Examining the mechanisms for and factors affecting benefit sharing in two South African aquaculture projects

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Declaration

I, Brett Daniel Agiotis, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise). This thesis/dissertation has been submitted to the Turnitin module and I confirm that my supervisor has seen my report and any concerns revealed by such have been resolved with my supervisor.

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Abstract

The Blue Economy, that gained traction at the Rio + 2012 Earth Summit hosted by the United Nations, has been put forward as a concept to fast-track socio-economic development in the ocean space in a way that integrates marine conservation and social equity. Aquaculture is one of the key sectors of the Blue Economy and is seen as a frontier for driving economic growth, enhancing food security, and relieving the pressure of capture fisheries. What remains uncertain is the extent to which these high-level policy interventions translate into benefits for people on the ground who are directly and indirectly affected by them. The aim of this study was to contribute to a better understanding of the perceptions of benefits marginalised individuals and coastal communities in South Africa derive from involvement in Blue Economy projects linked to aquaculture as well as the key factors enabling and inhibiting benefit sharing. In contexts where local people perceive that they benefit from Blue Economy activities, the study unravels whether the distribution of those benefits is seen as fair and equitable.

The study used two aquaculture projects implemented in Doringbaai and Saldanha Bay on the West Coast of South Africa as a lens. These aquaculture projects were implemented with the aim of creating jobs, enhancing food security, building skills, and benefiting individuals and the wider community. Findings revealed that despite positive impacts through employment, skills development, and the establishment of aquaculture enterprises, several factors influenced the effectiveness of benefit sharing for individuals and coastal communities leading to negative perceptions regarding these interventions. Unequal power relations, flawed benefit sharing arrangements, and the COVID-19 pandemic had a major impact on benefit sharing outcomes envisaged for both projects.

Moreover, while the South African government made considerable effort to support individual and wider coastal community participation in the aquaculture sector, the level of post-implementation support from the state for these projects was lacking. Based on an enhanced understanding of how the projects were executed as well as individual and community perceptions of benefit sharing, this study argues that the nature of benefit sharing arrangements, the institutional arrangements, and power dynamics amongst actors involved in the aquaculture projects can significantly influence the extent to which people benefit. Other factors such as power dynamics, participation, transparency, transfer of skills, post-implementation support, robust institutions, and effective benefit sharing arrangements must be considered in the planning and implementation of Blue Economy projects and programmes. This is vital in order to ensure that aquaculture projects involving individuals and communities can be financially viable, sustainable, and achieve equitable social benefits.

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List of Acronyms and Abbreviations

Africa Integrated Maritime (AIM)

Africa Maritime Domain (AMD)

African Union (AU)

Aquaculture Development and Enhancement Programme (ADEP)

Aquaculture Development Zone (ADZ)

Aquaculture Management Committee (AMC)

Basic Assessment (BA)

Blue Ocean Mussels (BOM)

Black Economic Empowerment (BEE)

Broad-based Black Economic Empowerment (B-BBEE)

Council for Scientific and Industrial Research (CSIR)

Common Market for Eastern and Southern Africa (COMESA)

Community-based Aquaculture (CBA)

Community-based Natural Resource Management (CBNRM)

Comprehensive Agriculture Support Programme (CASP)

Corporate Social Responsibility (CSR)

Department of Agriculture, Forestry, and Fisheries (DAFF)

Department of Environmental Affairs (DEA)

Department of Environmental Affairs and Tourism (DEAT)

Department of Forestry, Fisheries, and the Environment (DFFE)

Department of Mineral Resource (DMR)

Department of Public Works (DPW)

Department of Trade Industry and Competition (DTIC)

Development Finance Institution (DFI)

Doring Bay Abalone (DBA)

Doringbaai Atlantic Pebbles (DAP)

Doringbaai Development Trust (DDT)

Environmental Control Officer (ECO)

Environmental Impact Assessment (EIA)

Environmental Management Programme (EMPr)

Exclusive Economic Zones (EEZs)

Food and Agriculture Organisation (FAO)

Food Poverty Line (FPL)

Gross Domestic Product (GDP)

Harmful Algal Blooms (HABs)

Historically Disadvantaged Individuals (HDIs)

Interested and Affected Parties (IAPs)

Industrial Development Corporation (IDC)

Marine Living Resources Act (MLRA)

Mineral and Petroleum Resources Development Act (MPRDA)

Molluscan Shellfish Monitoring and Control Programme (MSMCP)

National Empowerment Fund (NEF)

National Development Plan (NDP)

Natural Resource Management (NRM)

Non-Governmental Organisations (NGOs)

Oceans Economy Master Plan (OEMP)

Operation Phakisa (OP)

Saldanha Aqua Farmers (SAF)

Saldanha Aquaculture Services (SAS)

Saldanha Bay Aquaculture Development Zone (SBADZ)

Saldanha Bay-Langebaan Lagoon (SBLL)

Save Langebaan Lagoon (SLL)

Small, Medium, and Micro-sized Enterprises (SMMEs)

South African Development Community (SADC)

South Durban Community Environmental Alliance (SDCEA)

Southeast Asian Fisheries Development Centre (SEAFDEC)

Strategic Environmental Assessment (SEA)

Sustainable Development Goal (SDG)

Transnet National Ports Authority (TNPA)

United Nations Conference on Trade and Development (UNCTAD)

United Nations Convention on the Law of the Sea (UNCLOS)

United Nations Department of Economic and Social Affairs (UNDESA)

United Nations Economic Commission for Africa (UNECA)

United Nations (UN)

University of Cape Town (UCT)

Western Cape Aquaculture Development Initiative (WCADI)

West Coast National Park (WCNP)

West Coast Rock Lobster (WCRL)

Western Indian Ocean (WIO)

World Forum of Fisherpeople (WFFP)

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Chapter One: Introduction

1.1 Introduction and Rationale

The world's oceans and coastal areas are the largest ecosystems on the planet. They are increasingly being recognised for the value they provide in supporting economic growth, food production, and the livelihoods of billions of people across the world (Halpern et al., 2012; Silver et al., 2015; Österblom et al., 2020). The capacity of the oceans in providing these vital ecosystem services in the long-term, however, is already under threat due to the fragmented, misguided, and over-extractive nature of human activities (WWF-SA, 2016; Germond-Duret et al., 2023). The prevailing perception amongst certain users that ocean resources are 'infinite' and can support increasing ocean economic development has led to a worldwide crisis where many fisheries have collapsed, vital ecosystem services have been affected, and habitats have been heavily degraded (Brent et al., 2018; Stobie, 2019a). Furthermore, the cumulative impacts of ongoing exploitation of resources and unsustainable development interventions in the marine environment have received limited attention (Cisneros-Montemayor et al., 2019; Brugere et al., 2021). In this regard, we are facing major challenges for present and future generations if unsustainable development practices remain unchanged (Stobie, 2019a; Niner et al., 2022).

Various countries around the world, in recent years, have incorporated calls from the United Nations (UN) and other key agencies for more sustainable approaches in their national ocean development strategies. These approaches are intended to promote a more sustainable balance between economic development, social equity, and ocean ecosystem health, an approach known as the Blue Economy (Economist Intelligence Unit, 2015; Eikeset et al., 2018).

The Blue Economy is a development concept that gained traction at the Earth Summit conference held in Rio de Janeiro and hosted by the UN in 2012 (Sparks, 2021). It is based on the premise of incorporating economic, environmental, and social considerations into the long-term development of the marine environment that will lead to more sustainable outcomes (Silver et al., 2015; Cisneros-Montemayor et al., 2022a). The main sectors of the Blue Economy include ocean energy, marine bioprospecting, offshore oil and gas exploration, aquaculture, ecotourism, and maritime transport. Aquaculture or 'fish farming' in particular, has received increased attention in recent years for the crucial role that it could play for sustainable fish production to meet global consumer demands (Cisneros-Montemayor et al., 2019; Techera and Hassan, 2021).

Aquaculture is growing faster than any other form of food production in the world and produces over half of all fish consumed globally (FAO, 2020). Owing to the rapid decline of fishery stocks around the world, many believe that aquaculture will relieve the pressures on capture fisheries that are on the brink of collapse (Dyer, 2015; Brent et al., 2018; Österblom et al., 2020). In theory, Blue Economy strategies such as aquaculture development hold great promise in helping to promote economic growth, food security, social upliftment, and solve unsustainable development practices that are deteriorating marine environments. While there is a rich and diverse body of literature on the Blue Economy (Silver et al., 2015; Foley, 2017; Voyer et al., 2018; Cohen et al., 2019; Österblom et al., 2020; Bennett at al., 2021), there is ambiguity around what the concept means both in theory and also how it should be implemented in practice. Owing to its wide interpretation, countries around the world have adopted their own interpretations of the Blue Economy and have formulated Blue Economy strategies according to the context of their developmental needs and priorities (Germond-Duret et al., 2023).

South Africa's national Blue Economy model for example, known as Operation Phakisa (meaning 'hurry up' in Sesotho), was established by the South African government in 2014 to address the high levels of poverty, unemployment, and inequality in the country (Operation Phakisa, 2014a). Operation Phakisa's overriding goal is to fast-track delivery of socio-economic benefits to address these socio-economic issues through implementing mega-projects aimed at driving economic growth and job creation (Operation Phakisa, 2020). Aquaculture was identified as one sector that showed great promise in helping to achieve this goal. Expanding aquaculture production could encourage economic growth through the trade and export of seafood products to domestic and overseas markets. It could also increase employment opportunities and enhance food security with a diverse array of fish protein available for impoverished coastal communities in South Africa to eat and sell. From 2015-2019, Operation Phakisa focused on creating 15,000 additional jobs and contributing over R3 billion to South Africa's local economy through the implementation of 24 pilot aquaculture projects across the country (Operation Phakisa, 2014a).

The Saldanha Bay Aquaculture Development Zone (SBADZ) and the Doring Bay Abalone (DBA) initiative in the Western Cape province of South Africa form part of the 24 aquaculture projects within Operation Phakisa. The DBA project was established before Operation Phakisa was formed but was then incorporated into Operation Phakisa's (OP) Oceans Economy[1] Programme shortly after its launch in 2014.

[1] The Oceans Economy and Blue Economy both refer to approaches to unlock the economic potential of South Africa's oceans and will be used interchangeably throughout this thesis.

The SBADZ was a strategy driven by the OP Oceans Economy Programme in 2016 to enable Historically Disadvantaged Individuals (HDIs) and communities[2] to start up their own aquaculture production enterprises in the Saldanha Bay area. Both aquaculture projects have a 'community-based' element to them, whereby HDIs and communities involved were provided with the opportunity to either start up their own aquaculture enterprise or were given a stake within the business that gives each member equal access to the economic benefits from their shareholding (Operation Phakisa, 2014a). It is important to note, however, that community-centred aquaculture is a very broad term that encompasses a number of characteristics and different interpretations. Hence, approaches to implement this type of aquaculture can be done in various ways according to the context in which it is applied. This will be discussed in more depth in the sections to follow.

While Operation Phakisa's 'fast results' methodology may help to speed-up the approval of Blue Economy initiatives that seek to address the socio-economic hardships facing many South Africans, some have argued that the socio-economic needs and concerns of key resource users and stakeholders, particularly HDIs and communities, have not been recognised and incorporated into planning and decision-making processes (Masie and Bond, 2018; Bond, 2019; Loring et al., 2019; Sowman et al., 2023). Concern has also been raised regarding the potential impacts that Blue Economy projects may have on surrounding communities and the environment due to their tendency to focus on 'economic solutions' and trade-offs rather than on holistic sustainability and equity considerations (Isaacs, 2016; Britz, 2017; Clarke et al., 2018; Österblom

[2] Operation Phakisa government documents, the Blue Economy literature, and other literature sources in the Southern African context commonly refer to marginalised people in South Africa during the apartheid era as historically disadvantaged individuals (HDI)s and communities. This term will be used throughout this thesis to refer to individuals and people within coastal and small-scale fishing communities in South Africa that have been or are currently still marginalised in democratic society.

et al., 2020). Moreover, the extent to which stakeholders such as impoverished coastal communities share in the benefits arising from Blue Economy projects has not been properly investigated. In fact, past research has shown that a significant number of coastal communities across the world, who are directly affected by Blue Economy activities, have never heard of the concept at all (Silver at al., 2015; Hills et al., 2019). Thus, as Bennett et al., (2021: 2) argue, "The dominant discourse that frames blue growth as beneficial for the economy, for developing nations and for coastal communities risks downplaying the uneven distribution of benefits and the potential for substantial social harms without sufficient 'checks and balances'".

In addition to the limited stakeholder participation, there is also inadequate understanding of the perceptions of local communities about Blue Economy projects and the extent to which they share in the benefits from these initiatives. These considerations are not being included in planning and decision-making of Blue Economy initiatives, and South Africa is no exception to this (Wynberg et al., 2014; Cohen et al., 2019; Sowman et al., 2023). As Troell et al., (2011: 3) argue, "An aquaculture activity can provide livelihood alternatives and employment opportunities, however, few studies have considered details concerning the social dimension side alongside the production". Research into perceptions and benefit sharing associated with Blue Economy projects (Mbatha and Wynberg, 2014; Wynberg and Hauck, 2014) can contribute vital knowledge into effective and inclusive planning and implementation of Blue Economy initiatives. Perception studies (Bennett, 2016; Bennett et al., 2019; Loring et al., 2019) can help to determine what communities and other stakeholders perceive as a benefit and which benefits they value most. For example, understanding people's perceptions could highlight that what proponents and government assume to be benefits may not be viewed as benefits that are necessarily prioritised by most HDIs and communities (Song et al., 2013; Wynberg at al., 2014; Bennett, 2016).

Benefit sharing mechanisms are tools or arrangements between different stakeholders that are implemented to promote a more equitable and fair distribution of benefits to people from a natural resource. By including benefit sharing into decision-making processes, it allows for the multi-faceted nature of benefits that communities value most to be considered and distributed evenly amongst participants (Wynberg et al., 2014). For example, there are a wide range of ecological, economic, and socio-cultural benefits that coastal communities derive from coastal resources and spaces (Österblom et al., 2020). This includes fish harvested from the sea to support food and livelihoods as well as the socio-cultural connection that coastal communities and their ancestors have had with the sea for centuries (Mbatha, 2011; Cowan Jr et al., 2012; Mbatha and Wynberg, 2014; Sunde, 2014). Although monetary benefits are of great value for their livelihoods, non-monetary benefits are also of paramount importance to coastal communities (Wynberg and Hauck, 2014; Österblom et al., 2020). It is therefore crucial to recognise that there are many different perceptions and values that various resource users and other stakeholders hold towards ocean resources and spaces that don't necessarily fit into the economic model that underpins the Blue Economy.

1.2 Aim

The aim of this study is to examine the mechanisms for and factors affecting benefit sharing from Blue Economy projects linked to the aquaculture sector in South Africa and ascertain whether communities consider the distribution of benefits from these projects to be fair and equitable. To do this, a three-year study was conducted on the West Coast of South Africa that focused on two case studies. The first, a marine abalone farming project in Doringbaai and the second, a mussel farming project in Saldanha Bay.

Both case studies have a strong focus on involvement of HDIs and local communities in the projects with the intention of creating jobs, alleviating poverty, and delivering socio-economic benefits to the wider community. Semi-structured interviews were conducted with owners of the enterprises in the study sites as well as with individuals and community members involved in the projects. This research sought to understand the perceptions of benefits flowing to communities from the Blue Economy interventions as well as the different perceptions towards the benefit sharing mechanisms employed to distribute benefits. The factors influencing benefit sharing were also explored in order to determine who ultimately benefited from the two case study projects of interest. Lastly, the study investigated the key opportunities and challenges facing the two aquaculture projects selected and offers recommendations to improve their sustainability performance from a socio-economic and ecological perspective.

1.3 Objectives

In light of this overarching aim, four objectives guided this study:

1. To understand how aquaculture projects, that seek to involve and benefit HDIs and communities, are currently operating in the context of South Africa's Blue Economy and the mechanisms employed for benefit sharing;
2. To understand HDIs, local communities, and other key stakeholders' perceptions of benefits and losses derived from the two aquaculture projects of interest, and to identify reasons for perceived benefits and losses;
3. To ascertain the factors that influence benefit sharing in these aquaculture projects and in particular, identify enabling factors and blockages to achieve equitable benefit sharing; and

4. To make recommendations for improving practice to enhance benefit sharing in the aquaculture sector in South Africa where local communities and HDIs are the target beneficiaries.

1.4 Structure of Dissertation

Chapter One has provided an introduction and rationale for the study, presented the aim and objectives of the research, and summary information of the two case studies selected for the study. Chapter Two presents the literature review that underpins this study and provides the theoretical frameworks that inform the study. Chapter Three discusses the research approach, data collection, and data analysis methods used in the study and also considers the ethical aspects of the research. Chapter Four discusses the background and context of the two case study sites in more detail. Chapters Five and Six explore the findings of the research in relation to the two case studies examined. These findings are then analysed and discussed in Chapter Seven. Finally, Chapter Eight concludes the study and provides recommendations for improving practice.

Chapter Two: Literature and theoretical perspectives guiding the study

In this chapter, four main concepts relevant to this research are discussed: i) the Blue Economy, ii) Aquaculture and Community-Based Aquaculture, iii) Access and Benefit Sharing, and iv) Perception studies. This chapter is divided into two different sections. In Part 1, the context of this study is provided through exploring the concepts of the Blue Economy and the growth of Aquaculture and Community-Based Aquaculture (CBA) from a global perspective, African perspective, as well as in the South African context. Part 2 examines the concepts of access and benefit sharing, and also explores the value of perception studies. These concepts form the theoretical framing of this study which is discussed further in Chapter Seven.

Part 1 – Context of the Blue Economy and Growth of Aquaculture

2.1 The Blue Economy in the Global context

The Blue Economy is a relatively new concept that emerged from the United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012 (Sparks, 2021). The concept increasingly received more traction post-2012 globally due to greater recognition of the rapid development of ocean economies which is inextricably linked with the deterioration of coastal ecosystems and impacting those who are dependent on it for their livelihoods (Österblom et al., 2020). Many countries as a result have now incorporated more 'Blue' approaches to better integrate marine conservation and social equity into their national ocean development strategies (Brent et al., 2018).

On a global scale, the notion of the Blue Economy is usually aligned with the United Nations (UN) Sustainable Development Goal (SDG) 14 – "to conserve and sustainably use the oceans, seas and marine resources for sustainable development" (United Nations, 2015a: 1). The main sectors of the Blue Economy include ocean energy, marine bioprospecting, offshore oil and gas exploration, aquaculture, ecotourism, and maritime transport. Aquaculture or 'fish farming' in particular, has received more attention by international organisations such as the UN General Assembly and the World Bank in recent years for the crucial role that it could play in sustainable food production and relieving pressures on capture fisheries (Cisneros-Montemayor et al., 2019; Stobie, 2019a). There is currently no commonly accepted definition of the concept 'Blue Economy' despite being adopted by many countries across the world (Eikeset et al., 2018; Cisneros-Montemayor et al., 2021).

A report compiled by the UN and World Bank describes the Blue Economy as, “A concept that seeks to promote economic growth, social inclusion, and the preservation or improvement of livelihoods while at the same time ensuring environmental sustainability of the oceans and coastal areas” (Vierros and De Fontaubert, 2017: 1). The Economist Intelligence Unit (2015: 7) defines it as, “A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy”. While there is a rich and diverse body of literature on the Blue Economy at the global scale (Silver et al., 2015; Foley, 2017; Voyer et al., 2018; Cohen et al., 2019; Österblom et al., 2020), there is ambiguity about what the concept means, how it should be practically implemented, and how it affects different groups and individuals. In other words, there is uncertainty around what the Blue Economy is both in theory and in practice.

Various countries across the world have adopted their own interpretation of the Blue Economy and have formulated Blue Economy interventions as a result according to the context of their developmental needs and priorities. Yet, as companies and governments rapidly capitalise marine resources for economic growth, implementation of these Blue Economy interventions has led to social injustices, environmental degradation, and conflicts among different stakeholders and sectors (Bennett et al., 2021; Sowman et al., 2023). Blue Economy activities such as oil and gas exploration, port expansion, and aquaculture that result in loss of access to natural resources, environmental pollution and waste, inequitable distribution of economic benefits, and marginalisation of small-scale fishers and communities have been well documented (Nash et al., 2017; Cohen et al., 2019; Bennett et al., 2021). These extractive and often damaging activities that claim ocean space and restrict access have raised ‘blue justice’ concerns and have been referred to in the literature as forms of ‘ocean grabbing’.

‘Ocean grabbing’ is referred to by Bavinck et al., (2017: 1) as, “the contested appropriation of coastal (shore and inshore) space and resources by outside interests”. ‘Blue justice’ refers to an approach that requires consideration of rights and socio-economic needs of small-scale fishers and coastal communities that may be affected by Blue Economy initiatives with the objective of promoting a sustainable and fair Blue Economy for all (Bavinck et al., 2017; Bennett et al., 2019). The recent acceleration of developments associated with the Blue Economy has increased the dispossession of resources from local users through the accumulation and privatisation of marine resources (Bennett et al., 2021). Local users such as small-scale fishers and coastal communities often bear the brunt of these activities which impacts their ability to derive benefits from marine resources required to support their livelihoods (Cohen et al., 2019; Sowman et al., 2023).

Many researchers have ‘raised the alarm’ on environmental and social injustices in Blue Economy sectors such as oil and gas exploration (Bond, 2019), industrial fisheries (Caswell et al., 2020), and aquaculture (Bennett et al., 2021). Moreover, an increasing number of civil society organisations such as the World Forum of Fisherpeople (WFFP) and the Transnational Institute are pushing back against forms of ‘ocean grabbing’ and ‘blue justice’ issues that are being perpetrated by the Blue Economy (Pedersen et al., 2014; Brent et al., 2018). The above effects of Blue Economy initiatives have resulted in increased tensions and conflicts amongst proponents of these projects and local communities living in areas affected by these initiatives. This research will examine the drivers of this conflict and impacts associated with aquaculture development in South Africa’s Blue Economy, particularly through exploring the perceptions of different stakeholders involved in two aquaculture projects of interest on the West Coast of South Africa.

2.2 The Blue Economy in the African context

Africa's 'Blue world' is made up of vast resources including oceans, coasts, rivers, and lakes that hold a largely untapped natural resource base of flora and fauna species (including fish stocks), minerals, oil, and gas (Sparks, 2021; Techera and Hassan, 2021). The continent's ocean water sovereignty spans over 13 million km^2 of Exclusive Economic Zones (EEZs) and 6.5 million km^2 of continental shelf jurisdiction (UNECA, 2016). This allows each African country the exclusive rights to conduct marine extraction activities such as fishing, seabed mining, and oil and gas drilling as defined by the United Nations Convention on the Law of the Sea (UNCLOS, 1982). Thirty-eight of Africa's fifty-four member States are coastal States with over 90% of imports and exports being conducted by sea as the continent holds some of the most important strategic shipping channels for international trade (UNECA, 2016). As such, Africa's international sea trade contributes to the livelihoods of over 200 million people and provides more than 10 million people with a source of income (FAO, 2020). The growth of the Blue Economy could thus play a major role in the structural transformation of Africa and enhance the socio-economic prosperity of African States through the sustainable exploitation of the continent's natural resource base (Akpomera, 2020).

Despite Africa's substantial resource endowments, however, the continent is still heavily impacted by large-scale poverty with over 40% of its population living in severe poverty (UNCTAD, 2021). Moreover, while the continent is experiencing a rise in the growth of the middle class, this growth in general has not been met with widespread social and economic progress. This can partly be attributed to the unequal distribution of wealth amongst the general population that is still currently in place (Spamer, J., 2015). In addition to widespread socio-economic disparity, the escalating use of the oceans combined with climate change effects has added further pressure on Africa's marine environment.

As Sparks (2021: 3) argues on the development of Africa's Blue Economy, "while there are clear opportunities, there are also risks associated with placing further pressure on already stressed marine resources and the ocean environment". With millions of African communities living along the coast, and population growth trends expecting to dramatically increase over time, the carrying capacity of the marine environment in supporting these many livelihoods with the 'business as usual' approach to maritime development could be in great jeopardy (Spamer, 2015; UNECA, 2016). This situation, in tandem with addressing key socioeconomic challenges such as poverty and food insecurity, prompted African nations to become more aware of the importance of managing ocean-oriented development more sustainably.

This in turn led to the adoption of Blue Economy practices amongst a number of African States to "diversify their economic base and catalyse socio-economic transformation" (UNECA, 2016: xi). In 2018, the first global Sustainable Blue Economy Conference was held in Kenya highlighting the importance of sustainable coastal and marine resource use (Sparks, 2021). The African Union (AU) played a crucial role in developing and enacting the Blue Economy strategy and policy for its member states. In 2014, the AU approved and endorsed the 2050 Africa Integrated Maritime (AIM) strategy to provide a framework for the protection and sustainable exploitation of Africa's Maritime Domain (AMD).The 2050 AIM framework is in line with the core principles of the Green Economy as well as the 2030 Agenda for Sustainable Development Goals (UNDESA, 2016) as it focuses on enhancing social equity and human welfare while mitigating key environmental risks with 'low carbon' and 'resource efficient' policies (Akpomera, 2020). Moreover, a key feature of Africa's Blue Economy is expanding the fisheries sector through aquaculture to promote various beneficial outcomes such as food security, sustainable livelihood opportunities, and economic development of renewable resources (Techera and Hassan, 2021).

Following the Blue Economy policy drive from the AU, a number of African regional economic communities and States started to implement their own Blue Economy strategies in the context of their own developmental needs and interests while being guided by the overarching 2050 AIM strategy. Regional economic communities such as the South African Development Community's (SADC) 'Industrialisation and roadmap strategy (2015-2063)' (SADC, 2017), and the Common Market for Eastern and Southern Africa's (COMESA) 'medium term strategic plan (2016-2020)' (COMESA, 2016), have recognised the leverage of the Blue Economy in driving socio-economic development in their regional strategies. At a national level, a number of countries have started to develop their own Blue Economy frameworks such as Mauritius (Beejadhur et al., 2017), Seychelles (Secretariat, 2018), and South Africa (Operation Phakisa, 2014a). Similar to the AU, other continental regions have also promoted the Blue Economy initiatives in other areas such as the Indian Ocean Rim Association (ICORA) in the Indian Ocean region (Doyle, 2018).

Although fish is a crucial source of protein for millions of people across Africa, fish consumption in East-Africa is less than half that of West Africa (Techera and Hassan, 2021). This has been attributed to due population growth rising higher than levels of fish production, stagnation of fish production due to pressures on capture fisheries, and poorly developed aquaculture sectors (FAO, 2020). Examining the Blue Economy policies of different African states, the strategies vary significantly. For example, significant efforts to have been made to develop Blue Economy sectors in countries such as Kenya (Munguti et al., 2022), Tanzania (Msuya et al., 2022), and South Africa (Britz and Venter, 2016). In contrast, other poorly developed countries such as Somalia have struggled to formulate effective Blue Economy strategies (Techera and Hassan, 2021).

The AU has argued that in order to tackle issues affecting the continent, a more integrated Blue Economy agenda is required to improve 'African's' wellbeing while reducing negative developmental effects on marine environments (AU, 2013). Thus, while the potential of Blue Economy sectors such as aquaculture are frequently highlighted, states have been slow to fully develop the sector due to gaps in implementing effective policy frameworks. The following section will discuss the development of the Blue Economy sector in South Africa, in particular the aquaculture sector.

2.3 The Blue Economy in the South African context

South Africa has yet to realise the full potential of the Oceans Economy as it only contributed 4.47% to the country's total Gross Domestic Product (GDP) in 2020 (Impact Economix, 2020). Moreover, growing the Blue Economy is seen as a means to address inequalities that persist in the country. In 2022, it was reported that:

- Over 30 million South Africans (approximately 52% of the country's demographic) live in poverty (World Bank, 2020).
- Over 25% of the population are currently living below the Food Poverty Line (FPL) of R624 per day, which according to Stats SA (2015: 7) is, "The rand value below which individuals are unable to purchase enough food to supply them with the minimum per-day energy requirement for adequate health".
- In the fourth business quarter of 2022, unemployment in South Africa increased by over 30,000 unemployed people to 32.7% of the population (Stats SA, 2022b).

To address this declining growth trajectory in the country, former president Jacob Zuma launched South Africa's Blue Economy initiate in 2014 known as Operation Phakisa (Operation Phakisa, 2014a). Inspired by Malaysia's 'Big Fast Results' (BFR) methodology, Operation Phakisa was adapted from this approach to achieve significant government and economic transformation in a short period of time (Akhalwaya, 2015). Phakisa's Big Fast Results methodology aimed to unlock the economic potential of South Africa's oceans, which were estimated to have the potential to contribute R177 billion to the country's GDP and produce up to 1 million jobs by 2033 (Operation Phakisa, 2014a). The overriding goal of Operation Phakisa has been to fast-track delivery of socio-economic benefits to help address the high levels of poverty, unemployment, and inequality in the country. Operation Phakisa is a broad based multi-sectoral programme that has growth initiatives in a number of sectors that include: i) marine manufacturing and repairs, ii) maritime transport, iii) aquaculture (freshwater and marine), iv) fisheries (small-scale and commercial), and v) offshore oil and gas exploration (DFFE, 2022).

While the Operation Phakisa programme was the overall responsibility of the Department of Environmental Affairs (DEA), each of the focus sectors was mandated to their respective government departments in order to create and implement development plans for each sector. For example, offshore oil and gas exploration was mandated to the Department of Mineral Resources (DMR), while aquaculture was the responsibility of the Department of Agriculture Forestry and Fisheries (DAFF), now known as the Department of Forestry, Fisheries, and the Environment (DFFE) [3] (Findlay, 2018). In 2014, the South African government held a series of Oceans Economy collaboration sessions in Durban, otherwise known as 'laboratory sessions (labs)' (Akhalwaya, 2015).

[3] In June 2019, the DEA and DAFF merged into one department (the DFFE) that takes responsibility for aquaculture development in South Africa and the overall Operation Phakisa programme (Republic of South Africa, 2019).

The labs brought over 650 key stakeholders from the public, private sector, and academia together to collaboratively produce economic development plans for the key focus sectors. The implementation of every development plan was initially monitored against each key performance indicator and results were publicly audited and reported upon in annual progress reports for each focus area. This research will focus specifically on two projects that fall under the aquaculture development sector.

Although the scale and potential of Operation Phakisa's high-level policy initiatives are impressive on paper, several authors have heavily critiqued South Africa's Blue Economy initiative and argued that it has not come close to meeting its ambitious targets originally set out in 2014 (Dyer, 2017; Pretorius, 2018; Masie and Bond, 2018; Bond, 2019; Sowman et al., 2023). For example, a study done by Pretorius (2018) revealed that Operation Phakisa had fallen far behind on meeting its initial targets set for the aquaculture sector which aimed to implement 24 pilot aquaculture projects, provide up to 15,000 jobs, and contribute over R3 billion to the local economy from 2014-2019. In fact, by 2020 the aquaculture sector had only created 2480 jobs and contributed just over R1.1 billion to the local economy (Operation Phakisa, 2020). Masie and Bond (2018: 315) have characterised Phakisa's "overhyped GDP-led evaluation of the oceans' potential" as not sufficiently balancing the "short-term economic and political gains" against Phakisa's "massive eco-social destruction". Similarly, Dyer (2017: 2) notes that whilst Operation Phakisa has implemented several reports, programmes, and pilot projects, "limited attention has focused on the practical side of ensuring a maritime future occurs".

The government acknowledged that Operation Phakisa had fallen short in meeting the targets set for the aquaculture sector from 2014-2019 and stated that, “to date, the implementation of Operation Phakisa has had varying successes and impacts, and further work is required in unlocking South Africa’s oceans” (DFFE, 2022: 7). In light of this, the DFFE worked towards developing an ‘Oceans Economy Master Plan (OEMP)’ in order to “stabilise, revive and grow key sub-sectors of South Africa’s Oceans Economy through to 2035” (DFFE, 2022: 8). The intention of the OEMP strategy is to build on the foundation of Operation Phakisa initiatives and adopt a more dedicated approach to engaging with public, private, academic, NGO, and civil society institutions in order to create an Oceans Economy strategy that is more realistic in achieving common policy objectives such as job creation and economic growth. The OMEP also aimed to implement economic recovery strategies after the outbreak of the COVID-19 pandemic (DFFE, 2022). However, despite the intentions of South Africa’s Blue Economy strategies a number of Phakisa-led projects have already been heavily contested.

