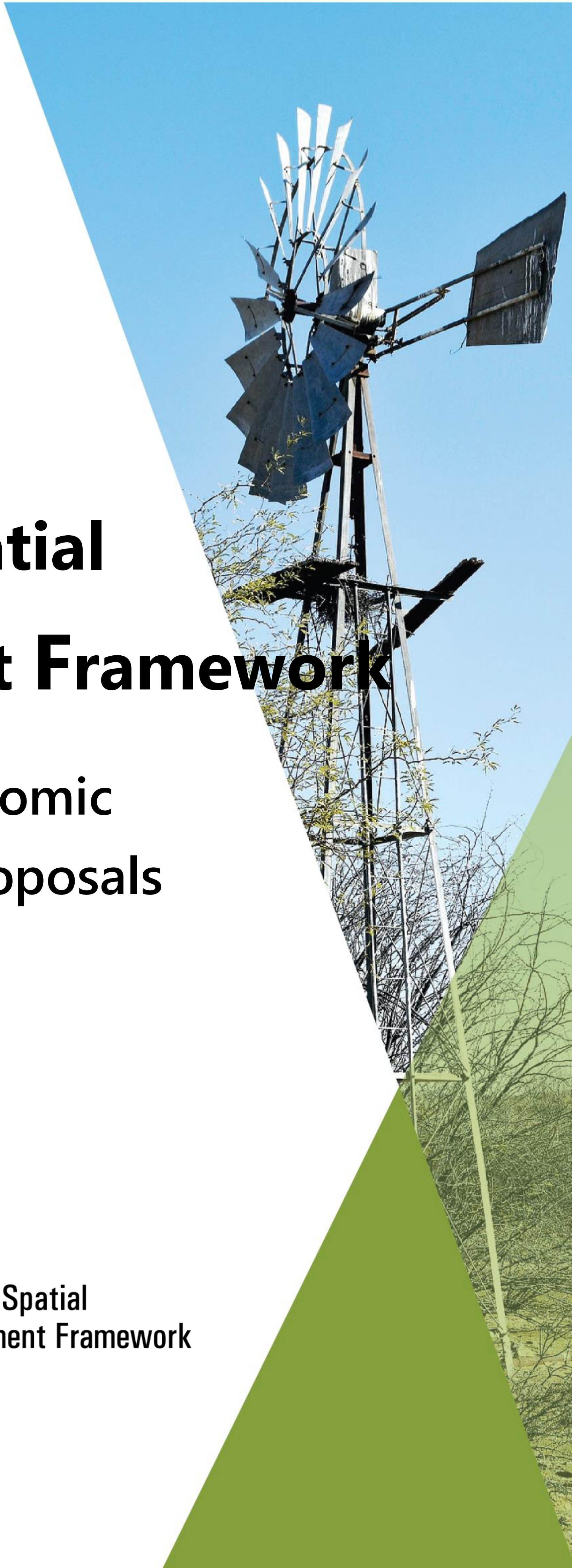
KAROO

Regional Spatial Development Framework

Annexure A: Economic Diversification Proposals

October 2021



KAROO RSDF Regional Spatial Development Framework

TABLE OF CONTENTS

1. SPATIAL-LINKED FOCUS SECTORS FOR GROWTH, INNOVATION AND DIVERSIFICATION

The previous phase's economic analysis indicated that the Karoo Region economy has an over-dependence on consumption sectors, has a very narrow production base, and too little invested in innovation and economic diversification.

In that vein, based on the nature of the Karoo Region's economy, there is a severe need for economic diversification and ways to unleash the business, technology, and key sector innovation that will drive growth in the region and for its people.

The identified **Economic diversification opportunities** within the Karoo Region can be further classified, prioritised, and developed by focussing on the following three dimensions:

- Growth in global demand (as a driver of local growth),
- Level of innovation, and
- Horizontal and vertical diversification.

