




The Durban Aerotropolis strategy for sustainable socio-economic development



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Background: There has been a growing emphasis on airport development strategies as these strategies contribute towards economic growth and development. An aerotropolis as one of the initiatives is a strategy that facilitates the realignment of airports into economic hubs by increasing their scope of activities.

Aim: To describe the Durban Aerotropolis strategy and contextualise its socio-economic impacts to the city and region of Durban, KwaZulu-Natal. The socio-economic factors utilised are limited to the environment, people (community) and the economy.

Methods: A qualitative research approach was adopted and used sequentially, concurrently and iteratively. The findings and recommendations are based on 12 in-depth interviews and five focus group sessions with participants from the target population.

Results: The Durban Aerotropolis development is in its initial stages of adoption, and there is evidence of early positive socio-economic impacts including employment creation, growth in imports and exports and the creation of a competitive environment.

Conclusion: The success of the strategy has been attributed to the adoption of novel strategies and concepts that enable improved logistics and mobility planning, connectivity and responsiveness, amongst other critical success factors. This has seen several strategies being considered, including roadway expansions, network designs, mobility platforms and many other infrastructural developments. This will enable purposeful planning to ensure that the region and South Africa are economically viable and competitive.

Keywords: Durban Aerotropolis; Porter's diamond model; logistics and mobility planning; aerotropolis; socio-economic development.

Introduction

Airports are considered an essential and instrumental form of infrastructure which influences economic development (Sattel & Jarrell 2014). Previously they were viewed as transit hubs for passengers and cargo; however, this has since changed, and they are now seen as strategic sites for socio-economic development (Bogdanski 2014). The importance of airports has been accelerated by the increase in the flow and movement of passengers, information and freight because of increased globalisation and trade. It is estimated that global air transportation accounts for about 40% of the total value of international trade for high-value and low-weight shipments (Kasarda 2016).

In responding to these changes, governments at national and provincial levels have forged partnerships with the private sector to achieve sustainable economic growth as guided by the Sustainable Development Guidelines' (SDGs) framework (Accelerate Cape Town 2017). Sustainable Development Guidelines are often referred to as the global goals and are part of the United Nations' agenda for sustainable development. The SDGs' framework has been applied in measuring regional progress, especially given that it has provided guidance on the questions around what development entails and how it can be achieved and measured (Centre for Quality, Growth and Regional Development 2011). This study focuses on the Durban Aerotropolis strategy, which is considered one of the recently adopted developmental initiatives aimed at advancing regional socio-economic development through public and private partnerships. As advocated in Porter's diamond model (1990), regional development depends on factor and demand conditions, a firm's strategies and related industries that create a conducive environment for economic activities.

Misago (2016) describes the aerotropolis strategy as ideal for regions with high levels of unemployment, poverty and inequality, as it is directly linked to the development of digital cities and urban regeneration. It supports the development of rural and township economies and revitalises the production sector, driving the radical economic transformation agenda (Graham 2004). Evaluating the aerotropolis strategy will be limited to determining its impacts on the environment, society and economy, which are also essential components provided for in the SDGs' framework. It is against this background that this study aimed to describe the Durban Aerotropolis strategy and contextualise its socio-economic impacts, within the challenges of the South African perspective, developmental priorities and programmes.

This study is one of the first attempts to determine how the aerotropolis, from a South African context, can be influential in addressing the various socio-economic dynamics of the region. Evidence suggests that strategies like the aerotropolis have been adopted but not properly implemented, and thus their intended economic benefits have not been realised (Revello 2014:55). Therefore, this study presents the real benefits associated with the aerotropolis strategy, which should enable purposeful planning to ensure that South Africa is economically viable and competitive.

The Durban Aerotropolis masterplan in context

The Durban Aerotropolis strategy involved the development and transformation of the King Shaka International Airport (KSIA) and the surrounding areas into a strategic economic magnet in which 21st century aviation-oriented infrastructural developments have been adopted (Royal Haskoning DHV 2020). The airport is located approximately 35 km north of the city of Durban, and it is considered a strategic and critical infrastructural development, serving as a catalyst for economic growth in the province of KwaZulu-Natal (KZN) and South Africa as a whole. It comprises a 2000 ha site, with a runway length of 3700 m (accommodating the latest wide-bodied aircraft) and with runway and taxi areas of 400 000 m², and it can initially handle 7.5 million passengers with provision for an extension to 45 million passengers per annum (Airports Company South Africa 2016). In addition to the 100 000 m² building, there is also a 15 500 m² cargo handling platform for handling 150 000 tonnes of cargo per annum, a 60 m high control tower, a multi-storey parkade and a variety of airport ancillary buildings. The terminal building at the airport is approximately 103 000 m².