For example, the South Durban Community Environmental Alliance (SDCEA) challenged the Environmental Impact Assessment (EIA) process in granting authorisation to Operation Phakisa’s main investor Transnet to deepen the port of Durban in 2014. The DEA rejected the EIA due to the SDCEA raising concerns about the lack of assessment of the damage that this process could have on the harbour’s sandbank – with the crucial ecosystem services it provides such as a breeding ground for bird and marine life and acting as a buffer mitigating the threat of sea level rise (Bond, 2019). Another case arose in the Western Cape where local activist groups Save Langebaan Lagoon (SLL) and Coastal Links challenged the EIA application process in granting Operation Phakisa authorisation to establish an Aquaculture Development Zone (ADZ) in Saldanha Bay. Some key ecological impacts highlighted by the Interested and Affected Parties (IAPs) were water quality degradation, transmission of pathogens to wild marine populations,

and entanglement of marine and seabird species at finfish farm sites (Clarke at al., 2018; Operation Phakisa, 2020). SLL and Coastal Links also raised concern that small-scale fishers in the area may lose access to historical fishing grounds in the bay with the 'no-go' areas that would be declared in areas in close proximity to the ADZ precincts (Agiotis, 2019). As a result of these concerns, the DEA ruled in favour of the IAP's appeal and instructed the former DAFF to reduce the size of the ADZ from 988ha to 884ha in total and also to adequately address the ecological and socio-economic concerns raised by the IAPs (Clarke et al., 2018; Agiotis, 2019).

A number of other Operation Phakisa projects in the mining sector have also been met with heavy contestation and even legal action, such as the Shell case along the Wild Coast (TimesLive, 2021) and the Searcher case along the West Coast (Mongabay, 2022; News24, 2022). It is evident that there are some major gaps in Operation Phakisa's alignment with the objectives set out for South Africa's Blue Economy on paper compared to what is being implemented on the ground. The examples above help to illustrate this and also show resistance from civil society to government's imposition of these Blue Economy projects. Thus, although the Blue Economy strategy holds the potential to create jobs, alleviate poverty, and grow the economy in South Africa, the impacts with this kind of development need to be carefully considered.

2.3.1 Governance of the Blue Economy

In the context of the Blue Economy, it is often assumed by its proponents that 'Blue' growth will lead to net socio-economic benefits for the different stakeholders that are involved in the process (Bennett at al., 2021; Cisneros-Montemayor et al., 2022a). However, past research has shown that benefits derived from the Blue Economy may not trickle down to some stakeholders,

particularly HDIs and marginalised coastal communities, where benefits are often shared unevenly (Ertör and Ortega-Cerdà, 2015; Masie and Bond, 2018; Cohen, 2019; Bond, 2019; Bennett et al., 2021). In the South African context, Operation Phakisa's overriding goal has been to fast-track delivery of socio-economic benefits to address issues of poverty, unemployment, and inequality in the country. While Operation Phakisa's 'fast results' methodology may help to address some of the pressing socio-economic issues in South Africa, concern has been raised as to whether the views and perceptions of key stakeholders, such as coastal communities, regarding the benefits that are expected to flow from these projects have materialised and whether they are being heard and included in planning and decision-making processes (Engel, 2018; Masie and Bond, 2018; Loring et al., 2019; Sowman et al., 2023).

In South Africa, the views of politicians, policymakers, and scientists have largely informed Blue Economy planning and decision-making. Understanding how communities are impacted by these Blue Economy initiatives and how they perceive the distribution of benefits from these projects is key to more effectively integrating community values, interests, and needs into more socially inclusive and equitable development (Bennett et al., 2019; Loring et al., 2019). Assessing how different stakeholders benefit from such initiatives and ascertaining who 'wins' and who 'loses' assists in designing projects in a way that ensures fair distribution of the associated benefits. As aquaculture is a major growth sector under the Blue Economy and a key focus area for this research, the growth of the aquaculture sector from the Global, African, to the South African context will be discussed in the following section.

2.4 Growth of Aquaculture

Aquaculture practices date as far back as 4,500 years ago where it is thought that Egyptians were the first to cultivate tilapia (Beveridge and Little, 2002). Aquaculture started to develop further in China about 3,000 years ago where fishermen kept their surplus catch alive in baskets submerged in rivers and ponds (FAO, 1989). People who emigrated from China to other Asian countries then passed this knowledge onto other people to take up more modern forms of fish farming that we know today. Aquaculture has received more attention in recent years for the crucial role that it can play in sustainable food production. Aquaculture is broadly defined as "the cultivation of aquatic organisms such as fish, shellfish, and even plants in controlled environments such as ponds, lakes, and oceans" (NOAA, 2019: 1).

Aquaculture refers to the cultivation of both freshwater and marine species that can range from operations based on land to operations in the open ocean. A number of freshwater and marine species of fish and shellfish are being farmed across the world. Freshwater aquaculture mainly cultivates species such as trout, tilapia, carp, and catfish. Marine aquaculture (hereafter referred to as mariculture) mainly cultivates species such as mussels, oysters, abalone, salmon, prawns, and algae (Béné et al., 2007). Fish farming is however a 'sub-section' of aquaculture which only focuses on producing finfish species (FAO, 2022).

2.4.1 Aquaculture in the Global context

Aquaculture is growing faster than any other form of food production in the world and produces over half of all fish consumed globally (FAO, 2022). In the past 30 years, aquaculture production has rapidly increased around the globe outpacing the growth of capture fisheries by an average of over 8% each year, and in 2016 surpassing capture fisheries in production for human consumption (FAO, 2020). As shown in Figure 1 below, from producing less than 1 million tonnes of fish in 1950, world freshwater aquaculture and mariculture production has increased to over 80 million tonnes in 2018 (FAO, 2020). This trend is expected to continue as fish production from capture fisheries levels off. The demand for fish is rapidly increasing and aquaculture will have to make up the shortfall in supply if consumption per capita is to be sustained. Thus, owing to the rapid decline of fishery stocks around the world, many believe that aquaculture will enhance food production, create jobs, promote economic growth, and relieve the pressures on capture fisheries (Brent et al., 2018; Cisneros-Montemayor et al., 2022a; FAO, 2022).

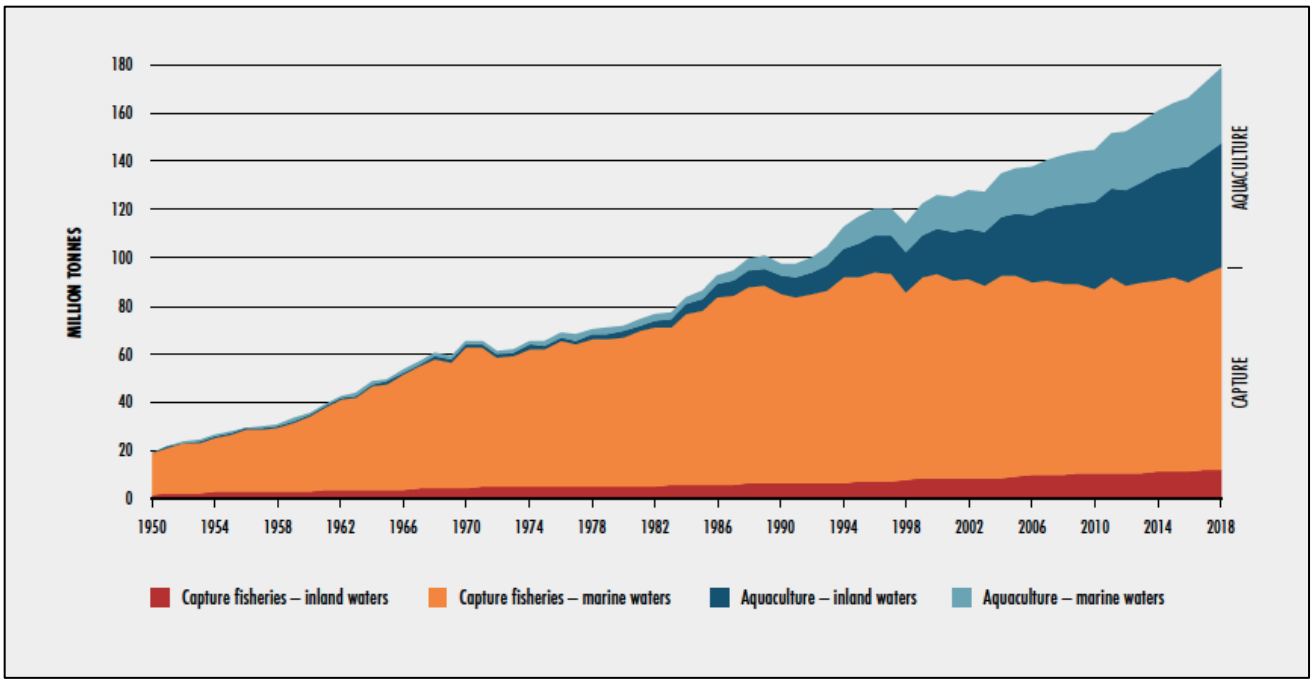

Figure 1: *World Capture Fisheries and Aquaculture Production from 1950-2018. Source: (FAO, 2020).*

While the rapid development of aquaculture may be seen as a solution to increase fish production, contribute to human nutrition, and enhance food security, the pace that this growth is unfolding raises notable concerns. The impacts that aquaculture development is having on the environment and people in society such as marginalised individuals and coastal communities is of particular concern (Ahmed and Thompson, 2019). The following section will discuss some of the key concerns and impacts associated with aquaculture development.

Key concerns of the rapid development of Aquaculture

For many years, aquaculture has been linked to a wide range of environmental concerns such as water pollution, habitat destruction, disease outbreaks, and negative ecological effects (Ahmed and Thompson, 2019; Bennett et al., 2021). Intensive forms of aquaculture such as finfish farming have received criticism due to the unsustainable farming practices used which causes negative ecological impacts (Bavinck et al., 2017; Quiñones et al., 2019). For example, the high amounts of nutrients required to feed salmon generates waste which can cause eutrophication[4] and also raises the risk of pathogens being spread to other marine life in the surrounding waters (Clarke et al., 2018).

Moreover, it is regarded as an unsustainable form of aquaculture as over double the amount of fishmeal protein is required to feed the salmon compared to the amount of salmon produced (Edwards et al., 2019). Salmon is a high-end product destined for the tables of only those who can afford its lavish price. Thus, expansion that is focused on exporting high value species such as salmon may not increase local food availability. On the contrary, salmon farming could decrease food availability as small pelagic fish are used for farm feed, fish which make up a key part of the staple diets of coastal communities across world (Cisneros-Montemayor et al., 2021). Intensive forms of aquaculture have also been widely criticised for habitat degradation and livelihood loss.

[4] Eutrophication is the process by which a body of water becomes enriched with excess nutrients that stimulates the growth of algae. As the excess algae dies and decomposes, they deplete all the oxygen in the water which can kill other aquatic plants and marine life (Chislock et al., 2013).

For example, intensive shrimp farming in Southeast Asia has destroyed vast areas of mangrove forests which are a major source of food and materials for small-scale fishers and coastal communities, provide flooding protection from natural hazards, and act as major carbon sequesters (Paul and Vogl, 2011; Bavinck et al., 2017; Ahmed and Thompson, 2019). Shrimp farming has also led to 'elite capture' of benefits by a select few by producing a luxury food item for consumers mainly in the Global North leaving traditional resource users, mainly in the Global South, to lose out with few jobs provided and loss of access to traditional common property resources (Bryceson and Beymer-Farris, 2011; Bennett et al., 2021).

The concerns raised above highlight the importance of addressing key issues associated with aquaculture development. While aquaculture is a promising alternative to capture fisheries in driving fish production and providing an alternative source of protein for people, key environmental and social issues need to be considered in tandem with the opportunities provided by this form of development. The following section will discuss the growth of aquaculture in the African context and how different economic regions and countries in Africa have adopted this into their Blue Economy strategies.

2.4.2 Aquaculture in the African context

Despite its largely untapped natural resources (including land, water, and coastlines) Africa (except Egypt) has limited historical roots in aquaculture. The oldest forms of freshwater aquaculture in Africa dates back almost 4,500 years ago in Egypt (Beveridge and Little, 2002) while coastal aquaculture only began in the Western Indian Ocean (WIO) region[5] just over 200 years ago in Mauritius (Bryceson and Beymer-Farris, 2011). Modern freshwater aquaculture was first introduced to most African countries in the 1950s with the aim to enhance food security and improve the socio-economic conditions of different regions (Hecht and Britz, 1990; Troell et al., 2011). Aquaculture production gradually began to gain momentum as more African countries encouraged public and private sector involvement in the sector.

In the 1970s, small-scale aquaculture trials began in WIO regions such as South Africa, Kenya, Tanzania, and Mauritius cultivating tilapia, trout, mussels, and oysters. It was not until the late 1980's and 1990's that large-scale aquaculture developments expanded in the WIO region (Bryceson and Beymer-Farris, 2011). The 1990s saw a trend of aquaculture production in some African countries such as South Africa shifting away from food security type aquaculture to more commercially based forms of aquaculture. According to Rouhani and Britz (2004), commercially based aquaculture is comprised of the following key characteristics:

[5] The WIO comprises of 5 Eastern African coastal states (Somalia, Kenya, Mozambique, Tanzania, and South Africa), four island states (Mauritius, Seychelles, Comoros, French Territories of Mayotte and Reunion), and Madagascar (Troell at al., 2011).

- The majority of fish harvested is not consumed by the farmer and is sold to local or regional markets;
- Usually only high value species such as abalone, mussels, oysters, and salmon are produced; and
- The farm is based around a business or enterprise-type operation model.

Freshwater aquaculture and mariculture in Africa focused on exporting high value species destined for international markets such a seaweed in Tanzania (Bryceson, 2002; Msuya et al., 2022), prawn farming in Mozambique (Ghermandi et al., 2019); tilapia farming in Kenya (Munguti et al., 2022); and abalone and mussels in South Africa (Britz and Venter, 2016). Figure 2 below illustrates the increase in average fish production from aquaculture in Africa from 300 tonnes between 1950-1969 to over 2 million tonnes between 2010-2018 (FAO, 2020).

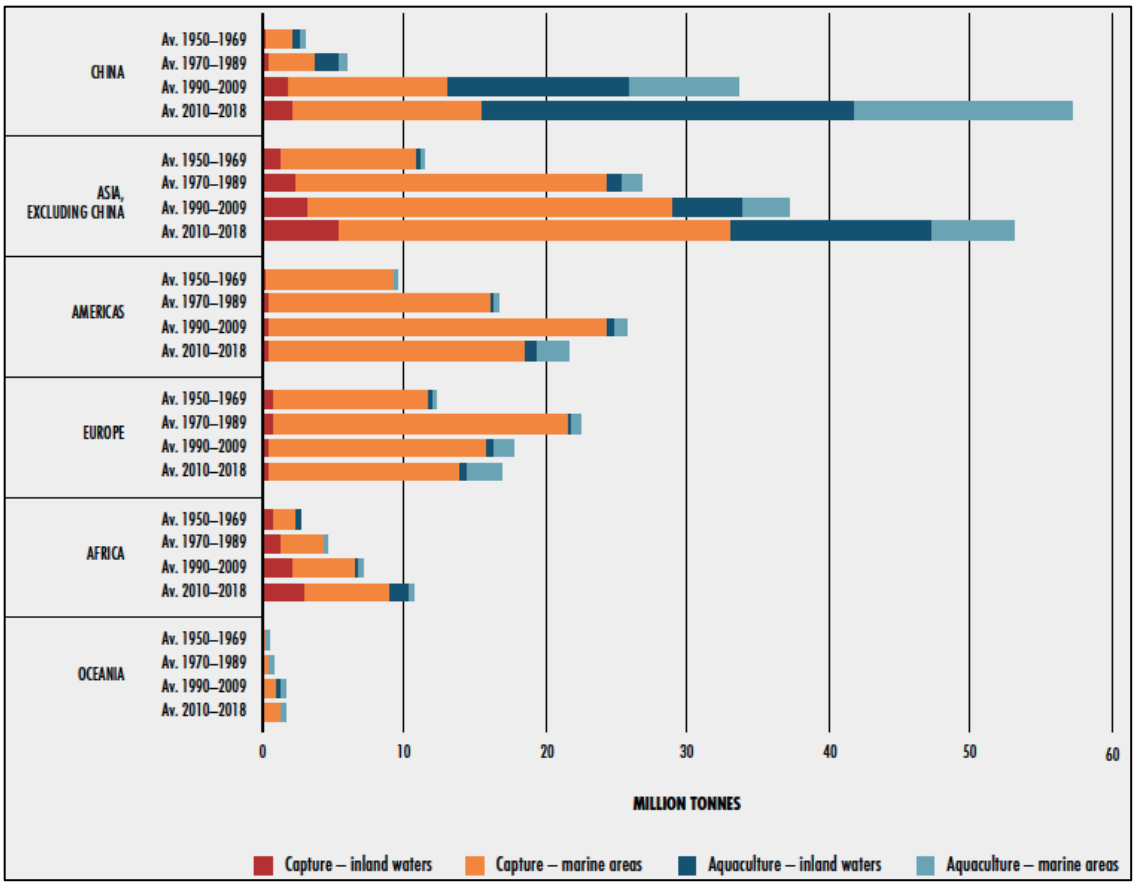

Figure 2: *Regional Contribution to Global Capture Fisheries and Aquaculture Production. Source: (FAO, 2020).*

It is clear from the figure above that China, Asia, the Americas, and Europe continue to dominate the production chain currently accounting for over 90% of world aquaculture production. In 2018, Africa contributed only 2.67% to world aquaculture production. Egypt, Nigeria, and Sub-Saharan Africa are currently the three leading aquaculture producing regions in Africa. Egypt currently accounts for over 70% of this production, Nigeria accounts for 13%, and regions in Sub-Saharan Africa make up just under 14% (FAO, 2020).

According to the Food and Agriculture Organisation (FAO), the main reasons why Africa is still far behind from other regions are due to: i) misguided policy and planning, and ii) a lack of an enabling environment with the necessary infrastructure, technical expertise, and investment to promote aquaculture development (FAO, 2020). Despite the staggered progression of aquaculture production, fish is a crucial source of protein for over 200 million people in Africa (Béné et al., 2016). Thus, a great opportunity exists for the expansion of aquaculture in Africa that could help enhance food security and contribute towards livelihoods.

However, as mentioned previously, the promising rhetoric that frames Blue Economy sectors such as aquaculture development risks downplaying associated environmental degradation issues and social injustices (Bennett et al., 2021). Past research that has highlighted key impacts associated with aquaculture expansion such as mangrove destruction in Southeast Asia (Ahmed and Thompson, 2019) and the negative effects of finfish farming (Cisneros-Montemayor et al., 2021) provide lessons for future development of the sector. The following section will provide an overview of the aquaculture sector in South Africa.

2.4.3 Aquaculture in the South African context

South Africa's extensive coastal and inland waters exhibit a largely untapped potential to increase food production and promote socio-economic development in the country. Expanding aquaculture production could encourage economic growth, increase GDP through the export and trade of seafood products to overseas and domestic markets, and support transformation in the sector (Britz et al., 2019). However, the effects of South Africa's colonial past are still evident today. During the apartheid era for example, the black population were forcibly removed to live on only 13% of the land which hindered people's ability to gain access and benefit from natural resources, a legacy that still exists today (DAFF, 2019b). The period of transition from the apartheid era to the late 2000s also saw a decline in funding to support research and development in aquaculture resulting in a substantial decline in aquaculture production in South Africa (Rouhani and Britz, 2004).

In more recent years, however, the DFFE conducted a number of government-led programmes to further develop the aquaculture sector and to encourage job creation and ownership of aquaculture projects amongst HDIs and local communities (DAFF, 2020; Brown-Webb et al., 2022b). Table 1 provides a summary of the key programmes and initiatives that have been developed by the South African government. The implementation of these programmes and their relevance to the two aquaculture projects investigated in this research will be discussed further in the findings and discussion sections.

***Table 1**: List of government programmes for promoting growth of the aquaculture sector. Source: DAFF (2020).*

Programme	Purpose
Operation Phakisa (2014)	Aims to implement priority economic and social programmes better, faster and more effectively. Six growth areas were identified, one of which is the aquaculture sector which is led by DFFE. The targets over five years (2014-2019) include: • Grow sector revenue from R 0.67 billion to R 3 billion • Increase production by 20 000 tons • Increase jobs from 2 227 to 15 000 • Ensure increased participation to support transformation in the sector
Aquaculture Development and Enhancement Programme (ADEP) of 2019	ADEP seeks to enhance the Oceans Economy through its incentives for marine and freshwater aquaculture operations. The programme is available to SA registered entities that participate in primary, secondary and ancillary aquaculture activities. The primary goal of the programme is to stimulate investments by commercially viable enterprises in the sector through the following objectives: • Increase the production of aquaculture species • Promote the geographic spread of aquaculture operations • Broaden participation • Create and/or sustain jobs
Comprehensive Agriculture Support Programme (CASP) of 2003	To provide effective agricultural support services, promote and facilitate agricultural development by targeting beneficiaries of land reform's restitution and redistribution, and other African producers who have acquired land through private means and are engaged in value-adding enterprises domestically or involved in export.
National Empowerment Fund (NEF) of 1998	The NEF is a catalyst for BBBEE in South Africa. The Fund aims to promote investment and improve the meaningful participation of Black people in the mainstream economy. The fund provides finance and private equity in bankable projects within sectors that have been identified as key drivers for economic growth. Agriculture and agro-processing (under which aquaculture is classified) are considered to be key sectors for economic development.
AgriBEE Fund of 2014	The purpose of the AgriBEE Fund is to support small, medium and micro-enterprises (SMME's) within the agricultural sector who wish to acquire a shareholding in existing commercially viable and through agro-processing and value-adding activities to previously marginalised people who could not participate in the sector value-chain.
Micro Agricultural Financial Institutions of SA (MAFISA) of 2004	MAFISA aims to address the financial services needs of smallholder farmers and agribusinesses. It provides capital (loans) to enhance agricultural activities for purchase of production inputs, small equipment, livestock, harvesting (in the case of aquaculture) and agro-processing.

While aquaculture does hold socio-economic promise for South Africa, its potential is constrained by a number of factors. Currently no form of subsistence or commercial aquaculture plays a major role in food security provision or economic development due to the low level of aquaculture production output in the country. In 2019, it was reported that the sector contributed only 0.3% or roughly R1,2 billion to the country's total GDP of over R388 billion (AgriSETA, 2020). Some of the reasons behind the low level of production include South Africa's environmental constraints, legislative barriers, poor marketing structures, lack of human capacity and access to technology (Mahieu, 2015; Britz et al., 2019).

Environmental constraints

South Africa's seasonal temperature fluctuations across the country restricts aquaculture projects to in certain areas that have suitable environmental conditions. Winter seasons for example are often too cold for the economically viable production of a number of cold-water fish species (both fresh and saltwater) such as salmon and trout, yet summer temperatures in the same areas are too warm for certain warm-water fish species such as tilapia and carp (Rouhani and Britz, 2004). The second major constraint is scarcity of water. South Africa is a water scarce country with over 60% of its rivers currently being overexploited and only one-third of those active rivers remaining in good condition (Donnenfeld et al., 2018). Consequently, it will be a challenge to setup freshwater aquaculture projects if they require a considerable amount of capital and investment to operate given the widespread water shortages in the region.

In addition to water scarcity, one key factor to consider for sea-based aquaculture is exposure of marine species to strong wave action (CSIR, 2019b). Some experts in the aquaculture industry have highlighted that the majority of South Africa's coastline is exposed to heavy wave action from strong Atlantic and Indian Ocean currents (Britz, 2017; Clarke et al., 2018). As a result, there are a limited number of protected coastal areas that offer suitable conditions for farming saltwater species such as oysters and mussels which only grow in sheltered coastal embayments. Nonetheless, South Africa could potentially learn from Egypt, a country whose freshwaters alone produce over 1 million tonnes of tilapia each year (FAO, 2020). Egypt is surrounded by the Sahara and Libyan Desert with only one main water source, the Nile River, to produce the most fish production in Africa by far (Kaleem and Sabi, 2021). Thus, despite the pressure on water, Egypt has the biggest aquaculture industry in Africa which is dominated by small and medium scale fish farms that has strong support from the government (Soliman and Yacout, 2016).

Limited public and private sector support

Another barrier to expanding the aquaculture sector in South Africa is the initial costs for starting up an aquaculture project are very high. Start-up costs generally include the purchase of land, leasing a premises or ocean water space, and site development of production facilities and processing rooms. As commercial aquaculture is still relatively new to South Africa, there is still very limited public and private sector support for aquaculture start-up projects as it is not well understood by financial institutions and is perceived to be a 'high-risk' sector (DAFF, 2019b). Aquaculture projects tend to have high start-up costs and take years to eventually break even and start to become profitable. Thus, the high start-up costs combined with the reluctance of financial institutions to invest in aquaculture projects are factors that are hindering the growth of new projects in South Africa (AgriSETA, 2020; Operation Phakisa 2014b).

Limited technology, skills, and energy supply

South Africa's novel aquaculture sector also has a limited pool of technical skills and human capacity in the commercial industry to produce finfish, mussels, oysters, and abalone species. Commercially based aquaculture production is a highly technology-driven sector that requires significant investments in research, development, and a diversity of skills to establish optimal production methods. There is a limited base of aquaculture specialists in academia as well as the industry in general in South Africa (DAFF, 2019b). Thus, access to technology and production systems often needs to be bought in from abroad or from the private sector. This can be a huge initial start-up cost for new commercial aquaculture projects that could pose a major barrier for introducing new aquaculture projects in the area (Britz, 2017; Brown-Webb et al., 2022b).

Fish farming systems, especially land-based re-circulating systems rely on a large amount of electricity to pump, aerate, and filtrate water in and out of the farm. These 'life-support' systems are most often required on a 24-hour basis. If there is a power outage for as little as 20 minutes it could result in fish starting to die off (James, 2014). Load shedding by Eskom, due to years of lack of maintenance and the grids inability to handle the current and increasing demand for power, has created major issues in South Africa's energy sector (Mahieu, 2015; Njokweni, 2015; Masie and Bond, 2018). Electricity supply issues pose a major risk to the growth of the aquaculture sector in South Africa since they are deemed too risky and expensive to operate under such unstable power supply conditions (Operation Phakisa, 2014b).

The small-scale subsistence aquaculture industry cultivating low-value species such as tilapia, carp, and dusky kob for local communities has also not been very successful in South Africa (Adeleke et al., 2020). This has mainly been due to issues with human capacity and post-implementation support from the government. Examples of past community-based projects in South Africa that have failed due to a lack of post-implementation support and training of communities include the Hands-On Fish Farmers Cooperative in the Western Cape (Boulle, 2007), the Siyazama Aquaculture project in the Eastern Cape (Njokweni, 2015), and several other community-based projects noted by Rouhani and Britz (2004).

Legislative barriers

One of the major challenges negatively impacting the growth of aquaculture in South Africa is the lack of an enabling legislative environment. Currently there are various laws and policies that apply to the aquaculture sector with several government departments being responsible for implementing different pieces of legislation. For many years, aquaculture farmers in South Africa have argued that their industry is over-regulated due to the complexity of the regulations inhibiting entry into and expansion of the market. For example, bivalve farmers in Saldanha Bay are required to secure over five permits to operate their businesses which is costly and very time-consuming (Olivier et al., 2013; DAFF, 2019a). Moreover, certain aquaculture activities listed under the National Environmental Management Act (NEMA) EIA regulations of 2014 require an application for Environmental Authorisation from the DFFE prior to commencing any aquaculture production. This is also a very time consuming and costly process which involves conducting either a Basic Assessment (BA) process or a full Scoping and EIA report for any sea-based aquaculture activities producing more than 50 tonnes per annum.

Some of the main pieces of legislation that govern and regulate the aquaculture sector in South Africa are summarised in Table 2 below.

***Table 2**: Key pieces of legislation that govern and regulate the aquaculture sector in South Africa. Source: CSIR (2019) and DAFF (2020).*

Legislation	Purpose
Marine Living Resources Act (MLRA), Act No.18 of 1998	To conserve marine ecosystems and sustainably utilise marine resources. Mariculture forms part of the activities that are regulated under the MLRA due to its utilisation of marine space and marine species. It currently continues to be regulated in the form of issuing of rights and permits, and exemptions where applicable.
National Water Act (NWA), Act No. 36 of 1998	Water use is key to any freshwater aquaculture farm and an application for general authorisation (GA) or a water use license (WUL) may be required to be submitted to the National Department of Human Settlement, Water and Sanitation (DHSWS) depending on the scale of the operation and quantity of water required.
National Environmental Management Act (NEMA), Act No. 107 of 1998	To establish cooperative environmental governance on matters affecting the environment. Marine and freshwater aquaculture operations trigger a number of identified activities under NEMA's EIA regulations of 2014. Aquaculture activities mainly require a Basic Assessment (BA) process, however depending on the scope and nature of the activity, a comprehensive Scoping and EIA report (S&EIR) may be required.
National Environmental Management: Biodiversity Act (NEM:BA), Act No. 10 of 2004	To protect aquatic, marine and terrestrial ecosystems that are threatened or need protection from proposed activities such as cleaning of vegetation for a land-based aquaculture facility that is located in an endangered ecosystem. This would trigger the need for a BA in terms of NEMA section 24.
National Aquaculture Strategic Framework (NASF) of 2012	The vision of the NASF is to build an expanding sustainable and competitive aquaculture sector that meaningfully contributes to job creation, economic development and sustainable livelihoods. The NASF in this regard seeks to develop efficient dissemination and transfer of relevant scientific and technical knowledge to make the aquaculture sector profitable and competitive in the global market in an economically and socially responsible manner.
National Aquaculture Policy Framework (NAPF) of 2013	The NAPF seeks to promote the growth of the aquaculture sector in South Africa by enhancing food security, create job opportunities, support wealth generation and reduce aquaculture imports. The policy emphasises the importance of transforming the aquaculture industry in ways that it goes beyond subsistence farming, but encourages the ownership of aquaculture production enterprises, which leads to job creation and inclusion of previously disadvantaged individuals and communities into the aquaculture development process.
Alien and Invasive Species Regulations (A&IS) of 2014	No person may carry out restricted activities such as the import of and cultivation of alien invasive species such as Mediterranean Mussels from outside the country without a permit in terms of the A&IS invasive species regulations of 2014.
The Aquaculture Development Bill of 2018	The Bill was developed to promote ecologically, socially and economically sustainable aquaculture development in South Africa. It seeks to promote: i) the development, management and effective regulation of the sector, ii) promote investment into the sector, iii) promote aquaculture as a farming activity, and iv) establish ADZs to enhance aquaculture development in key regions.

Implementation of Aquaculture Development Zones (ADZs)

To address South Africa's legislative bottlenecks in growing the aquaculture sector, the DFFE embarked on undertaking Strategic Environmental Assessments (SEAs) across the country to reduce the number of Environmental Authorisations required for aquaculture projects located in strategic Aquaculture Development Zones (ADZs) (CSIR 2019a; DAFF, 2020). ADZs are "land- or water-based areas that have been reserved exclusively for aquaculture development" (DAFF, 2020: 40). In 2016, the DFFE appointed the Council for Science and Industrial Research (CSIR) to carry out the SEA process to identify strategic areas in various provinces of the country that are suitable for aquaculture. A total of eight ADZs were identified to hold suitable conditions for land and sea-based aquaculture, see Figure 3 below (Operation Phakisa, 2020).