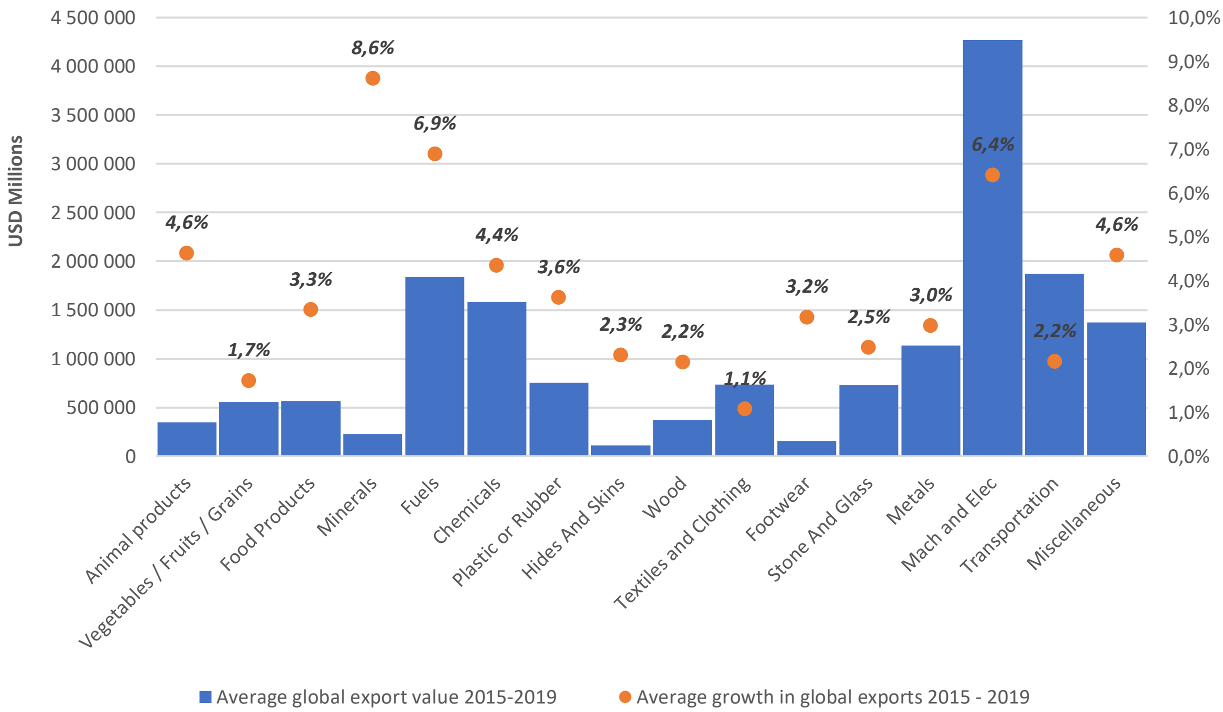
More detail on each of these dimensions is provided next.

1.1. GROWTH

Diversification opportunities in the Karoo Region can be capitalised by focusing on export-led growth underpinned by foreign (global) demand. According to the OECD (2021), the global economy's rebound after the Covid-19 pandemic will be faster than expected. The OECD forecasts global GDP growth of 5.6% and 4.0% in 2021 and 2022, respectively, with most growth coming from the emerging economies. From a more medium-term perspective, the IMF (2021) envisaged an average annual growth of the global economy by 3.5% in the period up to 2026. This uprise in economic activity is underpinned by a recovery of global demand for products.

Looking historically at the different growth sectors in global trade, Figure 1 shows that minerals, fuels, machinery and electronics recorded the highest average growth in global supply/demand over 2015-2019. In terms of size, machinery and electronics are by far the largest group of products traded globally. Other large global industries are fuels, chemicals, and transportation equipment.

