



High Level Business Case for Drones Industry in the West Coast District

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Table of Contents

1. EXECUTIVE SUMMARY	3
2. STATE OF THE SOUTH AFRICAN DRONE INDUSTRY	3
3. GAP ANALYSIS	4
3.1 Potential growth	4
3.2 Value chain analysis	5
3.3 Human cost related to safety	6
3.4 Lost revenue due to suboptimal asset utilization	7
3.5 Forgone failure mitigation	7
3.6 Inefficiencies in substandard data collection	8
3.7 Waste associated with repetitive labour	8
3.8 Regulatory compliance	9
4. OBJECTIVE	9
5. GLOBAL DEMAND, APPLICATION AND USES	9
6. DEMAND FOR DRONES IN SOUTH AFRICAN INDUSTRIES	11
6.1 Agriculture	11
6.2 Construction	11
6.3 Mining	11
6.4 Services: Insurance/ Health	11
7. SUPPLY	12
7.1 Overview of the West Coast District	12
7.2 Employment in the West Coast District	15
7.3 Economic overview of the West Coast District	15
8. WEST COAST OFFERINGS	17
9. HOW CAN THE DRONE INDUSTRY SUPPORT THE SBIDZ?	19
9.1 Gathering data for inspection	19
9.2 Security and surveillance	19
9.3 Maritime search and rescue	19

1. EXECUTIVE SUMMARY

The advent of the Fourth Industrial Revolution provided businesses with the opportunity to adopt technologies, which would allow them to abandon inefficiencies and revolutionize the way in which they conduct business. The introduction and use of drone technology into most business applications has been surging on a global scale over the last few years, which is easily identified by the size and growth of the global market. The UAV (Unmanned Aerial Vehicles) market is expected to grow at a compounded average growth rate of 16.4% to USD58.4bn (from USD27.4bn in 2021) by 2026. A pertinent reason for rampant adoption of drones into almost every industry is due to its impressive efficacy capabilities, where outdated, mundane, or dangerous work is replaced by using drones and thereby increasing productivity.

The increasing significance of the drone industry can also be deduced by the implementation of favourable legislation introduced by various governments across the globe in an effort to ramp-up the development of the industry. For example, with grand ambitions by the Indian government to become a global hub for drone manufacturing swiftly passed the Drone Liberalization Policy to significantly reduce legislative red tape and thereby rapidly grow the drone ecosystem¹. In contrast, legislation around drones in South Africa has been stagnant since its promulgation in 2015, which led to the country severely trailing the rest of the world in the development and implementation of drones for commercial use. To this end, the National Drone Council was established to address the challenges faced by the industry and act as a bridge between the private and public sector. To this end, “Operation Catch up 2023” was adopted to provide South Africa with a road map to recovery and aggressively advance the UAV sector.

It is with this in mind that the West Coast has been identified as pragmatic location to develop a drone’s ecosystem. The manufacturing, and particularly testing of drones, is loaded by significant legislative concerns for safety. The West Coast, being the second largest area by square kilometre and the second less dense region of the Western Cape, provides an ideal location for the testing of drones. The weather conditions experienced in the West Coast also provide an idyllic location for drone engineering, as drones manufacturing and testing is best suited within an arid climate.

Lastly, leaning on the proven manufacturing capabilities in the West Coast and a history of artisanal skills, the infant drone industry will benefit insurmountably from knowledge spillovers through industry support and expertise, along with the Saldanha Bay Industrial Development Zone, which provides key incentives and business support to ensure the success of the drone’s ecosystem. The success of the drone-manufacturing hub is particularly important for South Africa, particularly since notable uptake in the use of drones in various sectors such as mining, agriculture, healthcare and marine sectors has already occurred and the benefits of integrating it into other sectors are robustly being investigated by business leaders across South Africa.

2. STATE OF THE SOUTH AFRICAN DRONE INDUSTRY

South Africa has historically been at the forefront of drone development and advancement just a few years ago, since it was the first African country to promulgate drone regulations in 2015² and was the first African country to grant a commercial drone license.³ However, notwithstanding exponential growth in the usage and demand for drones across various industries in South Africa, a stringent regulatory process and a lack of coordination by industry bodies has resulted in South Africa lagging behind the progress of mass drone adaptation in other countries on the continent. These unpropitious conditions had led to an unfavourable environment for foreign direct investment into the South African drone industry, thereby adversely diverting investment to other countries, which allowed them to develop their Unmanned Aerial Vehicle (UAV) industry at an accelerated rate and overhaul the once auspicious South African drone sector.⁴ To this end, the Drone Council of South Africa (DCSA) developed and facilitated the implementation of “Operation Catch-up 2023”, a plan that aimed to succinctly identify and address critical factors that ail the development, deployment and operations of drones and its commercial applications in South Africa.

¹ Source: <https://www.livemint.com/industry/manufacturing/liberalized-drone-rules-2021-to-ushe-in-growth-of-drone-ecosystem-industry-11630070249070.html>

² Source: <https://dronelife.com/2021/05/20/african-drone-regulations-how-easy-is-it-to-operate-in-the-african-market/>

³ Source: <https://itweb.africa/content/DZQ58vPPjnMzXy2>

⁴ Source: <https://www.engineeringnews.co.za/login.php?url=/article/drone-council-seeks-to-help-the-industry-by-influencing-government-2020-12-04>

Among the various critical issues that hinder the massification of drone adoption in South Africa, a prominent factor emerging is the lack of regulatory capacity, which result in delays in approving licenses for drone operators and pilots.

To put this into perspective, to obtain a remotely piloted aircraft systems (RPAS) operating license can take up to 18 months and nine months to receive authority to fly a registered drone. In contrast, a drone-operating license can be secured in 48 hours in Rwanda. Moreover, there are currently 26 drone license holders (up from 24 registered in 2018) registered with the South African Civil Aviation Authority (SACAA) and 86 RPAS operators. This was out of the 300 companies that applied for a RPAS license almost three years ago.

A further cumbersome obstacle is the cost of set up. In South Africa, a company would need qualified pilots as employees to obtain an operating license. The average basic salary paid to entry-level pilots of this nature ranges between R15,000 – R16 000 per month, with more experienced pilots expected to earn much more. Given the infancy of the industry, majority of these businesses trying to penetrate the drone industry are Small to Medium Enterprises (SME's), and few can afford these pilots if they do not have the license to generate revenue. Moreover, it costs approximately R20, 000 and R25,000 to obtain a pilot license and between R150,000 to R200,000 for an operator license.

3. GAP ANALYSIS

Notwithstanding the current state of the drone industry outlined above, South Africa is still in a position to become an industry leader if the pace of technology adoption and a supportive regulatory reform is aligned to the rapid growth experienced in the drone industry. Further, research conducted by the Commercial Unmanned Aviation Association of South Africa (CUAASA) showed that job creation is imminent, adding that a well-developed industry could create as much as 40,000 jobs over a ten-year period.

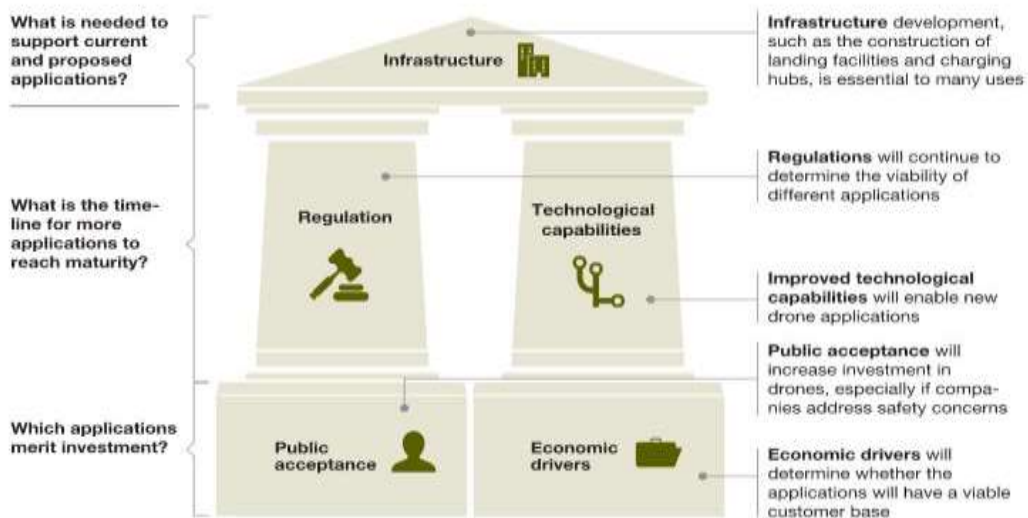
3.1 Potential growth

Although there is unequivocal consensus of the significant future role that the drone industry will play in the global market, the extent and realisation of its promising growth is still conditioned on a number of factors. According to research published by Mckinsey, there are five factors which will determine the value of the drone industry in the future, which can be observed in the figure below. At the very foundation, public acceptance of drones as a general business practice is at the forefront of this consideration. According to a 2016 poll conducted in the US market, only 44% of respondents supported the use of drones for delivery services. However, in 2019, packages were delivered to consumers' homes using drones in Virginia, with a resounding 87% of people satisfied and approving the use of drones as a delivery service. ⁵

⁵ Source: <https://insideunmannedsystems.com/drone-delivery-gets-positive-response-in-recent-survey/>

FIGURE 1: FIVE FACTORS THAT WILL INFLUENCE THE GROWTH IN UAS INDUSTRY

Five factors will influence UAS growth.