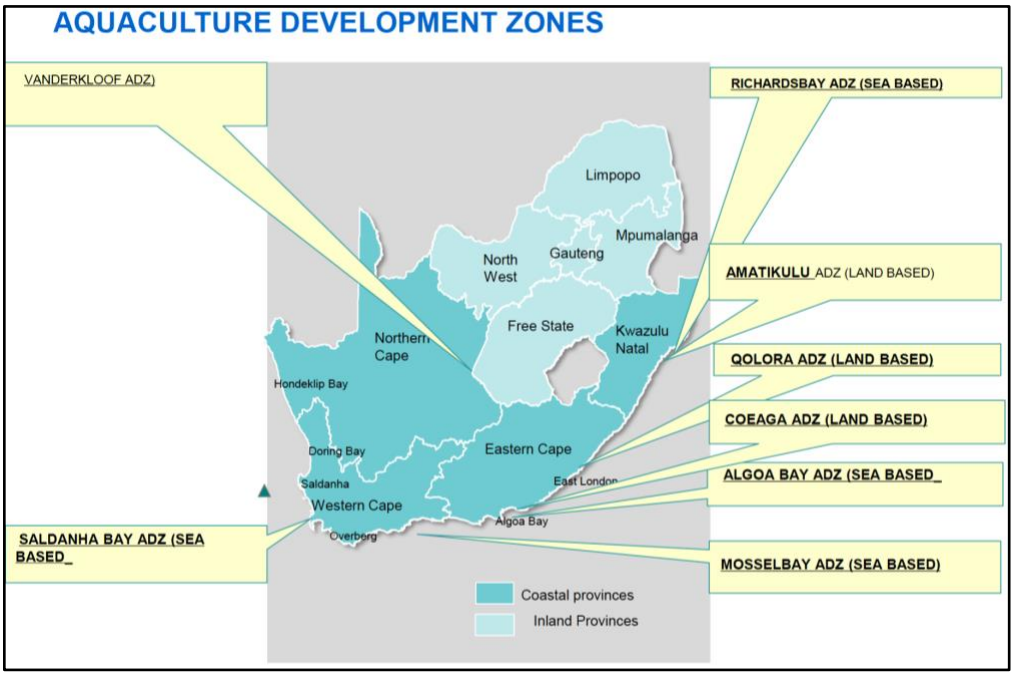

***Figure 3**: Operation Phakisa Aquaculture Development Zones. Source: (Operation Phakisa, 2021).*

In 2017, As part of the OP Oceans Economy Programme, the DFFE conducted an EIA to establish a sea-based ADZ in Saldanha Bay. The intention of the overall SEA process for the SBADZ was to undertake EIAs on behalf of aquaculture farmers, mitigate environmental and socioeconomic impacts identified from the environmental assessments, streamline the permit and authorisation processes under one department, and to create an enabling environment for HDIs and communities to enter into the space. Since launch of the OP Oceans Economy Programme in 2014, the programme has attracted more than R1.2 billion in public and private investment into 35 new aquaculture projects of which 28 were Small, Medium, and Micro-sized Enterprises (SMMEs) or 'catalyst projects' (Brown-Webb et al., 2022a). By 2019, a total of 13 Broad-Based Black Economic Empowerment[6] (B-BBEE or BEE) individuals who qualified for participation in the project were individually selected under the OP Oceans Economy Programme to start up their own SMMEs to farm mussels in Saldanha Bay (DAFF, 2018b; DAFF, 2019d). The 13 BEE individuals selected to participate in the SBADZ will be discussed in further detail in Chapters Four and Six.

Despite the constraints and opportunities facing the aquaculture sector in South Africa, it is clear that aquaculture holds great promise for South Africa in driving much needed economic growth, job creation, and food security for impoverished HDIs and coastal communities. As outlined above, however, there are a number of barriers and constraints that need to be overcome before the potential of the aquaculture sector can be realised. While this research aims to better understand how local communities and HDIs participate in and benefit from Blue Economy aquaculture initiatives, it is instructive to consider the origins and development of community-based aquaculture in the Global and in the African context.

[6] After South Africa's first democratic election in 1994, the government implemented the Broad-Based Black Economic Empowerment (B-BBEE) Act, No. 53 of 2003 to address inequalities of the past and to advance economic transformation and participation of black people into the South African economy (DTIC, 2014).

2.4.4 Origins of Community-Based Aquaculture

Community-based aquaculture (CBA) in its initial form was referred to as a form of small-scale and low-impact aquaculture that was community owned and managed, and also centred around the principle of "common interest groups working together regardless of sex and age" (Ananth et al., 2014: 947). CBA was widely adopted throughout Asia in the 1960s where it was put forward as an alternative to large-scale industrial aquaculture in providing a cheap source of protein for communities in the rural sector. It typically required very little infrastructure and was not capital intensive (Chumnongsittathum and Wongsanga, 2008; Galappaththi, 2013). CBA was promoted in Southeast Asia during the mid-20th century through the Southeast Asian Fisheries Development Centre (SEAFDEC), which was an intergovernmental organisation responsible for promoting fisheries development in Southeast Asian countries (SEAFDEC, 2007).

Given that the rural poor in these areas generally lacked access to inputs such as capital, technology, and information, the SEAFDEC introduced small-scale CBA initiatives to help alleviate this problem. Remote rural villages were identified as key target areas to implement such initiatives to help improve the nutritional status of local communities (Chumnongsittathum and Wongsanga, 2008). This approach to CBA can be described as a type of 'food security' aquaculture. According to (Rouhani and Britz, 2004), this form of aquaculture is generally comprised of the following characteristics:

- The majority of fish produced is for household consumption and excess produce is sold locally usually with no value added on top of the product;
- Low value species such as catfish, tilapia, and carp are farmed;
- The projects are normally extensive where fish are farmed at lower densities in water bodies and feed on natural products such as aquatic plants, worms, insects; and

- The projects are usually dependent on government or donor aid for their implementation and in some instances for their ongoing operations.

Community-Based Aquaculture in Africa

As highlighted earlier, Africa (except Egypt) has limited historical roots in commercial forms of aquaculture despite the region's largely untapped natural resources including land, water, coastlines, and human capital. Artisanal aquaculture has been practiced in some African countries dating back to the early 20th century. For example, in the 1920s, tilapia was successfully produced by artisanal fish farmers in Kenya (Rothuis et al., 2011) and also in the DRC (formally Zaire) (Brummett and Williams, 2000). However, other than Egypt, aquaculture in most other African countries was introduced by colonial authorities in the mid 20th century to improve nutrition and food security for rural communities (Adeleke et al., 2020). In the 1950s, small-scale aquaculture projects were introduced to the rural farming sector in a number of African countries for farmers to produce low value species such as carp, tilapia, and catfish as an inexpensive alternative protein source. However, these efforts spanning over 50 years largely failed for a number of reasons (Brummett and Williams, 2000; Rouhani and Britz, 2004).

A survey of aquaculture projects in South Africa conducted by Rouhani and Britz (2004) revealed that all food security type aquaculture projects implemented between the 1950s to the early 2000s in South Africa did not materialise because: i) the fish produced were of low value, ii) there was a lack of technical support and guidance, and iii) there was no commercial aquaculture sector that existed for these species. It was also found that small-scale farmers involved in these projects possessed limited education, personal capital, and were inadequately trained in aquaculture

techniques. These shortfalls in food security aquaculture projects were also experienced in other African countries such as Uganda, Kenya, Zambia, and Zimbabwe (Machena and Moehl, J., 2001; Mwanja and Nyandat, 2013).

Most food security type aquaculture projects surveyed by Rouhani and Britz (2004) were generally stand-alone ventures that required a high number of inputs to become operationally viable such as the capital required to build ponds and facilities, and the purchase of fish feed and fingerlings. These are inputs which rural subsistence farmers could not afford without support from the government (which was very limited at the time). It was also found that simple problems often resulted in project trouble or failure and the majority of projects had too many participants leaving a significantly lower level of income per participant (Rouhani and Britz, 2004). This is supported by Cai et al., (2009), where it was found that the main reason why aquaculture projects centred around food security objectives were short lived was because they were not promoted as a business that could see benefits coming out of such ventures in the sustainable long-term.

Thus, in light of these constraints, aquaculture projects that aimed to provide food security with government or private sector support had limited success in Africa between the mid-20th and early-21st century. As Hecht and De Moor (1997: 9) argue, this is where the crux of the problem lies, “aquaculture must be promoted and developed as an enterprise and not as a means to simply enhance nutrition”. One can therefore conclude that aquaculture definitely has a place in Africa, however, it is important to bear in mind that aquaculture is an economic activity no matter how small the scale of the project.

2.4.5 The 'people-policy gap' in aquaculture production

For many years, aquaculture development has been part of the Blue Economy narrative in the opportunities it could offer to improve the well-being of HDIs, coastal communities, and the wider population. Aquaculture is often seen as a 'frontier' for economic expansion that should be capitalised upon to generate international trade, revenues, as well as employment creation and food security (Stobie, 2019a; Österblom et al., 2020; Cisneros-Montemayor et al., 2022a). For example, this view is reflected in the OP Oceans Economy Programme that is actively pursuing the implementation of mega-projects to fast-track delivery of socio-economic benefits in South Africa (Operations Phakisa, 2014a). What remains uncertain is the extent to which these high-level policy initiatives translate into mechanisms through which the benefits reach people directly and indirectly affected from aquaculture development (Krause et al., 2015; Brugere et al., 2021).

The local socio-economic effects of aquaculture are also often overlooked with more focus being placed on intensifying sustainable aquaculture production through technological and market driven efforts (Cisneros-Montemayor et al., 2022a). New aquaculture developments implemented on a larger scale can reconfigure local socioecological systems which can transform the relationship between people and the distribution of benefits from their environment, potentially causing winners and losers in the process (Bennett et al., 2021). Thus, the inclusion of people in aquaculture development is often missed which may cause negative outcomes and be damaging to the very people, particularly HDIs and coastal communities, that aquaculture is supposed to benefit. This is concerning given that the majority of aquaculture production comes from developing countries in which small-scale producers dominate the space, ranging from

subsistence-based aquaculture to more commercially driven forms of fish farming (Krause et al., 2015; Bond, 2019; Brugere et al., 2021).

If the potential socio-economic benefits and losses from aquaculture projects are not considered as an essential part of aquaculture development policy and programmes, the very people in society that this Blue Economy sector is intended to benefit, may be excluded. Krause et al., (2015) refer to the exclusion of people from aquaculture decision-making and policy development processes as the 'people policy gap'. The 'people' in this term not only includes those working in the industry, but also nearby individuals and communities that are directly and indirectly affected by aquaculture. The 'gap' refers to the lack of including perceptions, values, local knowledge, and context specific considerations into policy planning and decision-making. The people policy gap occurs in many countries across the world because "policies disregard or do not give fair consideration to the stakes of other agents which are affected by the development of aquaculture systems" and the implications of this gap are "an uneven distribution of benefits (or dis-benefits)" (Krause et al., 2015: 44-46).

The following sections make up Part 2 of the literature review which will explore the concepts of Access, Benefit Sharing, and Perceptions. These sections will inform the theoretical basis of this study.

Part 2 – Theoretical Framing of the study

2.5 Access and Benefit Sharing

The concepts and processes underlying access and benefit-sharing analysis could provide a useful framework for understanding the various socio-economic and political processes, mechanisms, and factors shaping people's ability to access and benefit from natural resources. Particularly, in the context of aquaculture initiatives targeting impoverished communities. Benefits are important to consider as people and society depend on them for livelihoods. Moreover, the distribution of benefits can either cause social prosperity or social conflict. First, it is necessary to understand the components of 'access' and 'property' in the context of benefits derived from complex socio-ecological systems. Access is defined as, "the ability to benefit from things – including material objects, persons, institutions, and symbols" (Ribot and Peluso, 2003: 153). Access involves all possible means that enable someone to benefit from something.

Benefits from property are attributed through rights allocated by law or custom through title deeds, permits, and licences. Property therefore legitimises rights or claims through the state or other legal authority sanctioning them. Property theory as an analytical lens has however been challenged as being too narrow in scope in understanding the various mechanisms that influence access to and benefits from resources (Ribot and Peluso, 2003; Sikor and Lund, 2009; Lund, 2017). In other words, property is not the only means in which different actors are able to benefit from a resource.

2.5.1 A theory of access

The difference between access and property suggests that formal property rights do not necessarily result in people deriving benefits from a resource by holding those rights. For example, someone may have the formal right to harvest a tree or plant in a forest but may not have the capacity to gain any material benefit without proper access to labour to harvest it or access to markets to sell it (Faye and Ribot, 2017). By the same token, people may derive benefits from resources without holding the rights to them. For example, even though someone does not hold the property rights to a piece of agricultural land, they may still derive benefits from it through living on the land or by market exchange. Therefore, it is important to understand, "why some people or institutions benefit from resources, whether or not they have institutionally recognized rights to them" (Ribot and Peluso, 2003: 154).

Ribot and Peluso's (2003) access analysis theory argues that focus should not only be placed on the *right* but also on the *ability* to benefit from something as it brings greater attention to a wider range of mechanisms that affect the ability of people to benefit from resources. This analysis demonstrates that there are various mechanisms that create 'bundles of power' within society in addition to property that shape people's ability to gain, control, and maintain access to benefit from resources (Myers and Hansen, 2020). These relations are referred to as mechanisms of access which include access to technology, capital, markets, labour, social relations, and identities (Ribot and Peluso, 2003). The mechanisms of access that relate to this research will be discussed in more depth in the findings and discussion section.

2.5.2 Benefit Sharing Interventions

Benefit sharing is defined as a way of thinking and a practical process to "distribute the monetary and non-monetary benefits of resource utilisation across the economy and its stakeholders, to generate broad-based inclusive growth and to progress towards social equity outcomes" (Brugere at al., 2021: 2). Understanding the various mechanisms[7] underpinning the ways in which benefits are shared can help shift economic development away from the 'business as usual' approach towards more sustainable aquaculture development. Shifting economic development approaches in this way can enhance human wellbeing by ensuring that both inter and intra-generational equity issues are addressed (Wynberg and Hauck, 2014; Krause et al., 2015). The following section will explain the 'business as usual' approach further and examine how this can lead to outcomes that can result in few benefits and heavy losses incurred for different actors involved.

Benefits, Losses, and 'Business as Usual'

Despite increased understanding about the nature and sensitivity of coastal ecosystems and communities, development practices that exacerbate levels of social inequality, marginalisation, and environmental degradation continue unabated. This type of development is referred to as the 'business as usual' approach (Cisneros-Montemayor et al., 2019; Brugere et al., 2021).

[7] Benefit sharing mechanisms and benefit sharing interventions are terms used interchangeably in this research, but both terms refer to the approaches taken and institutional arrangements to give effect to benefit sharing for intended individuals and communities.

This approach tends to ignore the finite nature of natural resources and the planet's capacity in absorbing waste and pollution, but rather promotes the maximisation of profit through increased consumerism and exploitation of natural resources. The impacts of this approach are widespread and well known: habitat destruction and biodiversity loss; social conflict; loss of access to resources; increased poverty and food insecurity; and marginalisation of the most poor and vulnerable (Mbatha and Wynberg, 2014; Masie and Bond, 2018; Cohen et al., 2019; Bennett et al., 2021; Sowman et al., 2023). Wynberg and Hauck (2014) depict a scenario where the impacts and losses associated with the 'business as usual' approach from different economic sectors may far surpass the benefits secured by different actors involved as illustrated in Figure 4 below.

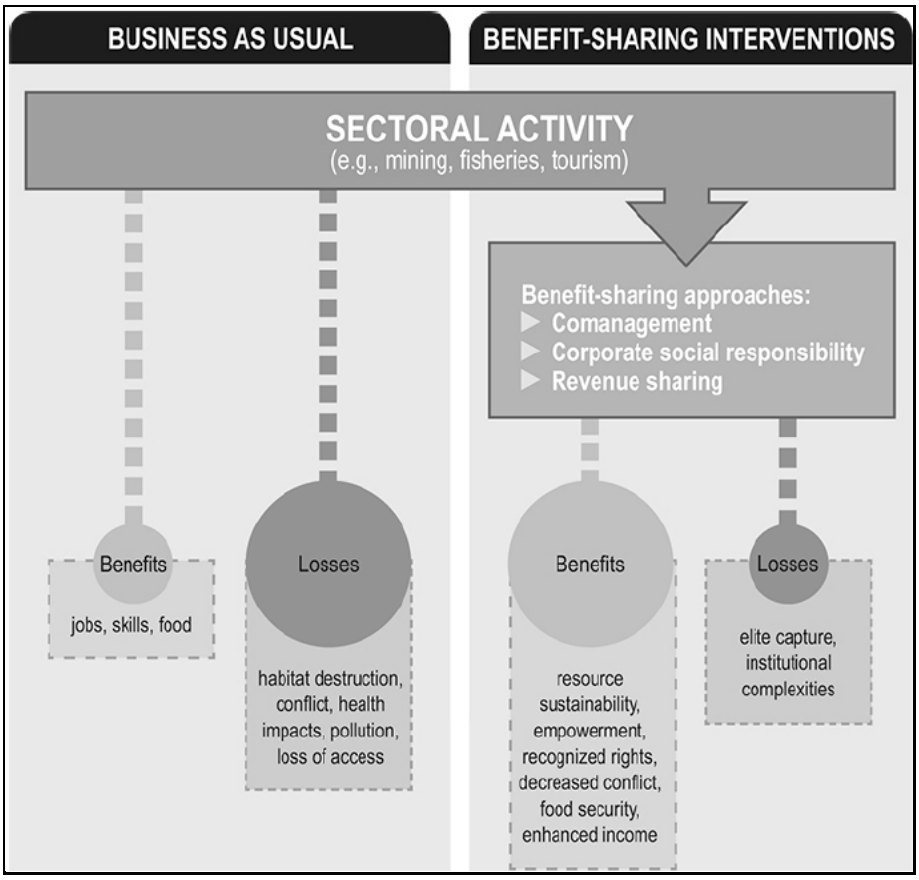

***Figure 4**: 'Business as usual' approach versus benefit-sharing mechanisms associated with different economic sectors. Source: Wynberg and Hauck (2014).*

As greater attention is given to understanding the connections between the benefits gained and losses incurred in development processes, novel approaches are surfacing that stress more equitable solutions and outcomes in an attempt to move away from the 'business as usual' approach (Bennett et al., 2019). Such initiatives include benefit-sharing interventions which tend to have the shared objective of establishing institutional arrangements and decision-making processes that enable the fair distribution of benefits to different actors. However, these interventions can differ considerably in their objectives, ideologies, and the way in which they seek to reach equity (Brugere et al., 2021).

The most common types of benefit sharing interventions are: i) Community-Based Natural Resource Management (CBNRM), ii) Co-management, iii) Revenue Sharing, and iv) Corporate Social Responsibility (CSR) (Wynberg and Hauck, 2014). The sections below will outline the basic characteristics of each of these benefits-sharing interventions.

Community-based natural resource management (CBNRM) and co-management

CBNRM can be defined as where a community "is allocated ownership and responsibility to manage natural resources, aimed at allowing members to benefit from those resources" (Kegamba et al., 2022: 2). Examples include the CAMPFIRE programme in Zimbabwe (Frost and Bond, 2008) and the ADMADE programme in Zambia (Nkhata and Breen, 2010). However, the outcomes of adopting CBNRM in these areas have been mixed (Kegamba et al., 2022). CBNRM emerged as a way to empower local communities and return stewardship of natural resources to them in light of historic exclusion and displacement of local people in natural areas. A number of the principles of CBNRM have also been adopted in co-management interventions. These interventions offer promise in light of increased concerns about conventional state-centric and top-down resource management practices that largely exclude local people in decision-making processes (Bennett et al., 2018; Parlee et al., 2021).

Co-management in practice is often a hybrid between local community and science-based management in an attempt to decentralise decision-making over the management of natural resources (Cohen and Steenbergen, 2015). Both benefit-sharing interventions place emphasis on sharing the responsibilities and roles of resource management amongst government, the private sector, local communities, and other resource users to govern a natural resource sector sustainably and equitably (Brewer and Moon, 2015; Khan et al., 2023).

Revenue sharing

Revenue sharing has gained traction as a benefit-sharing approach in the conservation and eco-tourism sectors which is driven largely by government, the private sector, Non-Governmental Organisations (NGOs) and foreign donors. This approach has the main objective of promoting community development and upliftment through introducing permits, taxes, or levies that are required to be paid by those entering or using a certain coastal area or resource (Cisneros-Montemayor 2022b). The proceeds are then allocated to the community either through direct payments or reinvestment is made into infrastructure (e.g., schools, health care facilities, public roads) for the benefit of the community (Wynberg and Hauck, 2014; van Wijk et al., 2021). However, while there may be socio-economic benefits that communities get from revenue sharing interventions, many communities see this as an inadequate form of compensation in light of the trade-off of losing land as well as significant restriction to accessing natural resources (Mbatha, 2011; Sandbrook and Adams, 2012; Cohen et al., 2019).

Corporate social responsibility (CSR)

CSR has been around for over two decades and is often thought of as one of the 'weaker' interventions to benefit sharing (Mbatha and Wynberg, 2014). The private sector is the main proponent of this kind of benefit sharing approach which is commonly in response to government legislation, shareholder demand, or community and civil society pressure. CSR can be defined as an activity that involves "creating social change and improving the dynamics between companies and local communities and stakeholders" (Fordham and Robinson, 2018: 1).

Most forms of CSR interventions include investment in social development to build infrastructure for local communities, hiring of local community members in private companies, and giving communities a share in the private company (Voyer and van Leeuwen, 2019). Unlike the other interventions, the drive behind CSR is typically fuelled by self-interest where power and decision-making remains in the private company itself, rather than the other actors involved in the process. Hence, some have argued against the claim that CSR interventions make an overall positive contribution to target communities and other stakeholders involved (Jenkins, 2004; Wynberg and Hauck, 2014; Carroll and Brown, 2018; Voyer and van Leeuwen, 2019).

2.5.3 A conceptual benefit sharing framework

As outlined in the sections above, benefit sharing interventions and mechanisms may differ in the processes followed to 'equitably' distribute benefits and may have varied outcomes for the different actors involved in the process. However, benefit sharing ultimately has strong interconnecting components. Wynberg and Hauck (2014) developed a conceptual framework for understanding benefit sharing and its core elements in the context of coastal resource use, as depicted in Figure 5 below. The framework reflects the dynamic process in which benefit sharing interventions are implemented to distribute benefits to different actors who utilise natural resources in coastal areas. The different actors range from the global to local level with often competing and conflicting interests. Such actors can include government, private companies and corporations, environmental protection agencies, civil society groups, and local communities.

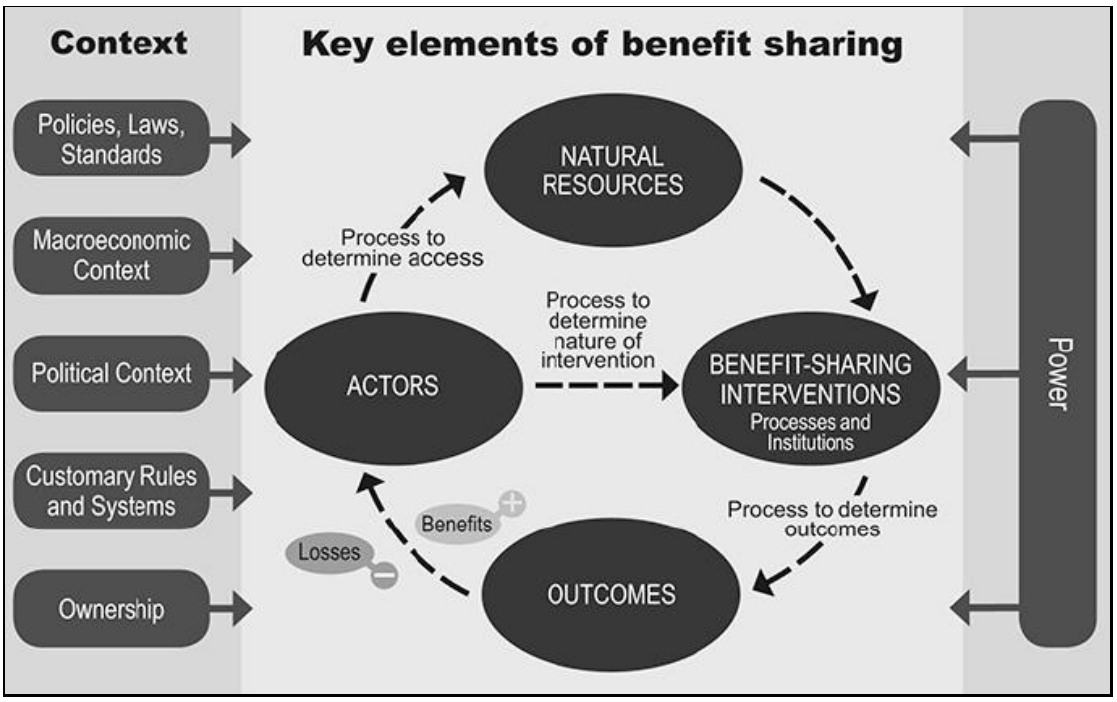

Figure 5*: A conceptual framework for understanding benefit sharing and its core elements in the context of coastal resource use. Source: Wynberg and Hauck (2014).*

Actors

The different actors accessing, mediating, or benefitting from coastal resources can include government departments, politicians, private corporations, civil society organisations, conservation agencies, and local communities (Wynberg and Hauck, 2014). These actors operate at different levels from global, regional, to local. The stakeholder interests often differ and compete with each other, with those holding more power and authority controlling access to and benefits derived from the natural resources of interest (Dressler et al., 2010).

Natural Resources

The natural resources that people access and use include a wide range of marine biodiversity resources (e.g., fish, plants, and minerals), and products from coastal forests and coastal land (Österblom et al., 2020**)**. Stakeholder interests can vary as some stakeholders for example, may value extracting heavy metals and minerals from coastal sands to benefit from substantial tax revenues and company profits. Other stakeholders may value preservation of the coastal environment and devolution of power through joint decision-making that promotes more equitable access to natural resources. These competing interests are major barriers to fairly distribute benefits to different actors (Jentoft and Chuenpagdee, 2009).

Wynberg and Hauck (2014) argue that benefit sharing interventions are critical to mediating these types of social conflicts through designing interventions that can fairly and effectively assess the benefits and losses amongst different stakeholders, including the trade-offs that need to be considered and accepted amongst them. Moreover, they argue that focus needs to shift away from traditional 'monistic' benefit sharing interventions such as cost-benefit analysis or valuation of ecosystem services as these measures often fail in their attempts to, "objectively quantify different values in complex social and ecological systems that are inherently political, that have multifaceted power dynamics and plural forms of value articulation" (Wynberg and Hauck, 2014: 8).

Processes, institutions, and mechanisms as an integral part of benefit sharing

Figure 5 highlights 'processes' and 'institutions' as important elements in the benefit sharing framework for determining who gains access to and ultimately benefits or suffers losses from natural resources. Multi-actor involvement and procedural fairness are vital determinants of whether the outcomes of the benefit sharing mechanisms are ultimately equitable (Bennett et al., 2019; Brugere et al., 2021). Hence, what is essential to this process is establishing institutions at the local level (e.g. a fishing committee) to ensure there is adequate representation of different actors involved who have an equal say in the decision-making process. However, it is important to note that even with such a process in place there will still most likely be a mismatch between the interests and the expectations of different actors which could put desired outcomes at jeopardy (Wynberg and Hauck, 2014). Owing to the important elements that make up benefit sharing, particular attention is placed on the institutions and mechanisms that were setup to enable benefit sharing for the two aquaculture projects in this research. This is discussed in more depth in the findings and discussion sections.

Context and its influence in benefit sharing

Context is another important determinant of how benefit sharing mechanisms are set up and the nature in which benefits are distributed (Niner et al., 2022). Benefit sharing mechanisms take place within a wider social, political, and economic context that are influenced by multiple interconnected factors. For example, policies, laws, and regulations governing fisheries in certain countries may benefit some actors more than others. Informal or customary institutions may clash with more formal institutions within government that could consequently create confusion in governing a commonly shared natural resource (Krause et al., 2015). Moreover,

macroeconomic factors such as neoliberal market forces may have a direct influence in what type of benefit sharing mechanism is established as well as the value of the natural resource, and thus the underlying motive of certain actors (Dressler et al., 2010; Song et al., 2013; Wynberg and Hauck, 2014).

The importance of power in benefit sharing

One of the most important determinants of the outcomes of benefit-sharing mechanisms is power. Power relations function at different levels (global, national, and local), inside different spaces (closed, inclusive, and declared), and can be of different natures (Bennett et al., 2021). Power may be very visible through transparent decision-making but can also be more secretive and done behind closed doors, and even done in an exclusionary manner that prevents alternative viewpoints and perceptions from being heard (Wynberg and Hauck, 2014). This is confirmed by Ribot and Peluso (2003) who argue that the transfer of powers to distribute benefits within local institutions may enhance or undermine equitable and transparent processes. This depends on the local actors who are entrusted with the benefit distribution powers. A number of studies have already shown how unequal power dynamics can lead to elite capture of benefits by those who hold more power in benefit sharing interventions (Mbatha, 2011; Larson, 2011; Torpey-Saboe et al., 2015).

Wynberg and Hauck's conceptual framework for benefit sharing provides a useful tool for understanding the key components of benefit sharing and how internal and external factors can influence benefit distribution. Adopting this framework could also help to overcome the consequences of the 'business as usual' approaches associated with Blue Economy projects that

can often exclude people directly and indirectly affected by it. Thus, in the context of this research, better understanding of benefit sharing interventions, mechanisms, and institutional arrangements could assist in translating Operation Phakisa's high-level aquaculture policy initiatives into projects that employ interventions and mechanisms to ensure benefits reach people directly and indirectly affected from aquaculture development.

2.5.4 Benefit sharing and policy coherence

Using the ideas from Krause et al's. (2015) framework for identifying the 'people-policy gap' in aquaculture, benefit sharing and policy coherence are important concepts to help fill this gap and in order to achieve fair and equitable aquaculture development. Policy coherence can increase the likelihood of change and better policy outcomes because it focuses on reinforcing the positive impacts of individual policies. Policy coherence can utilise the positive synergies across the social, economic, and environmental policy arenas by minimising the trade-offs with shared environmental resources and associated socio-economic costs. It is also able to reconcile local policy objectives with internationally agreed objectives (OECD, 2015). In the context of aquaculture, better development outcomes are realised when social, economic, and environmental departments collaborate with those responsible for aquaculture. Coherence between government policy objectives and Blue Economy benefit sharing mechanisms can form the foundation of synergies and positive outcomes for aquaculture development involving individuals and local communities.

However, as Brugere et al., (2021: 3) argue, in order to be effective and inclusive, "decision-making and policy formulating processes for the aquaculture sector should be informed by science and include input from stakeholders at various levels of decision-making (e.g. individual, national, and regional, the public, private and civil spheres)". Such initiatives, however, face major challenges as these stakeholders often operate in separate and fragmented silos that disconnects bodies of knowledge. This makes it challenging to meet the needs of different stakeholders and anticipate key impacts and trade-offs to consider. This is the 'people-policy gap' in practice that Krause et al., (2015) refer to. Policy coherence (Figure 6 below) can therefore assist in overcoming this gap and enable more effective implementation of benefit sharing mechanisms through ensuring that framing the conditions of 'why' and 'for whom' in aquaculture development are fulfilled, the inequalities from fish production are minimised, and positive outcomes through equitable aquaculture development are realised (Brugere at al., 2021).

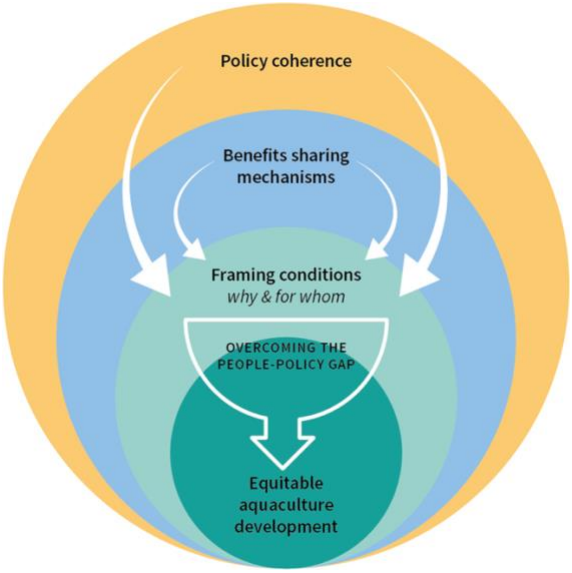

***Figure 6**: The connection between policy coherence, benefit sharing mechanisms, and the framing of aquaculture conditions to overcome the 'people-policy gap'. Source: Brugere et al., (2021).*

2.6 Understanding Perceptions

Many scholars have highlighted the importance of improving natural resource management in South Africa through incorporating the perceptions of different stakeholders in the planning and decision-making processes (Sowman and Wynberg, 2014; Muhl, 2016; Pretorius, 2018). Given that marine resource governance in practice involves a number of stakeholders with different views and interests, it is necessary to understand the perceptions, values, and underlying beliefs of these stakeholders in order to both inform and make practical changes to policies, development programs, and projects. After examining government publications, policy documents, and guideline reports for one of Operation Phakisa's key focus sectors (i.e. aquaculture), it is unclear whether adequate consultation has been held with IAPs to ascertain peoples' views, perceptions, and priorities (DAFF, 2013; Operation Phakisa 2014a and b; DAFF, 2016; DAFF, 2020).