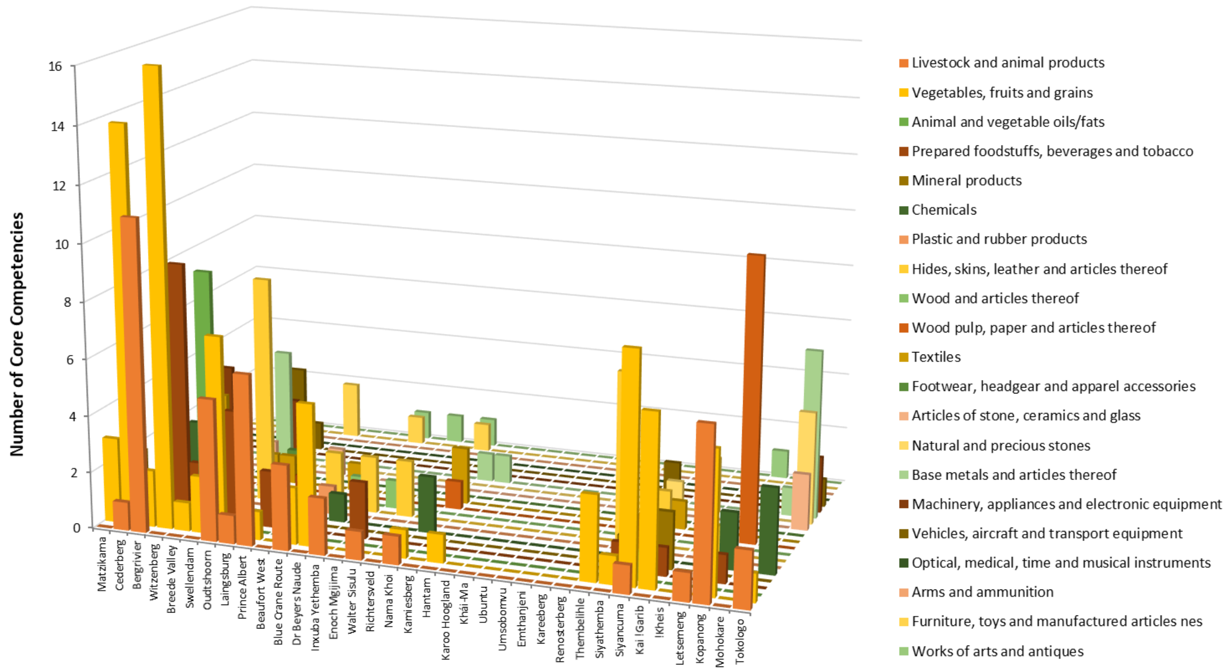
Figure 1: Structure and growth of global trade



Source: Own calculation based on data from UN Comtrade (2021).

Most of the core production competencies in the Karoo Region (see Figure 2) can be found in the vegetable, fruits, and grain sectors. Linking this with Figure 1, it is evident that this sector has shown a moderate average annual level growth of 1.7% in global demand. Another large set of core competencies in the region are within the livestock sector. Although smaller in global trade, this industry has shown a relatively high average annual growth level in global demand (+4.6%). The Karoo Region has a relatively limited amount of core competencies in the high growth sectors such as minerals (6), machinery/ electronics (13) and fuels (0).

Figure 2: Spatial-sectoral composition of core competencies in the Karoo Region (2015-2019)



Source: Own calculation based on data from Quantec Research – EasyData (2020)

Linking Figure 1 with the identified diversification opportunities (see Table 1) reveals a similar pattern regarding growth prospects. These opportunities are strongly linked to the core competencies in the Karoo Region. Most of the region's diversification opportunities fall within the vegetable/fruit/grain sector, showing moderate growth prospects from a global demand perspective. The number of diversification opportunities within the region's processed food sector was also proportionally higher, and these face slightly better global demand prospects. Only one opportunity was identified in one of the high-growth sectors.

Table 1 provides an overview of the Karoo Region's diversification opportunities that can be regarded as realistic. A total of 28 products were identified. The number of diversification opportunities is relatively low, which is closely related to the region's relatively narrow economic base.

