



**OCCUPATIONS CONTRIBUTING TOWARDS GREEN SKILLS WITHIN THE
WHOLESALE AND RETAIL SECTOR OF THE SOUTH AFRICAN ECONOMY**

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Executive summary

The growing awareness of the gradual value destruction of the natural ecosystem has been helpful in generating the urgency that is required to address environmental issues. A number of response initiatives to ecological challenges have been put in place with regards to moderating human economic activities. The catalytic role of the wholesale and retail operations in the South African economy can be supportive of the green campaign. The wholesale and retail sector is considered to be more diverse and volatile than any other sectors of the economy. Therefore, this intermediary role of the sector can be leveraged to advance the conformity of industrial activities to the requirements of a green economy.

Various attempts have been made by public and private institutions to stem the tide of industrial threats to the natural environment. Research and innovation effort within the W&R sector are increasing along the line of green occupations, technologies, and skills. The W&RSETA is therefore tasked with the green mandate as expressed in the National Development Plans (NDP) to reflect the green principles in its operational strategies. This increasing effort of the W&RSETA within the sector seeks the assurance of a sustainable natural environment for a sustainable economic development in South Africa.

This report presents a situational snapshot of the extent of green coverage in the wholesale and retail sector of the South African economy. The overall aim of this study is to identify occupations that contribute towards green skills within the W&R sector of the South African economy, to determine which green occupations and skills are applicable within the W&R sector, to determine which technological tools are considered green with regards to the implementation of green occupations and skills within the sector as well as to provide prescriptions for policy and practice. The following questions were generated which were address in the study:

Key questions

- ✓ What are the applicable green occupations within the W&R sectors in South Africa?

- ✓ Which green technological tools support the implementation of green occupations and skills within the W&R sector?
- ✓ What findings and recommendations are there for policies and practice?

This research study approach consisting of a sequential integration of literature review, questionnaire-based interviews as well as survey approach. A systematic analysis of green trends and development in the wholesale and retail sector was done from both the regional and national levels

A total of 680 study participants were surveyed within the trade categories of wholesale and retail operations. The survey also considered various size categories of Small, Medium and Micro-sized Enterprises (SMMEs) as well as the survivalists. Population parameters and characteristics were estimated and distributed across the nine provinces, business categories, and on the basis of whether it was a wholesale or retail grouping.

Finally, statistical data analysis was carried out to ascertain findings. Descriptive statistics were used in presenting the following evidence-based findings as well as recommendations:

Findings:

1. Trade category and operational size influences on green implementation

Trade categories and operational sizes were found to influence the extent of green implementations. Owing to differences in the characteristics of the study population, it seemed necessary to differentiate trade categories and operational sizes of enterprises included in the sample.

2. Shared values for green occupations, skills, and technologies

The study identified some shared values occurring most among the study population. In terms of green practices, there was a common consensus that there are generally acceptable green practices such as re-use, recycling, and recovering of materials, equipment or other forms of devices, which are mostly tools for operations.

3. Occupational, skills, and technological impact on the environment

Occupational, skills, and technological impacts on the environment were found to be central to the issues often associated with the green movement.

4. Market influence on green practices

Green practices, as well as implementations, were found to be generally regarded as a noble and responsible manner of conducting activities among the study participants. A number of market-related factors have the potentials to influence both consumers and firms to adapt to the joint responsibilities of green practices.

Recommendations:

- 1. Recommendation for institutional policy coherence:** A unified policy framework that supports green strategies across occupations in the wholesale and retail sector is required.
- 2. Recommendation for innovation capacity development:** A collaborative strategy among a broad network of stakeholders in the wholesale and retail sector is required.
- 3. Recommendation for adaptive local knowledge system:** This study considers the imperatives of harnessing local knowledge system that have the potential to support the green skills implementation strategy.
- 4. Recommendation for inclusive green policy framework along trade categories and operational sizes:** The study identified the need for an inclusive green policy framework that can address the peculiarity of trade categories of the wholesale and retail operations, taking into consideration the operational sizes.

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1 Introduction

The awareness of the danger associated with negative influences on the ecosystem as confronting environmental and economic sustainability is increasing across nations. In South Africa, the green concept is receiving considerable attention in both private and public institutions. South Africa has embraced the ideals of environmental sustainability while continuing to develop in ways that raise the standard of living across its population. One of the emerging approaches the country has demonstrated in realizing the green ideals is by modeling economic development in consideration of the natural environment. The green concept is spreading with much influence on the development of occupations, skills and technologies. It shapes emerging institutional policies, as well as influencing the way business strategies are executed alongside technology.