Perceptions are defined as "the way an individual observes, understands, interprets, and evaluates a referent object, action, experience, individual, policy, or outcome" (Bennett, 2016: 585). Exploring perceptions can provide valuable insights into the underlying values, beliefs, and worldviews of different stakeholders towards Blue Economy initiatives. It can also help to identify what potential socio-economic and ecological impacts Blue Economy projects can have on different stakeholders and try to mitigate these impacts in advance. Aquaculture projects for example are often located near communities whose livelihoods depend on the surrounding environment. Perceptions studies could aid in better understanding whether the direct and indirect benefits of aquaculture projects will outweigh the negative impacts, and ultimately if local communities will support the projects or not if they perceive it doing more harm than good (Bennett et al., 2019).

In South Africa, the views of scientists and policymakers have largely informed Blue Economy planning and decision-making. Research suggests that these decisions often exclude and disregard the perceptions of other stakeholders such as coastal communities (Masie and Bond, 2018; Loring et al., 2019; Muhl, 2019; Sowman et al., 2023). It is necessary to incorporate social issues such as social inequality, marginalisation, and poverty as considerations informing policy and science just as environmental issues such as climate change and habitat destruction have. However, the government and private sector's approach to development is mostly focused on economic growth, whereas large environmental NGOs place emphasis on conservation (Cohen et al., 2019). It is therefore key for Blue Economy frameworks to address social inclusion and equitable opportunities by considering the perceptions of HDIs and communities, equitable access to resources, and the fair distribution of costs and benefits (Cisneros-Montemayor et al., 2019).

Most quantitative analyses developmental outcomes centre on measuring the distribution of monetary-based benefits or costs among different stakeholders involved, but seldom include an assessment of the levels of recognition, inclusion, or participation of stakeholders within the process (Halpern et al., 2013; Bennett et al., 2021). In this regard, including the perceptions of different stakeholders in Blue Economy planning and decision-making can assist in making the trade-offs of development projects clear and facilitate implementation and monitoring plans that allow for the evaluation of social equity considerations throughout the process. There are already a number of high-level documents and reports detailing best practice principles and guidance on how such inclusion can be implemented in specific development contexts. For example: the FAO's Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (FAO, 2015); the UN Declaration of Human Rights (United Nations, 2015b); and towards achieving a sustainable and equitable Blue Economy (Osterblom et al., 2020).

In the South African context, past research has highlighted the importance of improving natural resource management through integrating the perceptions of local communities and different stakeholders as well as benefit sharing mechanisms into planning and decision-making processes (Sowman and Wynberg, 2014; Pretorius, 2018; Muhl et al., 2020). Given that natural resource involves a number of stakeholders with different views and interests, understanding the perceptions, values, and underlying beliefs of these different stakeholders is necessary in order to make effective changes to policy and regulations. Perception and benefit sharing studies are potentially useful methodological approaches that could help to provide an understanding and insight into the actual benefits received by HDIs and communities involved in Blue Economy projects.

Chapter Three: Approaches and Methods

This chapter discusses the research approach and the data collection and analysis methods used to address the aim and objectives of this research. This study was conducted mainly through the use of qualitative data, mostly constituting semi-structured interviews. A total of 36 interviews were conducted with key stakeholders from the two case study sites with each lasting between 40 minutes to one hour on average. A case study approach was supported by various data collection methods including semi-structured interviews, non-participant observation, as well as the analysis of secondary data sources including grey literature. The process of selecting the research participants as well as the limitations and ethical considerations of this research are outlined at the end of this chapter.

3.1 The case study approach and context

This research methodology was based on a case study approach which used the Doringbaai and Saldanha Bay aquaculture projects as the sites of interest. Case study research is a qualitative method used to generate an in-depth understanding of complex issues on the ground. Yin (2009: 18) defines case study research as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are indistinct". By studying multiple cases simultaneously, it allows for a broader investigation and understanding of a particular focus of inquiry. Furthermore, it lets the researcher gather a detailed account of the area and people of interest, which is followed by analysing the key themes and findings that arise from engaging with the relevant stakeholders associated with the case study (Yin 2009; Cresswell, 2014).

3.2 Participant selection

The aim of this research was to understand what benefits HDIs and communities derive from involvement in the Doringbaai and Saldanha Bay aquaculture projects. To address this aim, it was necessary to identify the key stakeholders involved in these projects. The initial list of relevant stakeholders was obtained from researchers and government officials who had worked in these areas and who were known to the researcher. These stakeholders were contacted at the beginning of the scoping stages of this research in April 2020. Snowball sampling was used as a method to ask initial participants to introduce the researcher to other participants of relevance to this research through accessing their social networks. This method was advantageous to use as it assisted the researcher in finding participants that were difficult to get in contact with (Biernacki and Waldorf, 1981).

3.3 Semi-structured interviews

Interviews are a popular form of data collection for many researchers. Although they can be used for collecting straightforward and factual data, they are best used when applied in the exploration of more complex narratives and phenomena (Ritchie et al., 2013). The main advantage of using semi-structured interviews as a data collection method is that the interviews are guided by a flexible framework where the interviewer knows the topics to be addressed but, at the same time, also allows for topics, themes, and follow up questions to be discussed with participants in more depth if relevant (Denscombe, 2014).

Guided by the same set of questions, the interviews were carried out with all the different stakeholder groups. All interviews were conducted in English with the help of a research assistant in Doringbaai who helped translate the interview questions and responses for some participants who preferred to engage in Afrikaans. The interviews in Doringbaai were mostly conducted at the abalone factory premises while the Saldanha Bay interviews were conducted remotely due to COVID-19 and travel restrictions in place during the time fieldwork was conducted. A few interviews were completed in pairs or small groups of people as some participants felt more comfortable talking in a group than on their own. The interviewees were provided with a document outlining the aim of the research and the rationale for conducting the research. The interviews were all recorded, with permission given by the participants. The interviews were all transcribed at a later date and were then used to analyse and discuss the data collected.

The tables below provide a summary of the key stakeholders in the different groups that were interviewed in this research project. To ensure that anonymity was maintained, each participant in each stakeholder group is not further disaggregated.

***Table 3**: Summary of key informants interviewed in Doringbaai.*

Date	Key Informant	Code
11 March 2021	Doringbaai local community member 1	DBKI1
11 March 2021	Doringbaai local community member 2	DBKI2
4 May 2021	Matzikama Municipality official	MMKI1
5 May 2021	Doring Bay Abalone member 1	DBAKI1
5 May 2021	Doring Bay Abalone member 2	DBAKI2
5 May 2021	Doring Bay Abalone member 3	DBAKI3
5 May 2021	Doring Bay Abalone member 4	DBAKI4
5 May 2021	Doring Bay Abalone member 5	DBAKI5
5 May 2021	SANParks official	SANPKI1
5 May 2021	Doringbaai local community member 3	DBKI3
5 May 2021	Doringbaai local community member 4	DBKI4
6 May 2021	Doringbaai Development Trust member 1	DDTKI1
6 May 2021	SAPS official	SAPSKI1
6 May 2021	Doringbaai local community member 5	DBKI5
7 May 2021	Doring Bay Abalone management member 1	DBAMKI1
7 May 2021	Doring Bay Abalone management member 2	DBAMKI2
7 May 2021	Doring Bay Primary School member 1	DBPSKI1

7 May 2021	The Jetty Restaurant management member 1	JRMKI1
7 May 2021	Doringbaai local community member 6	DBKI6
7 May 2021	Doringbaai Atlantic Pebbles member 1	DAPKI1
Total		**20**

***Table 4**: Summary of key informants interviewed in Saldanha Bay.*

Date	**Key Informant**	**Code**
9 July 2021	Saldanha Aquaculture Services member 1	SASKI1
15 July 2021	Private mussel producer in Saldanha Bay 1	PMPKI1
22 July 2021	New Service Provider management member 1	NSPMKI1
29 October 2021	Private mussel producer in Saldanha Bay 2	PMPKI2
17 November 2021	Saldanha Aquaculture Services member 2	SASKI2
23 November 2021	New Service Provider management member 2	NSPMKI2
9 December 2021	Saldanha Aquaculture Services member 3	SASKI3
1 February 2022	Saldanha Aquaculture Services member 4	SASKI4
Total		**8**

***Table 5**: Summary of other key informants interviewed.*

Date	Key Informant	Code
20 June 2020	Private aquaculture company member in the Northern Cape	PACKI1
20 July 2020	Private aquaculture company member in the Eastern Cape	PACKI2
24 February 2021	Research Group One Ocean Hub member	OOHKI1
24 February 2021	Operation Phakisa official 1	OPKI1
2 March 2021	Stellenbosch Aquaculture Department official	SADKI1
26 March 2021	Operation Phakisa official 2	OPKI2
13 September 2022	SBADZ Aquaculture Management Committee member 1	AMCKI1
2 December 2022	Operation Phakisa official 3	OPKI3
Total		**8**

3.4 Non-Participant Observation

In this study, non-participant observation was chosen over the more commonly used participant observation as a method to gain more understanding about the Doringbaai and Saldanha Bay aquaculture projects. Non-participant observation is a simpler form of observation where the researcher remains as an external observer watching and listening to specific interactions or phenomena as these occur (Kumar, 2005; Babbie and Mouton, 2007). In this research, non-participant observation was carried out by observing the participants at work at the aquaculture projects while being shown around the farms and factories. This was useful in order to learn more about the type of marine species being farmed and how these species were being cultivated, processed, and sold to domestic and international markets. While conducting the observations, the participants were asked questions about their roles in the projects, the infrastructure and facilities used, and what the day-to-day operations of the farm entailed. Notes, photographs, and videos were also taken with the consent of the participants. It is important to note that DBA permitted the use of photographs and videos to be taken of the farms and premises while the Saldanha Bay facility did not allow this as a matter of the company's policy and in order to protect its proprietary information.

3.5 Data analysis

After transcribing the interviews conducted in Doringbaai and Saldanha Bay, the data was analysed through inductive analysis. Inductive analysis can be defined as, “Approaches that primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data” (Thomas, 2003: 238). Triangulation of information was then gathered from the interviews, non-participant observation, and literature was used to provide a more robust interpretation, cross validation, and comparison of the information contained in the data (Thurmond, 2001). Triangulation can be defined as, “the combination of methodologies in the study of the same phenomena” (Denzin, 1978: 291). The advantages of using the triangulation approach in data analysis is that it gives the researcher new insights and inventive ways to interpret the phenomena found in the data collected.

Drawing from (Thomas, 2006), the following principles guided the use of inductive analysis in this research:

1. Preparation of the raw data: preparing the raw data files into a common format (i.e., transcribing the recorded interviews into a standardized Microsoft Word document format).
2. Close reading of the data: after being recorded into a common format, the raw text from the data was closely read in detail to become more familiar with the content and to start understanding what themes are emerging from the text.
3. Categorization of the data: after closely reading the raw data, key categories and themes were identified from specific text segments that were in relation to the research objectives and not according to stakeholder groups. These segments of text were then labelled to develop core categories (e.g., ‘access’, ‘trust’, ‘benefits’).

4. Overlap in coding and uncoded text: to reduce overlap and redundancy amongst categories: i) some segments of text were coded into more than one category, and ii) a large amount of raw text was not assigned to any category because it was not relevant to any of the research objectives.
5. Revision and refinement of the categories: after further revising each category, the original interviews were re-examined to gauge deeper meaning behind the 'audio clues' left by the interviewees. From that, emerging codes, sub-topics, and contradictory viewpoints were identified (e.g. 'lack of trust', 'winners', 'losers'). Moreover, appropriate quotations from the interviews were used to help convey the essence of each of the categories listed. A final set of 3 main categories were then developed out of this process. A summary of the coding process used in this analysis is depicted in Figure 7 below.

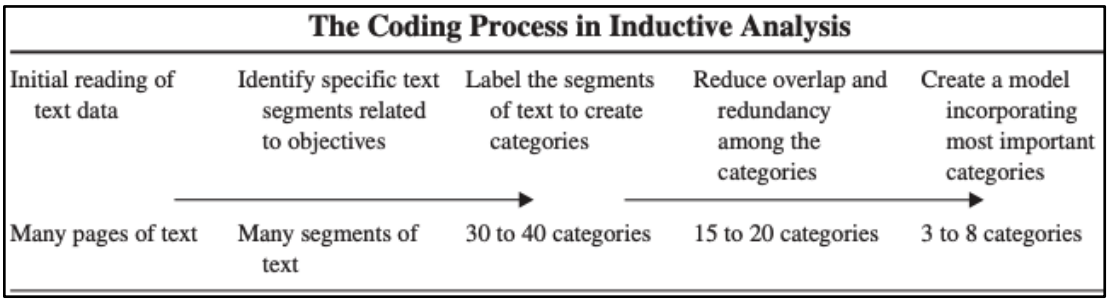

***Figure 7**: The coding process for Inductive Analysis of Qualitative data. Source: (Thomas, 2006).*

3.6 Research limitations and challenges

Limitations with snowball sampling as a qualitative research method

There were several challenges and limitations encountered while conducting this research. Firstly, using snowball sampling as a research method can lead to samples not being representative as the they are "not randomly drawn but are dependent on subjective choices of the first contact, samples may then tend towards a reflexive bias" (Woodley, and Lockard, 2016: 323). This in turn can exclude or under-represent other relevant participants from being interviewed as the social networks selected by the participant may be based on their own personal biases. Thus, this research may reflect the views and perceptions of certain individuals over others. However, this challenge was mostly mitigated by interviewing a broad range of individuals across each of the key stakeholder groups, as illustrated in Tables 3-5 above.

Secondly, snowball sampling can present significant ethical issues, especially if the topic of research is of a sensitive nature. In the context of this research, some participants were reluctant to participate because they feared that they would get pushback from other community members and/or the organisations that they were a part of by being interviewed. It took a long time to overcome this challenge by engaging with the participants regularly and assuring them that anonymity and confidentiality could be guaranteed if they chose to participate in this research. The three-year research process enabled the building of some level of trust with research participants. Nonetheless, some participants were still reluctant to participate in this research because of reservations they had about the potential social issues they could face, which was respected and therefore they were not interviewed.

Impacts of COVID-19

The COVID-19 pandemic disrupted universities across the globe after the global outbreak in 2019. The University of Cape Town (UCT) was heavily impacted by the strict lockdown in South Africa with the proliferation of covid infection rates. Travel in South Africa was also heavily restricted in 2020-2021 which put a hold on any fieldwork travel being conducted. As interviewing participants was the main data collection method being used in this study, some participants identified (e.g., local community members and people working in the aquaculture projects) were living in remote areas that had limited signal. Moreover, these people did not have access to a computer or a stable internet connection. As a result, in person interviews were required. Owing to the strict lockdown in South Africa, the first case study visit to Doringbaai only occurred in May 2021, while the second case study visit in Saldanha Bay took place in October 2021. These challenges did significantly delay the progress of this research, especially in visiting the case studies and conducting the interviews.

3.7 Ethical considerations

This research was conducted in a way that safeguarded the interests of the participants and ensured their anonymity. The researcher obtained the full and informed consent of all participants to participate in the study prior to the interviews. Application was made to the Faculty of Science Research Ethics Committee at UCT to obtain ethical clearance to conduct this project, which was accepted and approved by the committee on 16 March 2021 (see Appendix A).

Before any interviews, observations, or photographs of the sites were conducted, research participants were asked to sign a consent form that detailed the intention of the research as well as the role that each interviewee would play as a participant. The consent form was in line with the research ethics guidelines (see Appendix B). All participants were guaranteed anonymity throughout the conduct of this research and were also informed that they could withdraw from the study at any time if they felt uncomfortable. Effort was made to interpret data collected in an objective and unbiased manner. However, given the sensitivity of some topics discussed with the participants and given that their views differed markedly from the organisations that they worked for or the community they were a part of, common terms such as 'most' or 'almost all' were used in order to protect their anonymity. Follow-up fieldwork visits were made to both Doringbaai and Saldanha Bay after this research was completed to provide participants interviewed with feedback about the results found.

Chapter Four: Background and Context of Case Study Sites

4.1 Introduction

This chapter will discuss the two case studies selected for this research in more detail by providing the historical background and context of the aquaculture projects being investigated. Information on each case study site was gathered through semi-structured interviews with key stakeholders, non-participant observation, photographs and videos taken on site (with the landowners permission), and a review of relevant literature.

4.2 Doringbaai

Doringbaai is a small settlement situated in the Matzikama Municipality along the north-west coast of the Western Cape Province in South Africa. The town of Doringbaai (previously known as Thornbay) was originally established as a fishing village in response to the abundance of West Coast Rock Lobster (WCRL) found along its coastline (WCDM, 2021). Doringbaai has a population of approximately 1260 people, consisting of around 315 households (Stats SA, 2022a). The primary language spoken is Afrikaans (96.37%), with some English, Xhosa and Setswana spoken as well. The majority of the population is of a Coloured descent (90.17%) followed by Black Africans (6.9%), White (2.7%), and other (0.23%). As there is only one local primary school in Doringbaai, the level of education in Doringbaai is very low with only 18.6% of the population having a matric education level, 4.4% having a higher education certificate, and 2.7% having no schooling at all (Matzikama Municipality, 2022; Stats SA, 2022a). A regional map of Doringbaai and DBA is depicted in Figure 8 below.

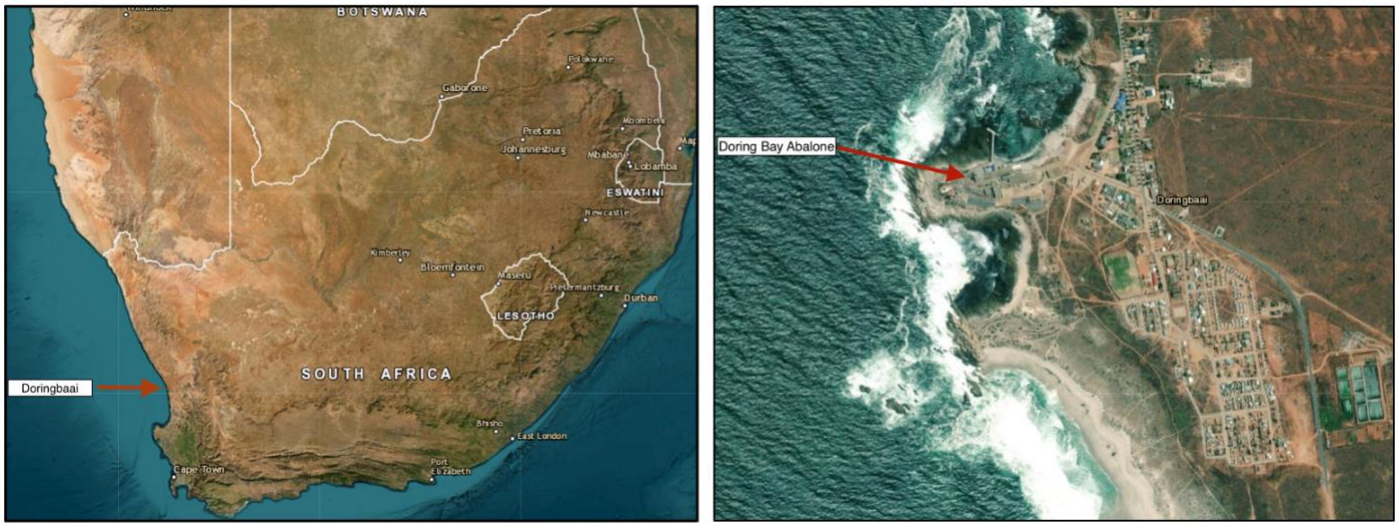

***Figure 8**: Regional map of Doringbaai. Source: (Cape Farm Mapper, 2022).*

Prior to Doringbaai being formally established, the protected bay area was used as a safe anchorage site for trade ships travelling along the Cape West Coast trading route. In 1925, the North Bay Canning Factory was opened and processed and sold WCRL, or locally known as crayfish, and other canned fish products to local and international markets. The factory, later acquired by the Oceana group, was primarily responsible for the establishment and development of the town as it provided numerous jobs and proved to be a key source of income for the majority of households in Doringbaai (DiMP, 2013). Traditionally, many of the Doringbaai male residents were local fishermen and relied on the ocean to generate income through selling their catches to the processing factory or directly working for Oceana's fishing fleet. Most of the women in Doringbaai worked in the factory processing the harvested products.

Not only did the factory provide its workers with direct employment but it also provided them with other benefits such as accommodation, electricity, free transport, and free basic medical services (Rohe, 2012; Bouwer et al., 2013). In the mid 1970s, however, the WCRL stock began to plummet and has not recovered. By the late 1980's, due to the rapid decline in the catches, quotas were reduced and several new fishing regulations were introduced to reduce fishing effort. As a result, the Oceana fishing company and its fleet closed down in the 1990s and moved southwards nearer to Cape Town, leading to many fishers, men, and women losing their primary source of livelihood (Bouwer et al., 2013; Louw et al., 2022). Thereafter, only Oceana's processing factory remained in Doringbaai which continued to provide many of the women in the community with employment and in turn made them the sole family breadwinners (Holloway and Butterworth, 2021). After the closure of Oceana's fishing fleet, some workers and fishers in Doringbaai travelled to Lambertsbaai and worked in a potato chips factory (DBKI1and2).

WCRL continued to steadily decline and reliance on this resource as a source of livelihood became less viable. The Marine Living Resources Act (MLRA) of 1998 was introduced to regulate the marine environment through issuing of rights and permits for the extraction of marine resources (Rohe, 2012). Although the MRLA recognised the need for redress and widening access to marine resources for all South Africans, traditional small-scale fishers were not catered for in the MLRA. Consequently, only a small number of traditional fishers in Doringbaai actually benefitted from the MLRA leaving most traditional fishers with no form of legitimate means to sustain their livelihoods (Sowman et al., 2011; DAFF, 2020). Oceana eventually closed its doors in 2006 due to the dwindling crayfish stocks and changes in the demand for fresh crayfish which made it more financially feasible to move the processing factory to Cape Town (Rohe, 2012).

The closure of Oceana saw its factory and premises becoming the property of the Department of Public Works (DPW). The factory had operated in Doringbaai for over 75 years and provided the majority of employment for the coastal town, its subsequent closure saw the benefits as well as the sole source of income that many households relied upon for decades vanishing. Some employees were offered some form of compensation when the factory closed while others who had left shortly before the closure to find alternative employment received nothing (DDTKI1). This in turn dramatically increased levels of unemployment and poverty in Doringbaai (Bouwer et al., 2013; Louw et al., 2022).

4.3 Setting up the Development Projects in Doringbaai: Actors, Processes, and Institutional Arrangements

Doringbaai's local economy has been characterised as 'vulnerable' since the closure of the Oceana factory with people's standard of living continuing to be affected by the declining capture fishing industry (Matzikama Municipality, 2022). In 2007, in response to the closure of the crayfish factory, the Doringbaai local community with the help of the Matzikama Municipality established the Doringbaai Development Trust (DDT). The DDT then setup a committee of trustees with duties to oversee the Trust management, create community development plans, and structures to engage with and give feedback to the wider community. Four committee trustees were elected by the Doringbaai local community by majority vote to conduct these duties on behalf on the community. The Trust was also established to act as a vehicle to drive both public and private investment into the Doringbaai community (DBKI2; DDTKI1).

It currently represents over 650 local community members and everyone over the age of 18 in Doringbaai automatically receives a membership into the Trust (GAN, 2020; DDTKI1). Moreover, membership in the Trust affords each member the opportunity to get an equal share of the future generated profits from strategic development projects implemented by the DDT (DDTKI1). The DDT has the support of the Matzikama municipality with their management expertise and resources to setup several community development projects. In 2008, the DDT signed a lease agreement with the DPW to utilise the premises of the abandoned Oceana factory. The Trust identified three main strategic development projects (or 'benefit sharing interventions') to establish on the premises: i) an abalone farm (Doring Bay Abalone), ii) a restaurant and wine cellar (Fryer's Cove), and iii) a pebble company (Doringbaai Atlantic Pebbles) (Bouwer et al., 2013; GAN, 2020; Matzikama Municipality, 2022).

4.3.1 Doring Bay Abalone

The Matzikama Municipality acknowledged that addressing the severe levels of poverty in Doringbaai would be a major challenge in light of the closure of the Oceana factory that had been the town's main employer for over 75 years (GAN, 2020). The Municipality, the Western Cape Aquaculture Development Initiative (WCADI), and other key industry experts identified the abalone sub-sector to hold great potential in stimulating economic growth and creating jobs in Doringbaai. This was due to the upwelling of cold rich waters along the Matzikama coastline that proved to hold suitable conditions for land-based abalone farming and ranching (IDC, 2020; Louw et al., 2022).

In 2011, Doring Bay Abalone (Pty) Ltd was established by two private entrepreneurs who invested the initial seed capital to install the necessary infrastructure, train staff to start producing abalone, and prove the viability of the project to external investors. The biggest challenge with land-based abalone farming, however, involved raising the necessary funds to start an intensive form of mariculture production that typically required a significant amount of capital and investment (DBAMKI1; MMKI1).

The legal reform in post-apartheid South Africa proved to play a key role in addressing this challenge as under the Mineral and Petroleum Resources Development Act (MPRDA) of 2002, all mining companies were obligated to commit to community development activities in the municipality that the mine is located in (Republic of South Africa, 2002; Matzikama Municipality, 2014). In this case, a local mining company named Tronox Namakwa Sands had mining activities in the vicinity of Doringbaai, and through the MPRDA of 2002 the local Matzikama Municipality approved the investment of a R6.2 million grant in 2014 to expand DBA to a 25-tonne abalone project. This investment was part of Tronox's Social and Labour Plan programme from the Department of Mineral Resources and Energy (DMRE) (Tronox Limited, 2013; Matzikama Municipality, 2014 and 2022).

Further funding for DBA was provided by the WCADI and the DFFE in 2014 who facilitated R2.4 million in grant funding from the Western Cape Department's Comprehensive Agricultural Support Programme (CASP) (GAN, 2020; Matzikama Municipality, 2022). Thereafter, the Industrial Development Corporation (IDC) saw the potential of this aquaculture venture in uplifting the impoverished fishing community after the closure of the Oceana factory. The IDC is a national Development Finance Institution (DFI) that is owned by the South African government which promotes economic growth and transformation in the country (IDC, 2020).

In 2018, the IDC invested approximately R15 million into DBA to expand to a 50-tonne abalone project in order to provide more employment opportunities to the local community in Doringbaai (Wesgro, 2018; IDC, 2020; DDTKI1). Thus, not only was the project started as a commercial operation for the production of abalone, but it was seen by various other state and non-state actors as an important way to bring benefits to the local community in Doringbaai through job creation and shares of profits generated from DBA. While the DDT held the lease agreement for the old Oceana premises and attracted some public funding to establish the abalone project, they did not have the access to capital, technology, and markets necessary to establish a commercially viable abalone project. The private shareholders in DBA did have access to these key components of starting up the business and thus acquired a combined 63% share in the company.

DBA is a private sector partnership with the Doringbaai community and was the first majority black owned equity project producing abalone in South Africa. The community have a majority 37% stake in the company, which is managed on their behalf by the DDT, 28% of DBA is owned by one of the private co-founders, and the remaining 35% share is owned by other co-founder and CEO (DBA, 2020). Since 2018, DBA produces approximately 50 tonnes of abalone (*Haliotis midae*) per year and employs a total of 52 full-time permanent staff from the local community. This is projected to increase each year as the company grows further. The Trust holds the responsibility for managing and distributing benefits to the community's from their majority share in the project. Benefits to the community are not only channelled through direct employment but, after the company starts to break-even and turn a profit, their 37% stake in the company will be reinvested back to the community through implementing strategic development projects to create employment and develop community infrastructure which will be managed by the DDT (GAN, 2020; Matzikama Municipality, 2022; DDTKI1; MMKI1).

The stakeholders involved in the DBA project and the intended flow of benefits envisioned by DBA, the DDT, and the Matzikama Municipality to go to the Doringbaai local community are summarised in Figure 9 below.

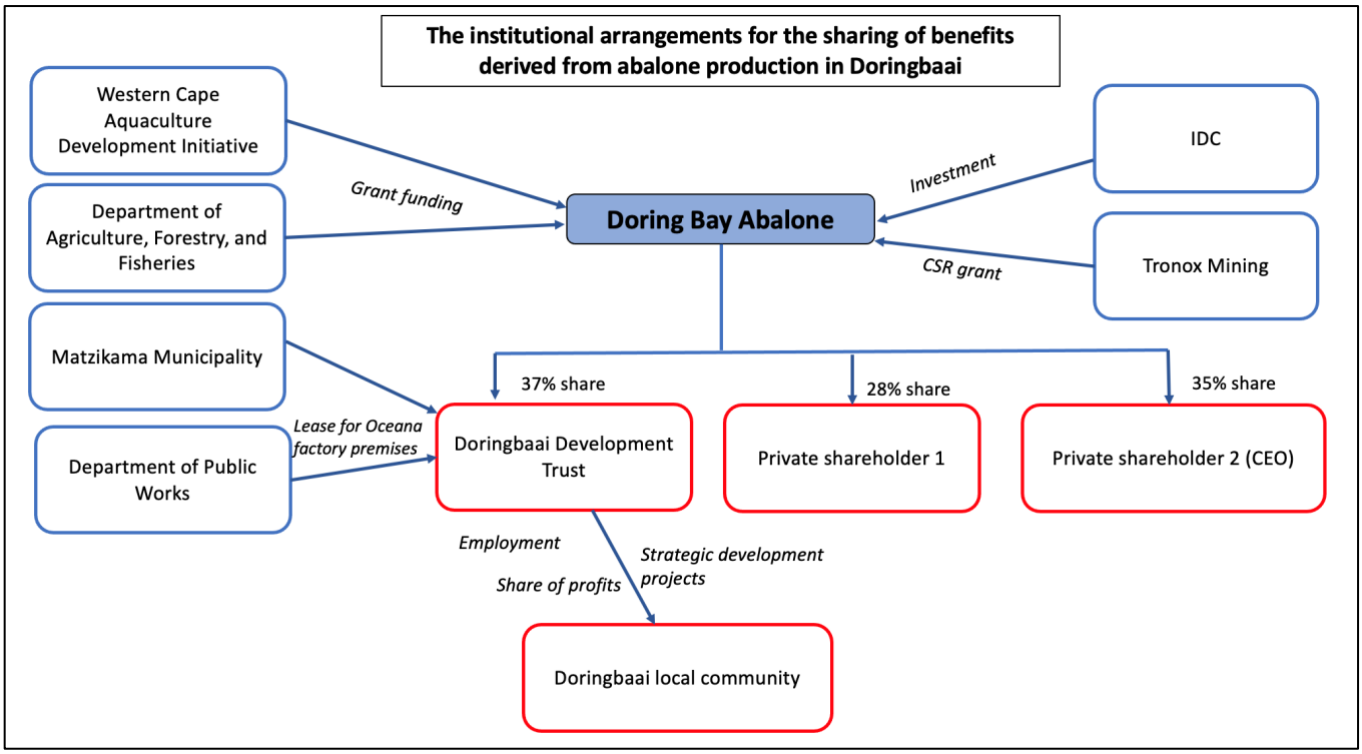

***Figure 9**: The various stakeholders involved in and institutional arrangements setup to distribute benefits from abalone production in Doringbaai to the local community.*

Abalone – species background in South Africa

Abalone is one of the most luxurious and expensive seafood products globally and are in high demand on the Asian markets in particular as they are considered a culinary delicacy, a symbol of status and wealth, and have certain medicinal qualities (DAFF, 2018a). Abalone are a group of large edible sea molluscs that belong to the Haliotidae family. The abalone industry in South Africa has experienced rapid growth and is regarded as one of the most valuable species to the aquaculture industry. This development catalyst can be attributed to increased market demand, high premiums received for abalone, suitable coastal conditions to cultivate abalone in South Africa, and the dwindling numbers of wild abalone stocks due to poaching. Wild abalone once thrived in South Africa's coastal waters but has been so heavily exploited over the past few years that it now faces commercial extinction (DAFF, 2018a).