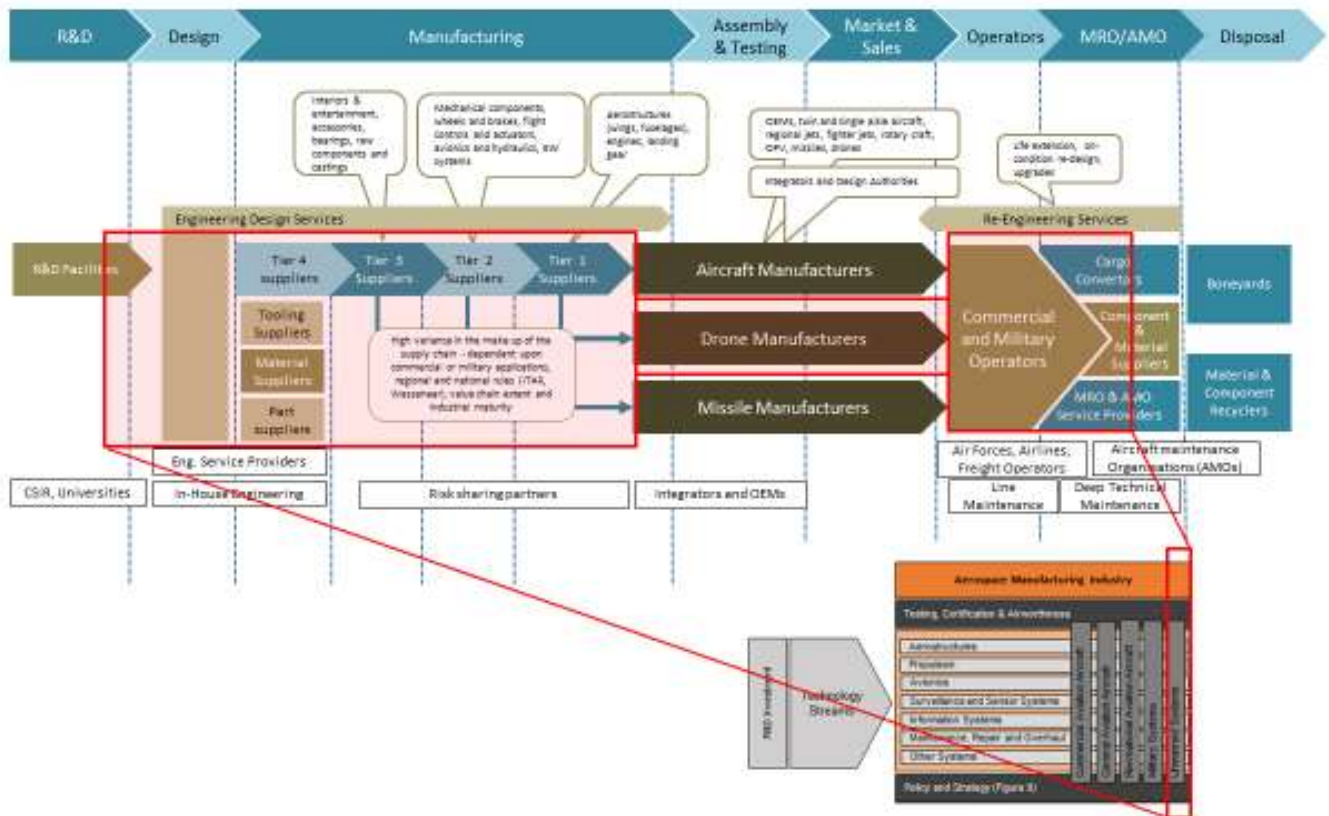
Source: Adapted from McKinsey & Company, *Commercial drones are here: The future of unmanned aerial systems*, December 2017

3.2 Value chain analysis

The chart below provides an overview of the drone value chain in South Africa. There are currently 15 commercial operators and 600 RPAS license holders, of which 100 are for commercial use. Further, there are 10 manufacturing companies in the aerospace space (Tier 1 = 5, Tier 3 = 1 and Tier 4 = 4), with two in propulsion (Tier 1), one in avionics (Tier 2) and two in Maintenance, Repair and Overhaul (MRO). Although South Africa has a proven record of accomplishment in manufacturing of world class drones, these impressive engineering capabilities are concentrated in a small number of well-established small to medium sized drone manufacturers. This infancy in the local supply chain is mostly due to prominent sector constraints such as an opaque national strategy and vision by industry bodies, lack of access to development capital and a notoriously inexpedient regulatory process.

In contrast, India, which quickly realized the positive impact that widespread drone utilization can have on the economy, recently implemented the Drone Liberalization Policy with the ambitious goal to make India the global hub for drones by 2030. A prominent feature of the new policy is the relaxation of a number of procurement and usage red tape, making the technology affordable and accessible. If South Africa is going to be a major global player in the supply of drones, they will need to radically change the way in which the drones ecosystem is viewed, and fast-track liberalization policies which could assist in the proliferation of the industry.

FIGURE 2: SOUTH AFRICAN DRONES VALUE CHAIN



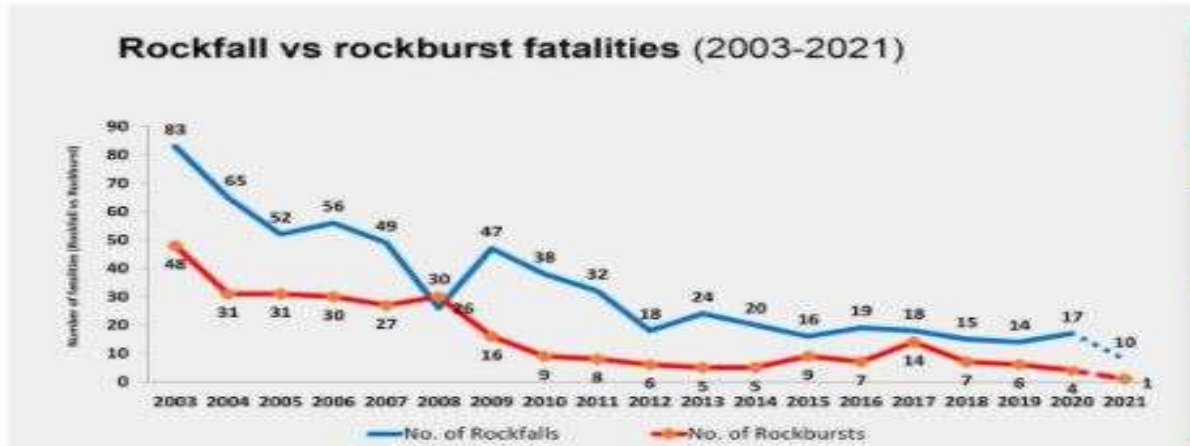
Source: Updated Value Chains, Aerospace and defence, 2021

3.3 Human cost related to safety

The use of drones are particularly valuable in the case of dirty, dull and dangerous work. According to the Department of Mineral Resources and Energy, more than 11,000 mineworkers have died in South African mines over the period 1984 to 2005. Moreover, despite the death toll in mines reaching an all-time low in 2019 with 51 casualties, this number climbed to 60 in 2020. More recently, the South African mining industry recorded 32 fatalities halfway through the 2021 financial year, with 11 of these deaths occurring due to rock falls and rock bursts⁶.