The left side of Table 1 lists the core competencies and the respective local municipalities from which the diversification opportunities "originate." The right side of Table 1 shows the list of realistic diversification opportunities. The "distance" column in the table ranges between 0-1. The lower the distance value, the better connected the diversification opportunity is to existing core competencies in the Karoo Region. A few opportunities are very "close" to existing competencies.

Given the high unemployment rate in South Africa, exports' labour intensity was added as a strategic value to the Karoo Region's identified diversification opportunities. This was done to highlight those diversification opportunities with the highest potential for job creation. The labour intensity was calculated using "The Labor Content of Exports Database" developed by Cali *et al.* (2106).[1] This dataset includes data for 11 economic sectors in South Africa for the year 2011.

The labour intensity index reflects the total number of direct jobs per 1 million USD of exports per sector. This index was calculated using total exports and the total direct employment of exports for each of the 11 sectors available in the dataset. This ratio was then normalised to create a 0 to 1 index score, with products with a higher labour intensity having a score closer to 1. Table 1 shows that the opportunities within primary agriculture have the highest labour intensity as where the opportunities in the food processing sector (i.e. secondary agriculture or agro-processing) have a much lower labour intensity. Hence, these diversification opportunities are less favourable for job creation.

The diversification opportunities depicted in Table 1 are so-called "low hanging fruits" in the sense that capitalising on these opportunities would require relatively small investments in new capability and knowledge as most of them are already embedded in the Karoo Region's economy. Hence, with the necessary enabling environment, these specific diversification opportunities are attainable in the medium-term (seen as approximately 5 to 10 years). However, why these have not yet been explored requires further analysis as this can potentially be due to limited market potential, market failures, supply-side constraints, and first-mover-disadvantages.

Some of the Karoo Region's main mineral mining competencies and its core competencies in primary agriculture have already led to the development of related processing competencies in milling and leather production. However, developing other activities in the region outside the related activities discussed in this section will require large "jumps" in the product space network and, thus, large investments in capabilities and knowledge. Such ventures are only attainable in the long-term (that is, in 10+ years) but are still an option when looking to transition to a more diversified economy by moving incrementally within the product space. These opportunities are still worth exploring but should form part of a longer-term strategy.

[1] Cali, M., Francois, J., Hollweg, C.H., Manchin, M., Oberdabernig, D.A., Rojas-Romagosa, H., Rubinova, S. and Tomberger, P. 2016. The Labor Content of Exports Database. Policy Research Working Paper, No. 7615. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/24156.

Table 1: Realistic diversification opportunities per Local Municipality in the Karoo Region based on the product space (2019)

Core competency			Diversification opportunity				
HS	**Product description**	**LM's**	**HS**	**Product description**	**Sector**	**Distance**	**Labour intensity index**
030366	Frozen Hake	Bergrivier, Kopanong	030251	Fresh or chilled Cod	Livestock and animal products	0.00	0.36
030219	Salmonidae n.e.s, fresh or chilled	Bergrivier	030319	Frozen Pacific salmon	Livestock and animal products	0.40	0.08
030329	Salmonidae, n.e.s, frozen	Kopanong					
030369	Frozen fish of the fam. Bregmacerotidae, Euclichthyidae, Gadidae, Macrouridae, Melanonidae	Kopanong					
070992	Fresh or chilled olives	Witzenberg	071120	Olives, provisionally preserved but not suitable for immediate consumption	Vegetables, fruits and grains	0.50	0.08
081070	Persimmons	Swellendam					
080520	Mandarins, clementines, fresh/drid	Cederberg, Witzenberg, Dr Beyers Naude	080420	Figs, fresh or dried	Vegetables, fruits and grains	0.14	0.36
080550	Fresh or dried lemons and limes	Cederberg, Witzenberg, Dr Beyers Naude, Kai !Garib					
080610	Grapes, fresh	Breede Valley, Dr Beyers Naude, Kai !Garib					
080840	Quinces	Kai !Garib					
080930	Peaches, including nectarines, fresh	Witzenberg					
070310	Onions and shallots, fresh or chilled	Witzenberg	080910	Apricots, fresh	Vegetables, fruits and grains	0.50	0.36
080610	Grapes, fresh	Breede Valley, Dr Beyers Naude, Kai !Garib					
080810	Apples, fresh	Bergrivier, Witzenberg					
080830	Pears	Bergrivier, Witzenberg					
080929	Fresh cherries (excl. sour cherries)	Witzenberg					
080930	Peaches, including nectarines, fresh	Witzenberg					
080940	Plums and sloes, fresh	Witzenberg					
081070	Persimmons	Swellendam					
081330	Apples, dried	Witzenberg					
081350	Mixtures of edible nuts or dried fruits	Cederberg					
151229	Cotton-seed oil and its fractions	Swellendam, Siyancuma					
220421	Grape wines n.e.s, incl fort & grape, must unfermented by add alc in ctnr<=2l	Matzikama, Cederberg, Breede Valley					
220429	Grape wines nes,incl fort&grape must,unfermntd by add alc,in ctnr > 2l	Matzikama, Cederberg, Breede Valley					