The steep decline in wild abalone stocks started in the 1990s in South Africa due to an exceptionally high demand and high premiums offered for poached abalone on the Asian black market, which saw a proliferation of illegal poaching of abalone across South Africa's coastline. The decline of wild abalone stocks has led to the introduction of farmed abalone to meet the global demand as a result (Raemaekers et al., 2011; Witte, 2017). *Haliotis midae* are one of five species of abalone that are endemic to South Africa and is the only locally farmed species (see Figure 10 below).

***Figure 10**: Haliotis midae abalone species in South Africa. Source (DAFF, 2018a).*

Currently, land-based flow through systems are the most commonly used systems to produce abalone in South Africa, and this system is used by DBA. Within this system, grow out tanks are continuously replenished with fresh sea water often pumped directly from the ocean. This helps remove the accumulation of waste and replenishes the tanks with fresh oxygenated sea water to enhance the growth rate of the abalone. Once the abalone have grown out to approximately 100g in size they are harvested and processed for export. Most abalone in South Africa are exported to the Far East namely China (mainland and Hong Kong), Japan, and Singapore. South African abalone is one of the most sought-after products in Asia due to its high quality, good texture, flavour, and colour (Britz and Venter, 2016).

Abalone is typically sold as live, fresh, or frozen but value added canned or dried abalone products (secondary processing) are also popular on the market (DAFF, 2018a). DBA exports live and frozen abalone directly to the Asian market through an independent marketer and distributor. When the fieldwork was conducted for this research in May 2021, DBA did not do

any secondary processing of their abalone into dried or canned products but were in the process of installing a fully equipped processing factory when this research was conducted (DBAMKI1, DDTKI1).

4.3.2 Fryer's Cove – The Jetty Restaurant

In addition to helping establish the DBA project, the DDT identified several other strategic projects to create jobs for the local community and to make use of the unused Oceana factory premises. There were plans to upgrade the small harbour near the factory to attract visitors to Doringbaai while driving along the busy Cape to Namibia route (MMKI1, DDTKI1). In 2011, Fryer's Cove Winery setup a wine tasting facility to showcase their locally produced wines with cheeseboard pairings and later in 2013 established the Jetty Restaurant at the Doringbaai harbour in partnership with the DDT. The restaurant pairs locally made wines with locally caught seafood products. It is 30% owned by Fryer's Cove and the remaining 70% is owned by the local community which is managed on their behalf by the DDT (JRMKI1).

***Figure 11**: The Jetty restaurant with local food and wine served. Source: (Self-taken photo, May 2021).*

Fryer's Cove helped finance the restaurant and still oversees the administration, logistics and training of staff. Members from the Doringbaai community were hired to help run the restaurant where 3 women from the Doringbaai community are permanently employed as chefs in the kitchen and 11 men and women are hired on a casual basis based on customer demand. Members working at the restaurant revealed that they feel that they are benefitting from being employed and also feel empowered to be part of a project that has helped put Doringbaai on the map as a tourist attraction (JRMKI1, DBKI2, DBKI3). Moreover, some of the dishes on the menu were created by the women chefs from the local community such as Kerrievis (pickled fish), Roosterkoek (traditional South African bread), and Snoekkoekies (fish cakes) (JRMKI1).

4.3.3 Doringbaai Atlantic Pebbles

Doringbaai Atlantic Pebbles (DAP) was another strategic development project that the DDT implemented to increase employment opportunities for the local community. In 2010, the Trust formed a partnership with the Trans Hex Group – an international mining company that has mining activities stretching along the Cape West Coast. As part of Trans Hex's CSR programme, a deal was made where the DDT had open access to the mining company's tailings (mine waste left after target minerals are extracted from an ore) from their mining operations free of charge. The tailings of value in this case were excess pebbles which DAP sold across South Africa for gardening and landscape purposes (DAPKI1).

***Figure 12**: Pebbles being sorted into different sizes at DAP. (Source: self-taken photo, May 2021).*

DAP is managed by the trustees of the DDT and currently employs 22 full-time workers. Roughly half of the workforce (who are mostly male) help collect the pebbles from the mine sites and unload the pebbles at the factory premises. The other half of the workforce (who are mostly female) wash, process, and sort the pebbles into different sizes and colours. The company sells 20kg bags of pebbles at roughly R50 each with an output of approximately 80 tonnes/4,000 bags per month. Interviews with members working at the pebble factory revealed that they feel that they are directly benefitting from the project through getting a source of income each month by being employed full-time (DAPKI1, DBKI2).

4.4 Saldanha Bay

Saldanha, also known as Saldanha Bay, is a town situated in the Saldanha Bay Municipality along the west coast of South Africa. On its western side, the bay is connected to the southern Benguela current which also feeds into Langebaan Lagoon – a shallow tidal system at the southern part of the bay. Combined these water systems form the interconnected Saldanha Bay-Langebaan Lagoon (SBLL) system. The SBLL system offers a paradise for recreational water activities such as kite surfing, diving, and sailing. Langebaan Lagoon also incorporates the West Coast National Park (WCNP) which is well known for its pristine beaches and also hosts a Ramsar site of international importance for the variety of rich marine and terrestrial biodiversity it holds (CSIR, 2019b; SANP, 2022). Figure 13 below depicts a regional map of Saldanha Bay.

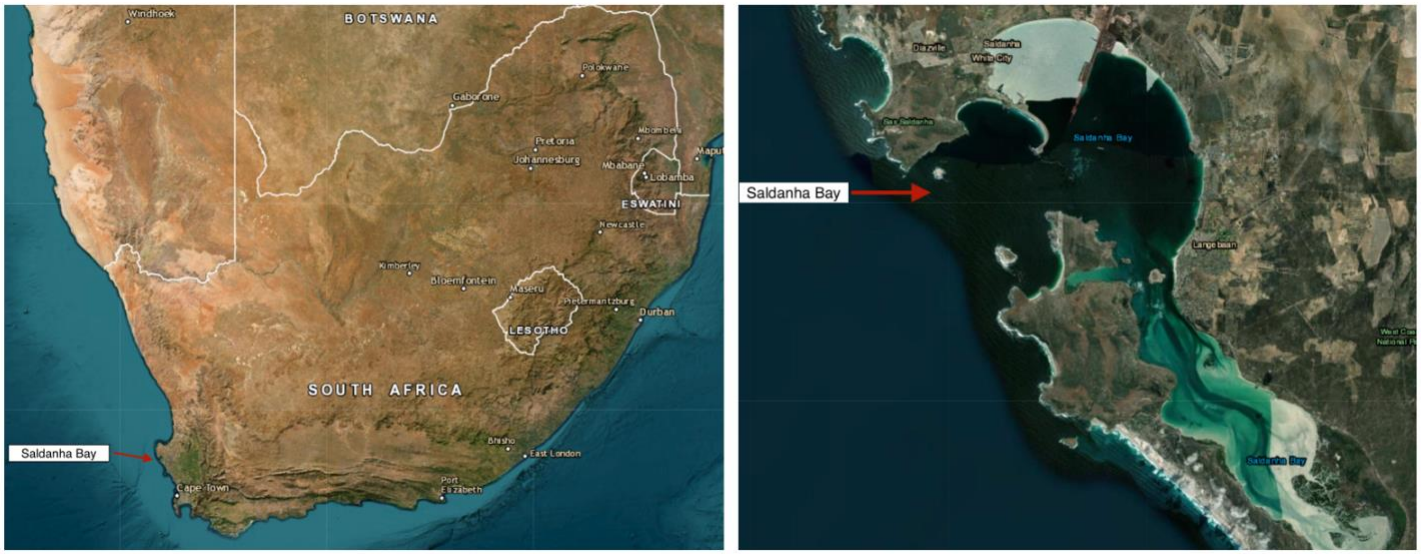

***Figure 13**: Regional map of Saldanha Bay. Source: (Cape Farm Mapper, 2022).*

Saldanha Bay has the biggest natural port in Africa that has been earmarked as a 'regional engine' for the expansion and development of the Western Cape (SBM, 2015). Moreover, not only is the bay a strategic deep-water port, but it is one of the only few embayments in South Africa to provide a sheltered and suitable environment for bivalve culture due to the upwelling of cold and nutrient rich water coming from the Benguela current. As a result, a fully-fledged mussel and oyster industry began to develop in the 1980s (Olivier et al., 2013; Operation Phakisa, 2020; Brown-Webb et al., 2022b). This mussel and oyster industry was however mostly owned and managed by the minority white population (DAFF, 2019b). To address the historical exclusion of HDIs from participating in the aquaculture space, the new democratically elected government in 1994 committed towards promoting more inclusive growth and development in the aquaculture sector. As mentioned in Chapter Two, various policies and initiatives have been established to develop the aquaculture sector in South Africa and also to encourage transformation in the industry (DAFF, 2019b; DAFF, 2020).

4.5 Setting up the Aquaculture Project in Saldanha Bay: Actors, Processes, and Institutional Arrangements

As highlighted in Chapter Two, the South African government recognised the shortfalls tied to food security type aquaculture and shifted to implementing commercial aquaculture projects. Moreover, the DEA appointed the CSIR to carry out several SEAs to identify aquaculture projects located in strategic ADZs. As Saldanha Bay was seen as a 'hotspot' for aquaculture production (Operation Phakisa, 2020) the SBADZ was established in order to enhance the growth of the aquaculture sector in this area and to create an enabling environment for HDIs and communities to enter into the space.

In 2016, the DFFE placed various newspaper and media articles that advertised the opportunity for individuals to participate in the SBADZ (see SBWQFT, 2018). The DFFE intended to establish the SBADZ as an enabling environment for new and existing farmers to enter into the space to farm bivalve species such as oysters and mussels. A number of applications were made by emerging BEE farmers to: i) the DFFE for the right to engage in aquaculture, ii) DFIs such as the Aquaculture Development and Enhancement Programme (ADEP), the Comprehensive Agriculture Support Programme (CASP), and the National Empowerment Fund (NEF) to purchase the initial infrastructure to conduct bivalve farming, and iii) Transnet to lease water space in the SBADZ. In 2019, 13 BEE individuals had applied to conduct mussel farming through longline technology in the SBADZ (Operation Phakisa, 2021). The following section will outline the process followed by the 13 BEE individuals to start their own SMMEs to farm mussels in the SBADZ.

4.5.1 Saldanha Aquaculture Services (SAS) partnership with a private mussel producer and processing company

Although the SBADZ gave these 13 individuals the opportunity to enter into the space to farm mussels, there was still a lot of work that needed to be done before they could start operating their businesses. Some of the required steps, detailed in (DAFF, 2019a), included:

- Applying for a marine aquaculture right to engage in aquaculture, a marine aquaculture grow-out permit, a permit to import marine aquaculture products, and a permit to export marine aquaculture products.
- Submitting a comprehensive business plan detailing the company structure, business model, and production methods used to cultivate the mussels.
- Applying to the Transnet National Ports Authority (TNPA) to lease a 10-15ha of water space in the Saldanha Bay ADZ.

The applicants would also need to finance the initial capital expenditure for the mussel production equipment and other ongoing operational costs to run their business. Access to finance in aquaculture is a major challenge in South Africa, especially for HDIs and communities entering into the space for the first time. Moreover, achieving economies of scale for a small-scale farmer in aquaculture is very challenging since producing fish at a larger scale requires a higher amount of capital to reduce the production costs (DAFF, 2017). Based on these challenges, the DFFE recommended that a clustering model approach would be a suitable intervention for the 13 individuals that could assist them in lowering production costs, attract greater funding opportunities as a collective, and ultimately increase their profitability (DEFF, 2021; SASKI1; OPKI2). In 2019, the group of 13 formed a collective business entity named Saldanha Aquaculture Services (SAS) (Pty) Ltd.

The 13 individuals were also advised by the DFFE to focus only on a *grow-out business* and not to develop a *vertically integrated operation* that included seeding, harvesting, processing, and marketing of their production. By focusing only on a grow-out business their capital costs would be reduced significantly (e.g., purchasing boats, harvesting equipment, building processing rooms and so on). The operational costs would however be much higher as the seeding, harvesting, processing, and marketing of their production will need to be contracted out, but nonetheless this was a more economically viable option than the vertically integrated approach (DAFF, 2019b; OPKI2). In early 2019, a private mussel producer approached the DFFE to form a partnership with the 13 emerging mussel farmers. The private mussel producer, which also had a processing facility in Saldanha Bay, had a local and international market demand that exceeded their current production and was thus seeking an additional supply of farmed mussels.

The partnership proposed by the private producer (or the 'service provider') was to help with the initial stages of getting the 13 small-scale farmers (or the 'SAS farmers') setup with their business, apply for the necessary permits and authorisations, and install the longline infrastructure to cultivate the mussels. The service provider would provide services such as the seeding, harvesting, processing, and marketing of the mussels, and thus would in essence 'farm on the members' behalf'(OPKI2, SASKI1-4). Mentoring and training would also be provided by the service provider in order for the SAS members to become self-sufficient and run their own grow-out businesses in the future (SASKI1; OPKI2). In return for these services, the 13 farmers would sell their mussels to the private producer at a better price compared to other external producers (OPKI2, SASKI1-4). Each SAS farmer signed an uptake agreement individually with the service provider which stipulated that a service fee would be charged for each kilo of raw mussels produced (before being processed) on each of the SAS member's farm.

By 2021, the service provider had helped get a total 10 SAS farmers to a stage in their project life cycle where they could begin mussel production. Unfortunately, the other 3 SAS farmers had either not been able to secure funding or the necessary aquaculture permits and were therefore not officially part of the SAS-service provider agreement (SASKI2). When this research was conducted in early 2021, the 10 active SAS farmers currently have 6 longlines each installed in the Saldanha ADZ. Three of the farmers each have 15ha of water space in the Outer Bay North precinct and the remaining 7 farmers each have a 10ha water space in the Big Bay precinct, see Figure 14 below (OPKI2; SASKI3; AMCKI1).

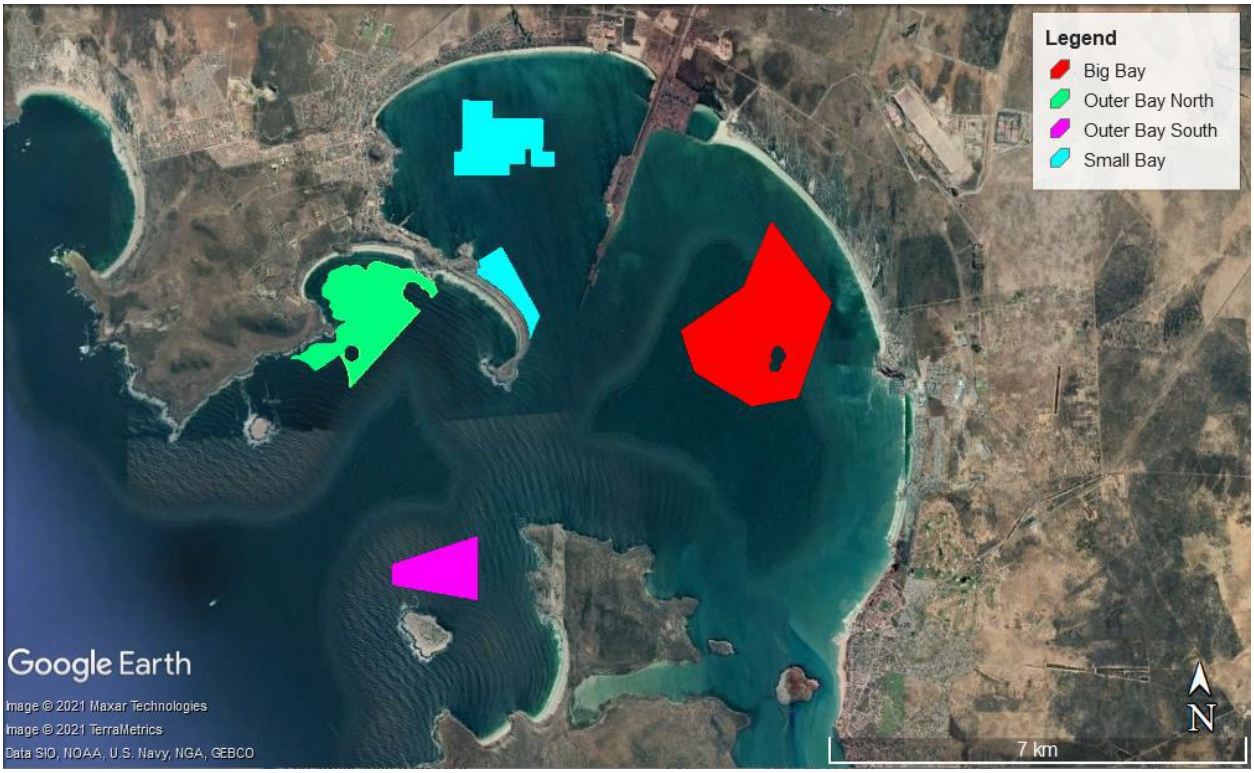

***Figure 14**: Saldanha Bay ADZ Precincts. Source: AEC (2022).*

Currently, both raft and longline culture are being used to cultivate mussels in Saldanha Bay, however, the water spaces that were granted to each of the SAS farmers by Transnet were in Big Bay and Outer Bay North precincts of the ADZ which were only suitable for longline production due to the areas being exposed to strong wave action that raft production could not handle (DAFF, 2017). This production technology constraint due to location is significant as this not only determined the nature of the benefit sharing mechanism established for the SAS members to farm mussels in the SBADZ, but it also influenced the process that determined the outcomes of the benefit sharing arrangement. This will be discussed further in Chapters Six and Seven.

Mussels – species background in South Africa

Currently there are two mussel species being cultivated in South Africa, the native Black mussel (*Chromytilus Meriodionalis*) and the non-native Mediterranean mussel (*Mytilus Galloprovincialis*) (CSIR, 2019b). The Black mussel is a filter-feeding bivalve species native to the coast of Southern Africa while the Mediterranean mussel is native to the Mediterranean and eastern Atlantic Sea. It is believed that the Mediterranean mussel was accidently introduced into South Africa from international trading ships in the 1970s and was subsequently farmed for aquaculture production (CABI, 2016). Although an invasive species, its success in aquaculture in South Africa is due to its rapid growth and reproductivity rates (Olivier et al., 2013). These marine species are being farmed commercially across Saldanha Bay mainly on rafts and longline technology. The preferred species for cultivation is the Mediterranean mussel due to its fast growth rate and desirable flesh colour (NSPMKI1; PMPKI1).

The majority of mussels produced in South Africa are sold to the domestic market with a small percentage reaching the international markets mainly in the United States and European Union mainly (NSPMKI2). Some mussel producers in Saldanha Bay sell their products to processing factories that in turn sell the processed products to the domestic or international markets. There are currently three companies in Saldanha Bay that produce mussels in the bay and also have established processing factories to process and distribute the mussels to local and international markets (PMPKI1). During the interviews conducted in this research, it was emphasised by various role players in the mussel sector that there is a limit to how much mussels can be sold locally in order to avoid flooding the market with an oversupply of product that will ultimately drive down the price of the mussels (OPKI1and2, AMCKI1, NSPMKI1-2, SASKI1).

Chapter Five: Doringbaai Case Study Findings

5.1 Introduction

Chapter Four highlighted the main actors, benefit sharing arrangements, and benefit sharing interventions that gave effect to benefit sharing in Doringbaai. In summary, the key actors involved in the aquaculture project in Doringbaai were members of the Doringbaai local community, members of Doring Bay Abalone, and members of the Doringbaai Development Trust. Doring Bay Abalone, Fryer's Cove Restaurant, and Doringbaai Atlantic Pebbles were the three main benefit sharing interventions implemented by the Doringbaai Development Trust, with the help of the government and the private sector, to drive benefit distribution for the local community in Doringbaai.

This chapter presents the findings of this study in terms the various actors perceptions' of the outcomes from the benefit sharing interventions implemented through the benefit sharing structures and arrangements in Doringbaai. Furthermore, this section examines the outcomes and factors that have affected benefit sharing in relation to the DBA project in particular. It is important to note that 'mechanisms' in this section refer to the benefit sharing arrangements (e.g. the partnership between the DDT and the private shareholders of DBA) that were setup in Doringbaai in order to give effect to the benefit sharing 'interventions' (e.g. DBA) to distribute benefits to the local community. A summary of key stakeholder perceptions of the benefits, losses, and negative impacts emanating from the benefit sharing structures and arrangements in Doringbaai are summarised in Figure 15 below.

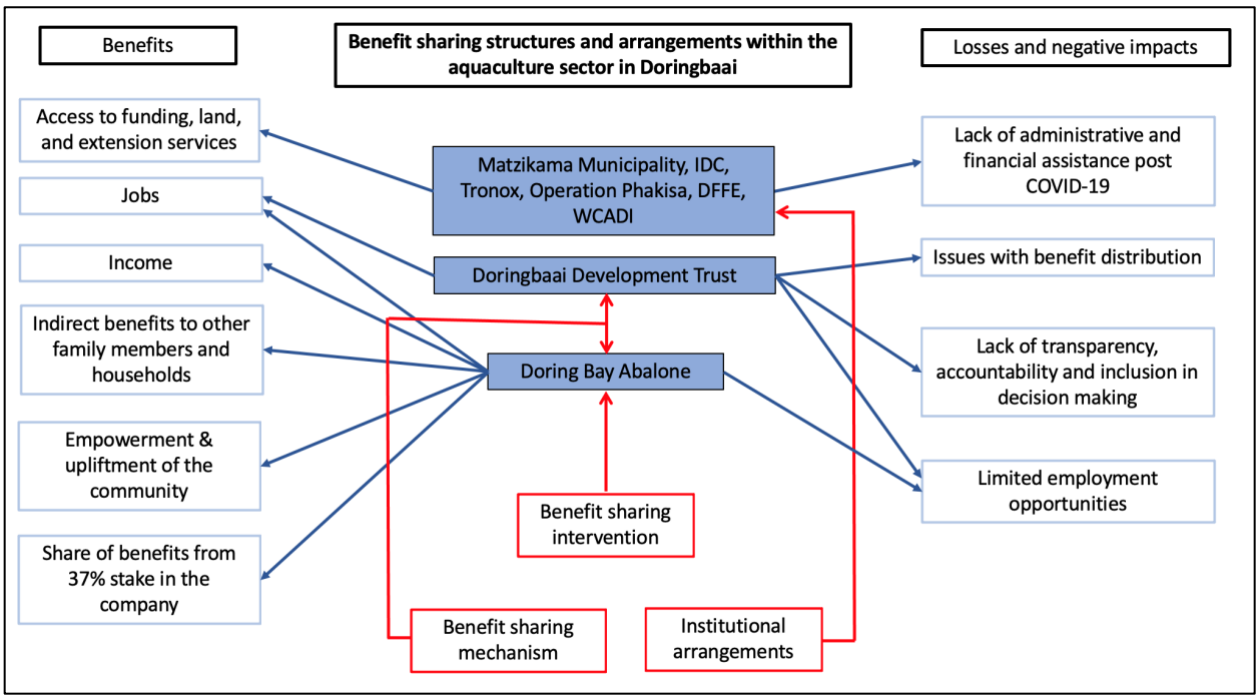

***Figure 15**: Key stakeholders perceptions of the benefits, losses, and negative impacts emanating from the benefit sharing structures and arrangements in Doringbaai.*

It is important to note that broader macroeconomic factors relating to the abalone sector such as high capital and technology requirements to farm abalone commercially influenced the process in determining the nature of the benefit sharing mechanism to be implemented in Doringbaai. As mentioned in Chapter Two, aquaculture production is a highly technology-driven sector that requires a lot of research and development (R&D) and a range of qualified people to establish optimal production methods in order to make an aquaculture business viable (AgriSETA, 2018; DAFF, 2018a). Thus, access to technology and production systems often needs to be bought from abroad or from private sectors who have done the R&D for the specific type of aquaculture production of interest (Mahieu, 2015).

As in the case in Doringbaai, while the DDT held access to property rights by possessing the lease for the old Oceana premises, they did not necessarily have the capacity to gain any material benefit from it. This is because of the various technical parameters that have to be performed in order to maintain the optimal environment for the abalone to grow under which required qualified technical-staff to oversee it. The private shareholders in DBA in this case did have access to the necessary capital, technology, and markets to derive benefits through commodifying the cultivation of abalone. Thus, DBA was formed based on the strength of the private shareholders providing the means to derive benefits from abalone production and the DDT sharing access to the factory premises. Moreover, the DDT negotiated a 37% equity share in the company based on the strength of securing the lease agreement as well as attracting public funding in the name of the Doringbaai local community from various sources such as the Matzikama Municipality, Tronox Mining, and the IDC (GAN, 2020; Matzikama Municipality, 2022).

5.2 Perceptions of benefits arising from benefit sharing mechanisms in Doringbaai

Interviews with respondents directly and indirectly involved in the DBA project generally portrayed a positive perception towards the benefits derived from the project. The results of this research revealed that there were four main benefits that members of the DBA project, members of the DDT, and other key stakeholders perceived to have obtained from the project. These included: i) income provided by employment from the abalone project; ii) indirect benefits to other family members and households; iii) empowerment and upliftment of the community; and iv) the benefits to be realised from the community's share in DBA.

5.2.1 Income provided by employment from the abalone factory

Most community members of Doringbaai who participated in the research noted that the income provided from employment at the factory was one of the most important benefits. During the time of this study, 52 people were full-time employees at DBA who were all from the local community. This was seen as a major benefit as not only were these workers and their families benefitting from the income, but it was estimated that at least 2-3 other households in the community were being supported by this income (DBAKI1-5; DBKI1-4; MMKI1). Some community members also mentioned that DBA provides contributions towards medical aid and pension funds which was also seen as an important benefit (DDTKI1; DBKI3and4). As on factory worker at DBA stated:

> *"The fact that the community as a whole can benefit financially from the jobs provided by DBA is very important to us. We were in a very dark street after Oceana closed and now the abalone factory has given us a beacon of hope again". - (DBAKI2).*

7.5.4 Indirect benefits to other family members and households

Different groups interviewed shared the view that there was an evident flow of indirect benefits coming from those being employed at DBA either to direct family members or extended family members and households (DBAKI1-5, DBKI1-6, MMKI1, DDTKI1). The most notable benefits from one person working at the abalone factory included income to pay for school fees, medical care, and rent and living expenses for various other households. A Matzikama Municipality official highlighted the importance of the indirect benefits flowing from DBA and stated:

"What it (DBA) does is it provides people with the income to pay for the transport and/or accommodation fees to send their kids to secondary school in neighbouring areas such as Vredendal/Lutzville in order for their kids to finish school and matriculate. This has significantly improved the literacy level and high school dropout rate in Doringbaai". – (MMKI1).

Additionally, a member of Doring Bay Abalone management remarked:

"I don't think there's a household in the (Doringbaai) area that isn't impacted by the income flowing out of the business". – (DBAMKI1).

7.5.4 Empowerment and upliftment of the community

After the closure of the Oceana factory and the devastating impact that it had on the entire community, the general tone of the interviews showed gratitude towards DBA helping uplift the community from the dire straits that they were in. The community shared the sentiment towards the DBA project in bringing "a new sense of hope" back to the community through being the main employer in the town (DBKI1-6, DBAKI1-5). One DBA worker remarked:

"This abalone project has been a great benefit to us workers and to the broader community also. People are now smiling because of the help this project has given to the people, and it's a steppingstone for us to grow and improve". – (DBAKI3).

Interviews with factory workers and management at DBA revealed a strong feeling of empowerment among employees from working at the company as many of them were the 'pioneers' that helped build the company in its initial start-up phase in 2013 (DBAKI1-5; DBAMKI1and2). Most employees came to the company with a very limited educational background as only a select few had finished their Matric education level and thus possessed a limited level of skills. By being directly involved in the start-up process however, they gained valuable knowledge and skills during that time as they were directly involved in building the necessary infrastructure (e.g., construction of grow out rooms, recirculation systems) through a hands-on approach (DBAMKI2).

Some respondents also mentioned that DBA sent some employees to aquaculture training institutes to enhance their understanding in abalone production (DDTKI1; DBAKI3; DBAKI5). According to four factory workers, it was that through this further training that enabled them to work their way up from general factory workers to section supervisors who oversee the operations for a given grow-out section (DBAKI1-3and5). One section supervisor remarked:

> *"Take myself for example, I was a school dropout with not a lot of skills or education. Now I am a section supervisor with a NQF level 4 certification. I've grown a lot because of DBA and the people in my section have grown as well".*
> *– (DBAKI1).*

Respondents from the DDT, DBA, and the local municipality all highlighted the fact that some members of the Doringbaai community now hold senior managerial positions at the abalone factory. This was a particular proud point as respondents claimed that these workers were some of the very few, if not the only, coloured people to hold managerial positions in the abalone production sector (DBAMKI1and2; MMKI1; DDTKI1; DBKI3and4).

7.5.4 Benefits to be realised from the community's share in DBA

Most local community members interviewed saw the 37% stake in the project as an important benefit to themselves and to the wider community in Doringbaai (DBKI2-4, DBKI6). When the DBA project was setup, it was agreed between DBA and the DDT that 5 years after the company became fully operational (i.e., in 2019) a share of profits will be given to the DDT to distribute back to the community as it takes approximately 3-4 years for farmed abalone to reach a market size of 100g (DBAMKI1; DDTKI1). The share of profits will then be distributed at the Trust's discretion either through dividends paid out to each member of the Trust or through implementing strategic development projects in the town to promote employment and social development (MMKI1; DDTKI1). A few members pointed out that although there were not as many people employed by DBA as they would like to have seen, they liked the idea that the Trust (comprising over 650 members) has shares in the company that will eventually be reinvested back into their town after a few years (DBKI1; DBKI3and4).

5.3 Perceptions of losses and negative effects arising from benefit sharing mechanisms in Doringbaai

A number of community members and other key stakeholders from the interviews (i.e., over half of all Doringbaai respondents interviewed in this research) raised both concern and frustration towards the Trust in managing benefit distribution (DBKI1-5; DBPSKI1). Most grievances stemmed from issues around the Trust not delivering to the extent that its members expected to have seen in driving socio-economic development for the town. This included: i) the limited employment opportunities provided by the DDT' strategic development projects, ii) issues with

benefit distribution from DBA, and iii) the Trust's lack of transparency, accountability, and limited inclusion of the wider community in decision-making.

5.3.1 Limited employment opportunities provided by the DDT's strategic development projects

Since its establishment in 2007, the Trust has implemented three main strategic development projects to promote social upliftment and provide local members of the Doringbaai community with employment: DBA; The Jetty Restaurant; and DAP (DDTKI1). To date, approximately 88 people in Doringbaai are employed by these projects out of a total of over 650 members of the Trust (Matzikama Municipality, 2022). This equates to just over 13% of members of the DDT receiving employment from these strategic development projects. Thus, it is from this relatively low rate of employment that some local community members expressed dissatisfaction towards the Trust (DBKI1-5). These members felt that not enough people have received employment from an institution that made a commitment to deliver more jobs to the town over 15 years ago. As one local community member stated:

> *"Direct employment and indirect benefits from the company (DBA) is great but looking at the larger Doringbaai community all I can see is the abalone company, the restaurant and the pebble company which aren't benefiting a huge amount of people. So, if this Trust is meant to represent the whole community how else are we benefitting from it?" (DBKI5).*

It was also apparent from many of the interviews that while community members in Doringbaai were grateful for employment opportunities being afforded to some people through the three projects initiated by the Trust, it did not come close to addressing the high rates of poverty and

unemployment in the town (DBAKI1and3; DBKI1-6). It was highlighted that over 70% of households in Doringbaai live on less than R5,000 per month to provide for their whole family and often other extended family members as well (DBAKI3; DBKI1-5; DBPSKI1). The community members went on to explain that the community struggles to sustain their livelihoods each day and have grown impatient with relying on the Trust to help alleviate their suffering by creating more jobs for the community.

Some of the interviews also suggested there was a sense of jealousy over those who were provided with employment from the strategic development projects and those who weren't (DBKI1, DBKI2, DBKI5). At DBA for example, 52 people are currently employed at the company which was seen as a positive from those who were either directly working there or had a family member working there (DBAKI1-5; DBKI3and4). Interestingly, some other local community members claimed that most of the people working at DBA is like an inner circle where those employed are there through being a family member or friend of someone else working there (DBKI1, DBKI2, DBKI5). Thus, some respondents felt that they had been 'losers' in this process as they were left out of gaining a chance to benefit from being employed at DBA.

