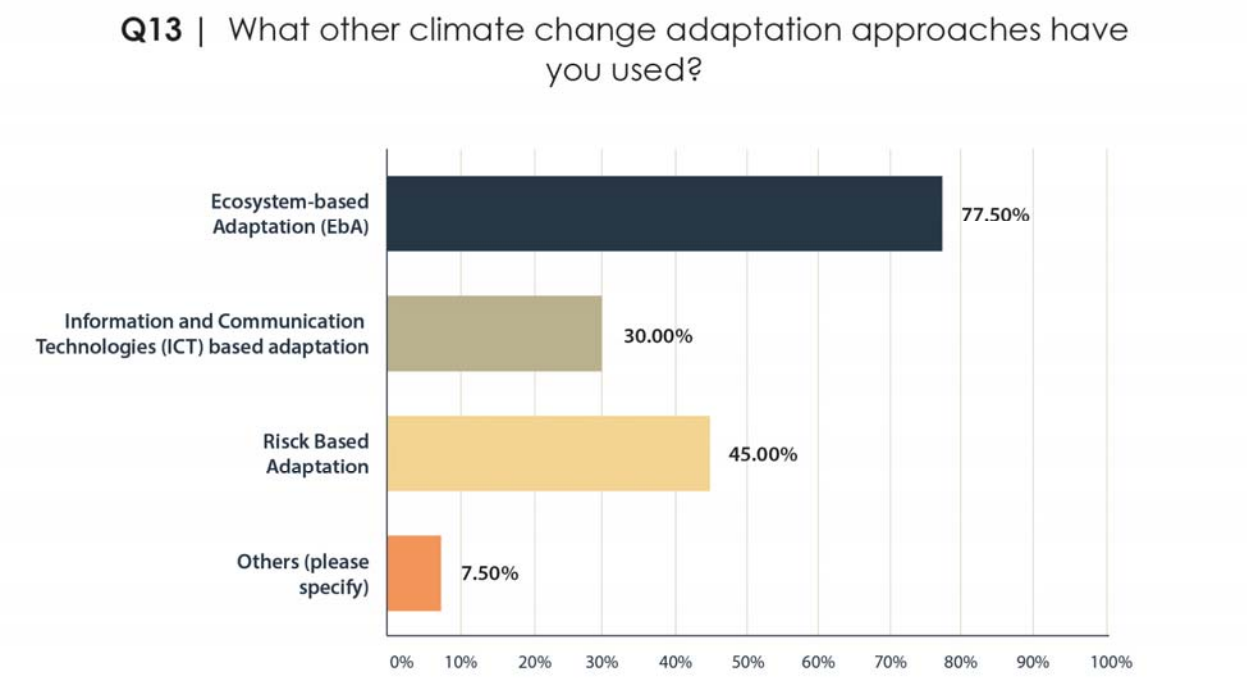

Figure 9 - Alternatives to CBA

4.3.3 Section 3 – Analysis

Alternatives to CBA and future research – A vast majority of respondents believe that the CBA methodology is appropriate to the conditions of the region of study, this shows that CBA projects have the potential to make an impact in Eastern and

Southern African society leading to the conclusion that there is value in undertaking further study in the methodology. As for the alternatives to CBA, EbA was the most common choice. A considerable number of respondents have already used this methodology before. However, both RBA and Information and Communication Technologies Based Adaptation (ICTBA) were also chosen by several responses. This means that all three options are alternatives to CBA. Further research into these adaptation methodologies could be valuable to determine which one provides the best results and what are the conditions each of them requires for achieving positive results.

5 CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents an overview of the research work that was undertaken and its main conclusions and recommendations. The research objectives are revisited, a summary of the findings demonstrating how they were used to achieve the research objectives is presented. The research question is also revisited, along with a demonstration of how the research has answered the question. The main research conclusions, recommendations are part of the chapter as well. The chapter and the research report end with the research limitations.

5.2 Research objectives revisited

5.2.1 Objective 1 – To determine what are the challenges of implementing CBA projects in Eastern & Southern Africa;

In summary this research consisted in a review of the literature, data collection and data analysis. Literature regarding CBA projects, with focus on the region of study was reviewed. Literature on PM and its link to CBA was also studied. The review of the literature indicated that CBA is not extensively used in Eastern and Southern Africa, however there is evidence of the methodology providing positive results. From the literature there was also the indication that PM has a strong link to CBA because it provides methods and tools for its implementation. This gave clear signs that the PM field can be valuable in this setting.