081290	Fruits&nuts provis preservd but unfit for immediate consumption n.e.s	Prince Albert	081400	Peel of citrus fruit/melons (watermelons) fresh,frz,drid/prov presvd	Vegetables, fruits and grains	0.00	0.08
091012	Ginger : Crushed or ground	Cederberg	91030	Turmeric (curcuma)	Vegetables, fruits and grains	0.00	0.36
100510	Maize (corn) seed	Oudtshoorn, Thembelihle	110220	Maize (corn) flour	Vegetables, fruits and grains	0.50	0.08
100590	Maize (corn) n.e.s	Thembelihle, Siyancuma					
100510	Maize (corn) seed	Oudtshoorn, Thembelihle	120600	Sunflower seeds, whether or not broken	Vegetables, fruits and grains	0.50	0.36
140420	Cotton linters	Siyancuma	120729	Cotton seeds : Other	Vegetables, fruits and grains	0.50	0.36
520100	Cotton, not carded or combed	Siyancuma					
080620	Grapes, dried	Kai !Garib	170260	Fructose&fructose syrup nes,cntg in dry state >50% by wght of fructose	Prepared foodstuffs, beverages and tobacco	0.50	0.08
081310	Apricots, dried	Witzenberg					
170230	Glucose&glucose syrup nt cntg fruct/cntg in dry state <20% by wt fruct	Blue Crane Route					
081070	Persimmons	Swellendam	200290	Tomatoes nes,prepared or preserved oth than by vinegar or acetic acid	Prepared foodstuffs, beverages and tobacco	0.50	0.08
200840	Pears nes,o/w prep or presvd whether or not sugared,sweetened,spirited	Witzenberg					
080510	Oranges, fresh or dried	Cederberg, Witzenberg, Dr Beyers Naude, Kai !Garib	200911	Orange juice,unfermentd&not spiritd,whether not sugard sweet,frozen	Prepared foodstuffs, beverages and tobacco	0.50	0.08
200929	Grapefruit juice, unfermented, Brix value > 20 at 20°C, whether or not	Matzikama, Witzenberg					
200971	Apple juice, unfermented, Brix value <= 20 at 20°C, whether or not con	Witzenberg	200921	Grapefruit juice, unfermented, Brix value <= 20 at 20°C, whether or no	Prepared foodstuffs, beverages and tobacco	0.33	0.08
220290	Non-alcoholic beverages nes,excludg fruit/veg juices of headg No 20.09	Enoch Mgijima					
080510	Oranges, fresh or dried	Cederberg, Witzenberg, Dr Beyers Naude, Kai !Garib	200939	Single citrus fruit juice, unfermented, Brix value > 20 at 20°C, wheth	Prepared foodstuffs, beverages and tobacco	0.50	0.08
080520	Mandarins, clementines, fresh/drid	Cederberg, Witzenberg, Dr Beyers Naude					
080540	Grapefruit, fresh or dried	Cederberg, Dr Beyers Naude, Kai !Garib					
080550	Fresh or dried lemons and limes	Cederberg, Witzenberg, Dr Beyers Naude, Kai !Garib					
080810	Apples, fresh	Bergrivier, Witzenberg	200961	Grape juice, incl. grape must, unfermented, Brix value <= 30 at 20°C,	Prepared foodstuffs, beverages and tobacco	0.20	0.08
080930	Peaches, including nectarines, fresh	Witzenberg					
220421	Grape wines nes,incl fort&grape must,unfermntd by add alc in ctnr<=2l	Matzikama, Cederberg, Breede Valley					
220429	Grape wines nes,incl fort&grape must,unfermntd by add alc,in ctnr > 2l	Matzikama, Cederberg, Breede Valley, Kai !Garib					