This in turn had caused some divide and jealousy between people in the community over the 'winners' who were working there and those who weren't. This was clearly reflected by two local community members:

> *"With the abalone project, the people that they (DBA) employed were family and friends of those already employed at the company. This has caused some disgruntlement within the community as they feel they have been excluded from the project". – (DBKI5).*

"It is very simplistic to say that the 'community' is benefitting from this project (DBA). We have come to a stage where 10 years after producing abalone at the factory a total of 50 jobs have been created. People directly involved will see the benefit but those who are not involved (the majority of the Doringbaai community) see the negative of it as they don't receive any benefits from it. So how can my name be used as a community member to secure funding on the 'communities' behalf' to start a project like this but I am not involved in it? – (DBKI1).

A member of DDT's Board of Trustees acknowledged these concerns and admitted that the Trust has not delivered to the extent that the community was hoping for and explained that there were various reasons for that (DDTKI1). As described by one the DDT's Trustees:

"Unfortunately, you won't keep everyone happy. I think there is frustration on the employment factor because of the patience needed in getting some sort of benefit out of an abalone project if you are not directly employed by it. It takes years before an aquaculture venture starts to break-even and can employ more people, especially with abalone. So, we can't in all fairness employ everyone otherwise the project (DBA) would not be economically viable, which we told the community before getting into this kind of business". – (DDTKI1).

5.3.2 Issues with benefit distribution from DBA

Another key issue that emerged from the interviews was a common lack of awareness and understanding around the distribution of benefits from the community's 37% share in DBA. The interviews showed that there was no clear consensus on how the community's collective share in the company would reach the wider community after the abalone project began to turn a profit (DBAKI1-5; DBAMKI1-2; DBKI1-6; DDTKI1; MMKI1). Some community members believed they were going to be paid out a dividend directly from the Trust once the company started to sell abalone (DBKI3-4), while others thought the profits from the company would be reinvested back into the community through strategic development projects that would be driven by the Trust (DBKI1-2; DBKI5-6).

Meanwhile, the DDT and people working at DBA appeared to share the same viewpoint that the profits would be reinvested back into the company in order to expand and produce more abalone each year (DDTKI1; DBAKI1-5). They argued that this would provide more jobs as the industry benchmark equates to 1 person being employed in the factory for every tonne of abalone produced (DBAKI2-3; DDTKI1). Thus, if the abalone project was to expand from 50 tonnes and produce 80 tonnes of abalone each year, a further 30 people could be employed at the company. One of the reasons behind this lack of understanding around benefit sharing was a result of poor communication between the Trust with the wider community around how the benefits from their stake in DBA would be distributed and when this would occur.

The contrasting views around benefits had in turn created a divide in the community. Some members wanted the 'shorter-term' benefit of dividends to be paid out as soon as the project began to export abalone (DBKI3-4). On the other hand, other members interviewed had a 'longer-term' vision towards benefit distribution and rather wanted the profits from the project to be reinvested back into the community for communal purposes or to be reinvested back into the abalone project so more people can get jobs there (DBKI1-2; DBKI5-6).

As expected, it appeared that community members with the 'short-term' vision towards benefit distribution were mostly those who were not directly employed by DBA or had any family members working there (DBKI3-4), while others with the 'longer-term' vision were either working at DBA or had family members working there (DBKI1-2; DBKI5-6). This could perhaps explain the divide in community perceptions towards benefit distribution as those who had a longer-term mentality were in a way already benefitting from the project, whether directly and indirectly being employed at the company, so were therefore more willing to wait for a longer period of time to benefit from the project compared to those who had not yet benefitted from the abalone project.

5.3.3 Lack of transparency, accountability, and inclusion in decision-making processes

Some community members and other key stakeholders raised issues with the way in which the leadership in the Trust made decisions on their behalf on matters relating to their collective share in DBA. They argued that the Trust would inform the community of the decisions made instead of consulting the members and putting it to a majority vote before making the final decision. (DBKI1-5; DBPSKI1; SANPKI1).

While community members expressed enthusiasm upon hearing that they had been given a majority 37% share in DBA, some concurrently expressed indifference to this as they questioned whether the benefits of this shareholding would ever equitably reach the wider community (DBKI1-5; DBPSKI1; SANPKI1). Respondents felt that they had been kept in the dark about the abalone project and their supposed share in it. One respondent claimed that there had been a lack of regular communication from the DDT trustees to the wider community about how benefits from the 37% will be distributed in line with the profits being made from the business (DBKI2). This was also mentioned by an official of the Matzikama Municipality who said:

> *"They (the DBA community) are passively involved in the abalone project and only hear about the decisions being made by the Trustees because they do not necessarily involve the community entirely in the decision-making process. The community will need to be more involved in the project in order to really feel a part of it". (MMKI1).*

When asked about these claims, one of Trust's Board members explained that monthly trustee agenda meetings are held where they make decisions on behalf of the community through a simple majority vote and present that back to the community (DDTKI1). The Trustee member went on to say that public meetings are held with all members in the Doringbaai community every business quarter to give an update on the DBA's performance and present what decisions have been made on the community's behalf. It was also emphasised that any questions or feedback from the community members was encouraged by the Trust's committee to discuss in the quarterly meetings.

> *"You elect your trustees as leaders to make decisions on behalf of you. By doing that, it is also important for us as trustees to be transparent, honest, and accountable to community members about those decisions". (DDTKI1).*

Community members interviewed confirmed that quarterly meetings were held by the Trust but argued that the last time a public meeting was held dated back to early 2020 and that limited information was provided in these meetings (DBKI1-5). Moreover, what concerned some community members most was the precariousness of the benefit distribution process, specifically once DBA started to export abalone and how the profits would start flowing back to the Trust (DBKI1-2; DBKI5). These members questioned how they would know if every cent was being accounted for and if their 37% share of profits would be equitably distributed. A DDT Trustee member responded to this and stated that they welcomed any questions members had about the benefit distribution process from DBA, and when profits started to come out of the business the details of where that money would be spent for the community's benefit would be shared with them in the quarterly meetings (DDTKI1).

It was also acknowledged by community members and other respondents that questions could be asked to the Trust at any time during the public meetings held each quarter. However, some respondents raised issue with the way in which this consultation process had been conducted (DBKI1-2, DBKI5; SANPKI1; DBPSKI1). One respondent claimed that questions would mostly be directed to one DDT Trustee member in particular which they felt very intimidated by as they did not want to ask questions to a 'well-educated/learned person' and seem 'illiterate or from a lower education level' (DBPSKI1). This intimidation was further exacerbated by an evident 'lack in self-confidence' in most community members who do not even possess a Matric education certificate. As a result, there was a lack of openness to engage and participate in the public meetings (DBKI1-4; DBPSKI1; SANPKI1).

Moreover, it was revealed that a public meeting was held by the Trust in June 2022 where it was announced that 5% of the shares in DBA had been allocated to one of the DDT Trustee members due to the work that they had done to setup the partnership between the Trust and the private abalone company. As a result, the community's share had been decreased to 32% (DBK2). It was mentioned by one local community member (DBKI1), that some of the community members in the public meeting were shocked and outraged by the sudden announcement in the decrease of their collective shares in DBA as they argued that this was never discussed or approved by the wider community. It was alleged that the DDT Trustee member mentioned that this was discussed and finalised in the previous public meeting held with the community. Some members strongly refuted this claim, however, and stated that this was not the case (DBKI1). It is still unclear if this dispute between the trustee and the community members will be resolved, but as it remains, the community now only has a 32% collective share in the abalone project.

5.4 Factors influencing benefit sharing in Doringbaai

The results of this study showed that although DBA did bring benefits to local community members, several factors influenced the effectiveness of managing and distributing benefits to the community. Some were unforeseen factors that fell beyond anyone's control such as the onset of the COVID-19 pandemic, while others involved poor business management and production of abalone, and the perceived influence of institutional arrangements on benefit distribution.

5.4.1 The impacts of COVID-19 in Doringbaai

The South African government responded to the COVID-19 pandemic by introducing strict lockdown measures to curb the spread of the virus. These measures had varying levels of impact on different economic sectors but nonetheless had an effect on all provinces and businesses in the country. Towards the end of 2019, key abalone importing countries in Asia started to close their borders and cease international trading as the COVID-19 virus started to rapidly spread across the world (Brown-Webb et al., 2022a). The abalone market suddenly collapsed as a result. Moreover, not only was the sale of abalone restricted but its price began to plummet as there was a surplus of farmed abalone available on the market with very few marketing channels available to sell to (Operation Phakisa, 2020).

Interviews with key stakeholders directly and indirectly involved with DBA confirmed the impacts highlighted above and revealed that the company was heavily impacted by the pandemic (DBAMKI1-2; OPKI1; DBAKI1-2). 2019 was the year that DBA planned to export their first major harvest since they became fully operational in 2014. With no abalone to export, they had a surplus of abalone that had reached their 100g target weight but were costing the company a lot of money to feed and maintain each month (DBAMKI1). Furthermore, the company had no processing factory at that time to prepare into canned, dried, or smoked abalone to prolong the life of the harvested product and had to keep growing the abalone as a result. With no source of revenue coming in and 52 staff salaries and other overheads to continue paying, the company's cash reserves started to deplete rapidly (DBAMKI1; DDTKI1).

The COVID-19 pandemic had therefore not only severely impacted DBA but also the aquaculture sector in South Africa as a whole. The strict lockdown brought DBA to the verge of going under, and as a result both private shareholders had to sell their shares in the company to an external investor in order for the business to recover from the pandemic. This will be discussed further in the following section. Due to these adverse effects, benefit distribution to the wider community in Doringbaai was also impacted. Although the 52 staff at the factory retained their jobs, very little revenue was generated in 2019 and consequently, the company's 5-year business plan to share profits to the wider community in 2019 from their 32% share was not realised (DBAMKI1-2; DDTKI1; MMKI1). Moreover, when fieldwork was conducted for this research in 2021, members of the Trust claimed they still had not received any benefits from the project which has caused some frustration and tensions amongst community members in Doringbaai (DBKI1-5).

5.4.2 Ineffective business management and inaccurate production projections

Interviews with management at DBA revealed that ineffective business management and production methods in the initial start-up stages almost collapsed the business (DBAMKI1-2). This included ineffective production methods being used to produce the abalone by the former hatchery and production section at DBA. Management at DBA explained that a state-of-the-art abalone hatchery was designed producing top quality abalone spat but not enough attention was placed in managing the abalone farm from day to day (DBAMKI1; DDTKI1). Two years after the hatchery was installed and abalone began to be cultivated in the flow through system, management realised that the abalone were not growing at the projected growth rates. This was due to the abalone being underfed and a lack of freshwater being recirculated back into the grow out tanks each day.

Hundreds of abalone had already been growing on DBA's farm for over 2 years but it was soon realised that it would take more than 5 years for them to reach the desired market size and thus would not be feasible to waste more resources to cultivate these undersized abalone. As a result, it was estimated that DBA had lost almost 3 years in production due to this setback and had cost the project millions of Rand in producing these abalone (DBAMKI1-2; DDTKI1; MMKI1). Consequently, the DBA management approached the IDC for emergency funding to save the business from collapsing due to this setback and new management was secured (DDTKI1).

Ineffective business management was acknowledged by current management at DBA who stated that more oversight and consultation with other abalone producers and experts should have been carried out in order to ensure the business model and production projections would be economically viable for the business (DBAMKI1). A more hands-on approach was adopted after a new local farm manager was found, which helped get the abalone project back on track. When interviews were held with members of DBA in May 2021, it was reported that the company was on track to start their first major harvest towards the end of 2022 (DBAMKI1-2; DDTKI1; DBAKI2).

5.4.3 Perceptions towards institutional arrangements and their influence on benefit distribution in Doringbaai

This section explores the perceptions of DDT, DBA members, and other key stakeholders towards public institutions that had an effect on benefit sharing and facilitating the long-term success of DBA.

Perceptions towards the Industrial Development Corporation (IDC)

In light of the economic devastation of the COVID-19 pandemic on South African businesses, the IDC (one of DBA's largest investors) suddenly demanded their investment back. This was due to their concerns about the high risk and uncertainty of the pandemic on the South African economy and the export sector (DBAMKI1). The corporation, which is fully owned by the South African Government, apparently deemed that it could not afford to continue supporting this upliftment aquaculture project with the risk of its potential closure in light of the abalone market collapse (DBAMKI1). This brought DBA to a standstill and put the project in jeopardy. With limited alternative options available, there was a sudden shift in management where both private shareholders had no choice but to sell their shares in the company to an external investor from overseas in order to pay back the hefty loan from the IDC and to ultimately keep the company afloat (DBAMKI1-2).

In early 2020, the IDC loan was settled by the external investor which gave them a 63% share and majority ownership into DBA (DDTKI1). As a result, the local community in Doringbaai no longer held the majority share in the project. The two private shareholders remained with DBA to help run the operations while the external investor assisted with selling the abalone directly through their marketing channels in Asia (DBAMKI1-2). Although IDC's exit from DBA did not have a direct impact on benefit distribution in Doringbaai, it put the abalone project in a precarious position until a new investor was found. Thus, some respondents highlighted the risks and vulnerabilities to those employed as well as the wider community as a result of the IDC's withdrawal from the project (DBAMKI1-2; DDTKI1). In 2020, the DDT informed the local community that benefit distribution from their 37% share would be delayed by a few years in light of the COVID-19 pandemic and the change in DBA's management structure (DDTKI1).

Perceptions towards Operation Phakisa within the DFFE

Operation Phakisa, seen as the catalyst for implementing Blue Economy initiatives across South Africa, has come under conflicting views of praise and criticism in helping to deliver socio-economic benefits to HDIs and communities through the aquaculture sector (Pretorius, 2018; Masie and Bond, 2018; Bond, 2019). Interviews with key stakeholders in Doringbaai showed a general negative perception towards Operation Phakisa and its role in promoting aquaculture development in Doringbaai (DBAMKI1-2; DDTKI1). Speaking to respondents working at DBA, it was alleged that Operation Phakisa did not assist them at all in getting the project off the ground (DBAMKI1-2; DDTKI1).

Respondents claimed they were the ones who did everything to get the DBA project started with no assistance from the government in securing the funding from external investors, lease agreements from the DPW, permits and licenses to produce and export abalone. Ironically, it was pointed out that Operation Phakisa has claimed DBA as one of their catalyst projects and 'success stories' incorporated as part of the OP Oceans Economy Programme to further develop the aquaculture sector in South Africa (Operation Phakisa, 2016). One member of DBA management stated:

> *"What we haven't seen is recognition from the government. Government usually has the perception that if a project starts looking good then you don't need to give it support but rather to another project that is most probably not going to work out. And that's the real crux of the issue where they (government) should be giving funding to successful projects to further them, instead they tangent off onto other projects which will most likely collapse in a few years' time". – (DBAMKI1).*

Operation Phakisa and DFFE officials were aware of these perceptions and in some cases supported these views. An Operation Phakisa official responded to these claims and stated that a lot of support has been provided to DBA over the years but some stakeholders 'cherry-pick' the information shared with others (OPKI3). With regards to funding, it was stated that Operation Phakisa staff approached DBA more than once to ask if they could assist in finding them private investment and equity partners, which DBA indicated they were not interested in (OPKI2). One Operation Phakisa official did mention that there was a request for government to 'bail-out' the DBA project when they found themselves in financial difficulty due various factors such as the impacts of the COVID-19 pandemic as well as inefficient management of the farm. The official explained that this request was made by DBA shortly before the private shareholders had to sell their shares to the external investor, which may be the reason why DBA claimed they received no further financial assistance from the IDC (OPKI3).

In terms of permitting and licencing, DBA had apparently approached the Phakisa Unit to request assistance with permit renewals as well as a right to engage in marine aquaculture for the proposed ranching of abalone, which Phakisa assisted them with and Environmental Authorisations were granted to DBA to ranch abalone in 2020 (OPKI2). In terms of COVID-19 relief, the Operation Phakisa programme had assisted aquaculture businesses across the country (including DBA) with rental reprieves and opening of local markets for the sale of undersized abalone to relieve the impacts of market closures and loss of revenue (OPKI2and3). The one Operation Phakisa official emphasised that they have continually told DBA that they are below the threshold of economic viability, based on the DFFE's generic economic abalone feasibility modelling (DAFF, 2018a), and would need to increase their scale of operation if economic viability is to be achieved (OPKI3).

5.5 Conclusion

The findings of this case study have shown that benefit sharing interventions in Doringbaai, particularly DBA, have brought a number of key benefits to local community members such as employment, income, and indirect benefits to other connected family members and households. Moreover, DBA's commitment to training and skills development has enhanced the capacity and skills of workers in the company and led to empowerment of some community members. However, it is apparent that these benefits are only reaching a select part of the community and the wider community is still to realise benefits from their collective 37% (now 32%) share in the company. The findings showed that flawed institutional arrangements for benefit distribution have hindered the ability of the community to realise benefits from DBA. Limited employment opportunities, lack of downward transparency and accountability, inadequate communication channels, and elite capture of benefits by those responsible for benefit distribution in the perceptions of some stakeholders were some of the blockages to benefit sharing. Furthermore, other external factors impeded the realisation of benefits such as the COVID-19 pandemic, lack of effective business management, and inadequate support from public institutions. As a result, these factors combined have hindered the realisation of benefits to the wider community in Doringbaai.

Chapter Six: Saldanha Bay Case Study Findings

6.1 Introduction

This chapter presents the findings of this study in terms of the benefit sharing structures and arrangements within the aquaculture sector in Saldanha Bay that provided HDIs the opportunity to enter into the SBADZ and benefit from mussel farming. The various actors perceptions' of the benefit sharing interventions implemented through these structures and arrangements will be examined as well as the outcomes and factors that affected benefit sharing. As highlighted in Chapter Four, the key actors in Saldanha Bay are the SAS members, SAS' service provider, private mussel farmers, and officials from Operation Phakisa within the DFFE. The 10 individual farming enterprises that were established under the SAS entity were the benefit sharing interventions implemented by SAS members with the help of their service provider, Operation Phakisa, and the DFFE to drive benefit distribution.

It is important to note that 'mechanisms' in this section refer to the benefit sharing arrangements (i.e. the partnership between the SAS members and their private service provider) that gave effect to the benefit sharing interventions in Saldanha Bay. A summary of stakeholder perceptions towards the benefits, losses, and negative impacts arising from the benefit sharing structures and arrangements in Saldanha Bay are summarised in Figure 16 below. The interviews suggested that from the SAS farmers perspective, no meaningful benefits were flowing to them from their businesses and the partnership arrangement with their service provider. It appeared that the benefit of being given the opportunity by Operation Phakisa and the DFFE to enter into the SBADZ to start a mussel farming enterprise was outweighed by the losses incurred.

The main losses highlighted by the SAS farmers involved trying to keep their businesses afloat in light of the poor yields of mussels harvested and the high operational expenses incurred each month.

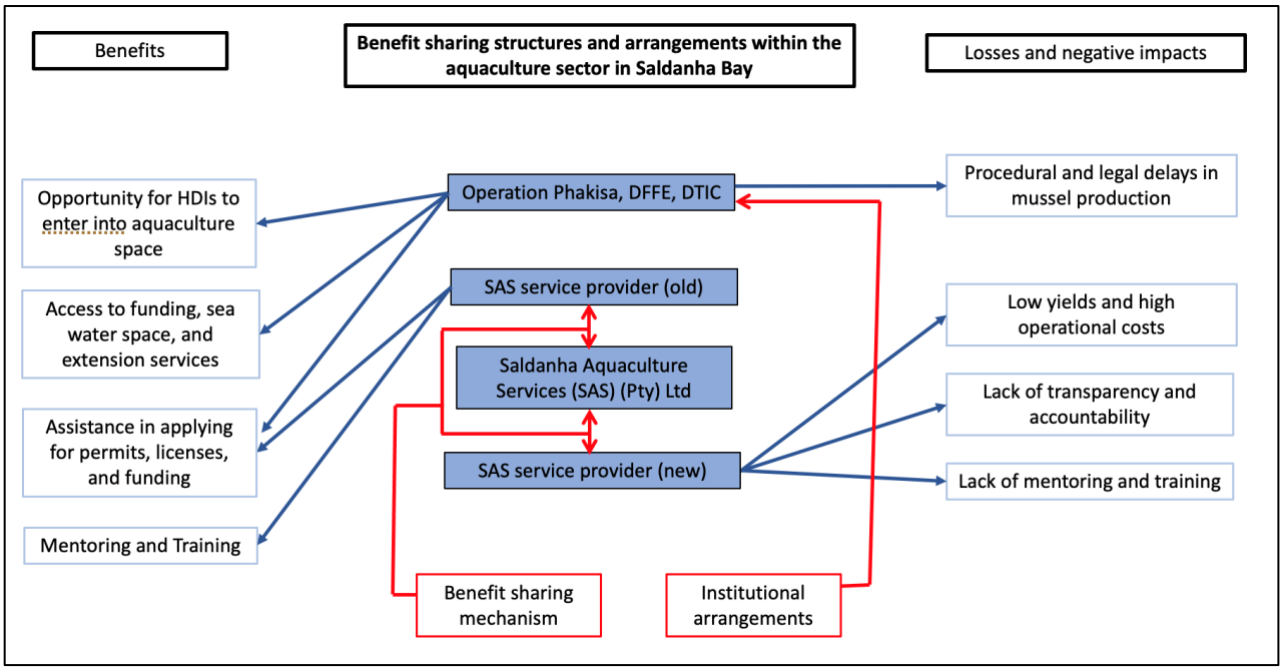

***Figure 16**: Key stakeholders perceptions about benefits, losses, and negative impacts emanating from the benefit sharing structures and arrangements in Saldanha Bay.*

6.2 Change in management structure of the service provider with SAS

The partnership between SAS and the service provider was formed in early 2019 before the outbreak of COVID-19. The service provider's previous CEO and management team at that time had signed an uptake agreement with 10 SAS members as described in section 4.5.1. However, the outbreak of COVID-19 had a major effect on the SAS farmers and their service provider.

In 2019, the service provider's CEO resigned and one of the their major investors withdrew because of the company's financial difficulties that were exacerbated by the closure of markets as a result of the pandemic (NSPMKI1). The 'old' service provider subsequently had a new CEO, management team, and investor in 2019. This change in management structure also saw a change in the uptake agreement that was in place with the SAS farmers (OPKI1; AMCKI1). The 'new' service provider proposed an amended agreement with the SAS farmers where a service fee of R6,000 – R9,000 per line would be charged per month for seeding, maintaining, and harvesting their lines (NSPMKI1). This change was significant as now the farmers were liable to pay the new service provider for servicing their lines regardless of whether any mussels were harvested. In the old uptake agreement, the SAS farmers would only be charged a service fee if mussels were produced off their lines and ultimately sold to the market. With the new uptake agreement, however, even if there were few or no mussels produced due to factors such as shake-off or poor seeding and growth uptake of mussel spat, the SAS farmers were liable to pay for the months the new service provider had spent servicing their lines (SASKI2-4; AMCKI1).

The new uptake agreement also changed the terms of when in the production cycle the SAS farmers would be paid for what was produced. In the new uptake agreement, the farmers would now be paid for each kilo of mussels produced *after* being processed. This meant that on top of paying for servicing fees for cultivating their mussels, the SAS farmers would also be required to pay fees for processing their mussels (e.g., cleaning, grading, packaging, and storing the mussels). Interviews with a member of the SBADZ management committee revealed that processing mussels can raise the risk of some mussels not being suitable to be sold as half or full-shell mussels, especially if they are slightly discoloured or cracked. The respondent also explained that these mussels would ultimately be thrown away or sold as mussel meat which fetch much lower prices on the market compared to half or full shell mussels (AMCKI1), see Table 6 below.

Table 6: *Price assumptions of mussel sold into different markets. Source: (DAFF, 2017).*

Product mix	Proportion %	SA Price (ZAR)/kg
Product sold into SA	100%	
Product for export	0%	
Fresh whole	20%	20.00
Frozen whole	40%	25.00
Frozen half shell	40%	25.00
Mussel meat	0%	10.00

Another amendment to the new uptake agreement was that mentoring and training on how to manage and operate a mussel farming business would no longer be provided by the new service provider (AMCKI1; NSPMKI2; OPKI2). The new service provider made provision for the SAS members to work in the factory offices and receive some training in business management, but training in the cultivation and harvesting of mussels was something not included in the new uptake agreement (NSPMKI2). This left the SAS farmers entirely reliable on the new service provider to run their mussel farms for them.

6.3 Perceptions of benefits arising from benefit sharing mechanisms in Saldanha Bay

Interviews with SAS members showed that there were some benefits they received from their original uptake agreement with the old service provider in early 2019 before COVID-19 (SASKI1-4). SAS members appreciated the assistance they received from the service provider and government departments such as Operation Phakisa and the Department of Trade Industry and Competition (DTIC) in setting up their businesses and during the application process to obtain the relevant permits, funding, licenses, and lease agreements to farm mussels in the SBADZ.

Moreover, the provision of mentoring and training on how to operate a mussel farm and business from the old service provider was one of the main factors that attracted the SAS members to sign the uptake agreement. The SAS members interviewed mentioned that mentoring and training was a crucial condition for them as this was the only way they would be able to take control of their businesses and eventually become self-sufficient (SASKI1-4). According to two SAS members, the uptake agreement also offered a fair price for the mussels produced by the old service provider on their behalf and that they would be paid for every kilogram of mussels produced at quayside (SASKI1and2). A quayside in this context refers to a platform situated alongside the waters where boats offload the mussels harvested for the day. The members argued that being paid at quayside was another beneficial part of the uptake agreement as they were being paid for the raw mussel product harvested off their lines with no additional costs charged by the service provider further down the value chain such as processing, storage, and marketing costs. This also limited the risk the SAS members may face if they were being paid after their mussels were processed in the processing factory as some of their mussels may have been rejected and not sold as half or full-shell mussels leaving lower returns for the SAS members.

Thus, the respondents viewed this original uptake agreement and partnership with the old service provider was a viable business venture to pursue (SASKI1-4). However, as described in the previous section, the management of the service provider changed after the COVID-19 outbreak in 2019. The new service provider changed the terms of the uptake agreement that the SAS members had in place previously. The perceptions of SAS members to the new partnership and uptake agreement with their new service provider will be discussed below.

6.4 Perceptions of losses and negative impacts arising from benefit sharing mechanisms in Saldanha Bay

The responses from SAS members about their perceptions of the partnership with the new service provider were generally negative (SASKI1-4). Most respondents criticised the 'new' partnership as not being a viable business partnership given the high running costs and the fact that most SAS member's business costs far exceeded the revenue being generated (SASKI2-4; PMPKI1). Most of the SAS members interviewed were also unhappy with how reliant they were on someone else running their farms for them and the limited visibility regarding what was going on with their businesses (SASKI2-4). This led to tensions and mistrust between the SAS farmers and the new service provider which stemmed from a lack of downward transparency and accountability from the new service provider's side in servicing their farms. The main losses and negative impacts raised by the SAS members and other key stakeholders with regard to this new uptake agreement and partnership arrangement were: i) issues with the low yields and high service costs; ii) lack of transparency and accountability from the new service provider; and iii) lack of guidance and mentorship from the new service provider.

6.4.1 Low yields and high service costs

Interviews with three of the SAS members revealed their dissatisfaction towards their new service provider. They mentioned that since they were so reliant on the new service provider running their farms for them, they 'had no choice' but to accept the fee offered for what had 'supposedly' been harvested off their lines (SASKI2-4).

The farmers also claimed that they were getting into further and further debt as the service fees being charged by the new service provider were almost always higher than the yields that they were being paid for. As one SAS farmer explained:

> *"With our previous service provider our yields were roughly about 11 tonnes of usable mussels per longline, which would be about 70 tonnes for all of our lines in one harvest. With our new service provider, however, we have only been paid for harvesting 5 tonnes of mussels since February 2020 which they said were infested with barnacles as well. We do accept the lower-than-expected harvest rate due to the environmental factors not being in our favour, but we don't believe that it could be that bad" – (SASKI4).*

This concern was confirmed by a member of the Saldanha AMC who stated:

> *"We are concerned with how the SAS farmers are currently being treated by their service provider, they seem to just be accruing debt. I would say the band is currently sitting between R200,000 – R2.5 million in debt to the service provider" – (AMCKI1).*

Interviews with management at the new service provider revealed that the main reason for low yields over the past few years had been due to various factors including delays in getting the EIA approval for the ADZ, the market closures due to the COVID-19 pandemic, and the government's lack of support in lifting the current restriction on the total production of mussels in the Bay. The respondent went on to explain how the new uptake agreement works and why the service costs have been higher than some of the SAS farmer's yields (NSPMKI2).

"We have followed the same principles as in the fruit and wine business with upliftment projects and co-ops where we will open-book every month and absorb all the costs of every kilo of mussels produced including our own farms. We then audit all those costs and we split that over all the 'active' lines, which we've then harvested, seeded, or maintained. Because the more you run it effectively with more lines in the water and keeping the logic, the lower the costs should be which will help towards making operations more sustainable. But you can't do that if you don't have a consistent base of lines with guys still not being able to install all of their lines, so only once that happens can you start to get this working properly. You will also have the complaint that the existing base is subsidising the new incomers with this model"- (NSPMKI2).

6.4.2 Lack of transparency and accountability from the service provider

Interviews with three of the SAS members showed a clear lack of trust between them and the new service provider (SASKI2-4). The members claimed that their involvement in the running of their farms was very limited as they were never sure when any maintenance or harvesting was being done on their lines. After receiving very low yields of mussels since 2020, some members asked if they could go on the boats to see their lines being maintained and harvested in order to reconcile what had been harvested off their farms. The SAS farmers claimed that the new service provider was reluctant to let them come on the boats and said that there was not enough room due to maximum capacity having already being reached by the crew harvesting their lines (SASKI2-4).

The respondents also claimed that in addition to not getting access to their farms, they were being 'kept in the dark' about what had been harvested off their farms (SASKI2). Apparently, hardly any documentation had been provided detailing what had been harvested off their lines in a given year and they had to request this information multiple times from the new service provider (SASKI2-4). As one SAS member mentioned:

> *"I said to them (the service provider), why is this such a big secret for me to see the movement document showing what you have harvested off my very own farm?" (SASKI2).*

When the new service provider was asked about how they keep the SAS farmers informed about the status of their farms, one management member responded:

> *"We give them a monthly report on exactly what's happened on every line with all the sampling data as well. It's actually in Beta testing stages now but we've securitised the data so that the farmer can go on and login themselves to see what's been happening on their farms and get all the reports that they need to keep track of their business". (NSPMKI2).*

There is clearly a lack of common understanding between the SAS members and their new service provider. These contrasting perceptions could be attributed to the evident breakdown in communication channels within the partnership. As a result, this has further eroded levels of trust amongst members within the partnership.

6.4.3 Insufficient guidance and mentoring from the service provider

All SAS farmers and private mussel producing companies interviewed felt that the most critical reason why the partnership between SAS and their new service provider was not working was due to a lack of guidance and mentoring being provided (SASKI1-4; PMPKI1). One private mussel producer explained that this was because aquaculture is not yet a mature industry in South Africa as there are inadequate extension and support structures as well as limited access to long-term mentors (PMPKI1). This is consistent with the findings of a study looking at the critical success factors for aquaculture development in South Africa, where insufficient guidance and mentoring contributed to enterprise failure (Brown-Webb et al., 2022b). All SAS members interviewed were also unhappy with how reliant they were on someone else running their business for them and raised concern that there will never be a transfer of skills for them to eventually take ownership of their enterprise (SASKI1-4). Moreover, some members said that they had few alternative options to choose from as there were no other companies with the boat equipment to service their longlines in the ADZ (SASKI2-4).

The SAS farmers acknowledged that they would not be able to function without the new service provider but argued that the terms in the uptake agreement did not made it economically viable for them as they were accruing further debt in service fee costs, lease fees, and water testing fees. This led to respondents classifying themselves as being the ‘losers’ in this case as they felt that the ‘disbenefits’ of their aquaculture enterprises were outweighing the benefits. They saw vertically integrated businesses, such as their new service provider, as being the ‘winners’ in this case as they had advantage over the small-scale producers as they owned the upstreaming, processing, and marketing processes.