⁶ Source: <https://www.dailymaverick.co.za/article/2021-07-08-underground-hazards-work-related-deaths-in-south-africas-mines-rose-33-in-the-past-six-months-minerals-council/>

FIGURE 3: ROCKFALL VS ROCKBURST FATALITIES IN SA MINING
Focus on falls of ground



Source: Daily Maverick. Press Release 08 July 2021.⁷

To this end, the mining industry has become acutely aware of the efficiencies and safety benefits provided by using drones as an essential part of their operations. For example, drones are used in the Rio Tinto Kennecott mine in Utah to identify safety risk – which includes the identification of rock movement and signs of cracks, which generally leads to rock bursts and rock falls (Raj, 2019)⁸.

3.4 Lost revenue due to suboptimal asset utilization

Drones provide an alternative method to business processes by providing safer, cost-effective solution, thereby allowing companies to increase their revenue stream, stimulate growth and curtail redundant and repetitive work. For example, for crops to be manually sprayed with herbicides may cost a farmer about R10,000 a hectare whereas if a drone were deployed, this cost would be drastically decreased to around R1500 a hectare, which is quicker and more effective. In India, cost-effective solutions is expected to perpetuate from the rapid-growing drones ecosystem in industries such as medicine delivery, agriculture and emergency response.

Another further illustration of the benefits of using drones can be seen through innovative operations of AT&T, a communications giant situated in the United States. AT&T will deploy drones to inspect more than 65,000 cell towers in the US, which was usually done through manual inspection⁹. However, the cost component of manual labour when inspecting these towers were enormous, especially since the need for upgrades were constant and workers would need to climb the 100 feet towers with components out of reach. To this end, the extended use of drones has the potential to reduce the cost of inspection by 50%, reducing the price of each inspection by \$5000¹⁰. This comes off the backdrop of the Federal Aviation Administration (FAA) passing new regulations which will quickly see the expansion of drone usage for commercial purposes as opposed to the extensive military application seen thus far.

3.5 Forgone failure mitigation

The use of drones could directly mitigate cost of failure. To put this into perspective, it is estimated that acts of cable theft and vandalism cost South African State-Owned Enterprises approximately R7 billion a year, with a spill-over cost effect to the economy of R187 billion annually¹¹. Moreover, many small businesses are heavily reliant on internet connectivity, particularly during the advent of the fourth industrial revolution where an online presence is vital for on-going business operations. Cable theft could leave households and business without internet connectivity and electricity for days, severely affecting their business. The use of drones to police

⁷ Source: Daily Maverick. Press Release 08 July 2021. Underground hazards: Work-related deaths in South Africa's mines rose 33% in the past six months — Minerals Council. <https://www.dailymaverick.co.za/article/2021-07-08-underground-hazards-work-related-deaths-in-south-africas-mines-rose-33-in-the-past-six-months-minerals-council>.

⁸ Source: Raj, P., 2019. Use of drones in an underground mine for geotechnical monitoring. *Department of Mining and Geological Engineering*.

⁹ <https://www.computerworld.com/article/3097487/att-sees-cost-savings-with-drone-inspections-of-cell-towers.html>

¹⁰ <https://enterprise.dronerds.com/how-using-drones-instead-of-workers-can-lower-inspection-costs-drone-surveying-vs-manual-surveying/>

¹¹ <https://www.iol.co.za/business-report/companies/cable-theft-vandalism-cost-sa-firms-r7bn-a-year-8fd38f89-ab08-42b9-947c-a34a5e1cb29b>

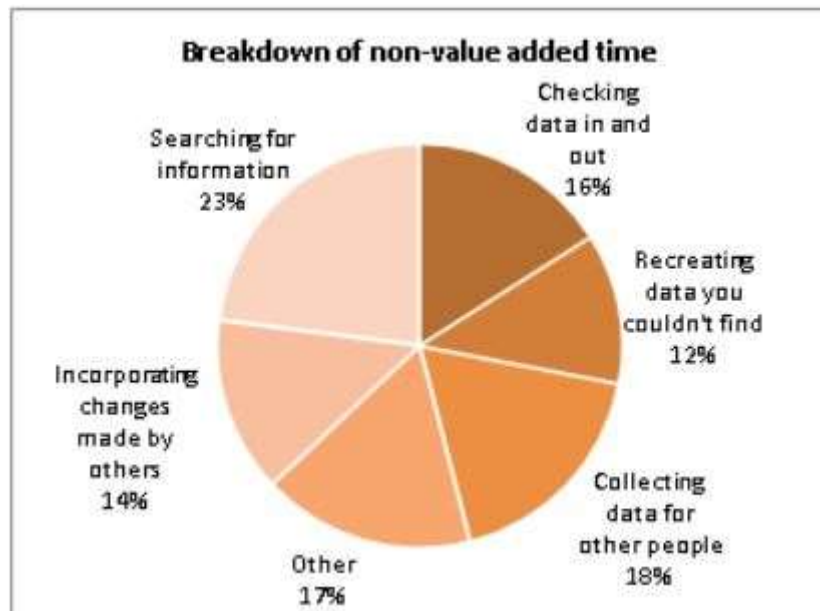
cable theft and vandalism can save the country of South Africa billions, as drones are able to detect movement in key locations or illegal access points. This key ability would reduce the cost of surveillance, mitigate the risk of loss of human life and provide live feeds and greater data and information to create more countermeasures that are effective.

In the mining industry, drones are able to capture and process thousands of high-resolution images and able to process the resulting data quicker and more efficiently. With AI-driven visual analysis, predictive modelling and 3D elevation models all provided by the use of drones, mining companies are able to gain a holistic view of the mine and pinpoint safety issues that dictate immediate action, thereby mitigating the risk of failure and tragic events even before it occurs.¹²

3.6 Inefficiencies in substandard data collection

Sub-standard data collection from the South African mining industry, particularly as it pertains to poor quality and data integrity, will inevitably lead to downstream increases in administration time and costs. Further, a study by Tech Clarity found that 32% of an engineer's time in mining is spent on non-value added work. That is, two hours out of an eight-hour day is wasted. As seen below, searching for information (23%), data collection for others (18%), checking data in and out (16%), and even recreating data (12%) are among the highest ineffective practices making up wasteful work.

FIGURE 4: BREAKDOWN OF NON-VALUE ADDED TIME IN MINING ENGINEERING



Source: GEOVIA Blog, driving digital transformation in mining, 2019¹³

Across the mining industry, the use of drones has demonstrated significant results by improving the quantity and quality of the data collection and analysis process in most aspects of the mining workflow. For example, drones improve site safety management by collecting volumes of visual data from volatile and high terrains and also from blast sites, thereby improving overall safety on the ground. Drones also provide an alternative to hiring a piloted plane for surveying and mapping of mineral sites, which is generally a time-consuming process. The use of drones in this regard can save the mine 90% of the cost per hour and collect unlimited aerial data.¹⁴

3.7 Waste associated with repetitive labour

A study carried out by Unit 4, a leader in enterprise systems for service organizations, found that office workers spend 69 working days per annum on redundant, repetitive tasks, which loosely translates to a global lost

¹² Source: Drones R Africa, 2020. <https://dronenews.africa/the-case-for-drone-technology-in-mining/>

¹³ Source: <https://blogs.3ds.com/geovia/the-real-cost-of-ineffective-data-and-file-management-in-mining/>

¹⁴ Source: Mining Technology, 2021. Drones in mining. Drones applications in mining. <https://www.mining-technology.com/comment/drone-applications-mining/>

productivity cost in the services sector of \$5 trillion annually.¹⁵ Further, serious workplace injuries in manufacturing cost United States manufactures around \$7 billion per annum, with majority of these injuries occurring due to overexertion, falls, collisions with equipment and repetitive motion injuries. From the list, overexertion is the most frequent manufacturing industry, accounting for around \$1.77 billion annually, with lifting, pulling and pushing heavy objects at the forefront of these injuries. The use of drones in manufacturing is becoming increasingly important to mitigate such risk, as drones are equipped to capture thermal images to identify temperature changes, and could inform when machinery is too hot and in need of quick and proactive action.¹⁶

3.8 Regulatory compliance

Drone regulations have seen rapid evolution within the global context over the last few years, as legislators and key industries bodies across the globe recognize the insurmountable value emanating from a well-regulated drones ecosystem. For example, the United States' Federal Aviation Authority (FAA) has recently published extensions to their drone regulations to allow for routine operations over people and routine operations at night. This rule significantly lowered the barrier for operating drones as it does not require large corporations to apply for permission from the FAA and cuts down on significant time-consuming and expensive processes. Further, India issued the New Liberalised Drone Rules; effectively the Indian Government cut back drastic measures of control, abandoning mandatory approvals such as unique authorisation numbers, unique prototype identification numbers, a certificate of manufacturing and airworthiness in an effort accelerate AI and robotics-enable technology and make the use and procurement of drones accessible and affordable. Meanwhile, drone regulations in South Africa remain rigid, time-consuming and costly process for business to integrate into their workflow.