220210	Waters incl mineral&aeratd,containg sugar or sweeteng matter or flavourd	Enoch Mgijima	220110	Mineral&aerated waters not cntg sugar or sweeteng matter nor flavoured	Prepared foodstuffs, beverages and tobacco	0.43	0.08
151550	Sesame oil & its fractions	Swellendam	220720	Ethyl alcohol and other spirits, denatured, of any strength	Prepared foodstuffs, beverages and tobacco	0.00	0.08
220421	Grape wines nes,incl fort&grape must,unfermntd by add alc in ctnr<=2l	Matzikama, Cederberg, Breede Valley	220820	Spirits obtained by distilling grape wine or grape marc	Prepared foodstuffs, beverages and tobacco	0.00	0.08
200799	Jams, fruit jellies, fruit/nut purée & paste	Witzenberg	220890	Undenatrd ethyl alc <80% alc cont by vol&spirit,liqueur&spirit bev n.e.s	Prepared foodstuffs, beverages and tobacco	0.00	0.08
220210	Waters incl mineral&aeratd,containg sugar o sweeteng matter o flavourd	Enoch Mgijima					
100590	Maize (corn) nes	Oudtshoorn, Thembelihle	230500	Ground-nut oil-cake&oth solid residues,whether or not ground or pellet	Prepared foodstuffs, beverages and tobacco	0.40	0.08
140420	Cotton linters	Siyancuma					
250610	Quartz (other than natural sands)	Kai !Garib	251612	Granite, merely cut, by sawing or otherwise, into blocks etc	Mineral products	0.00	0.16
710310	Prec/semi-prec stones (o/t diamonds) unworkd/simply sawn/rough shapd	Siyathemba, Kai !Garib, Tokologo	260800	Zinc ores and concentrates	Mineral products	0.50	0.16
481019	Paper and paperboard used for writing, printing or other graphic purpo	Kopanong	481092	Multi-ply paper and paperboard, coated on one or both sides with kaoli	Wood pulp, paper and articles thereof	0.00	0.08
291813	Salts and esters of tartaric acid	Witzenberg	720219	Ferro-manganese, n.e.s	Base metals and articles thereof	0.33	0.08
720211	Ferro-manganese, containing by weight more than 2% of carbon	Tokologo					
732189	Stoves, heaters, grates, fires, wash boilers, braziers and similar app	Breede Valley	732119	Appliances for baking, frying, grilling and cooking and plate warmers,	Base metals and articles thereof	0.50	0.08
732189	Stoves, heaters, grates, fires, wash boilers, braziers and similar app	Breede Valley	841581	Air cond mach n.e.s inc a ref unit&a valve f rev of the cool/heat cycle	Machinery, appliances and electronic equipment	0.50	0.08
252210	Quicklime	Matzikama	970300	Original sculptures and statuary, in any material	Works of arts and antiques	0.50	0.08

Source: Own calculation based on data from Quantec Research – EasyData (2020)