Consequently, most SAS members said that they had started to lose interest in trying to make their businesses work and may be forced to liquidate their businesses soon in light of how everything is currently unfolding (SASKI2-4). Interestingly, management at the new service provider company appeared to share the view that some of the SAS farmers were not benefitting from the uptake agreement currently in place. They said that the main reason why the SAS farmers' business model was not working is because of how capital intensive this form of mussel production is (NSPMKI2). Moreover, there are apparently too many mussels in the Bay for every producer to sell on the domestic market at a high profit, and thus exporting was the only viable way to make higher profits (NSPMKI1). As one management member stated:

> *"How can they (SAS farmers) take ownership of something when they can't even run their business on their own without the help of another private party? This is exactly why a vertically integrated and invested model which the farmers own the upstreaming processing and marketing process is the only way you can corporatize a transformation platform. And this does not just go against South Africa but a lot of other governments in Africa with their notion that 'the small-scale farmer is the way forward'. This is not the way forward if you want to build a brand-new export industry and compete with international markets and further develop your nations". (NSPMKI2).*

6.5 Factors influencing benefit sharing in Saldanha Bay

6.5.1 EIA delays and restrictions on aquaculture expansion in the Saldanha Bay ADZ

As highlighted earlier, the aim of establishing the SBADZ was to create incentives for further development of the aquaculture sector and provide employment opportunities and skills development for HDIs and coastal communities (DAFF, 2018b; DAFF, 2019d). There were activities listed in terms of Listing Notice 1 of the EIA Regulations of 2014 that were triggered by the Saldanha Bay ADZ however, which required a Basic Assessment (BA) to be undertaken (AEC, 2022). SRK Consulting (Pty) Ltd. was appointed by the then DAFF to undertake the BA and to develop a framework for the ADZ project. In January 2018, the environmental authorising agency (the DEA at the time) granted environmental authorisations to three applicants, the then DAFF and two other private aquaculture companies, to conduct sea-based aquaculture in the Bay (AEC, 2022). However, as mentioned in Chapter Two, the establishment of the ADZ triggered various concerns from IAPs such as SLL and Coastal Links (Clarke et al., 2018; Agiotis, 2019). As a result, the area for aquaculture development was reduced to 884ha including existing areas allocated for aquaculture production total (DAFF, 2020).

Additional measures were put in place to reduce the potential socioeconomic and ecological impacts of the SBADZ. The then DAFF appointed an Environmental Control Officer (ECO) to oversee the operational phase of the ADZ and setup an Aquaculture Management Committee (AMC) which would meet every 2 months to ensure that the ADZ's implementation was in line with the specified requirements in the Environmental Management Programme (EMPr). Restrictions were also placed on bivalve cultivation in the SBADZ to a threshold of 10,000 tonnes per annum, from 2019-2021.

Production increases of 5,000 tonnes would be granted each subsequent year pending that the previous threshold had been met and the bay's ecological carrying capacity had not been compromised (AEC, 2022). It was estimated that Saldanha Bay's maximum carrying capacity for aquaculture production is threshold of approximately 27 600 tonnes (DAFF, 2020). The delay in obtaining the EIA approval for the SBADZ as well the total production limitations had an impact on the number of new farmers that could enter into the sector.

Interviews with the SAS farmers indicated that the farmers with a 10ha water space could have up to 14 longlines on their farm, while those with a 15ha water space could have up to 20 longlines on their farm (SASKI1-4). With the EIA restrictions, however, most of the SAS farmers were limited to only cultivate mussels on 50% of the longline capacity of their farms. For example, one SAS farmer interviewed was in the process of installing 13 longlines that had been approved by a grant from CASP, however, the carrying capacity restrictions of the ADZ meant that only half of the lines could be installed (7 lines in this case) (SASKI1). This had major knock-effects for the farmer as there were concerns that operating at 7 lines would not be viable. As the SAS farmer stated:

> *"My initial projection was to start with at least 20 lines with an annual output of just over 600 tonnes, this would be economically viable for my business and within 3 years' time I would even start to breakeven. Now with the EIA, I am down to 7 lines which is about 350 tonnes. This is on the borderline of being a 'spaza' and is not viable – I am accumulating more debt than revenue being generated and I don't foresee that improving until I can install more lines in the water" (SASKI1).*

6.5.2 The impacts of COVID-19 in Saldanha Bay

The main impacts that the COVID-19 pandemic had on the aquaculture sector were market closures and the loss of income. The oyster and mussel sectors were severely impacted because most of their local sales and trade was done with hotels and restaurants which were closed for extended periods of time during the strict lockdown (OPKI2). The export markets were also restricted due to international travel and trade being shut across the world. This led to an overstock of products across the entire aquaculture value chain (marine and freshwater), with hatcheries unable to market their stock, and farmers unable to harvest and process their produce (Brown-Webb et al., 2022b). Some mussel producers interviewed, such as SAS's new service provider, were able to harvest and store their mussels until the markets opened again. However, this not only increased the costs of storing the mussels, but this raised concerns about the overproduction of mussels and the potential 'price wars' it could bring when markets reopened in an already over saturated domestic market (NSPMKI1and2).

Interviews with the SAS farmers who were not able to harvest and sell their mussels revealed that the pandemic caused a huge loss of production in the ADZ, which was estimated at over 500 tonnes for 2020 (SASKI1-4; AMCKI1). All SAS members interviewed mentioned that COVID-19 impacted them severely as it delayed some members from making a start with their production and for others it caused them to fall far behind with their production schedules (SASKI1-4). What seemed to have exacerbated this issue was that whilst these businesses received minimal to no income, they still needed to pay for overheads such as lease fees, service fees for the maintenance of their longlines, and interest payments on loans to start their mussel businesses (Brown-Webb et al., 2022b).

It was mentioned by one Operation Phakisa official that some of the SAS members were in serious arrears with Transnet, some that exceeded R100,000, with no solution in sight to pay back the lease fees. The official also mentioned that the DFFE had negotiated with the TNPA to give the SAS farmers 7 months off their lease fees during the COVID-19 pandemic in 2020. However, once markets started to open up again towards the end of the year, some farmers asked for a further extension on their lease fees which the department could not provide (OPKI2). Not only had COVID halted international travel and trade, but the investments into technology and food production saw a dramatic decline. One SAS members mentioned that since the pandemic there had been a sharp reduction of investments made into aquaculture businesses as investors were reluctant to take the risk given the closure of global aquaculture production and trade. As one member stated:

> *"If it wasn't for COVID, we may have been able to get funding to put our lines in the water and start producing mussels. But now we are still not operational, accumulating more and more debt with Transnet lease fees, and are still battling to get people onboard to invest in our company" – (SASKI4).*

6.5.3 Environmental factors influencing mussel aquaculture

Harmful Algal Blooms (HABs) or 'red tides' are an unpredictable phenomenon of the West Coast of South Africa, which form when ocean currents cause nutrient rich waters to rise to the surface which enhances the growth of marine microorganisms known as phytoplankton (Olivier et al., 2013). When the phytoplankton begin to form into dense concentrations (known as algal blooms) this causes the seawater to be discoloured and depletes oxygen levels in the water.

Although red tides do not usually harm mussels and oysters in the bay, and actually fuel the growth of bivalves, biotoxins secreted by the algal blooms are absorbed into the flesh of the bivalves which can be harmful or even lethal to humans if eaten. As a result of this, the DFFE monitors all commercial farms in the SBADZ under the Molluscan Shellfish Monitoring and Control Programme (MSMCP) and prohibits any bivalves being harvested from the bay if the weekly tests done in the bay pick up harmful toxins that are above a certain concentration threshold that is not safe for human consumption (Olivier et al., 2013; BOM, 2023).

Red tide was identified as a major inhibitor to mussel production for all mussel farmers interviewed in Saldanha Bay (SASKI1-4; NSPMKI1and2; PMPKI1). It was reported that there were extended periods of red tide in 2021 which forced the DFFE to close all precincts of the ADZ for bivalve cultivation and restrict boat access to these areas until the levels of harmful toxins returned to below the threshold for safe human consumption (OPKI2; AMCKI1). The new service provider company estimated that they and the SAS farmers lost nearly 4 months of production in 2021 due to extended periods of red tide in the bay (NSPMKI2). This put a halt on production on the farms and their processing factory until the levels returned to a safe threshold. This had a major impact on the SAS famers particularly as they were still required to pay lease fees to Transnet each month as well as regular sampling fees done by the MSMCP (SASKI1-4).

The red tide had other knock-on effects such as shake-off of mussels on lines that had seeded mussels. This was because the mussels were left on the longlines for an extended period without being attended to since the bay was closed for any mussel production. The mussels soon became too heavy in mass for the longlines to support and consequently were shaken-off by strong wave action and accumulated at the bottom of the sea floor.

This meant that some farmers lost their entire production during the red-tide closure in 2021 (SASKI2and3). This had a major impact on the SAS farmers in particular, as one member stated:

> *"It's very bad now, we had shake-off on 3 of our lines because of the red-tide, but we still had to pay the servicing fee of R8,000 per line per month for those 4 months regardless. So, we essentially paid R96,000 for nothing for those 4 months". – (SASKI3).*

6.5.4 Perceptions towards the influence of Operation Phakisa, within the DFFE, on benefit distribution in Saldanha Bay

As mentioned earlier, the DFFE was mandated to help further develop the aquaculture sector by providing an enabling environment for existing and new entrants to grow in the space through the OP Oceans Economy Programme. There were mixed responses received from SAS members and other mussel producers in the sector when asked about the assistance they had received from the DFFE. Firstly, almost all of the respondents mentioned that Operation Phakisa had been very helpful in the beginning phases of getting setup with the necessary permits, licenses, water space leases, and even funding for their businesses (SASKI1-4; PMPKI1). As a SAS member and a private mussel producer in Saldanha mentioned:

> *"Phakisa assisted us tremendously with expanding our farming operations in the ADZ" – (PMPKI1).*

> *"Phakisa and the DFFE were very helpful in allowing us to enter into the aquaculture space and assisted in securing permits, licenses, and initial infrastructure funding to start our mussel projects" (SASKI1).*

However, some respondents felt that they had not received adequate support from Operation Phakisa in terms of the procedural delays they encountered in expanding their production (SASKI1-4). This was due to the EIA restrictions placed on the total production in the bay at 10,000 tonnes per annum. All SAS farmers explained that they were limited to only 6-7 lines on their farms currently which was not viable for them given their production costs (e.g., servicing of lines, monitoring and testing fees, lease fees, processing fees) that far exceeds the revenue from the mussels produced (SASKI1-4). The farmers argued that the solution to this problem would be to produce more mussels at a larger scale to offset the production costs. As such, some farmers had managed to secure a second round of funding from DFIs such as ADEP and CASP in 2020 and 2021 to install 7 more lines on their farms and increase their production by 50% (SASKI1and2).

The SAS farmers claimed that there was supposed to be an increase in the production limit in 2021 by 50% to 15,000 tonnes per annum. However, the limit on production in the SBADZ had still not been lifted by the end of 2021 which frustrated them (SASKI1-3). One farmer said that the government funding secured would expire after 2-3 years and be recircled back into the National Treasury if not utilised within that time (SASKI1). As a result, some respondents had appealed to the DFFE to increase the production limits of their farms otherwise they would be forced to file for bankruptcy very soon (SASKI1and2). As two SAS farmers stated:

> *"The future and long-term viability of my aquaculture venture is in jeopardy by the very driving mechanism that helped me implement this project in the first place, it's complete madness." – (SASKI1).*

> *"I wrote to them (the DFFE) and said the very thing you are trying to help us with is pulling us down at the same time with not enabling us to put more lines in the water. They (the government) wanted things to change from the past and*

give emerging black farmers the opportunity to get their own farms going but we are not being empowered by them and in fact the opposite is happening". – (SASKI2).

An Operation Phakisa official responded to these claims and explained that unfortunately the condition of the SBADZ being approved by the former DEA was to limit total production in the bay to 10,000 tonnes per annum and only once that threshold is met will the production limit be reassessed as per the ADZ's EMPr (OPKI2; DAFF, 2018c). The official went on to say that another reason why the production limit had not been lifted was because the threshold had not been met yet.

"They (the mussel farmers) haven't been reaching their yields which is why the limit hasn't been increased. Because we (the DFFE) need to know state of the bay at 10,000 tonnes and whether or not that is having an impact on the environment before we can determine whether the carrying capacity of mussel production can be increased in the bay or not. That is the whole point of an EIA, to minimise risk on the environment". (OPKI2)

6.5.5 Perceptions of social factors affecting benefit distribution

Responses from key industry stakeholders and the new service provider for SAS provided insight into why they believed the businesses of the SAS farmers were underperforming and accruing more and more debt. There was emphasis placed on some of the SAS members lacking good business management and leadership skills which was given as one of the main reasons why their businesses were failing.

The key issues were the lack of business management skills, not having the right attitude and mindset, lack of responsibility and business leadership, and divide between group members (NSPMKI1and2; OPKI2; AMCKI1). Lack of business management skills was one of the most critical reasons why key industry respondents and the new service provider for SAS felt that some of the SAS members businesses' were failing. In particular, this was due to a lack of financial, market, and business administration related skills (NSPMKI1and2; OPKI2; AMCKI1).

One Operation Phakisa official mentioned that almost all of the SAS members had no previous background to aquaculture and thus entirely relied upon their old service provider to draw up their business plans, apply for funding, and secure the necessary permits in order to conduct mussel farming in the SBADZ (OPKI2). The official argued that it was due to this reliance that the SAS farmers were not able to function when there was a change in management of the service provider. This was acknowledged by all SAS members interviewed (SASKI1-4), and as one member stated:

> *"Our downfall was depending on our previous service provider to do everything for us and since that has changed it has put us in a very difficult position as we are now forced to learn things that we didn't think we would have to learn by ourselves" – (SASKI4).*

Not having the right attitude and mindset referred to some SAS members lacking the interest to start working on their businesses and having a misconception about the duration of turning a profit from a start-up aquaculture enterprise (NSPMKI1-2; OPKI2; AMCKI1). Some SAS members continue to blame the government for their businesses not succeeding, yet government departments such as the DFFE emphasised that they are not in the business of building farmers

but rather to serve in building an enabling environment for farmers to develop from (OPKI1-3). It was also alleged that some SAS members perceived grant funding from the government as 'risk-free' money and didn't realise that they were entrepreneurs and had to make the most out of that funding otherwise nothing would come to fruition (AMCKI1; OPKI2). A member of the Saldanha Bay AMC argued that:

> *"The SAS farmers only want free money and don't want to take out loans. But the reality is that grants are not always going to be there, you need to work to grow your business and can't just rely on handouts in order to do that" – (AMCKI1).*

Lack of business leadership pointed to a lack of drive from some of the SAS farmers taking ownership of their businesses by 'sitting back' and letting others run their business for them (AMCKI1, OPKI2). Several respondents referred to the SAS members as being 'couch farmers' since they had limited involvement in running their farms or businesses with some not even knowing where their farms are located within the ADZ (OPKI2; AMCKI1; PMPKI1). Respondents also mentioned that some SAS farmers were not eager to take advantage of opportunities presented to them such as finding an alternative service provider that may offer them with a better service and price for their mussels (OPKI2; AMCKI1). Divide between different members in SAS was apparently very evident whenever stakeholder meetings were held with government departments or with the new service provider (OPKI2; AMCKI1; NSPMKI1and2). In particular, there was a clear divide between the group where half sided with the new service provider and wanted to make it work with the current uptake agreement, while the other half wanted to break away and find a new service provider due to the amount of debt that they were continually accruing each month (OPKI2).

As a result, 7 members created another entity named Saldanha Aqua Farmers (SAF) (Pty) Ltd in 2021 and acquired a 30% share in the new service provider's company (NSPMKI2). These members formed this entity and bought shares in the company based on the 7 farmers' 2nd round of ADEP grants of up to R2 million each when approved by the DTIC (SASKI1; NSPMKI2). The other 5 members remain in SAS of which only 2 still have an active contract with their new service provider. After the uptake agreement comes to an end in 2023, they plan to find an alternative service provider (SASKI2). Since this research was conducted, one AMC member highlighted that one of the SAS farmers' businesses has gone into liquidation and is therefore no longer part of the SAS group (AMCKI1).

6.6 Conclusion

The findings of this case study have shown that the partnership between SAS and their new service provider is currently not yielding any significant benefits for the SAS farmers. However, with 7 SAS members forming a new entity (SAF) and acquiring a 30% share in the new service provider's company, the benefit flows may change. Although public institutions such as Operation Phakisa, the DFFE, and the DTIC assisted in providing the farmers the opportunity to access and benefit from mussel farming in the SBADZ, the nature of the partnership and uptake agreement is proving to not be economically viable for the SAS farmers in their perception. This is because the service charges and other operational expenses are currently higher than profits derived from mussels harvested, causing the SAS farmers to go further into debt. This has been further aggravated by a lack of transparency, accountability, and provision of mentoring and training from the new service provider.

The SAS farmers are therefore reliant on their new service provider to run their businesses for them and have little choice but to accept the terms of the new uptake agreement. Other external factors such as procedural delays, the impacts of COVID-19, environmental factors, and inadequate support from public institutions were also perceived as major blockages to the realisation of benefits for the SAS farmers. However, it was also shown that some of the control in determining the level of benefit sharing from mussel production was in the hands of the SAS farmers themselves. Indeed, poor business management, lack of business leadership, and having the wrong attitude were some of the key reasons why other key stakeholders believed that the SAS farmers were not benefitting from their mussel farming enterprises.

Chapter Seven: Discussion

7.1 Introduction

The findings of this study have shown that the Operation Phakisa aquaculture projects have delivered some benefits to project participants, but in the case of Saldanha Bay, the current situation suggests losses have outweighed the benefits. While the benefit sharing mechanisms employed in the Doringbaai and Saldanha Bay aquaculture projects aimed to enhance access to benefits for HDIs and local communities, the perceptions of key stakeholders regarding benefit sharing were contested. The study also revealed the main factors that research participants identified as affecting benefit sharing.

In the Doringbaai case study, the overriding perception was that the DBA project had delivered a number of key benefits to its employees, their family members, and other connected households in Doringbaai. Although there were issues raised by community members regarding how benefits were distributed by the DDT to the wider community in Doringbaai, there was a general consensus of appreciation towards the DBA project in uplifting and benefitting the town that had undergone severe hardship due to the closure of the Oceana factory in 2006. In the Saldanha Bay case study, the SAS farmers highlighted that they did benefit to some extent from their uptake agreement with their old service provider in early 2019. However, after the COVID-19 outbreak in mid-2019, the SAS farmers argued that everything drastically changed.

The respondents argued that due the combination of the partnership with the new service provider, the effects of the COVID-19 pandemic and environmental factors, and the administrative delays in expanding their mussel farms resulted in no meaningful benefits flowing to them. Thus, it seemed that the factors enhancing benefit sharing in Saldanha Bay were outweighed by the blockages.

This chapter explores these findings further and discusses why certain actors benefitted from the benefit sharing mechanisms in Doringbaai and Saldanha Bay at the expense of others and why the perceptions and experiences of benefits were so different in these two case studies. Three main themes emerged from consideration of these findings and will be discussed in this chapter. The first theme looks at the factors that enhanced access to and benefits derived from these aquaculture projects. The second theme looks at the factors that acted as blockages to access and benefit sharing. Finally, the third theme examines the mismatch between the high-level policy promises of Operation Phakisa compared to what is happening in practice. Wynberg and Hauck's (2014) conceptual framework for benefit sharing was central in understanding the key elements of benefit sharing and the different mechanisms employed to distribute benefits more holistically. However, this study has also explored and revealed the factors that affect the outcomes of benefit sharing interventions employed through different benefit sharing mechanisms. The key factors affecting the outcomes of benefit sharing interventions from the context of this study will be discussed further in this chapter and are summarised in Figure 17 below.

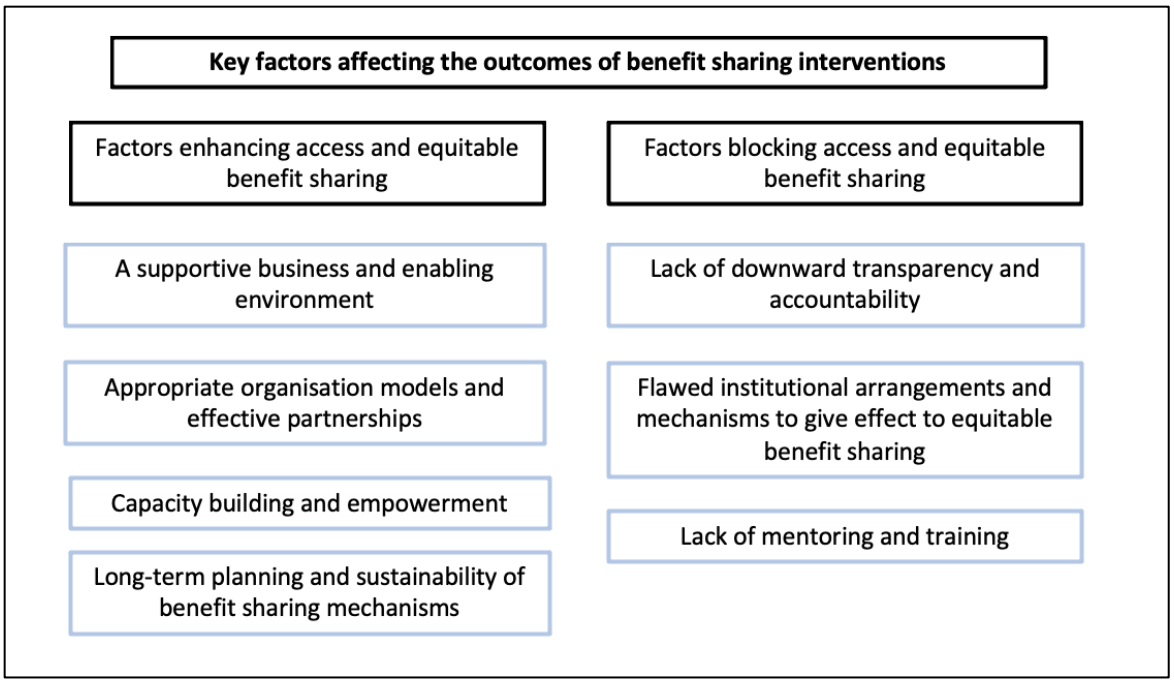

***Figure 17**: Key factors affecting the outcomes of benefit sharing interventions in the Doringbaai and Saldanha Bay aquaculture projects.*

7.2 Factors enhancing equitable benefit sharing

7.2.1 A supportive business and enabling environment

It has been widely acknowledged that the sustainable growth and development of the aquaculture sector in South Africa depends on an enabling environment that is conducive for individual aquaculture enterprises to be successful (DAFF, 2013; Britz and Venter, 2016; Adeleke et al., 2020; Brown-Webb et al., 2022b). An effective enabling environment can not only provide people with the *opportunity* to benefit from a resource but the *ability* to access and derive benefits from them (Ribot and Peluso, 2003; Faye and Ribot, 2017).

An enabling environment can include access to capital, technology, land and water space, and state support. With an enabling environment for aquaculture, the greater the chance of aquaculture projects succeeding and distributing socioeconomic benefits such as job creation and transformation for HDIs and local communities involved (Brown-Webb et al., 2022b). Adeleke et al., (2020) note that a lack of an enabling environment is one of the major reasons why many commercial aquaculture projects in African countries fail to become self-sustainable and distribute social benefits. The findings of this research revealed that support from state and non-state actors did in some respects enhance access to and the realisation of benefits from the aquaculture projects in Doringbaai and Saldanha Bay.

In Doringbaai, the support of the Matzikama Municipality, IDC, DFFE, and WCADI in raising the capital for infrastructure and operational costs for DBA proved to be crucial for the business incubation period from idea to start-up, expansion, and maturity. The Municipality also assisted the DDT in securing the lease agreement from the DPW in order for DBA to utilise the old Oceana factory and premises for abalone production. Moreover, state actors encouraged DBA to expand to a 50-tonne production in order to achieve economies of scale. Similarly, in Saldanha Bay, state support in the establishment of the SBADZ through Operation Phakisa reduced the need for individual environmental authorisations to be obtained and promoted transformation in the industry by encouraging HDIs and communities to enter into the space. Furthermore, the ADZ attracted both public and private investments into new aquaculture projects. For example, the DTIC provided financial assistance to the SAS farmers from various DFIs such as ADEP, CASP, and the NEF to purchase and install the necessary infrastructure to farm mussels using longline technology.

Hara et al., (2017) note that some of the major obstacles for communities and individuals to enter into mainstream commercial aquaculture in South Africa are limited investment funding, technical knowledge, skills, and access to markets. The authors argue that effective state support and partnering with established aquaculture companies can help overcome these obstacles and can be used for, "scaling-up viable and sustainable participation of formerly marginalised communities and individuals in commercial aquaculture" (Hara et al., 2017: 2).

The provision of state support through access to funding, land, and water space, and enabling legislature therefore played a vital role in the initial start-up phases for both case study projects. For the SAS farmers in Saldanha Bay, it afforded these BEE individuals the opportunity to participate in a historically white-dominated industry and to take ownership of their own small-scale mussel ventures. For DBA, the provision of state support allowed the project to expand its production to a 50-tonne capacity that provided over 50 permanent jobs to the local Doringbaai community and increased future revenues to be distributed from the community's 37% (now 32%) share in the project. Thus, not only is it important to have an enabling environment that is conducive for aquaculture development but it is also important to *sustain* the presence of an enabling environment in order to achieve business sustainability in the long-term (Hara et al., 2017; Brown-Webb et al., 2022b).

7.2.2 Appropriate organisational models and effective partnerships

Having the appropriate stakeholders, organisational model, and type of aquaculture operation that fits with the species selected for aquaculture production is essential. A number of studies have highlighted the importance of having robust public-private partnerships for effective and viable aquaculture projects, especially in developing African countries (Britz and Venter, 2016; Hara et al., 2017; Adeleke et al., 2020). In the case of Doringbaai, the start-up costs for producing a high value species such as abalone are substantial and production techniques require a significant number of advanced technologies and qualified personnel to operate the enterprise (DAFF, 2018a; CSIR, 2019a). In light of this, the approach taken by the Matzikama Municipality and the DDT in sourcing a private partner to run the abalone operation was crucial for the long-term success of DBA given that the original private shareholders had the necessary business, technical, and managerial skills to setup and run the business.

However, as described in section 5.4.2, it is important to note that setbacks were encountered by the original private partners due to ineffective management and production methods being used which almost collapsed DBA. Nonetheless, the original private partners were instrumental in building DBA into a viable business operation. Additionally, the original private partners acted as mentors through providing essential training and skills transfer for the staff to equip them to operate core functions within the business. Similarly in the case of Saldanha Bay, farming mussels through longline technology requires large capital investments for infrastructure development and operational costs, technical machinery, and highly skilled personnel to cultivate, harvest, and process mussels.

In light of these challenges, Operation Phakisa recognised that promoting HDIs and communities to enter the mussel farming sector would be difficult for the government to achieve alone. As discussed in section 4.5, the clustering model advised by Operation Phakisa for the 13 SAS members to farm mussels in the SBADZ proved to be a suitable intervention for the members in order to attract public funding and to form the partnership as a collective with an established mussel producing company. This approach allowed the SAS members to setup their mussel enterprises and significantly reduced capital costs as their service provider (old and new) was able to perform other aspects of the mussel production value chain such as harvesting, processing, and marketing of the mussels.

Clustering is a common approach used in small-scale aquaculture across the world and has proved to be successful in pooling resources, reducing costs, enhancing interaction between farmers and other actors in the value chain, and reducing individual risk to market forces (De Silva and Davy, 2010; Kassam et al., 2011; Joffre et al., 2019). However, although this clustering model was successful in helping establish most of SAS' individual mussel enterprises, the operational costs (service charges) and lack of mentoring and training from the government and new service provider as well as the effects of COVID-19 hindered the ability for the SAS members to become self-sustainable. This will be discussed further in the sections to follow.

7.2.3 Capacity building and empowerment

Kaminski et al., (2020) note that capacity building and empowerment are important determinants of the level of inclusiveness for mechanisms that aim to integrate impoverished people into the aquaculture value chain. However, research has shown that the extent to which

HDIs and communities are able to participate in and benefit from economic growth that is associated with aquaculture development is often inequitable (Beveridge et al., 2010; Pant et al., 2014). This may be attributed to the fact that simply providing tangible benefits such as job creation and income for HDIs and communities may not be perceived as meaningful benefit sharing (Mbatha and Wynberg, 2014). Instead, a combination of both tangible and intangible benefits such as empowerment and capacity building can translate into more meaningful participation and benefits for HDIs and communities that are involved in aquaculture projects (Snyman and Bricker, 2019). Thus, one can argue that providing positive development outcomes such as employment and income generation as well as focusing on social development (e.g. through mentoring and skills development) can enhance the overall wellbeing and equitable upliftment of those involved in aquaculture projects (Kaminski et al., 2020).

Drawing from the results of the Doringbaai case study, the management of DBA demonstrated a commitment to providing their staff with opportunities for personal development and professional growth. DBA management included their staff in the process of building the company from the ground-up and provided provision for further education and training in abalone production. In doing so, the workers were empowered through taking ownership of their respective roles in order to contribute to DBA's development and overall success. This in return fostered a collaborative and inclusive work culture through the worker's dedication and commitment to the company. Thus, the inclusive business model approach adopted by DBA management not only created positive developmental outcomes for its staff and the wider Doringbaai local community, but also led to social upliftment and some redress.

These capacity building and skills training benefits were appreciated by those involved in the project, however, there remains dissatisfaction amongst the broader DDT membership

regarding benefits accrued to the wider community. This finding resonates with other studies such as Ertör and Ortega-Cerdà (2015: 202), who highlighted the socio-environmental conflicts arising from the adoption of aquaculture in Europe due to “demands for an even distribution of burdens and benefits resulting from marine finfish aquaculture”. Similarly, Adduci (2009) examined the conflict between different classes situated in Lake Chilika in India over the disproportionate share of benefits from intensive aquaculture operations in the area.

In the Saldanha Bay case study, it is clear that the government has put considerable effort into creating an enabling environment for the SAS members to enter into the aquaculture space, however, there has been a lack of capacity building provided for the SAS farmers. For example, although the government provided SAS members with application and funding assistance and SAS’ new service provider had assisted with running their mussel farms, no transfer of skills through mentoring and training has been provided. This is significant as the SAS farmers are predominantly reliant on their new service provider to run their farms and businesses for them. Consequently, this has created a dependence in which the SAS farmers will likely not be in a position to become self-sustainable and take full ownership of their aquaculture enterprises.

Lessons can be learnt from the shortfalls experienced with SAS’ cooperative business model and commercial partnership drawing from a study done by Cush and Varley (2013) on cooperative mussel farming in Ireland. The study found that state support in the form of grant assistance and industry expert advice played a crucial role in initiating and sustaining cooperation amongst small-scale mussel farmers. The state’s provision of financial assistance and professional expertise helped to establish an effective cooperation where farmers were able to pool resources and share costs, labour, and markets, ensuring the long-term survival of the farmers within the industry (Cush and Varley, 2013). Thus, this reinforces the crucial role

that cooperation between farmers, state support, and extension services such as mentoring and training can have for the success of small-scale aquaculture projects in the long-term.

7.2.4 Long-term planning and sustainability of benefit sharing mechanisms

The private shareholders in DBA also focused on the project as a business venture first in order to become profitable before making promises of providing any social benefits to the wider community in Doringbaai. This played a critical role in ensuring the long-term success of DBA from their perspective. From the beginning of the project, the private shareholders emphasised that there was no guarantee that a large number of jobs would be provided by the business. Instead, they emphasised that only once economies of scale was achieved would the business be able to provide more jobs and distribute shares of profits to the local community in Doringbaai.

This long-term vision and realistic approach taken by the private shareholders was important because it sought to enhance benefit sharing for the local community by ensuring that: i) the abalone project could scale effectively into a 50-tonne production enterprise, ii) the company could provide more jobs for every tonne of increased abalone production, and iii) the business would mature and start turning a profit in order to distribute benefits to the wider community from their collective 37% (now 32%) share. These findings are supported in the literature where a number of studies have emphasised that one of the critical success factors for commercial aquaculture enterprises involves creating a business model that builds financial independence and commercial viability instead of social projects that continually require financial support and ultimately fail (Rouhani and Britz, 2003; Boulle, J., 2007; Hara et al., 2017; Brown-Webb et al., 2022b).