4. OBJECTIVE

In light of the above, it is immensely clear that the global commercial market is moving rapidly toward a new normal. The use of drone technology will be adopted, incorporated and integrated into a wide array of commercial applications, revolutionising the way in which companies conduct business on a global scale. As mentioned, South Africa was once at the forefront of drone technology regulations, and as the global market progresses in its rapid adoption of drone technology, so should the legislation that govern them. The aim of the next section is to provide context for the global demand for drone technologies in various industries, as well as provide insight into the local demand for commercial drones in South Africa. It is against this backdrop that the significance of a well-established drone market is contextualized and a case is made for it to be established in the West Coast region in the Western Cape is purported.

5. GLOBAL DEMAND, APPLICATION AND USES

The extract below from a report produced by Markets and Markets¹⁷ shows that the global drone industry is expected to experience robust growth, increasing from USD27.4 billion in 2021 to USD58 billion by 2026, equating to a compounding annual average growth rate of 16.4%. The main driver of this impressive growth can be attributed to the increase usage of drones in commercial applications as global markets see a trend in the relaxation of rigid and growth-debilitating regulations. North America accounted for the largest proportion of global drone demand in terms of volume at 37% and is expected to continue displaying significant growth as favourable government policies are adopted in response to the expeditious demand for drones from businesses across a wide variety of industries.¹⁸

¹⁵ Source: IT Chronicles, 2017. Repetitive tasks cost \$5 trillion in lost productivity annually. <https://itchronicles.com/technology/repetitive-tasks-cost-5-trillion-annually/>

¹⁶ Source: The National Law Review, 2021. Manufacturer Operations and workplace safety in the age of drones. <https://www.natlawreview.com/article/manufacturer-operations-and-workplace-safety-age-drones>

¹⁷ Source: Markets and Markets, 2021. Unmanned Aerial Vehicle (UAV) Market by Point of Sale, Systems, Platform (Civil & Commercial, and Defense & Government), Function, End Use, Application, Type, Mode of Operation, MTOW, Range, and Region - Global Forecast to 2026. URL: https://www.marketsandmarkets.com/Market-Reports/unmanned-aerial-vehicles-uav-market-662.html?gclid=CjwKCAjwhuCKBhADEiwA1HegOQcnRvq2k4hLjrTytIjC86K76rXWNVICm08NIKcYcz4cAIKdoOzyhoCkf0QAyD_BwE

¹⁸ Source: Grand View Research, 2021. <https://www.grandviewresearch.com/industry-analysis/global-commercial-drones-market>

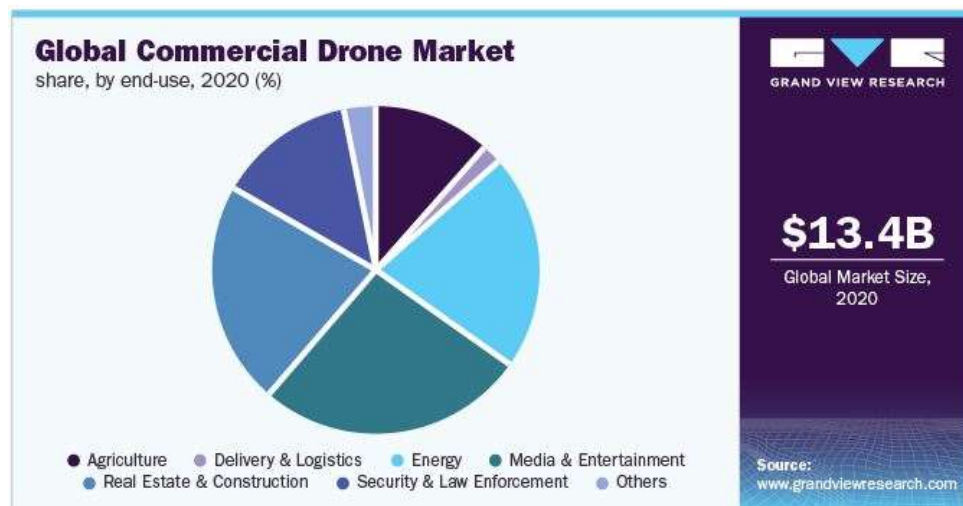
FIGURE 5: GROWTH OUTLOOK FOR THE GLOBAL UAV INDUSTRY



Source: Markets and Markets, 2021

Grand View Research, in its drone market report 2020, estimated the global market size of the drone industry at USD13.4 billion in 2020. The media and entertainment segment, particularly in filmmaking and advertising applications, accounted for the largest market share, which was estimated at 27.0% in 2020 and is expected to continue dominating global market demand for drones. With explosive demand for swift delivery of goods and a rapid rise in consumer preference for e-commerce, the demand for drones in the delivery and logistics segment is expected to grow at a compounded average growth rate of 60% per annum from 2021 to 2028.

FIGURE 6: GLOBAL DRONE MARKET BY SECTOR BREAKDOWN, 2021



Source: Grand View Research, 2021

6. DEMAND FOR DRONES IN SOUTH AFRICAN INDUSTRIES

6.1 Agriculture

There is robust demand for drones in the South African agricultural sector, with drone technology accelerating change as farmers innovatively used drones to increase their efficiency in farming practices. For example, at Elsenburg, drones are used for monitoring crops and farmland, assess the health of the vegetation, track animals and assess crops in need of special attention. This has resulted in a decrease in the use of chemical fertilizers, which lead to efficiency gains, reduced input costs and improved revenue.¹⁹ Furthermore, demand for drones among sugar cane farmers have been soaring over the last three years, given the technologies unique ability for precise and consistent application of pesticides²⁰. To place the demand for crop-spraying drones into perspective, around 500ha of crop spraying has been executed from its first legal flight in May 2019 to the end of November 2019.

6.2 Construction

The global demand for drones in real estate and construction is expected to reach USD20 billion by 2025, as the use of drones in the construction industry automate the entire field-to-plan process and accelerate accuracy to unprecedented degrees. With such promising prospects, the South African construction industry follows a similar trend²¹. A pertinent reason for an increased demand for drones in the South African construction industry stems from increased efficiencies in site inspection, as well as to curtail corruption. To the latter end, the extent of corruption in the construction industry was illuminated by the largest scandal back in 2010 where a group of construction companies colluded to increase the cost of the World Cup stadium by USD1 billion back in 2010. According to Chris Heathcote, CEO of the global construction hub, “corruption can increase the cost of infrastructure by 40%”. It is against this backdrop that drones in the construction industry is swiftly rising in South Africa.²²

6.3 Mining

Further, there is burgeoning demand for drones in South Africa’s mining sector, particularly owing to the proven efficiencies and safety benefits that drones usage provides. Moreover, drones usage in mining is also effective in mitigating the risk of cable theft at night as drones are equipped with thermal cameras and can provide rapid and unlimited live feed data on a continuous and consistent basis. A tangible example of the demand for drones in the mining industry is the appointment of Delta Drone International by global leading platinum producer Anglo American Platinum Group in 2021 in Mogalakwena²³, South Africa. Delta Drone’s ‘Rocketmine’ brand is contracted to provide the mining giant with drone-based survey mapping, blast monitoring and inspection services. Given the enormity and influence of Anglo American’s position as market leader, it is expected that a new precedent has been set and other mines are expected to wholly integrate drone-based services into its operations. This will surge demand for drones in all aspects of the mining industry.

6.4 Services: Insurance/ Health

The insurance industry is also rapidly integrating drones into their business practice. Drones used in the insurance industry generally has two major objectives: improved risk management through enhanced data collection processes and reduced operational costs through an increase in claims efficiencies. Old Mutual, a leading financial services firm in South Africa, is in the process of obtaining its remotely piloted license and once successful, drones will be used in the assessment of car accidents²⁴. A further use for drones will be to limit insurance fraud through capturing aerial images of properties when policies are initially entered in to, compared to images after damage has occurred – thus mitigating the risk of claiming for existing damage by policyholders.