At a provincial level, the Durban Aerotropolis is considered an economic initiative that seeks to provide a response to a growing demand for aeronautical services and to the economic and social challenges faced by the province (KZN-EDTEA 2017). One of the objectives of the Durban aerotropolis is to be considered a regional economic powerhouse, attracting a range of businesses and clients through its economic activities.

Durban Aerotropolis planning framework

Planning for an aerotropolis has primarily focused on ensuring that land use and urban form planning is prioritised, which focuses on the policies, concepts and strategies that determine and rationalise the use of land and patterns of the aerotropolis region. The basis of logistics strategy planning is the geographical landscape, which determines the nature and form of developments to be adopted. One of the advantages in planning for the Durban Aerotropolis has been the availability of vacant land (greenfield), which has meant that developments follow a planned pattern. However, some regions in KZN are characterised by underdeveloped rural communities and thus have poor transportation networks. The transportation sector is concerned with adequate roadway capacity, user safety and sufficient pedestrian and bicycle facilities (BARCELOC 2015). The emergence of the aerotropolis strategy provides the necessary intervention in ensuring that these regions are provided with functional transportation networks. In planning for the logistics strategy, the state of the transportation infrastructure is considered, with underdeveloped areas requiring more investments than developed urban centres.

One of the determining factors in setting up a logistics strategy for an aerotropolis is the physical infrastructure and surrounding environment. Efforts should be made to adopt policies, strategies and concepts that promote sustainable practices that are environmentally friendly and coexist with existing infrastructure. It is essential to point out that the Durban Aerotropolis occupies a 'greenfield', which implies the need for further environmental protection policies to be adopted, with only environmentally viable logistics practices being considered. Lastly, efforts are aimed at ensuring that there is an improvement in the economic climate of the airport city through ensuring sustained growth for targeted industries. Therefore, logistics strategy development is driven by the economic goals of the airport city. Thus, the Durban Aerotropolis aims to become the leading logistics gateway to Africa and has adopted logistics strategies that are aimed at ensuring that this goal is translated into a reality.

The concept of the aerotropolis strategy

From a geographical context, the aerotropolis strategy describes a phenomenon in which the airport mutates into a metropolitan development (Schaafsma, Amkreutz & Gukker 2008). An aerotropolis is characterised by aviation-oriented facilities, such as business and distribution centres, residential and commercial facilities and warehouses stretching up to a 20 km radius from the airport precinct (Kasarda 2013). It is described as representing the physical manifestation of globalisation, attained through the alignment of aviation-oriented, airport-centred residential and business developments (Kasarda & Canon 2016).

The aerotropolis strategy has been successfully implemented in various regions. For instance, Brisbane Airport has grown to occupy over 80000 m² of retail and office space, with close to 430 businesses operating from its premises (BNE Property 2017). Memphis Airport has gained the reputation of being the logistics hub of America, given its world-class warehouses and other ancillary logistics assets (Lynch 2016). These represent only a few examples of regions that have been transformed into aerotropolis cities and are reaping the benefits. Bridger (2014) aptly describes the aerotropolis strategy as representing an airport-centric form of urban development in which all logistical linkages, infrastructural and spatial planning developments support the airport as the central node of development. The aerotropolis can be easily summarised as a strategy which has the potential to influence both economic growth and development. It is pivotal in redefining urban spaces and contributing to the improvement of the standard of living and quality of life.

Benefits of the aerotropolis strategy

Several advantages of the aerotropolis strategy have been directly or indirectly identified by policymakers, theorists and researchers, including its ability to enhance connectivity and optimise mobility, economic leverage and how it is able to promote sustainable developments (Appold & Kasarda 2012). The foundations for aerotropolis connectivity and mobility are highways, rail arteries, surface linkages to ports and air routes (Kasarda & Canon 2016). Evidence from various aerotropolis regions, such as Amsterdam, Chicago, Dubai, Memphis and Singapore, suggests that there is a plethora of advantages associated with it. The growing emphasis on the development of airports around the world has increased as a consequence of their proven ability to bring about socio-economic benefits for regions (Asia-Europe Foundation [ASEF] 2016). Some of the benefits are dealt with in the next sections.