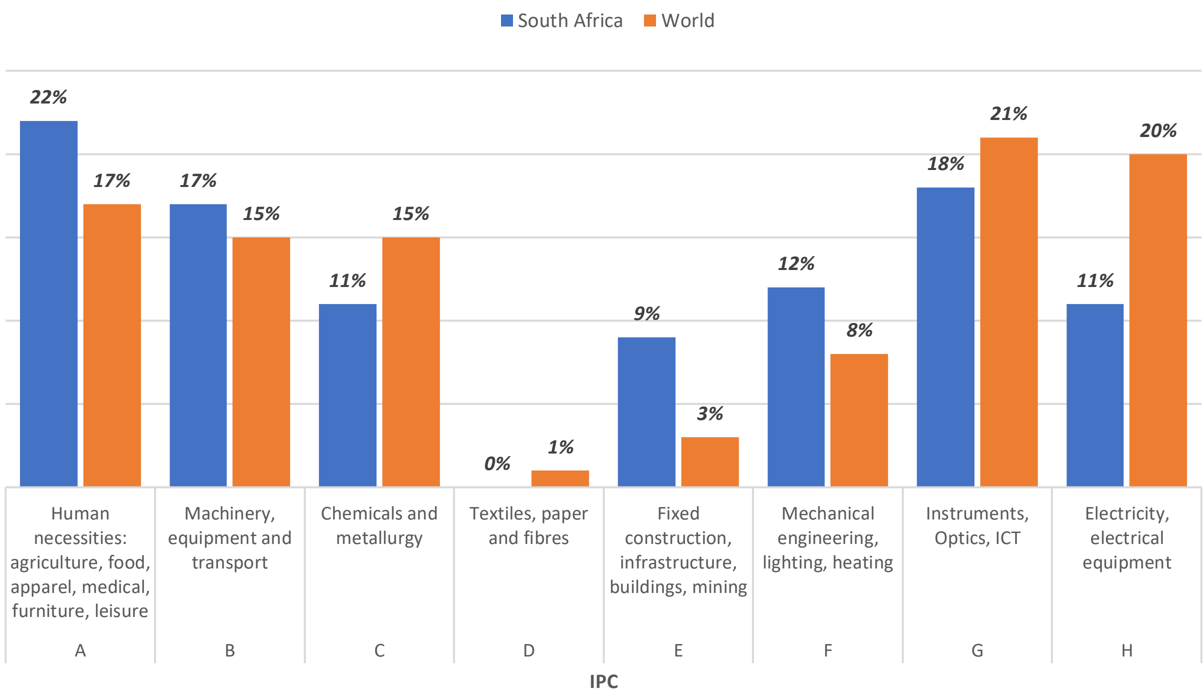
Another option to promote growth in the region, is to look at linkages with nodes outside the Karoo Region as drivers of activity within the region.

1.2. INNOVATION

Building a more innovative economy in the Karoo Region can also prove very favourable for its socio-economic development. However, it has become evident that its current production base is very narrow. Patents are an essential part of a country's innovation framework as it ensures protection and rights of local inventions that can provide a competitive edge in the global market. Therefore, registered patents indicate the innovation and scientific capacity of a country. They are essential for economic diversification, upgrading of products and for ensuring cost efficiency.

Figure 3 shows the composition of patent registrations in South Africa and the world for each of the International Patent Classification (IPC) broad groupings (IPC) from 2015 to 2020.

Figure 3: Composition of registered patents per broad category (2015-2020)



Source: Own calculation based on data from WIPO (2021).

Figure 3 shows that globally most patents are registered in the instrument and electricity categories. It is evident from Figure 3 that South Africa's innovation landscape has a strong focus on human necessities and instruments. The country exceeds the global innovation pattern in the fields of machinery, human necessities, construction, and mechanical engineering. On the other hand, it lags in terms of patents in chemicals, instruments, and electricity.