¹⁹ Source: University of Stellenbosch. The future of the Western Cape agricultural sector in the context of the 4th industrial revolution.

²⁰ Source: <https://www.engineeringnews.co.za/article/effective-drones-well-received-by-struggling-farmers-2019-12-06>

²¹ Source: <https://propertywheel.co.za/2017/07/local-construction-industrys-interest-in-drones-intensifies/>

²² Source: Drone Videos.com. South African Government to use drones in construction sites, 2021. <https://dronevideos.com/south-african-government-to-use-drones-on-construction-sites/>

²³ Source: <https://www.suasnews.com/2021/07/delta-drone-international-appointed-by-anglo-american-platinum-group-in-mogalakwena-south-africa/>

²⁴ Source: <https://businesstech.co.za/news/hardware/364902/south-african-insurers-will-begin-using-drones-to-check-claims/>

Drones utilization in healthcare is becoming increasingly important and therefore demand for a fully integrated drone-based service in healthcare is surging in South Africa²⁵. For example, the South African Medical Research Council in April 2021 began evaluating the use of drone technology to combat Malaria. Drones would essentially provide an aerial view of the area where a malaria case has been diagnosed in order to identify mosquito-breeding sites and disinfect the area. Staff members needing to walk around the site and manually identify a site usually do this ineffectively, as the infected area may lay far off the pathway of the staff. Other health services, which is rapidly demanding the use of drones, are blood transport services. The South African National Blood Services launched a drone-based blood delivery system in May 2019 to assist in delivering blood to needy patients in remote areas of Kwazulu-Natal and Eastern Cape. Further, the use of drones are also increasing becoming vital to emergency response tactics. To illustrate this, the Western Cape Government became the first province in South Africa to be allowed to fly drones legally as part of its emergency medical services. To this end, drones will likely become an integral part of emergency services such as search and rescue, drownings, mountain rescues and driving accidents.

7. SUPPLY

Notwithstanding the constraints in the South African drone industry, the country is still in a reasonably well position to take advantage of the global boom as demand for high quality and low cost drones keeps soaring. Although China has positioned itself as a global hub for drones manufacturing, the quality and reliability of these drones are dubious. In contrast, a small group of drone manufacturers for many years now has been on the forefront of producing superlative drones for the South African commercial and military market. In addition, South Africa's depth of expertise in producing superlative drones such as the Bateleur MALE and signal intelligence drones, is primarily owed to its well-constructed supply chain. With world-class universities producing highly skilled engineers to go into the UAV market, and the depth of expertise in the private sector and academia, South Africa still have an unwavering opportunity to capture a significant portion of the UAV market if the environment within which these manufacturers operate become favourable for advancement. To this end, the West Coast region of the Western Cape have been identified as a potential hub for drone manufacturing and engineering. To demonstrate this inclination, the next section will outline the economic development of the West Coast and posit relevant offerings, which could be utilised to establish an advanced UAV ecosystem.

12

7.1 Overview of the West Coast District

The West Coast (Weskus) is a district in the Western Cape that can be found on the western coastline of South Africa along the Atlantic Ocean. It is situated on 31,101km² of land. The district is bordered by the Namakwa District Municipality in the Northern Cape Province to the north and northeast, by the Cape Winelands District Municipality to the southeast, and the City of Cape Town to the south. The district is divided into five local municipalities, namely, Matzikama, Cederberg, Bergrivier, Saldanha Bay and Swartland.

FIGURE 7: FISUAL OF THE WEST COAST AREA, 2021



Source: Wesgro, West Coast District Factsheet, 2021

The West Coast district is the fourth largest district, by population size, in the Western Cape (accounting for 6.58% of the province's population in 2020). The population of the West Coast has been growing at an average growth rate of 2%. The district's population increased from 453 154 in 2019 to 460 813 in 2020. It is estimated

²⁵ Source: <https://www.spotlightnsp.co.za/2021/04/26/how-drones-are-used-in-sas-health-services/>

that the population of the West Coast will increase to 530 860 by 2024 (West Coast Integrated Development Plan, 2019). Furthermore, in 2020, the Coloured population constituted the largest ethnic group, accounting for 68.55% of the province's total population, followed by the Black African and the White population groups, representing 19.25% and 11.67%, respectively.

TABLE 1: WEST COAST KEY INDICATORS, 2021

WEST COAST KEY INDICATORS		
1	Executive Mayor	Alderman JH Cleophas
2	Population (2020)	460 813
3	Real GDP at basic prices (2020)	ZAR18.71bn
4	Unemployment (2020)	11.65%
5	Literacy rate [20+ years] (2020)	71.98%
6	Ethnic groups (2020)	Coloureds (68.55%), African Black (19.25%), Whites (11.67%) and Indian or Asians (0.53%)
7	Gini Coefficient (2019)	0.539
8	Human Development Index (2020)	0.782

Source: Wesgro, West Coast District Factsheet, 2021

It is important for drones manufacturing and thereby, testing, to occur at an acceptable level of safety of persons and property, particularly if these are happening under adverse weather conditions. Drones are generally flown close to the ground during testing and therefore more vulnerable to adverse weather conditions that occur at lower altitudes. Adverse weather conditions such as rainfall and strong winds could compromise the safety of the UAV system, particularly in UAV systems that use cameras for stability and navigation as rainfall may reduce the contrast required for the camera to discern movement. In contrast, frequent gustily winds may pose a potential danger to operating drones as correcting remotely piloting drones may not be sufficient to ensure safe operation under these conditions. With wind speeds exceeding 32km/h, the remote pilot may experience difficulties in navigating the equipment and thereby could lead to risk of collision with people, aircraft and obstacles. To operate drones under these conditions requires copious amounts of practice and patience. It is therefore imperative that a drones manufacturing hub be erected in a relatively remote part of the country with close to ideal weather conditions.

Although the West Coast was the Western Cape's fourth most populace district in 2020, its area coverage of 31,118km² makes it the second largest district by square kilometre area coverage and the second smallest district by population density, with only 14.81 people per square kilometre. Furthermore, with the West Coast situated on the coast of the Atlantic Ocean and at the Southern part of the Namib dessert, the climate is generally arid with little to no rainfall during the year. Moreover, there are no major cities located in the West Coast, and with the Benguela current cooling the ocean throughout the year, the climate is constantly mild with daytime temperatures reaching around 16 degrees Celsius in winter and around 20 degrees Celsius in summer.²⁶ It is to this end that the West Coast District provides a pragmatic opportunity for the development of an extensive UAV manufacturing and testing hub in South Africa.

TABLE 2: WEST COAST DENSITY, 2021

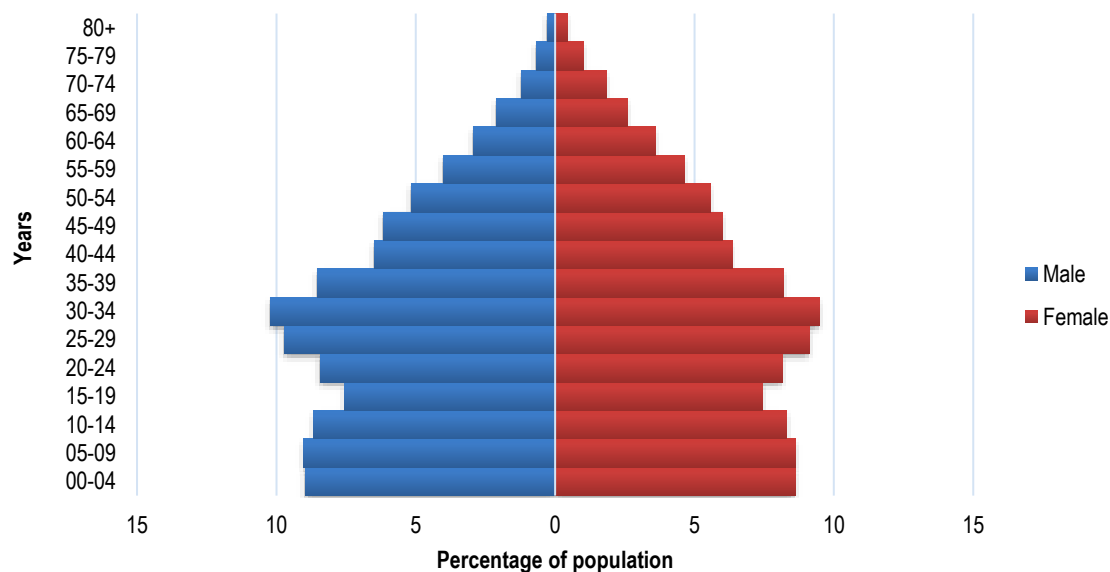
	Area (Square kilometre)	Population density (Number of persons per square kilometre)
1	Central Karoo	38854.00
2	West Coast	31118.68
3	Overberg	12240.76
4	Eden	23331.07
5	Cape Winelands	21472.68
6	City of Cape Town	2444.96