Improved regional connectivity

Unarguably, the adoption of the aerotropolis strategy has been motivated by the need to create businesses and regions that are time sensitive and that are able to respond to the dynamic global demand trends (Arts, Hanekamp & Dijkstra 2014). Morphet and Bottini (2013) consider connectivity as one of the positive results associated with the aerotropolis development. Connectivity means a region's positioning and ability to move passengers, cargo and services seamlessly from one destination to another. This is primarily supported by the concentration and development of infrastructure, including roads, rail, airport and port terminals. These collectively facilitate unrestricted access to the areas where economic activities are clustered (Keast, Baker & Brown 2008). Connectivity is important in unlocking a region's economic growth and potential, as it allows for the increased flow of business investments and human capital and enables tourism. The aerotropolis strategy easily promotes regional connectivity through capitalising on connecting the community and creating a synergy amongst

all the available transport networks within the airport corridor (Durban Aerotropolis Master Plan 2019). As summarised by Kozlak (2008), it has created a world network characterised by the rapid and fast exchange of goods and services amongst various locations supported by innovative transport and information systems and infrastructure.

Improved regional competitiveness

Regional competitiveness describes the degree in which an area under fair market conditions produces goods and services meeting the standards for both domestic and international markets, whilst at the same time positively contributing to the local economy through creating real economic benefits. Inasmuch as there are several factors that are equally responsible for contributing to regional competitiveness, the aerotropolis strategy (because of its emphasis on economic development and growth) is considered to directly contribute to competitiveness (World Economic Forum 2008). For regions such as Memphis and Schiphol- Amsterdam, the adoption of the aerotropolis strategy has enhanced their competitive advantage (Hakkak & Ghodsi 2015). This is primarily because of the structural changes to infrastructure and policymaking that are directly linked to the strategy. For instance, it has been responsible for transforming air transportation, influencing the adoption of innovative airport systems and strategies and resulting in improvements in spatial planning.

Economic development

Economic development describes the process of bringing social change, which allows people to achieve their human potential and thus contribute to economic growth (Feldman & Storper 2018). The process of economic development results in an increase in production capacities that have a direct impact on advancing individual, firm and regional growth potentials (Luthuli & Houghton 2019). The growing emphasis on the development of airports around the world has been increased by their proven ability to bring about socio-economic benefits for regions through attracting more aeronautical and nonaeronautical activities (ASEF Outlook Report 2016). The aerotropolis strategy involves immense developmental commitments, with investments in infrastructure and optimised spatial planning and land use in and around the airport region (Kasarda 2014). Evidence suggests that investing in strategies such as the aerotropolis that involve infrastructural improvements contributes to economic development.

Economic growth

Evidence suggests that the aerotropolis strategy has resulted in the growth and expansion of markets because of the creation of global networks, which have been facilitated by improved interconnectivity between Europe, Asia, the Middle East and the rest of the world. A report published by the Memphis-Shelby County Airport Authority (2005) indicated that there was a notable increase in the extent and volume of economic activity during the 10-year period (2005–2015)

because of an increase in total aircraft movements. During this period, there was an upward surge of aircraft movements of 11.1% recorded and a noticeable increase in cargo shipments, with an average growth of 54.7%. Wong (2002) reported that the Hong Kong aerotropolis development contributes actively to the financial services, trading and logistics, tourism and professional services sectors, which are considered to be the four pillars that define Hong Kong's economy. In the same way as the other leading aerotropolis developments, it has been instrumental in generating revenue through consolidated inbound and outbound cargo and passenger operations, including many other indirect activities and services that have positively influenced the economy (Eng 2015). The extent and scope of developments adopted for an aerotropolis have positively contributed to economic growth.