The research was designed as a survey using the quantitative method. Data collection was done through an online questionnaire. A questionnaire was developed to address the three objectives. The questionnaire was multiple choice and the choices provided derived from the findings of the literature review. Some questions gave the respondents the option to provide additional information in an open-ended format.

There were a total of 43 usable respondents to the survey. All 43 respondents had professional experience with CBA. From this group, 35 participants had experience in the region of study. The number of participants exceed the minimal sample size of 31.

The first research objective was achieved by determining that long term sustainability of projects, financial issues and stakeholder coordination are the most relevant challenges in this context. These were the most selected options in the survey. It was also determined that challenges relating to local culture and social norms, resistance to change, communication barriers and human resources are also present in the implementation of CBA projects in the region of study. From the open-ended questions another challenge that was not part of the multiple choices presented in the survey was identified: governance challenges. The results indicated a strong link with the literature, all options presented as challenges were selected, and the results demonstrated that social and resource challenges are the most frequent in these projects.

5.2.2 Objective 2 – To determine how the benefits can be better addressed during the implementation of CBA projects.

The survey findings confirmed that there are difficulties in achieving benefits in these projects. They also showed that attention to stakeholder management, having access to enough funds, and upgrading the participatory techniques used are all factors that can contribute for better addressing benefits in CBA projects. The analysis of the results disproved both hypotheses and indicated that achieving project success, and successfully overcoming challenges were both independent from the use of PM tools. This led to the conclusion that designing a PM toolkit directed to these projects, or, upgrading the existent PM tools were also two potential action plans to addressing benefits. The second research objective was achieved with the identification of these factors.

5.2.3 Objective 3 – To uncover what other project management methodologies can be used as alternatives to CBA, providing potential areas for further study

The survey responses confirmed the suitability of CBA to Eastern and Southern African environment, concluding that despite the importance of studying alternative methodologies, further research in CBA is also important. The most commonly used alternative, according to the research participants was EbA, although RBA and ICTBA are also used with frequency. This indicated that all three methodologies have the potential for further study. Research on each of the methodologies advantages and disadvantages could be valuable. Establishing this achieves the third research objective.

5.3 Hypotheses revisited

Hypothesis 1 was that there is a link between the use of PM tools and the ability of CBA projects to achieve their principal goals. This hypothesis was disproved by testing the dependency between these two factors.

Hypothesis 2 was the existence of a connection between the use f PM tools and the ability of overcoming the main challenges faced in CBA projects. The dependency test done between the two factors disproved hypothesis 2.

The results from testing the hypotheses contribute to the research and suggest that upgrading the existing PM tools or designing a specific PM toolkit for CBA projects might be a good solution to better address benefits in these projects.

5.4 Research question revisited

The research question to be answered was:

- What are the factors that contribute to CBE projects not focusing on long term objectives (benefits)?

The research was able to answer the research question by achieving its objectives. The challenges faced by CBA projects in Eastern and Southern Africa identified in this study are factors that impair the focus on long term goals. These challenges are: the long-term sustainability of projects; financial factors; and stakeholder coordination. The identification of areas that should be improved in order to better address benefits are also factors that contribute to the failure of CBA projects in focusing on long lasting benefits. These areas are: stakeholder management, fund raising, use of participatory techniques, and use of PM tools. This information is relevant and sufficient to answering the research question.

5.5 Conclusions

This research identified that the main challenges faced by CBA projects in region of study are long term sustainability of projects, financial issues, and stakeholder coordination. The study also showed that challenges relating to local culture and social norms, resistance to change, communication barriers, human resources, and governance are also current in CBA projects within the region. This concludes that all these challenges are factors that contribute to the lack of focus on long-termed objectives in CBA projects.

The study revealed that increasing focus on stakeholder management, having access to enough funds, upgrading the participatory techniques used, designing a specific PM toolkit for CBA, or, upgrading the PM tools currently available are factors that can allow CBA projects to better address benefits. It is concluded that all these factors are also contributors to the CBA project's inadequate attention to long-term benefits.

5.6 Further recommendations

Further recommendations are related to future study. Besides the PM methodologies identified in the third objective, several possibilities for future research were recognized in this work. The governance challenges showed potential. These challenges were not fully explored in this study, however, it was concluded that they should be included in future research regarding challenges in the implementation of CBA projects.