Source: Quantec, 2021

²⁶ Source: Climates to travel, 2021. <https://www.climatestotravel.com/climate/south-africa>

Figure 8 shows the West Coast's district population distribution for the period 2020. The district is home to 460 813 people of whom 49% are male and 51% are female. The shape of the pyramid is an indication that the district has a relatively young population. About 26% of the population are young dependents (0-14 years). The district has a large working age population (69% of total population), particularly those between the ages of 20 and 39 years. This dynamic provides a great opportunity to address youth unemployment in South Africa, which reached a record high of 46.3% in the first quarter of 2021. With a relatively young labour force, an opportunity exists for early stage upskill of the youth by introducing and equipping them with the future critical skills at a high school level. In so doing, it will equip them with the vital skills needed in the wake of the fourth industrial revolution and simultaneously address the desperate skills shortage faced by ICT sector, which hinders on the development of the South African economy.

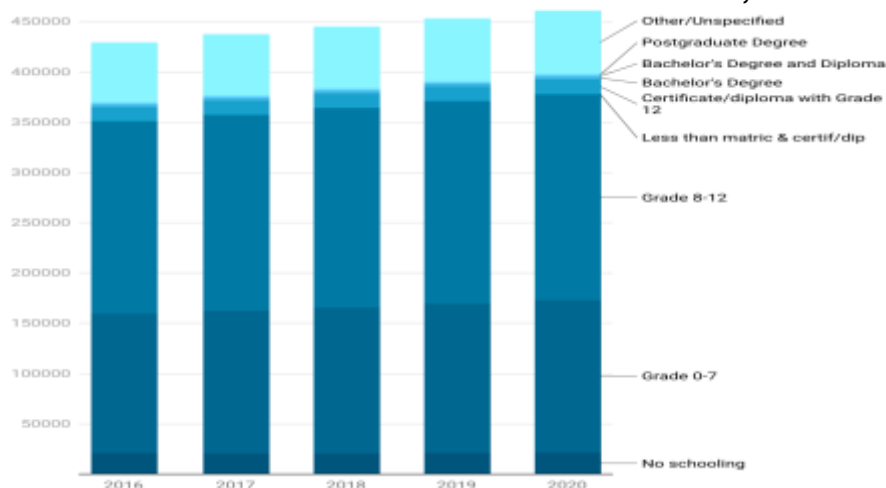
FIGURE 8: WEST COAST POPULATION BY AGE AND GENDER, 2021



Source: Wesgro, West Coast District Factsheet, 2021

The figure below shows the level of education among the population of the West Coast. Most of the population have primary and secondary education. In 2020, about 33% and 44% of the district's population had primary and secondary education, respectively. Moreover, the number of people with tertiary qualifications has increased between 2016 and 2020. For instance, the number of people in possession of postgraduate degree increased by 1.5% in 2020.

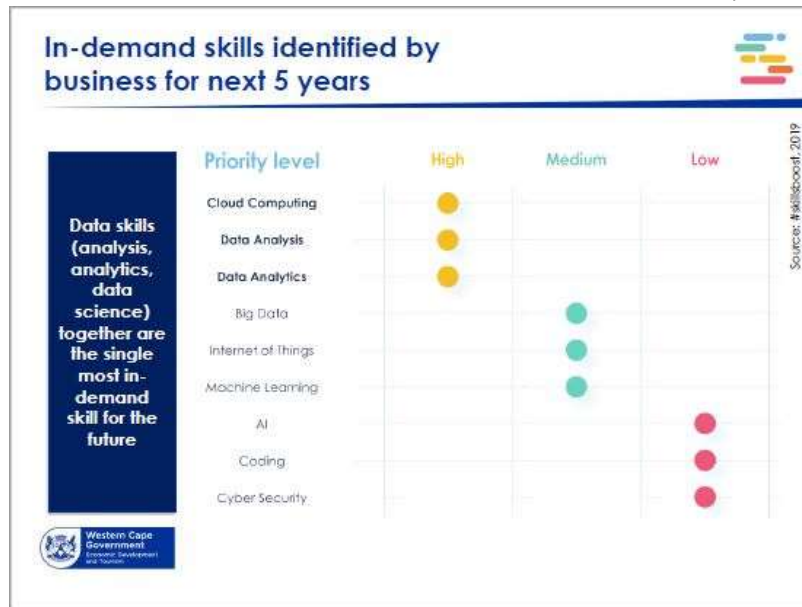
FIGURE 9: LEVEL OF EDUCATION IN WEST COAST, 2021



Source: Wesgro, West Coast District Factsheet, 2021

Although the level of tertiary educated individuals grew in the West Coast area, there is still a need to skew this growth toward sectors that will offer the greatest return on investment, not only for the individual, but also for the direction of the South African economy. A study conducted by the Western Cape found that data skills are the most in-demand skill set for South African businesses over the next five years. It is with this in mind, that the Saldanha Bay Innovation Campus has, among other initiatives, introduced a course on digital technologies for teachers as a first step to address the lack of STEM critical skills in South Africa. This course is designed to equip secondary mathematics teachers with the necessary digital skills that will enable them to integrate it into their curriculum and thereby develop the digital skill sets of their learners.

FIGURE 10: SKILLS DEMAND OVER THE NEXT 5 YEARS, 2021



Source: #Skillsboost, 2019

15

7.2 Employment in the West Coast District

The table below provides a snapshot of the 2020 labour market statistics for the West Coast district. Out of a working age population of 317 287 people, 172 910 were employed while 121 573 were not economically active. The labour force participation and absorption rates were 61.68% and 54.50% respectively. The district's unemployment rate decline from 12.05% in 2019 to 11.65% in 2020.

TABLE 3: WEST COAST LABOUR MARKET STATISTICS, 2020

Concept	2020
Working age population (Number)	317287
Labour force / economically active (Number)	195714
Employed - Formal and informal (Number)	172910
Employed - Formal sector (Number)	133385
Employed - Informal sector (Number)	39525
Unemployed (Number)	22804
Not economically active (Number)	121573
Unemployment rate (Percentage)	11.65
Labour absorption rate / employment-to-population ratio (Percentage)	54.50
Labour force participation rate (Percentage)	61.68

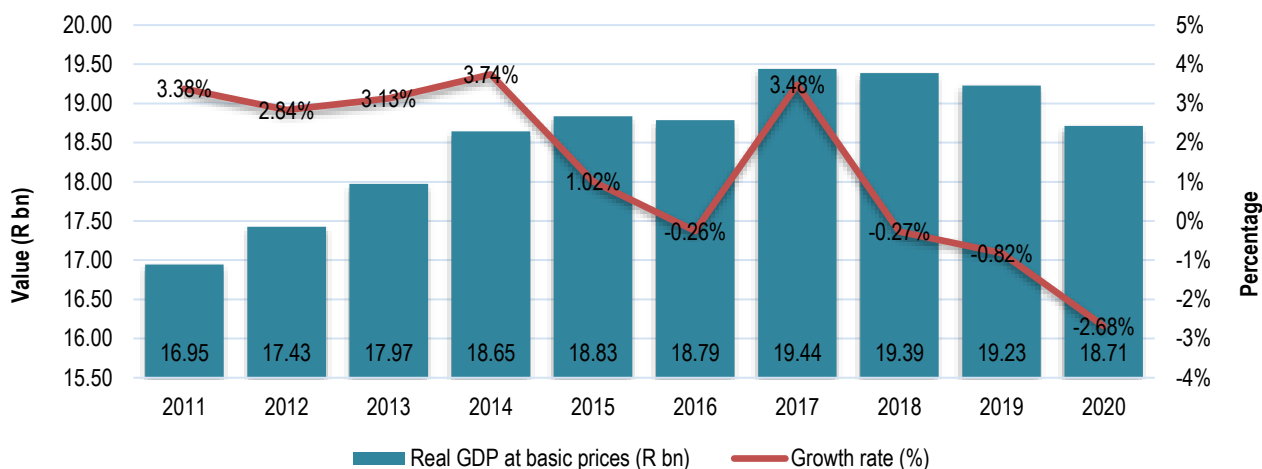
Source: Wesgro, West Coast District Factsheet, 2021

7.3 Economic overview of the West Coast District

Economic growth at the municipal level is essential for the attainment of economic development, the reduction of poverty and an improved standard of life. Fostering this growth requires an in-depth understanding of the economic landscape within which each respective municipality operates. Figure 11 shows the West Coast's real GDP at basic prices (real GVA) as well as the growth rate of GDP between 2011 and 2020. In 2020, the

real GVA for the West Coast economy was estimated at R18.71 billion. The district had negative GDP growth from 2018 to 2020. For instance, in 2020, the district's economy contracted by 2.68%.