Social and environmental advancements

As much as the aerotropolis strategy has successfully delivered positive economic outcomes, these have had substantial spillover effects on the social environment and have resulted in adjustments in the livelihoods of communities. One of the realities of an aerotropolis strategy is its influence on population migration, particularly from undeveloped or poor areas. This is because of its ability to create economic opportunities that act as pull factors for the various population groups in different geographical locations (Warin & Svaton 2008). Aerotropolis developments have given rise to urbanisation as a result of constructions and infrastructural developments that took place in areas previously referred to as greenfields (Abrams et al. 2012). Rapid developments have resulted in the improvement of the quality of life for the surrounding communities and contributions to the labour market in the form of employment creation. It should be noted that the aerotropolis strategy has been considered influential in determining macro-economic policies, labour market trends, poverty and inequality alleviation, social sector developments and globalisation, amongst many other factors (World Bank 2020).

Infrastructure and systems integration

One of the advantages of the aerotropolis strategy is the seamless implementation of infrastructural developments aimed at ensuring that efficiency and mobility within the aerotropolis region and its surrounding areas are achieved (Klos 2014). The nature of the infrastructural developments for an aerotropolis includes investments in tarred roads, bridges, high-rise buildings and warehouses, usually covering sizable areas and encompassing the latest innovations (Estache & Garsous 2012). The adoption of infrastructural developments has required the involvement and integration of various stakeholders as they include facilities responsible for transportation, water and sanitation, energy and parking, amongst many others who need to collectively work together to deliver a competitive aerotropolis region (Schaafsma et al. 2008).

Research methodology

To achieve the research aims of this study, which is to describe the Durban Aerotropolis strategy and to contextualise its socio-economic impacts from a South African perspective, various research approaches were deemed appropriate, such as the exploratory and case study research designs. An exploratory research study allows for the use of various methods in understanding the research problem or phenomena, particularly for studies where little or not much information is known (Burns & Grove 2005). For a study investigating the aerotropolis strategy, which is in its initial stages of adoption, it was essential to consider a wide variety of data sets. This therefore involved the review and analysis of secondary documents, such as publications, company reports, meeting minutes and council resolutions, amongst many others which were made available to the authors. The research study also incorporated a case-based approach, with an emphasis on the Durban Aerotropolis development located within the eThekweni Municipality in KwaZulu-Natal, South Africa.

To achieve the aims of this study, a qualitative research approach was used sequentially, concurrently and iteratively in collecting and analysing the data. The qualitative research techniques utilised involved conducting in-depth interviews and focus group sessions with experts in airport operations planning. In increasing information availability, the World Café technique of data collection was implemented to harness group intelligence (Schieffer, Isaacs & Gyllenpalm 2014). Purposive and cluster sampling techniques were utilised in selecting the study participants; cluster sampling ensured that the relevant population subgroups were equally targeted whilst purposive sampling ensured that specific participants were individually targeted (Cooper & Schindler 2008). The software program NVivo was used to transcribe the in-depth interviews, focus group and World Café sessions, and it facilitated the process of coding, finding answers and interpreting relationships and texts (Friese 2019).

The qualitative data collection included in-depth interviews, which were successfully scheduled and conducted with 12 participants from different organisations, such as Dube Trade Port ($N = 5$), eThekweni Municipality ($N = 1$), the KZN Department of Transport ($N = 1$), the Department of Economic Development and Tourism ($N = 2$) and private consultants and academicians ($N = 3$). This represents approximately 60% of the individuals who were involved in the initial stages of the Durban Aerotropolis development as informed by the strategy developers. A summary of the participants is presented in Table 1, which indicates their profiles and gender. Informed consent was obtained from all the participants.

Findings and inferences of the study

This section presents the various contributions collected from the participants, who were requested to discuss the fundamentals of the planning for an aerotropolis. The in-

TABLE 1a: Profiles of research participants.

Participant	Profile	Gender
Participant A	CEO and Executive	Male
Participant B	Senior Executive	Male
Participant C	Divisional Manager	Female
Participant D	Project Manager	Male
Participant E	IT Manager	Male
Participant F	Project Manager	Female
Participant G	Regional Executive	Male
Participant H	Senior Researcher	Female
Participant I	Executive Director	Male
Participant J	Researcher	Male
Participant K	IT Manager	Male
Participant L	Planner	Female

CEO, chief executive officer; IT, information technology.

TABLE 1b: Focus group and World Café sessions.

Session	Location or Event	Participants (6–10 people)
One	Westville, KZN	Academics
Two	Municipal Institute of Learning Conference, KZN	Policy makers and researchers
Three	Musgrave, KZN	Researchers, consultants and policy makers
Four	KZN Investment Conference, Durban	Businesses, policy makers, etc.