The current core production competencies and identified diversification opportunities in the Karoo Region predominantly fall within the agricultural sector. With regards to innovation in this sector, South Africa fares relatively well when compared globally.

1.3. DIVERSIFICATION

The pathways (strategies) towards diversification in the Karoo Region have been discussed in Phase 3. It provided the framework (i.e. the product space) that forms the basis for potential diversification strategies tailored for each Local Municipality in the Karoo Region. Table 1 shows that most of the diversification opportunities are "horizontal" in nature. This implies that these opportunities require relatively similar production capabilities and knowledge similar to what is already embedded in the region's current core production competencies. For instance, diversifying from orange production to the production of figs.

"Vertical' diversification implies moving into related downstream activities (i.e. value-adding), but this requires a relatively new set of production capabilities and knowledge that are not yet readily available in the region. For instance, diversifying from orange production to the processing of orange juice. The analysis in Phase 3 identified only just a few of this type of diversification opportunities in the Karoo Region.

Horizontal diversification requires relatively fewer investments and skills development than vertical diversification. Hence, the former is more realistically attainable in the short-term as where the latter can be strategized for the long run.

1.4. HOW TO FROM HERE

Phase 3 provided the framework (i.e. the product space) that forms the basis for potential diversification strategies tailored for each local municipality in the Karoo Region in Phase 4. The product-level growth paths for the Karoo Region in the product space can be implemented/driven based on three strategic values for diversification. These strategic values include **structural transformation**, **market-driven diversification**, and **employment-driven diversification**. Thus, the Karoo Region's growth path along the lines of market-driven diversification (i.e. market potential – Section 1.1), structural transformation (i.e. upgrade-driven diversification – Sections 1.2 and 1.3) and employment creation (addressed in Table 1 through the labour intensity index in Section 1.1) can be determined based on the region's position within the product space.

To leverage these identified opportunities and key sectors for promotion and growth, the Karoo Region needs to "Unify," "Regionalise," and "Diversify" as follows:

- **<u>Unify</u>: Install an operating system for 21st-century economic development**. First, the region needs to put in place the basic elements of a state-of-the-art region-wide economic development operating system. Therefore, the Karoo Region should move decisively to set out a clear and unified model for pursuing growth. Such a framework will entail both leadership from the top and decentralisation to the sub-regions and the provision of better information. Along these lines, the various stakeholders should:
  - Set out a compelling strategy for innovation and diversification – and lead
  - Structure effective partnerships with and among regional actors – including regional development authorities, strong non-profits, and the regions' local municipalities
  - Build an information base and use it to drive performance strategy and name industry-specific "sector champions" to spearhead cluster developments within the region.

- **<u>Regionalise</u>: Support smart sector strategies in the Karoo sub-regions**. There is a need to foster and contribute to "bottom-up" sector initiatives in the region. The Karoo sub-regions are uniquely different, and given that, the government and other key stakeholders should support the Karoo

Regions' regional development efforts as they develop sector- and region-specific strategies to spur growth, innovation, and job creation. To this end, the Karoo Region should:

- Support convenings of target industry and cluster actors in the sub-regions and their planning
- Support well-conceived cluster initiatives in the sub-regions
- Support other types of bottom-up sector development, including regional innovation districts, business plans, and regional export plans, and
- Align the overall Karoo Region's existing economic development policies, programs, and initiatives with the sub-regions sector strategies and cluster initiatives.

- **Diversify: Set a platform for higher-value growth through innovation and global engagement**. Finally, since the sub-regions of the Karoo Region can't "go it alone," the relevant government bodies (across all levels of government) need to set the stage for broad-based growth by investing in effective innovation and commercialisation infrastructure, attending to the Karoo Region's global engagement, and working to align its education and workforce training efforts to its new economic strategy. To this end, the Karoo Region should:
  - Bolster capacity for innovation and commercialisation,
  - Expand global engagement, particularly with emerging nations, and
  - Align higher education and workforce development resources and programs for innovation and diversification.