FIGURE 11: WEST COAST'S ECONOMIC PERFORMANCE, 2021



Source: Wesgro, West Coast District Factsheet, 2021

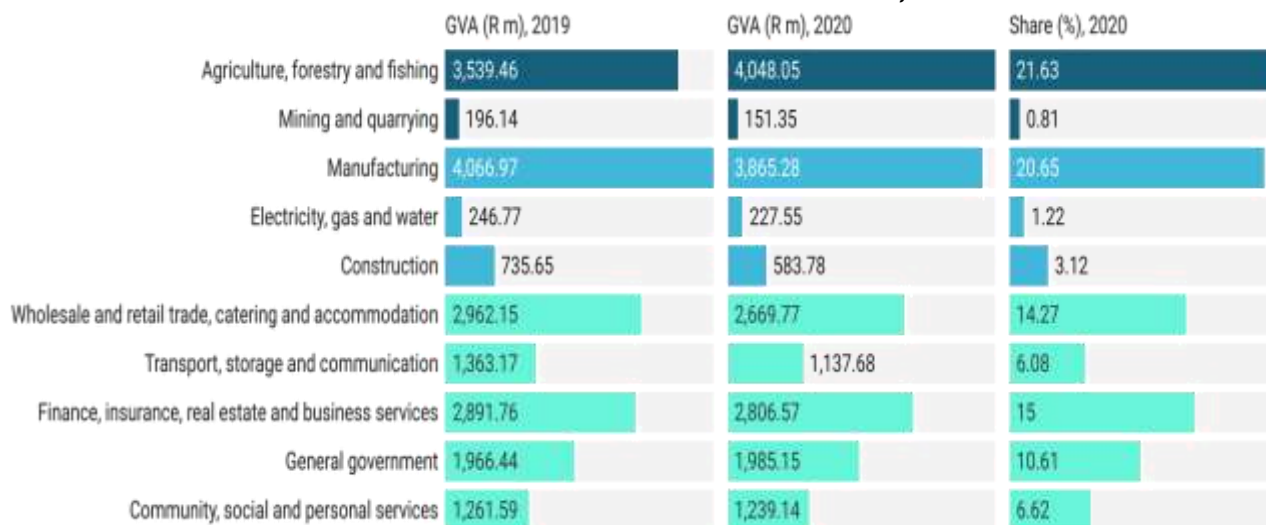
A major factor in deciding on an appropriate location of establishing a drones industry, which is still in its infancy, is the natural proven capabilities of the area and support available at a municipal level. The West Coast district has a strong manufacturing industry, contributing around 20.65% of total Gross Value Added in 2020. Production activities in the district include agri-processing, cement making, fish processing (along the coast) and mineral processing.

Other key industries in the West Coast are:

Agriculture and fishing – the district produces various agricultural products including grapes, wines, wheat in Moorreesburg, rooibos tea in Clanwilliam, fruit and forestry in the Cedarberg and citrus farming in Citrusdal. Several fishing activities such as rock-lobster fishing, line fishing and deep-sea fishing, among other activities take place on the West Coast.

Mining – the district has a sizeable mining sector. Titanium, zirconium, phosphate, limestone, sandstone, salt, and diamonds are among the commodities found in the district.

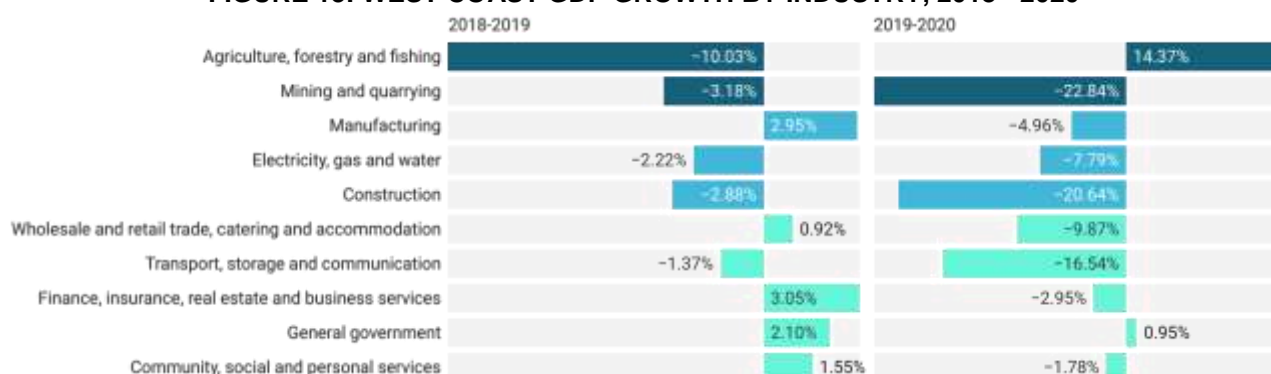
FIGURE 12: WEST COAST GVA BY INDUSTRY, 2020



Source: Wesgro, West Coast District Factsheet, 2021

Second to the finance, insurance, real estate and business services sector, the manufacturing sector recorded an impressive growth rate of 2.95% from 2018 to 2019 and the sector showed its relative resilience during the Covid-19 pandemic year, only contracting by 4.96% compared to other sectors such as mining and quarrying which fell by 22.84% in 2020.

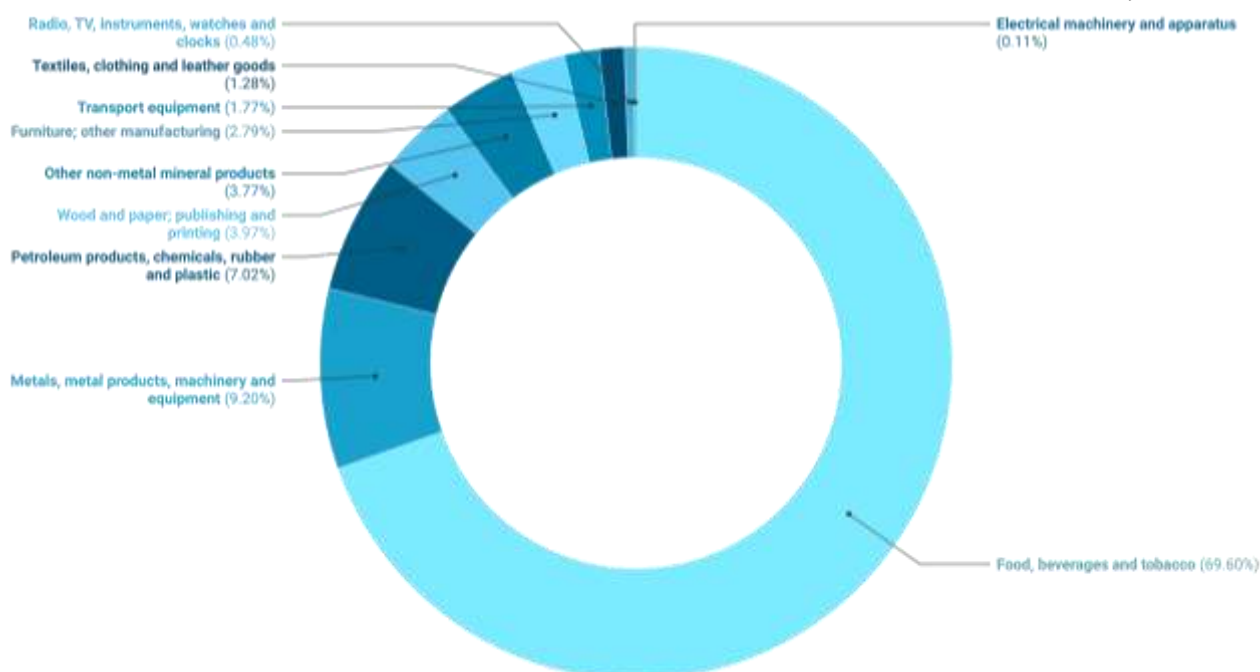
FIGURE 13: WEST COAST GDP GROWTH BY INDUSTRY, 2018 - 2020