KZN, KwaZulu-Natal.

depth interviews were recorded, transcribed and later analysed using thematic and content analysis techniques.

Contextualising the aerotropolis strategy to Durban, KwaZulu-Natal

The province of KZN is characterised by unique socio-economic conditions, including high levels of unemployment (22.3% as at 2019), inequality and high costs of doing business (Trade and Investment KZN 2018). The aim of the provincial government has been to identify strategies that will address these socio-economic challenges and contribute towards the attainment of economic competitiveness. Collective efforts involving the public and private sector have yielded results in ensuring the economic goals of the province, such as increasing the average growth rate of trade and creating at least 2.1 million new jobs (Trade and Investment KZN 2018). As noted from stakeholder engagements, it is evident that the Durban Aerotropolis is an ideal strategy which presents opportunities for KZN to improve on its social and economic profile. This is because the strategy has mainly emphasised the importance of regional airports as centres of economic development and has therefore been instrumental in contributing towards sustainable growth and improved transport systems and efficiencies, as evident in the following quotes:

‘As an institution, we consider the aerotropolis strategy as a potential for the King Shaka International Airport and its surrounding areas to be developed into a world-class airport city with modern and smart infrastructure capable of handling an increase in passenger and cargo volumes and through its ability to attract more businesses and manufacturers.’ (Participant B, Senior Executive, Male)

‘As a department, we are mandated to ensure that we identify and introduce strategies that positively contribute to the

economic growth, one of which is the Durban Aerotropolis, which will over the next years ensure that economic growth is centred around the King Shaka International Airport.’ (Participant D, Project Manager, Male)

‘There are advantages associated with channelling funds and investment to the development of the Durban Aerotropolis which could result in manufacturing organisations locating closer to the airport, which has the potential of increasing economic activities and employment opportunities.’ (Participant F, Project Manager, Female)

‘Our view as an organisation is that the creation of an aerotropolis within the vicinities of eThekweni Municipality has resulted in multiplier effects to the economy. These include the creation of employment and growth in the regional economy, which has also seen an increase in the amount of traffic within that region.’ (Participant C, Divisional Manager, Female)

The aerotropolis strategy has resulted in investments in infrastructure that have positively influenced the way business is conducted, particularly from a logistics perspective. As described by eThekweni Municipality, the Durban Aerotropolis has been influential in providing solutions to the existing regional logistics and transportation inefficiencies. It has also prioritised strategic planning and spatial and institutional interventions to improve connectivity around the aerotropolis region for the purposes of facilitating trade, moving passengers, cargo, workers and residents efficiently and advancing social and economic improvements.

From an academic perspective, the strategy has been associated with various processes and initiatives undertaken to influence desirable economic and social outcomes. For instance, its ability to integrate the airport and its surrounding environment through its emphasis on global supply chains and logistics to improve regional and global competitiveness has been highlighted. Planning for an aerotropolis is to a greater extent informed by the demographic realities and spatial and functional elements that determine the nature and scope of the developments adopted. The cluster of strategies implemented have had a variety of impacts on the socio-economic environment, as illustrated in the study findings. However, debates around the socio-economic benefits of the Durban Aerotropolis have largely remained inconclusive. This is because the development is still in its initial stages, and thus most of the impacts have not been fully realised. However, the research findings have given an account of the notable socio-economic changes that have been observed in the region, particularly how it has influenced employment, income, housing and education and economic development.

The Durban Aerotropolis and the regional economy

Regional economic growth is influenced by a combination of factors, one of which is the presence of competing and supporting industries and organisations that result in an increase in economic activities and a rise in the level of business activities. The Durban Aerotropolis is considered an

economic district housing various businesses with diverse interests. Using a sample of 36 businesses located within the Durban Aerotropolis precinct, it was found that approximately 25% of these specialise in logistics and warehousing activities, 17% in the assembly and production of heavy machinery, 8% in electronics, 6% in car manufacturing, 8% in fresh food production and 5% in automotive parts. The existence of a cluster of businesses has played an essential role in creating a competitive environment through enabling the interaction of various supply chains (Ngwenya 2020).