It would also be of interest to compare the results of this research to work done in different geographical areas. This could be a fruitful approach for future research.

Another option for the future is studying the PM tools used in CBA projects. In this research the Logical Framework Analysis (LFA) and the Community Based Adaptation Toolkit were the most common used PM methodologies, however their use did not show any link to project success. Future studies could focus on these tools to assess how they are implemented in practice, and to determine how they can be improved.

5.7 Research limitations

This research was limited by the sample size. Despite having sufficient participants to perform the study, there are indications that a much larger group of professionals has been involved in the implementation of CBA projects. There is a possibility that the sample size used in this research is not able to reflect the actual situation. Further surveys regarding CBA projects in the region should attempt to involve a larger number of professionals.

Another limitation relates to the fact that the research was done through a survey, which is based on individual perception. There might be gaps between personal points of view and what actually happened. Action research or case study

analysis into CBA projects could provide more in dept information as the data would be gathered closer to the source.

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7 APPENDICES

7.1 Appendix A - Questionnaire

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Directions for respondents

1. **The survey consists in 10 questions.**
2. **The questionnaire is in a multiple-choice format. Please select the answers that best fit your experience and opinions.**
3. **Some questions provide the option of adding open-ended responses. Please use this option if you feel that the choices provided do not express your experience and opinions.**
4. **Some questions relate to experience in CBA projects within the region of Eastern & Southern Africa. If you do not have such experience, please select the option: "Not applicable"**

Thank you very much for your participation.

Have you been professionally involved in any way (implementation, review, research, etc.) in Community Based Climate Change Adaptation (CBA) projects?

- ◯ Yes
- ◯ No

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Have you been professionally involved in CBA projects in the region of Eastern & Southern Africa?

- ◯ Yes
- ◯ No

Challenges in the implementation of CBA projects in Eastern & Southern Africa

In which country/countries?

- ☐ Angola
- ☐ Botswana
- ☐ Burundi
- ☐ Comoros
- ☐ Eritrea
- ☐ Eswatini

- [ ] Ethiopia
- [ ] Kenya
- [ ] Lesotho
- [ ] Madagascar
- [ ] Malawi
- [ ] Mozambique
- [ ] Namibia
- [ ] Rwanda
- [ ] Somalia
- [ ] South Africa
- [ ] South Sudan
- [ ] Tanzania
- [ ] Uganda
- [ ] Zambia
- [ ] Zimbabwe

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?

- ◯ Yes
- ◯ No
- ◯ Not applicable

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Which tools?

- [ ] Community Based Adaptation Toolkit
- [ ] The United Nations Development Programme (UNDP) practitioners guide to establishing CBA programmes
- [ ] Results Based Management (RBM)
- [ ] Logical Framework Analysis (LFA)
- [ ] Project Management Institute's Project Management Body of Knowledge (PMI PMBoK)
- [ ] Others (please specify)

Challenges in the implementation of CBA projects in Eastern & Southern Africa

What were the main challenges encountered in the implementation of CBA projects in Eastern & Southern Africa?

- [ ] Not applicable
- [ ] Stakeholder coordination
- [ ] Local culture and social norms
- [ ] Resistance to change
- [ ] Communications barriers
- [ ] Financial challenges
- [ ] Human resources challenges
- [ ] Long term sustainability
- [ ] Others (please specify)

In summary, what actions were taken to overcome the challenges in the CBA projects you professionally participated?

- [ ] Deploying additional financial or human resources
- [ ] Modifying or updating participatory techniques
- [ ] Modifying or updating information and knowledge transmission system
- [ ] Changing the scope of the project
- [ ] Updating project timeframe
- [ ] Others (please specify)

Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?

- ◯ Yes
- ◯ Partially
- ◯ No

Did the CBA projects you were professionally involved achieved their main objectives?

- ◯ Yes
- ◯ Partially
- ◯ No

Would you consider that the CBA projects you were professionally involved in Eastern & Southern Africa were able to improve the target community´s living conditions?

- ◯ Yes
- ◯ Partially
- ◯ No
- ◯ Not applicable

Please elaborate, if you wish

Would you consider the community-based approach for climate change adaptation to be appropriate for the context of Eastern & Southern Africa?

- ◯ Yes
- ◯ No
- ◯ Not applicable

What other climate change adaptation approaches have you used?