In Saldanha Bay, the setbacks encountered by the SAS farmers in establishing and running their mussel farming businesses creates uncertainty regarding the long-term sustainability of the benefit sharing mechanism between SAS and their new service provider. The main setbacks included the effects of COVID-19, the change in the terms of the uptake agreement with SAS' new service provider, environmental impacts on mussel production, and delays in approval for funding and mussel production increases. It is evident that these setbacks have put the SAS members in a precarious position where the future of their mussel farming enterprises are in jeopardy. Moreover, the continual accrual of debt in operational expenses by the SAS members is another factor inhibiting the long-term viability of their mussel farming businesses. Thus, one can argue that the current trajectory of SAS's business model will likely require continual financial support or may ultimately not be successful in the long-term. The factors acting as obstacles to benefit sharing in both Doringbaai and Saldanha Bay will be discussed in the following section.

7.3 Factors impeding access and equitable benefit sharing

Past research has shown that failure to set in place institutions that are accountable, transparent, and match local realities to give effect to benefit sharing will ultimately impede access and equitable distribution of benefits (Mbatha and Wynberg, 2014; Wynberg and Hauck, 2014; Krause et al., 2015; Bennett et al., 2018). The findings of this research revealed that while the HDIs and communities in both Doringbaai and Saldanha Bay acknowledged benefit sharing efforts through the aquaculture projects, the benefits from these projects have not been filtering down to the individuals and wider communities. This section discusses why this was the case through exploring the factors that impeded access to and the realisation of benefits from these

aquaculture projects and what this means in terms of the broader access, benefit sharing, aquaculture, and Blue Economy literature for community-based aquaculture interventions.

7.3.1 Factors impeding the realisation of benefits

The findings of this research have shown that a number of factors have impeded benefit sharing in Doringbaai and Saldanha Bay. In Doringbaai, the perceived losses and negative impacts arising from benefit sharing in Doringbaai were mostly centred around the ineffectiveness of the Trust in managing and distributing benefits to the community from DBA and other strategic development projects implemented by the Trust. This included the delays in distributing benefits from the community's share in DBA as well as the limited employment opportunities provided to community members by the DDT over the past 15 years. In particular, there was a strong sense of jealousy picked up in the interviews from those who were not provided with jobs at DBA who felt that they had been the 'losers' in the process over the 'winners' who had been provided with employment through being a family member or friend of someone else working there.

Ribot and Peluso (2003), argue that access to labour opportunities through social identity and relationships can have a significant influence over who benefits from resources. This is because access is often mediated by membership in a group or community or via the negotiation of other relations through connections based on social ties, friendship ties, and family ties. Thus, in the perceptions of some community members interviewed, access to and control of labour opportunities in DBA appeared to have been shaped by social relations which had in turn excluded others from receiving employment at the factory due to their weaker social connection with people working there.

In Saldanha Bay, the findings showed that there were currently no meaningful benefits flowing to the SAS members interviewed, they argued that this was because the benefits of their businesses and partnership with their new service provider were outweighed by the losses incurred. As revealed by the interviews, the SAS farmers were going further into debt due to the service charges, lease fees, and monitoring and testing fees which far exceeded the revenue they were receiving from their mussel production. Moreover, the farmers mentioned that setbacks such as the COVID-19 pandemic, restrictions on the total production imposed by the SBADZ, and the persistent outbreaks of red tide in the bay had significantly hindered their ability to produce and market mussels which further exacerbated their level of debt in terms of operational expenses.

A number of studies confirmed these findings in the Saldanha Bay case study and found that the COVID-19 pandemic (Brown-Webb et al., 2022a), the conditions imposed by the EIA restrictions (Brown-Webb et al., 2022b), and the repeated red tide outbreaks in the Bay (Olivier et al., 2013; CSIR, 2019b) were setbacks that resulted in some farmers not realising their maximum production potential which impacted the viability of their businesses in the SBADZ. The interviews with the SAS farmers conveyed a sense of frustration and demotivation, indicating how the setbacks they had encountered had affected their desire to make their business ventures profitable. This led to some SAS respondents classifying themselves as the 'losers' in this case and viewed vertically integrated businesses such as their new service provider as the 'winners'. Wynberg and Hauck (2014) note that this is a common problem manifesting in benefit sharing mechanisms, where the outcomes may affect a range of stakeholders, and although the aim of the process is to enhance overall benefits, they can also exclude people from the benefit sharing process which can lead to negative outcomes.

7.3.2 Lack of downward transparency and accountability

The difficulties described above were further aggravated by the perceived lack of transparency and accountability by the institutional arrangements and mechanisms setup in Doringbaai and Saldanha Bay to give effect to benefit sharing. In Doringbaai, there was a general misunderstanding between different stakeholders interviewed around benefit distribution due to the lack of downward transparency and communication from the Trust. The interviews with all stakeholders in Doringbaai showed no clear or common consensus around what benefits the wider community would receive from the 37% (now 32%) share in DBA and how or when this would occur. Interestingly, it was found that the majority of those wanting the profits to be reinvested back into DBA were already directly or indirectly benefitting from the project and were thus more inclined to see the company grow as this would gradually employ more people there in the long-term. In contrast, other community members that were not yet benefitting from the project questioned how investing the 'community's' profits back into the company would benefit the wider community when at best 30 more people may be employed by the abalone project.

Many of the community members interviewed stressed that poverty is rife in their town and that they have grown impatient with how it is often stated that the 32% share in DBA is for the wider community's benefit, yet in over 10 years since the company started producing abalone only 50 members in the Trust have been provided with jobs out of a total over 650 local members. Thus, one can argue that it is not accurate to state that the 'community' is benefitting from involvement in DBA when the results of this study indicate that only those directly employed at DBA and their families are receiving benefits from the abalone project but benefits are yet to reach the wider community.

This finding resonates with other studies which have shown that it is often claimed by proponents of the Blue Economy that all stakeholders will benefit yet benefits derived from the Blue Economy may fail to be distributed to some stakeholders, particularly marginalised coastal communities, and where benefits are derived these are often shared unevenly (Ertör and Ortega-Cerdà, 2015; Masie and Bond, 2018; Bond, 2019). Most community members were also unhappy with the leadership in the DDT for making decisions on their collective shares in DBA without consulting the community and putting it to a majority vote beforehand.

The fact that the community's shareholdership in DBA decreased from 37% to 32% due to the one of the DDT Trustee members apparently being allocated a 5% share in DBA serves as a prime example of this issue. The change in the community's shareholding in DBA without consultation is significant as it further eroded the level of trust that some community members have with the DDT. This also increased the levels of inequality between those who have benefitted from DBA and those who have not. Many other studies have uncovered elite capture of benefits by those who are able to obtain a disproportional share of group benefits through the power in which they hold in the group (Iversen et al., 2006; Mbatha, 2011; Larson, 2011; Torpey-Saboe et al., 2015; Bennett et al., 2021).

In Saldanha Bay, the results showed that most SAS members shared transparency and accountability grievances towards their new service provider (SASKI2-4). The farmers argued that they were being 'kept in the dark' about their farming operations as they were never sure when any maintenance or harvesting was done on their farms due the lack of communication and documentation being provided to them. The members also claimed that there was a reluctance by the new service provider in permitting them to go on the boats in order to see the status of their lines and reconcile what had been harvested off their farms.

Furthermore, the SAS farmers questioned whether what they were being charged and paid for in the uptake agreement was fair due to the service charges almost always being higher than the yields they were being paid for. This finding was also confirmed by other key stakeholders interviewed (OPKI2; AMCKI1; PMPKI1). Thus, the lack of transparency and accountability has further eroded levels of trust between the SAS members and their new service provider. It has also created a divide in the SAS group over those who were openly not in support of the new service provider and those who remained silent on the matter. Indeed, the loss of trust in the new service provider has exacerbated most of the SAS members perceptions of negative outcomes and impacted their perceived legitimacy of the partnership (SASKI2-4).

A number of studies have shown that transparency, stakeholder trust, and legitimacy are crucial to ensure the effectiveness of benefit sharing mechanisms (Wynberg and Hauck, 2014; Linke and Jentoft, 2016; Parlee et al., 2021). Legitimacy is defined by Dehens and Fanning (2018: 46) as, "the ability of a political action to be perceived as right and just by the various people who are involved, interested, and/or affected by it". The authors argue that legitimacy and trust can be influenced by the level of communication, participation, and transparency by representatives (Dehens and Fanning, 2018). This section has shown that the weak participatory processes in both benefit sharing mechanisms in Doringbaai and Saldanha Bay have ultimately undermined the perceived level of legitimacy and trust by the HDIs and communities involved. These findings echo conflicts and social tensions arising in other areas where the 'fair' distribution of benefits from salmon aquaculture was considered illegitimate by local communities due to the inadequate engagement and transparency from the industry and government (Sinner et al., 2020; Weitzman et al., 2023). Thus, the lack of downward transparency and accountability has affected HDIs and communities' trust in the procedural and distributional fairness from the benefit sharing mechanisms in both Doringbaai and Saldanha Bay.

7.3.3 Flawed institutional arrangements and partnerships to give effect to equitable benefit sharing

The factors blocking access and equitable benefit sharing in Doringbaai and Saldanha Bay point to flawed institutional arrangements and partnerships. Past research has shown how flawed institutional arrangements and partnerships can lead to an unequal sharing of benefits amongst stakeholders, negatively impacting local communities, and eroding levels of trust and legitimacy in various sectors such as aquaculture (Ertör and Ortega-Cerdà, 2015; Masie and Bond, 2018), mining (Mbatha, 2011; Mbatha and Wynberg, 2014), and marine conservation (Muhl, 2019; Bennett at al., 2018). Drawing from the findings, there were evidently issues of mistrust by the community towards the DDT managing and distributing benefits in Doringbaai while most grievances in Saldanha Bay stemmed from the nature of the partnership and uptake agreement between the SAS farmers and their new service provider. The following section discusses the flaws in the institutional arrangements and partnerships in both Doringbaai and Saldanha Bay and explores why this hindered access and equitable benefit sharing.

7.3.4 Issues with the nature of institutional arrangements and partnerships in Doringbaai and Saldanha Bay

The findings of this research have identified several factors that impeded the realisation of benefits in both Doringbaai and Saldanha Bay. One of the key reasons why benefits were perceived as unequal by the HDIs and communities interviewed is due to the unequal power relations between the different stakeholders involved in both projects.

In Doringbaai, the results showed that the community were of the view that the Board of Trustees held greater decision-making power and authority over the distribution of benefits from the DBA project than they did. Similarly, in Saldanha Bay, the farmers perceived the new service provider to hold the majority of decision-making power in the partnership which left the SAS farmers with little choice but to accept what they were offered in the uptake agreement. Wynberg and Hauck (2014) argue that power relations are one of the key elements that influence benefit sharing mechanisms and outcomes and remains the key factor shaping the way in which benefits are distributed. This is confirmed by Ribot and Peluso (2003), who argue that the transfer of powers to distribute benefits within local institutions may enhance or undermine equitable and transparent processes depending on the local actors who are entrusted with the benefit distribution powers.

In Doringbaai, the Board of Trustees of the DDT were given power by DBA and the Matzikama Municipality to distribute benefits from abalone production to the wider community. The interviews showed how local community members perceived the DDT to have misused its powers over benefit distribution as they failed to adequately consult the wider community on decisions made about the 'community's' original 37% share in DBA. As a result, the opportunities for the wider community to benefit from their now decreased 32% collective share in DBA were compromised. Ribot and Peluso (2003: 173) state that the structural and relational mechanisms of access to capital, technology, markets, authority, and knowledge form "bundles of power" that can result in "complex social patterns of benefit distribution". These mechanisms can lead to some actors holding more power than others which gives them the ability to control how others benefit from a resource. This could provide a possible explanation into why no meaningful benefits were flowing out of the partnership between SAS and their new service provider in the view of some members interviewed (SASKI1-4).

Drawing from the findings, it appeared that the new service provider held the majority power and decision-making in the partnership with the SAS members. This was due to the new service provider having access to the capital, technology, markets, and knowledge in the form of a fully vertically integrated business that could harvest, process, and market mussels in Saldanha Bay. Although there are a two other vertically integrated businesses in Saldanha Bay (Britz and Venter, 2016), they produce mussels through *raft technology*. The new service provider for SAS thus appeared to be the only vertically integrated business in the bay oriented towards mussel production through *longline technology*. This is significant because, as mentioned in Chapter Four, farming mussels through longline technology requires sophisticated boats and machinery to seed, maintain, and harvest mussels off of the longlines (DAFF, 2019b). Hence, without this machinery it is very difficult to viably operate a longline oriented enterprise.

Using Ribot and Peluso's (2003) theory of access, one can argue that while the SAS farmers were given the *right* to access and benefit from mussel farming in the SBADZ by the state in the form of funding, water lease space, and permits they did not have the *ability* to gain any material benefit from it as they lacked access to the necessary capital, technology, knowledge, and markets. Thus, with limited alternative options, this could perhaps explain why the SAS farmers mentioned that they "had no choice" but to accept the terms of the new uptake agreement with the new service provider (SASKI1-4) – even though this agreement was to their disadvantage as the huge levels of debt in service charges accumulated by the SAS members have shown (SASKI2-4; AMCKI1). Another factor inhibiting access and benefit sharing in Saldanha Bay was due to a lack of mentoring and training for the SAS farmers. This had consequently hindered their ability to meaningfully participate in and take ownership of their own aquaculture businesses.

A number of studies on community-based aquaculture projects in South Africa has shown how crucial training, mentoring, and transferring of skills is for their long-term-success (Rouhani and Britz, 2004; Hara et al., 2017; Brown-Webb et al., 2022b). In contrast to DBA, it appears that no commitment has been made by SAS's new service provider or the government in training the SAS farmers in how to run their businesses and to farm mussels in the bay. This has not only left the SAS members being so reliant on the new service provider to run their farms and businesses for them, but it has also disempowered these 'couch farmers' as they lack the ability to meaningfully participate and benefit from the partnership. Lessons can be learnt from other community-based projects in South Africa that ultimately failed due to a lack of mentoring and training being provided such as the Hands-On Fish Farmers Cooperative in the Western Cape (Boulle, 2007), the Siyazama Aquaculture project in the Eastern Cape (Njokweni, 2015), and various other community-based aquaculture projects across South Africa (Rouhani and Britz, 2004).

Saldanha's bivalve sector has demonstrated in the past that mussel farming can provide a platform to develop small-scale aquaculture projects that are commercially viable through effective partnerships (Olivier et al., 2013). For example, the Imbaza Mussels empowerment project was established in 2012 by six general workers from a private mussel producer known as Blue Ocean Mussels (BOM). These six black-empowered individuals were supported and mentored by BOM to farm and market mussels in the bay through raft technology. The farmers received a mixture of loans and grants from the NEF, the DTIC, and from the former DAFF of just under R12 million for the capital to buy the rafts, boats, and to cover some operational expenses (Hara et al., 2017). According to a report published by Njokweni (2015), through the training and support the farmers had received from BOM over the years, and with the financial support from the government, the six farmers were empowered through the transfer of skills and knowledge to effectively operate their farms and run their businesses to be commercially viable.

Imbaza currently produces approximately 600 tonnes of mussels per year which is sold directly to BOM (Hara et al., 2017). Within Imbaza Mussels, a worker's Trust was also formed (that comprises of the factory workers at BOM and the six farmers who also still work there) which holds a share in the empowerment project. This was important for the benefit of the wider workforce in BOM from Imbaza as well as the six farmers who were still able to derive a monthly income by working at the BOM factory. Moreover, this meant that no dividends were collected by the workers from Imbaza until the loan from the NEF was paid off (Njokweni, 2015). Thus, key lessons can be drawn from this project for the SAS farmers and their new service provider. Imbaza Mussels is an example of how a successful commercial mussel project can arise through effective partnerships between HDIs, the public sector, and the private sector that provide funding, mentoring, and training. Moreover, not only can this empower workers but benefit the broader workforce from BOM and their families in the long-term.

7.4 Mismatch between Blue Economy rhetoric and the reality of the beneficiaries on the ground

The sections above have discussed the factors that have enhanced and also blocked access to and benefits derived from the benefit sharing mechanisms in Doringbaai and Saldanha Bay. The factors blocking benefit sharing pointed towards flaws in the benefit sharing mechanisms themselves and the actors and institutional arrangements involved in distributing benefits. However, it is also important to emphasise that the state has also played a role, which has also affected benefit sharing and its outcomes.

This section explores how South Africa's Blue Economy narrative and strategy, 'Operation Phakisa', has not matched the realities on the ground. To do this, this section will discuss how the high-level policy initiatives of Operation Phakisa have not translated into mechanisms through which social benefits are reaching people that are intended to benefit.

As mentioned in Chapter Two, South Africa's Blue Economy was developed to meet the needs of a rapidly growing population with increasing levels of poverty, unemployment, and food insecurity. To address these challenges, Operation Phakisa was launched in 2014 as an initiative to unlock the economic potential of South Africa's Blue Economy and fast-track delivery of socioeconomic benefits (Operation Phakisa, 2014a). However, almost 10 years after its conceptualisation, a number of critical voices have already raised serious issues with the planning, implementation, and direction currently being pursued by Operation Phakisa. For example, Masie and Bond (2018: 315) characterise Phakisa's methodology in reality by "small, slow failures in planning and implementation, with miserable overall outcomes for the economy, polity, society, and ecology".

Similarly, Rogerson and Rogerson (2019) have highlighted Operation Phakisa's inability to unblock major growth and job creation roadblocks, with stakeholder engagement losing momentum, and the ineffective institutional arrangements being established. As a result, and confirmed in various Operation Phakisa reports, "outcomes are still far away from 2033 aspirations" (Operation Phakisa, 2015: 5). A study done by Pretorius (2018) revealed that Operation Phakisa had fallen far behind on its initial targets set for the aquaculture sector from 2014-2019 to implement 24 pilot aquaculture projects, provide up to 15,000 jobs, and contribute over R3 billion to the local economy. In fact, by 2020 only 2480 jobs had been created and contributed just over R1.1 billion to the local economy (Operation Phakisa, 2020).

Moreover, only 9 of the 28 (originally 24) aquaculture projects in 2020 were in production, providing jobs, and having an impact on transformation in the sector (Pretorius, 2018; Operation Phakisa, 2020). Respondents in Pretorius' study (2018: 46) suggested that, "apart from legislative reform, the majority of aquaculture projects that succeeded did so due to the involvement of external stakeholders and that these projects would most likely have succeeded in the absence of Operation Phakisa". These findings resonate with the findings in this research, and particularly in Doringbaai, where a number of DBA members and other key stakeholders argued that Operation Phakisa was a 'no-show' in helping in to establish and make their aquaculture projects a success (DBAMKI1and2, DDTKI1; PACKI1and2).

Another reason why Operation Phakisa may have fallen short in reaching its targets is that too much focus has been placed on intensifying sustainable aquaculture production through technological and market driven efforts, and too little attention has been placed on the social dimensions of recognition, inclusion, and participation of stakeholders within the development process. This is supported in the literature where Krause et al., (2015) argue that local socio-economic considerations of aquaculture are often overlooked with more focus being placed on the intensification of sustainable aquaculture through technology innovation and enhanced market interventions. The authors refer to this as part of the 'people policy gap' and argue that the consequences of not including people in aquaculture development can result in negative outcomes and be damaging to the very people, particularly HDIs and coastal communities, that aquaculture is supposed to benefit (Krause et al., 2015).

In Saldanha Bay, Operation Phakisa put a significant amount of time and resources into establishing the SBADZ, attracting public and private funding, conducting feasibility studies to determine the most appropriate technology to farm mussels, and legislative reform to speed-up

environmental authorisations and licensing approvals (DAFF, 2017; DAFF, 2018b; DAFF, 2020). However, as the results of this study have shown, limited focus was given to post-implementation support through capacity building, mentoring, and training of the SAS farmers to effectively participate in and take ownership of their mussel businesses. Instead, Operation Phakisa marked these catalyst project as being 'successfully' established and swiftly moved onto implementing other catalyst projects in order to meet their behind-schedule targets set back in 2014 (Operation Phakisa, 2014a). This was confirmed by two key stakeholders involved in the Doringbaai and Saldanha Bay aquaculture projects who stated:

> *"We are so close to making our business and partnership with the SAS farmers work. So surely we should focus on and support the industry that is almost there rather than the government hastily establishing new micro projects that have a very low chance of scaling sustainably" (NSPMKI2).*

> *"They [the government] usually have the perception that if a project starts looking good then you don't give it more support but give it to someone else. And that's the real crux of the issue where they should be giving more money to successful projects to further them, but instead they tangent off onto other projects which will most likely collapse in a few years' time" (DBAMKI1).*

Drawing from the findings, it is also apparent that Operation Phakisa's Big Fast Results methodology has not adequately considered the benefits and losses amongst different actors involved in aquaculture development. This is despite Operation Phakisa's concern for 'transformation' and redressing the inequalities caused by the apartheid era through 'empowering black people' to participate in the aquaculture space (DAFF, 2017; DAFF, 2019b).

In Doringbaai, the results have shown that there has been a lack of benefits flowing from DBA to the wider community who feel excluded from the benefit sharing process due to flaws in the institutional arrangements established to distribute benefits (DBPSKI1; DBKI1-5). In Saldanha Bay, all of the SAS farmers interviewed stated that they felt disempowered by their aquaculture ventures due to the high level of debt they are continually accumulating and the lack of support from their new service provider and the government (SASKI1-4).

7.5 Conclusion

This chapter has discussed several factors that enhanced and impeded benefit sharing. It has also critically examined the perceptions and experiences of benefits in Doringbaai and Saldanha Bay. It was apparent that the negative impacts identified in both case studies including a lack of trust, feelings of exclusion, and unequal benefit sharing centred around flaws in the nature of institutional arrangements and partnerships set up to give effect to benefit sharing. The presence of a supportive enabling environment, effective partnerships, and capacity building enhances the robustness of benefit sharing mechanisms. Indeed, DBA demonstrated a commitment to including the local community members in the abalone project which helped build the company to its success. It also empowered the community members in the process through effective mentoring and further education to promote personal growth. The effects of flawed institutional arrangements and ineffective partnerships on the HDIs and communities in Doringbaai and Saldanha Bay were also discussed. It has also been highlighted how power asymmetries played a central role in shaping benefit sharing in both case studies. The last section highlighted that the high-level policy rhetoric of Operation Phakisa has not translated into mechanisms that result in benefits reaching the intended beneficiaries.

Chapter Eight: Conclusion and Recommendations

This research has contributed to improving understanding of what benefits HDIs and communities derive from involvement in Blue Economy aquaculture projects in South Africa, and whether they considered the distribution of benefits to be fair and equitable. The findings of this study have shown that there are various ways in which local communities can benefit from Blue Economy aquaculture development initiatives, but the mechanisms for benefit sharing may also lead to exclusion and result in negative impacts and losses. This study has identified some of the key factors enabling and inhibiting equitable benefit sharing from aquaculture projects involving HDIs and communities in South Africa. The results have shown the importance of establishing robust partnerships in order for aquaculture projects to be effective and viable. Partnerships that are inclusive, transparent, accountable, and supportive are crucial for the long-term success of these projects.

Using Wynberg and Hauck's (2014) conceptual framework for benefit sharing, it is clear that the benefit sharing mechanisms in both case studies were underpinned by unequal power relations between the different stakeholders involved. Power has thus been shown to be a significant factor that affects the ability of people in both case study sites to benefit from aquaculture development and in particular, the extent to which decision makers involve people in the process of deciding how benefits are distributed. This is an issue that has been found in several other studies (e.g., Ribot and Peluso, 2003; Mbatha and Wynberg, 2014; Wynberg and Hauck, 2014; Sowman et al., 2023). This research affirms the significance of power asymmetries in determining equitable benefit sharing.

The aquaculture sector has been frequently cited as a 'frontier' for economic growth that can provide jobs, enhance food security, and relieve the pressure of capture fisheries (Österblom et al., 2020; Cisneros-Montemayor et al., 2022a). This study has shown that the ambitious targets set by Operation Phakisa's high-level policy initiatives to develop the aquaculture sector, provide jobs, and enhance food security have not been achieved. The narrative in high-level policy documents and progress reports published by Operation Phakisa convey a focus on 'production', 'jobs', and 'investment' in existing and new aquaculture projects. However, key benefit sharing considerations such as social equity, participation, capacity building, and fair distribution of benefits are not a key focus in determining success. Indeed, the predominant focus on improving market interventions and technological innovation may enhance the growth of aquaculture but this approach runs the risk of overlooking other key considerations to achieving equitable and sustainable aquaculture development (Bennett et al., 2019; Österblom et al., 2020).

Wynberg and Hauck (2014) argue that increased recognition is being given to the flaws of 'monistic' methods of common benefit sharing approaches used such as cost-benefit analysis or ecosystem service valuation. This is because these approaches fail in their attempts to 'objectively' measure diverse values in intricate socioecological systems that have complex power dynamics, are inherently political, and have various ways of expressing value. Thus, although the intentions of Operation Phakisa in trying to promote transformation of HDIs and communities in the aquaculture space is commendable, it is likely that no meaningful transformation will be realised if the 'business as usual' approach to benefit sharing remains unchanged. Instead, it is critical to acknowledge the complexities involved in understanding and implementing benefit sharing where there are a range of actors, resources, institutional arrangements as well as economic, social, and political influences (Wynberg and Hauck, 2014; Cohen et al., 2019).

As the results of this study have demonstrated, there are various components of benefit sharing that can enhance and also block access and equitable benefit sharing if not carefully considered. Therefore, to achieve more equitable benefit sharing it is imperative that ecological as well as social equity considerations such as participation, effective communication, transparency, and accountability are included in Blue Economy planning and decision-making (Cohen et al., 2019; Sowman et al., 2023). This will in turn facilitate planning, implementation, and monitoring that allow for the incorporation of sustainable aquaculture and social equity considerations throughout the process.

The aquaculture sector in South Africa faces major transformation challenges as effective participation of HDIs and communities is lacking (Bond, 2019; Brown-Webb et al., 2022b). Moreover, aquaculture is a highly technical and capital-intensive enterprise that is difficult to enter into especially for HDIs and communities who have limited access to funding, capital, technology, and skills. The provision of effective post-implementation support such as mentoring, training and capacity building is crucial for the long-term success of aquaculture ventures in South Africa, especially for SMMEs involving HDIs and communities (Britz and Venter, 2016; Brown-Webb et al., 2022b). Thus, one can argue that it is not enough for the state to provide 'an enabling environment' for emerging small-scale farmers and expect them to mature into self-sufficiency and achieve economies of scale on their own. In addition, as was the case with the DBA project, the state cannot rely on partnerships with the private sector to help realise benefit sharing. Instead, it is necessary to focus on creating an enabling environment for SMMEs that is supported at every stage including start-up, growth, maturity, until the conditions for self-sustainability are in place.

The role of the government is important in achieving benefit sharing outcomes and needs to establish the necessary policies and provide an enabling environment including access to capital and operational funding for aquaculture projects. Skills transfer and training for communities is also crucial and could be carried out with established aquaculture operators through partnership agreements. The business model and partnership arrangements for community-based projects will vary depending on the type of species being cultivated and the capability of the community. The correct model and partnership arrangement would however need to be appropriate to the particular context – the species being farmed, community context, and local environmental conditions. The advantages and disadvantages of each model would also need to be assessed in a participatory manner. It is also important to consider the extent to which the model chosen would result in empowering individuals and communities, build financial independence from government funding, and allow the aquaculture enterprise to run without relying on a private partner.

One of the main recommendations that can be drawn from this study is the need for further analyses of Operation Phakisa aquaculture projects involving HDIs and communities. This is necessary in order to learn key lessons regarding the factors that enable and those that impede successful projects that benefit local communities. Such studies would also provide further understanding of the institutional arrangements and partnerships that delivered benefits to communities and under what conditions they succeeded. Establishing incubator programmes where government, aquaculture industry experts, and emerging aquaculture entrepreneurs engage could enhance the sustainable growth of the aquaculture sector and achieve social benefits. These programmes could help impart technical knowledge and business skills needed for business owners and staff to operate and manage an aquaculture enterprise, foster a culture

of business leadership for new entrepreneurs, and provide networking channels between farmers and other key stakeholders.

This study has provided an in-depth understanding of the benefits communities derived from involvement in Blue Economy projects linked to aquaculture development. Aquaculture has the potential to contribute to economic growth, job creation, and food security. However, the benefits derived from aquaculture can be paralleled by losses for different stakeholders involved, in particular, HDIs and coastal communities. The benefit sharing mechanisms used by institutions and actors involved in the aquaculture sector can significantly influence the extent to which HDIs and communities benefit. Unequal power dynamics, flawed benefit-sharing mechanisms, lack of transparency and accountability, elite capture of benefits, and a lack of an enabling environment are some of the key factors that acts as blockages to equitable benefit sharing from community-based aquaculture development. Thus, there is a need to seriously address weak participatory processes, skewed power dynamics, and limited attention to capacity building and skills development in community-based aquaculture projects in order for more equitable outcomes to be realised. This study asserts the importance of establishing accountable, representative, and robust, institutions and partnerships in order to give effect to equitable benefit sharing from aquaculture projects involving HDIs and communities.

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Appendix A: Faculty of Science Research Ethics Committee Approval

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UNIVERSITY OF CAPE TOWN
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16 March 2021

Mr Brett Daniel Agiotis

Department of Environmental and Geographical Science

An analysis of two community-based aquaculture projects in the context of South Africa's Blue Economy

Dear Mr. Brett Daniel Agiotis

I am pleased to inform you that the Faculty of Science Research Ethics Committee has approved the above-namedapplication for research ethics clearance, subject to the conditions listed below.

- You need to submit the Human Participants Fieldwork Checklist.
- Restrictions on involving human participants in research must be adhered to, given current concerns about thespread of Covid-19. Please ensure that you are aware of and comply with UCT policy on this, as communicatedby management.
- Implement the measures described in your application to ensure that the process of your research is ethicallysound; and
- Uphold ethical principles throughout all stages of the research, responding appropriately to unanticipated issues: please contact me if you need advice on ethical issues that arise.

Your approval code is: **FSREC 030 – 2021**

I wish you success in your research. Yours sincerely

Dr Melissa Densmore

Acting Chair: Faculty of Science Research Ethics Committee

Cc: Associate Professor Merle Sowman and Dr Philile Mbatha (supervisors)

Appendix B: Informed Voluntary Consent Form

DEPARTMENT OF ENVIRONMENTAL and GEOGRAPHICAL SCIENCE

UNIVERSITY OF CAPE TOWN
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Informed Voluntary Consent to Participate in Research Study

Project Title: An analysis of two community-based aquaculture projects in the context of South Africa's Blue Economy

Invitation to participate, and benefits: You are invited to participate in a research study conducted with key stakeholder groups in Saldanha and Doring Bay. The study aim is to document the perceptions of different stakeholders regarding the two aquaculture projects currently operating in both Saldanha and Doring Bay. I believe that your experience would be a valuable source of information, and hope that by participating you may gain useful knowledge.

Procedures: During this study, you will be asked to answer a few questions about the aquaculture projects in Saldanha/ Doringbaai.

Recording: We may record audio and take photographs as part of the study. If you object to this, please indicate this below.

Risks: There are no potentially harmful risks related to your participation in this study except participants may be subjected to criticism by others for talking to an outsider about their views of towards these projects. If you are worried about this being a potential risk for you, you have the choice not to participate in this research and withdraw from this research at any time if you feel uncomfortable.

Disclaimer/Withdrawal: Your participation is completely voluntary; you may refuse to participate, and you may withdraw at any time without having to state a reason and without any prejudice or penalty against you. Should you choose to withdraw, the researcher commits not to use any of the information you have provided without your signed consent. Note that the researcher may also withdraw you from the study at any time.

Confidentiality: All information collected in this study will be kept private in that you will not be identified by name or by affiliation to an institution. Confidentiality and anonymity will be maintained as pseudonyms will be used.

What signing this form means:

By signing this consent form, you agree to participate in this research study. The aim, procedures to be used, as well as the potential risks and benefits of your participation have been explained verbally to you in detail, using this form. Refusal to participate in or withdrawal from this study at any time will have no effect on you in any way. You are free to contact me, to ask questions or request further information, at any time during this research.

I agree to participate in this research (tick one box) ☐ Yes ☐ No _____ (Initials)

I agree to be photographed/audio-recorded/video-recorded (strikethrough as applicable)

☐ Yes ☐ No _____ (Initials)

I agree to the use of properly anonymized photographs/audio recordings/videos in websites and publications for research purposes (strikethrough as applicable)

☐ Yes ☐ No _____ (Initials)

_____	_____	_____
Name of Participant	Signature of Participant	Date
_____Brett Agiotis_____	_____	_____
Name of Researcher	Signature of Researcher	Date