The businesses located in the aerotropolis region have actively contributed to the regional Gross Domestic Product (GDP) through increasing the supply and demand of essential commodities. Dasgupta and Singh (2005) found that there is a correlation between manufacturing output and GDP, which is considered the driver of economic growth. From a South African context, the manufacturing and agricultural sectors are the major contributors to the economic growth, and given that most of the active organisations located within the aerotropolis are categorised within these sectors, it implies a positive prospect for the regional economy. However, it cannot be ignored that the service sector has an equal opportunity to contribute to regional economic growth, mainly because KZN is seen as a viable tourist attraction.

The inception of the Durban Aerotropolis strategy has seen a variety of airlines being actively involved in connecting Durban and the rest of the world, with 20% of these connecting the region to local destinations and 80% to international destinations. The number of airlines has increased year on year since 2010, which implies a growing appetite on the part of businesses, because of the projected increase in demand in both passenger and cargo volumes. Aircraft have high fixed and operating costs, which make it risky to consider setting up a route when demand is low. The influx of the various domestic and international airlines has increased the demand for cargo and passengers. The Durban Aerotropolis has recently attracted British Airways, resulting in the establishment of connections with Heathrow Airport and Emirates, thus connecting Durban to Dubai in the United Arab Emirates (UAE). These two are key nodes, as they have created opportunities for KZN to compete with international destinations. There are projections that in the next 5 years, the King Shaka International Airport will attract more airlines, which might increase its chances of positively influencing economic growth.

Enhancing economic growth and development

As highlighted in the research findings, economic growth is firstly considered to be associated with the physical growth in terms of infrastructural investments and secondly as representing an increase in the level of economic activities and services conducted within the aerotropolis region. The emphasis for the study has been directed towards the

initiatives flagged as the contributing factors to economic success. For example, the creation of special economic development zones has boosted the level of business activity and positively contributed to regional GDP. The impact of the aerotropolis strategy on economic development and growth has been highlighted in the engagements with different stakeholders, as evident in the following quotes:

‘There are surely advantages associated with channelling funds and investment to the development of the Durban Aerotropolis, which can effectively result in more manufacturing organisations locating closer to the airport, which has the potential of increasing economic activities and a growth for the employment opportunities.’ (Participant F, Project Manager, Female)

‘As an institution, we consider the aerotropolis strategy as offering a potential for the KSIA and its surrounding areas to be developed into a world-class airport city with modern and smart infrastructure capable of handling an increase in passenger and cargo volumes and through its ability to attract more businesses and manufacturers.’ (Participant B, Senior Executive, Male)

The above statements provide a generalised view of the study participants, who consider the adoption of the Durban Aerotropolis as having made notable contributions to the economic prospects of the region, primarily driven by the creation of new market opportunities and expanding on the already existing ones. It has also been recognised as the provincial government’s strategic attempt to influence the regional economy over the next 30 years. Accordingly, a review and analysis of quantitative reports and statistics provided by the logistics companies operating within the airport region was conducted to further understand the impact of the strategy on economic growth. It is evident that there is a growing market for cargo, as the region is actively involved in importing and exporting various commodities from diverse industries. Of the shipments conducted during 2018 and 2019, seafood accounted for 19%, car parts and equipment for 16%, processed and raw tobacco for 12%, fruits for 10%, computer parts and accessories for 13% and flowers for 9%. From a competitive perspective, this implies not only that KZN has become connected to the global markets, as local farmers are able to reach them with their flowers and fruits, but also that local manufacturers can access the various materials that they need for their production quickly and at a reasonable cost.

Evidence also suggests that the Durban Aerotropolis has seen an increase in passenger volumes, cargo movements and the numbers of businesses taking up retail and industrial spaces. In addition, the extent and scope of services and products have increased. One can consider the Durban Aerotropolis as directly responsible for creating demand through the various innovations and infrastructural developments which have encouraged urbanisation and the emergence of a smart city. This increase in demand is the result of creating capacity through the implementation of various developments, such as expanding transportation networks and infrastructural developments. These developments have attracted major airlines that have played a central role in serving regional and international

routes. Between 2012 and 2013 and just prior to coronavirus disease 2019 (COVID-19), 2019–2020, there has been a 73% increase in international arrivals as a result of the creation of direct flights to Durban (Airports Company South Africa 2022). Such flights facilitated an increase in the number of international visitors to KZN, which strengthened its tourism industry. Interestingly, 30% of the domestic passenger airlines connect the Durban Aerotropolis with other local destinations, such as Cape Town, Johannesburg and Port Elizabeth, whilst the remaining 70% are shared between regional routes, including Botswana, Zimbabwe and Zambia, and international routes covering various global destinations, such as the United Arab Emirates, France and the Netherlands, amongst many others. There has been a general increase in the demand for airfreight services globally as the overall number of passengers (domestic, regional and international) has increased over time, which has also contributed to an increase in the number of flights coming into the airport.