- ☐ Ecosystem-based Adaptation (EbA)
- ☐ Information and Communication Technologies (ICT) based adaptation
- ☐ Risk Based Adaptation
- ☐ Others (please specify)

7.2 Appendix B – Consent Form

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Consent form

Thank you for agreeing in participating in this survey. This consent form is necessary for to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. You are participating in an ongoing research study undertaken by Faizal Osman from the Department of Construction Economics and Management, Faculty of Engineering and the Built Environment, University of Cape Town.

The purpose of this research study is to determine the challenges involved in the implementation of Community Based Climate Change Adaptation (CBA) projects in Eastern & Southern Africa. You will be asked to share your professional experiences in the implementation of CBA projects in general, and, if you have such experience, CBA projects implemented within the region of Eastern & Southern Africa.

Completing this survey should take about 15 minutes of your valuable time.

All the information provided is confidential, your name or email will not be included on the response forms, only a number will identify you. No information that you provide about your experience will be shared with anybody outside, and nothing will be attributed to you by name.

Please understand that your participation in this research is entirely voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate but wish to withdraw at any time, you will be free to do so without any negative consequence. However, we would be grateful if you would participate in this study.

There is no direct benefit to you by participating in this research. The knowledge gained may benefit the public in the future.

This document acknowledges that you understand your rights as a participant in this study, which the researcher has explained to you prior to accepting participation.

Please read the following information and then click yes to certify that you approve and agree the following:

- **I acknowledge that my participation is voluntary, and I may withdraw my participation at any time**
- **I have the right to decline to answer a question and/or stop the survey if I feel uncomfortable**
- **I don't expect to receive any benefit or payment for my participation**
- **I understand that my identity will be kept confidential**
- **I give consent to the recording of my answers in this survey and acknowledge that a transcript will be produced**
- **I will be sent the transcript and given the opportunity to correct any factual errors**
- **Faizal Osman and Mark Massyn will analyze the transcript of the survey as the research investigators. Access to the survey transcript will be limited to Faizal, Mark and academic**

colleagues and researchers with whom they might collaborate as part of the research process.

I acknowledge that the researchers have explained my rights, the requirements of this study, and the potential risks involved in participating in this study. By clicking yes in the question below, I am indicating that I consent to participate in this study and that I am at least 18 years of age.

Do you consent to participate in this research?

- ◯ Yes
- ◯ No

7.3 Appendix C – Example of individual response

Challenges in the implementation of CBA projects in Eastern & Southern Africa

#7

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 02, 2020 5:04:43 PM
Last Modified:	Monday, November 02, 2020 7:23:52 PM
Time Spent:	02:19:09

Page 1: Consent form

Q1	**Yes**
Do you consent to participate in this research?	

Page 2: Directions for respondents

Q2	**Yes**
Have you been professionally involved in any way (implementation, review, research, etc.) in Community Based Climate Change Adaptation (CBA) projects?	

Page 3

Q3	**Yes**
Have you been professionally involved in CBA projects in the region of Eastern & Southern Africa?	

Page 4

Q4	**Kenya,**
In which country/countries?	**Malawi,**
	Tanzania

Page 5

Q5	**Yes**
Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	

Page 6

Challenges in the implementation of CBA projects in Eastern & Southern Africa

Q6 Which tools?	**Logical Framework Analysis (LFA),** Others (please specify): Theory of change analysis

Page 7

Q7 What were the main challenges encountered in the implementation of CBA projects in Eastern & Southern Africa?	**Stakeholder coordination,** **Financial challenges,** **Human resources challenges,** Others (please specify): Unpredictable and unreliable flow of funds from donors.
Q8 In summary, what actions were taken to overcome the challenges in the CBA projects you professionally participated?	**Modifying or updating participatory techniques,** **Updating project timeframe**
Q9 Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?	**Partially**
Q10 Did the CBA projects you were professionally involved achieved their main objectives?	**Yes**
Q11 Would you consider that the CBA projects you were professionally involved in Eastern & Southern Africa were able to improve the target community´s living conditions?	**Partially**
Q12 Would you consider the community-based approach for climate change adaptation to be appropriate for the context of Eastern & Southern Africa?	**Yes**
Q13 What other climate change adaptation approaches have you used?	**Ecosystem-based Adaptation (EbA)**

7.4 Appendix D – Results from likelihood ratio test

7.4.1 Use of PM Tools versus Success of CBA projects

Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa? * Did the CBA projects you were professionally involved achieved their main objectives? Crosstabulation