Source: Wesgro, West Coast District Factsheet, 2021

To further demonstrate the manufacturing capabilities of the West Coast, Figure 14 shows the share of the West Coast's manufacturing sub-sectors in 2020. Food, beverages, and tobacco was the largest manufacturing sub-sector, accounting for 69.6% of the manufacturing industry's GVA. The second largest manufacturing sub-sector was the metals, metal products, machinery, and equipment sub-sector, with a share of 9.2% of manufacturing GVA, followed by petroleum products, chemicals, rubber, and plastics, which contributed 7% to the industry's GVA. It is against this backdrop that developing a drone manufacturing industry in the West Coast is a viable decision due to its robust manufacturing base, allowing for industry spill-overs and improvements in the manufacturing of UAV's.

FIGURE 14: CONTRIBUTION BY WEST COAST'S MANUFACTURING SUB-SECTORS, 2020

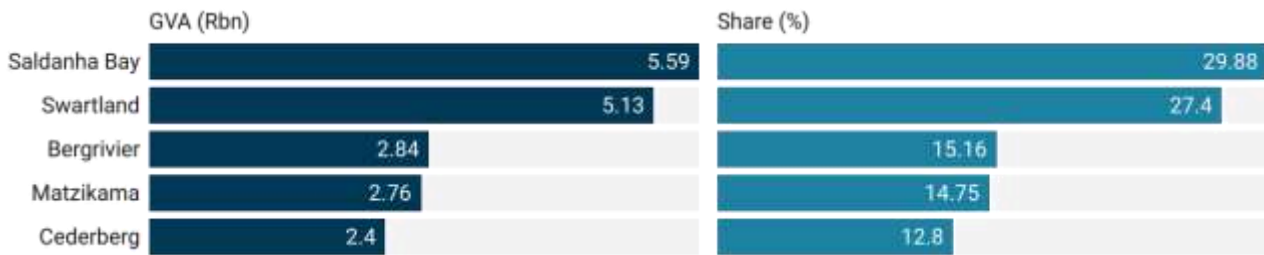


Source: Wesgro, West Coast District Factsheet, 2021

8. WEST COAST OFFERINGS

The Saldanha Bay municipal area is the largest economy within the West Coast district. Saldanha Bay is the West Coast's largest municipality in terms of its contribution to economic activity in the district. In 2020, the GVA of Saldanha Bay was R5.59 billion, representing approximately 30% of the real GVA of the West Coast economy as shown in Figure 14. The Swartland and Bergrivier municipalities were the second and third largest contributors to the West Coast's GVA, with values of R5.13 billion and R2.84 billion respectively during the same period.

FIGURE 14: LOCAL MUNICIPALITY CONTRIBUTION TO WEST COAST ECONOMY, 2020



Source: Wesgro, West Coast District Factsheet, 2021

The Saldanha Bay Industrial Development Zone (SBIDZ) was officially launched on South Africa's Southwestern coast on 31 October 2013. Wesgro acted as an administrative partner in the delivery of the Saldanha Bay Industrial Development Zone (SBIDZ) designation. The Saldanha Bay Industrial Development Zone Licencing Company SOC Ltd (SBIDZ-LC) was formally awarded an Operator's Licence for the SBIDZ. The SBIDZ is the first Special Economic Zone (SEZ) to be located within a port and is the only sector specific SEZ in South Africa catering specifically for the oil and gas, maritime fabrication and repair industries and related support services such as:

- ❖ Established relationships with both public and private sector service providers.
- ❖ Zoning and Environmental Impact Assessments (EIAs).
- ❖ Streamlined, easy to understand Investor procedures.
- ❖ Skilled labour and quality suppliers.
- ❖ Assistance in securing funding and incentives.
- ❖ Dedicated skills and enterprise development programmes.

It is with this in mind that positioning a drones hub within an SEZ will allow businesses within this industry to benefit from the much needed support services to help grow the industry while still in its infancy. However, the SBIDZ, after studying various SEZ's from across the globe, reverted that the success of an SEZ is pivoted around strong clusters that drive research, development and innovation. To this end, the Saldanha Bay Innovation Campus has been established by the SBIDZ to bolster innovation and technology capabilities and empower Saldanha Bay region with Fourth Industrial Revolution skills and opportunities.

A key initiative already implemented by the Saldanha Bay Innovation Campus was the hosting of the Drone Technology Innovation Showcase, a programme that aimed to provide a platform for the identification of drone technology application and to assist in the advancement of the industry. Pertinent outcomes of the showcase was to:

- ❖ Drive awareness in the public domain of the endless uses of drone technology.
- ❖ Bridge the gap between private, public and academia on drone technology applications.
- ❖ Provide an opportunity for African drone manufactures to develop into sustainable companies.
- ❖ Inspire the youth and educators on the endless possibilities of drone technology.

It is against this backdrop that locating a drone hub along the West Coast of the Western Cape provides the industry with an excellent opportunity to not only develop, but to excel. In so doing, the drone industry could access a wide network of peers, mentors and industry experts, take advantage of business incentives offered to companies within the SBIDZ, lean on the strong manufacturing capabilities of the West Coast region, and operate and testing of new drones within a practical climate.

Furthermore, Saldanha Bay IDZ is situated at the southernmost tip of Africa, and with a draught of 23m, makes it the largest and deepest natural port in the Southern Hemisphere. To this end, the port is not only idyllic to accommodate and service large vessels, but its ideal location provides a linkage between African and international markets. Moreover, the SBIDZ, is designated as a Customs Controlled Area (CCA) and Freeport, allows for duty and VAT-free entry of any foreign goods intended for re-export. For this reason, and together with preferential trade agreements derived from the African Continental Free Trade Area (AfCFTA), inter-Africa trade of drones and its components is expected to experience exponential growth from a drones manufacturing hub on the West Coast.

9. HOW CAN THE DRONE INDUSTRY SUPPORT THE SBIDZ?

9.1 Gathering data for inspection

Although the SBIDZ provides a logical reason for the establishment of a UAV industry on the West Coast, the converse is likewise beneficial in that a drones manufacturing hub off the West Coast will provide immense support to the functioning of the SBIDZ. This is particularly relevant as it relates to catapulting efficiencies in maritime safety and procedures. For example, the use of drones to identify ship defects while at sea could drastically reduce diagnostics time and maintenance costs of vessels. Moreover, a drone could be deployed to investigate a flair tip, which is far safer and more efficient than using an individual to climb up scaffolding. What is equally impressive is a drones ability to potentially save an oil and gas enterprises approximately a million dollars a day by being able to enter environments and conditions (such as routine industrial chimney inspections) which would otherwise have to be shut down before it can be inspected by a human, causing costly delays. Lastly, there are drones being developed, such as the Naviator drone, which can be submerged and operated under water. This is expected to have vast marine applications such as gathering invaluable data on piers, ships and docks - particularly parts of these that is submerge into water.

9.2 Security and surveillance

Perhaps the most common private use of drones is in videography, given the drones unique ability to capture photo and video image from an unlimited number of angles. To this end, the use of a 24-hour drone surveillance and monitoring capabilities is invaluable to mitigate the risk of theft, pollution or any illegal activity that might cause serious problems to the functioning of the SBIDZ. An example can be demonstrated through The European Maritime Safety Agency, which uses drones to assist in border patrol, pollution monitoring and even to detect drug trafficking and illegal fishing.

9.3 Maritime search and rescue

The use of drones in search and rescue efforts on land is commonplace, but drones with the ability to carry out such functions at sea is revolutionary. These drones are equipped with Visual Detection and Ranging (VIDAR), which gives it the ability to detect hundreds of large and small objects at sea in a wide array of varying conditions. These drones also provide the ability to reach vessels which have sent out emergency signals and locate them in real time. This video capture is able to be transmitted to a nearby aircraft on a rescue mission.

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