Employment creation and other societal multiplier effects

The Durban Aerotropolis has created new opportunities for local and international businesses, as evidenced in the number of companies that have taken up the available spaces in the established Special Economic Zones (SEZs). The growth in the number of companies has meant an increase in the level of economic activities, especially in the aeronautical, manufacturing and logistics sectors. As projected by the provincial government, this should create about 750000 employment opportunities in the manufacturing and services sectors, which will be a major boost for the region as it is currently battling with a rising level of unemployment. Also, the infrastructural developments have seen the creation of temporary employment, which has provided necessary relief in reducing the number of people dependent on social services. The Durban Aerotropolis development has been viewed as a progressive strategy in which the provincial government can achieve its SDGs through driving improvements in food security and nutrition, youth empowerment and employment creation, amongst others. From an economic perspective, an increase in GDP also results in multiplier effects, including a rise in disposable income and an improvement in the standard of living and the quality of life (Emas 2015).

From an empowerment perspective, it should be stated that the Durban Aerotropolis masterplan has resulted in the establishment of an educational institute, the Aerotropolis Institute Africa at UKZN, aimed at providing advisory frameworks for the education and training of the required personnel who are deemed critical for the success of the strategy. The aim is to ensure that this contributed to the much-needed critical skills in airport and route planning, which can positively aid economic development in the province. For instance, there have been coordinated attempts between the various institutions and government to train unemployed youth in various trades that will be

essential in supporting sustainable cities. One of the other advantages relates to the amount of land within the Durban Aerotropolis which is set aside for real estate developments, including low-cost housing initiatives. The creation of a sustainable aerotropolis city requires an emphasis on low-medium cost housing developments which can also address the housing challenges in KZN (eThekweni Municipality 2017).

Enhancing regional competitiveness

One of the variables that has been the subject of the study relates to how the Durban Aerotropolis has the potential of repositioning the region as being competitive. Based on the findings of the research, KZN is capable of outperforming other provinces, such as Gauteng and Western Cape provinces, in efficiency, cost of doing business, nature of development, innovation and economic growth. On the other hand, it represents the degree to which the Durban Aerotropolis, using fair market conditions, successfully produces and markets its products and services to national (South Africa), regional Southern African Development Community (SADC) and international markets, holding a significant market share over time. As observed, the emergence of the Durban Aerotropolis has resulted in the creation of a business district also referred to as a SEZ, which at the time of the study had approximately 60 businesses in diverse industries and specialities. Of note is that 25% of the occupants have competence in logistics, warehousing and transportation, whilst there is also significant representation of manufacturers of food, machinery, cars, electronics and automotive parts. Most of the businesses located in this region were first-time entrants in the province or had expanded their operations from other geographical locations. The impacts of the Durban Aerotropolis on the competitiveness of the KZN economy have also been measured using the extent and level of economic activities, including the following:

- The region has seen a 73% increase in the number of domestic and international flights between 2012 and 2013 and 2019 and 2022 (Airports Company of South Africa 2022). In other words, the region has become more connected to the globe, which has opened new markets for the local businesses.
- There has been an increase in the passenger and cargo volumes between 2015 and 2018, international passengers increasing by 22.22%, domestic passengers by 12.7% and regional (SADC countries) passengers by 317.8%.
- There has been an increase in the commodities imported and exported to other parts of the world. On average, cargo handled through the Durban Aerotropolis comprises 18.19% seafood, 12.13% computer equipment, 10.10% fruits and fresh produce and 7.7% flowers. These volumes have been increasing from year to year, and the projections also indicate an increase in the number of markets from which or to which these are being imported.
- There has been an increase in the demand and supply of commodities, with both local and international markets.

Notably, AgriZone (one of the regions in the Durban Aerotropolis) has doubled its production capacity and become actively involved in supplying fresh produce to the international market.