			Did the CBA projects you were professionally involved achieved their main objectives?			
			Yes	Partially	No	Total
Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	Yes	Count	7	12	1	20
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	35.0%	60.0%	5.0%	100.0%
		% within Did the CBA projects you were professionally involved achieved their main objectives?	50.0%	44.4%	50.0%	46.5%
		% of Total	16.3%	27.9%	2.3%	46.5%
	No	Count	5	6	1	12
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	41.7%	50.0%	8.3%	100.0%
		% within Did the CBA projects you were professionally involved achieved their main objectives?	35.7%	22.2%	50.0%	27.9%
		% of Total	11.6%	14.0%	2.3%	27.9%
	Not applicable	Count	2	9	0	11
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	18.2%	81.8%	0.0%	100.0%
		% within Did the CBA projects you were professionally involved achieved their main objectives?	14.3%	33.3%	0.0%	25.6%
		% of Total	4.7%	20.9%	0.0%	25.6%
Total		Count	14	27	2	43
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	32.6%	62.8%	4.7%	100.0%
		% within Did the CBA projects you were professionally involved achieved their main objectives?	100.0%	100.0%	100.0%	100.0%
		% of Total	32.6%	62.8%	4.7%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.879[a]	4	0.578
Likelihood Ratio	3.400	4	0.493
Linear-by-Linear Association	0.253	1	0.615
N of Valid Cases	43		

a. 5 cells (55.6%) have expected count less than 5. The minimum expected

7.4.2 Use of PM tools versus the ability to overcome challenges in CBA projects

Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa? * Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges? Crosstabulation

			projects you were professionally			
			Yes	Partially	No	Total
Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	Yes	Count	6	12	2	20
		Expected Count	6.5	11.6	1.9	20.0
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	30.0%	60.0%	10.0%	100.0%
		% within Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?	42.9%	48.0%	50.0%	46.5%
		% of Total	14.0%	27.9%	4.7%	46.5%
	No	Count	6	4	2	12
		Expected Count	3.9	7.0	1.1	12.0
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	50.0%	33.3%	16.7%	100.0%
		% within Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?	42.9%	16.0%	50.0%	27.9%
		% of Total	14.0%	9.3%	4.7%	27.9%
	Not applicable	Count	2	9	0	11
		Expected Count	3.6	6.4	1.0	11.0
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	18.2%	81.8%	0.0%	100.0%
		% within Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?	14.3%	36.0%	0.0%	25.6%
		% of Total	4.7%	20.9%	0.0%	25.6%
Total		Count	14	25	4	43
		Expected Count	14.0	25.0	4.0	43.0
		% within Have you used a specific project management methodology or tool(s) in the implementation of CBA projects in Eastern & Southern Africa?	32.6%	58.1%	9.3%	100.0%
		% within Would you consider that in the CBA projects you were professionally involved it was possible to overcome the main challenges?	100.0%	100.0%	100.0%	100.0%
		% of Total	32.6%	58.1%	9.3%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.936[a]	4	0.204
Likelihood Ratio	6.913	4	0.141
Linear-by-Linear Association	0.001	1	0.977
N of Valid Cases	43		

a. 5 cells (55.6%) have expected count less than 5. The minimum expected

7.5 Appendix E – Ethics approval form

ETHICS APPLICATION FORM

Please Note:
Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application prior to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: http://www.ebe.uct.ac.za/ebe/research/ethics1

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant		Faizal Bique Osman
Department		Construction Economics & Management
Preferred email address of applicant		OSMFAI004@myuct.ac.za
If Student	Your Degree e.g., MSc, PhD, etc.	MSc Project Management
	Credit Value of Research: e.g., 60/120/180/360 etc.	60
	Name of Supervisor (if supervised):	Mark Massyn
If this is a research contract, indicate the source of funding/sponsorship		
Project Title		Challenges in the implementation of EIA projects in Southern Africa

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

APPLICATION BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Faizal Bique Osman		16/10/20
SUPPORTED BY	**Full name**	**Signature**	**Date**
Supervisor (where applicable)	Mark Massyn		16/10/20

APPROVED BY	Full name	Signature	Date
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (including Honours).	Louie van Schalkwyk		26 Oct 2020
Chair: Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the questions in Section 1.	Louie van Schalkwyk		26 Oct 2020

Signatures Removed