- Many of the companies located within the aerotropolis region have seen an increase in demand, including the logistics providers.

The findings revealed that global competitiveness has been consistently referred to as one of the motivating factors behind the development of the Durban Aerotropolis. One of the measures in which the Durban Aerotropolis has enhanced regional competitiveness is:

‘Through its ability to facilitate an increase in productivity resulting from the efficient production systems and supporting institutions, for instance the establishment of SEZs.’ (Group Session 3, Researchers, Consultants and Policy makers, 13–15 March 2019)

‘The aerotropolis emphasises ... environmental sustainability through ensuring that it adopts smart and sustainable initiatives that can influence how international and local markets position it.’ (Group Session 2, Policy makers and researchers, 18–19 October 2018)

Study recommendations

There is a need for policymakers to prioritise contextual realities when enacting policies. It is essential that, despite the notable successes of a strategy or policy in other regions used as benchmarks, a broader analysis should be conducted to address the questions relating to feasibility, practicality and relevance before it can be considered for adoption (Jungwirth & Luxford 2014). Economic downturns, especially in Africa, have seen government planners and policymakers favouring the adoption of aggressive economic development strategies which have been achieved using international frameworks (World Economic Forum 2008). The alternative approach for policymakers should be to focus on delivering an aerotropolis development which can be easily adopted within the local context with an improved possibility of success. This requires a planning approach that prioritises the local factors and conditions, including the availability of land, labour, capital and human resources, amongst other variables.

The development of an aerotropolis should consider the smart city framework, which needs to be flagged for adoption because it incorporates a multidisciplinary approach and emphasises variables such as the economy, environment, mobility, people, governance and living. Using this framework allows for informed decision-making, as it addresses questions relating to the impacts of the strategy better. This has the advantage of ensuring that the resources and the tools and techniques required for the policy also reflect the perspectives of the community.

There is often a limited understanding amongst planners and politicians about how to measure the real benefits associated

with megaprojects like the aerotropolis. This gap needs to be accurately addressed, as it affects future development initiatives associated with the aerotropolis strategy. Robinson and Torvik (2004) argue that most of the megaprojects involving extensive infrastructural developments do not necessarily result in positive results for the economic outlook. This implies the need for frameworks that can provide the basis for measuring the benefits associated with any aerotropolis developments, using quantitative and qualitative variables.

One of the areas that needs to be prioritised relates to measuring the economic benefits of the strategy. Measurements must be meaningful and relevant to the needs of different stakeholders (policymakers, planners, businesses and passengers). They should reflect the intended goals and identify the expected outcomes, for instance, connectivity, access and ease of movement. The expectations of the stakeholders should be identified and further analysed into dimensions, indicators and measurements of effectiveness. Measuring the individual variables allows one to establish the performance of the strategy and whether it has been a success or otherwise. This can be customised to the different dimensions which constitute the aerotropolis plan.

Study limitations

This study is not without its limitations. These are as follows:

- The lack of South African literature relating to aerotropolis developments and their economic impacts entailed that the authors relied on the use of data pertaining to mainly developed countries.
- The study focused only on the Durban Aerotropolis as a case study, and given that the development is still in the initial stages of implementation, the authors could not access all the required information.
- It was identified during the data collection that there are only a few individuals who have been actively involved in the Durban Aerotropolis strategy – hence the study had a small sample size.
- When this study was completed, the aviation industry faced an uncertain future because of the COVID-19 epidemic which negatively impacted the growth of the Durban Aerotropolis.

Conclusion

To conclude, inasmuch as the Durban Aerotropolis development is in its initial stages, there is evidence of socio-economic impacts relating to employment creation, growth in imports and exports and the creation of a competitive environment. The success of the strategy has been attributed to the adoption of novel strategies and concepts that enable improved logistics and mobility planning, connectivity and responsiveness, amongst other critical success factors. This has seen several innovative strategies, including roadway expansions, network designs, mobility platforms and many other infrastructural developments being considered for the Durban Aerotropolis.

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Competing interests

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Authors' contributions

The article arose from the PhD study of K.N. who was under the supervision of M.J.N. and H.F.W. K.N. wrote the initial manuscript. M.J.N. finalised the article, which was checked for accuracy by H.F.W.

Ethical considerations

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

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