Even though South Africa is regarded as the economic hub of Africa, the challenges of skills shortage and high rate of unemployment remain to be addressed. The green economy is considered as having the potential to generate more opportunities if well explored, despite the assumption that some occupations may be affected.

In a bid to ensure that these changes remain within manageable thresholds, actions are required in the area of natural resources efficiency to enhance industrial productivity and environmental sustainability. In line with global consensus and commitment to the National Skills Development Strategy (NSDS), this study takes an integrated approach to facilitate green skills development needs at the level of the wholesale and retail sector of the South African economy. The approach demonstrated is in consideration of the challenges associated with skills and training needs. According to a 2014 OECD Green Growth Studies report these needs are threefold: 1) upgrading skill sets in industries experiencing only minor adjustments; 2) gearing up educational institutions and firms to provide the new skills for new occupations and sectors that will emerge from the green economy; and 3) restraining and realigning skills in sectors that will decline as a result.

One of the key focuses of government as indicated in the National Development Plan (NDP), is how to transition to a green economy. The W&RSETA therefore proactively

identifies itself with the exploration of skills base and technological tools that should be in place to deal with existing and future challenges.

1.1 Sector background

The wholesale and retail sector is among the top sectors that continue to contribute more to the South Africa's economy in terms of gross Domestic Product (GDP). The 2016 4th quarter GDP report of Statistics South Africa indicated that national trading activities contributed 2.1 percent to the GDP. The sector is highly volatile and sensitive to economic shocks.

The wholesale and retail sector of the economy promotes an environment of buying and selling of a wide range of goods and services as deliveries to end users in society. The sector is more volatile with a concentration of small-sized businesses. It is considered to be, the highest absorber of the nation's labour force. Data from the 2010 Stats SA Quarterly Labour Force Survey (QLFS) indicated that the W&R sector employs about 19.93% of the economically active workforce. The report of the W&R SETA Skills Plan: 2011-2016 indicated that small and micro enterprises constitute about 87% of the sector, the majority of which are informal enterprises, while 9.5% are of medium size and 4.5% large enterprises. Key trends in the sector include the use of franchising as a business model to ensure sustainability. The mall or shopping centre localization is highly prevalent in South Africa.

There exists a growing culture of resale transaction across the wholesale and retail business that contract the traditional functions and specialization. The wholesalers intermediate between manufacturers and retailers, while on the other hand, the retailers intermediate between wholesalers and consumers. Nevertheless, the boundary of specialization in the value chain seems somewhat blurred, as some retail services can be found among wholesalers and manufacturers.

The wholesale and retail sector of the economy is characterized by formal and informal trading activities. The informal economy of South Africa is taking a leap, but is, however, failing to keep pace with expectations in generating employment amid challenges of sustainability. The production output of the informal trade activities in South Africa was

reported to have ranked second to manufacturing in 2004 (Alman, 2008:16). Advancement in technologies has been a remarkable trend contributing to the development of the sector. This presents the sector with ample opportunities to innovate across value chains.

1.2 Wholesale and retail trend outlook

The ever-increasing opportunities in the trade sector can be attributed to the rich diversity that characterizes the economy. A positive outlook is projected for the wholesale and retail sector in 2018, given the exponential rise in the population of South African consumers, most of whom are enjoying the proliferation of choices. The rise in urban drift remains a factor to be considered in the distribution value chain of goods and services. This is supported by the rapid development of the mall infrastructure across the country. The growing utilization of technology in support of trade activities is a major development in the modernization of the South African market. More start-ups have to be doing business at ease as they align with the growing technology innovation in the banking and other financial institutions. A variety of applications and devices that support wholesale and retail transactions are being developed, much of which is related to the internet. This development has equally given the sector a face-lift.

There has been a slight drop in the unemployment rate from 27 to 26 percent in the first quarter of 2018 as well as a drop in the Consumer Price Inflation (CPI) rate from 4.50 to 4.27 percent. This is a strong indication that doing business in South Africa may ease off following the ideological stance of the new administration of President Cyril Ramaphosa who promises to address obstacles associated with legal and regulatory compliance requirements confronting small businesses. Market outlook is envisaged to be slightly different as the one percent hike in value added tax from 14 to 15 percent becomes operational. However, to some extent, the effect may be mitigated as more money is expected in the pockets of social welfare-dependent consumers in the form of government grants following the 2018 national budget. It is anticipated that a new minimum wage administration will take effect in the 2018 financial year which may put

more pressure on employers in the sector. These factors signals a rise in real disposable income awaiting retailers.

1.3 Key international trends

More than any other sector of the economy, the wholesale and retail sector is more volatile and can be sensitive to developments in the international environment. Therefore, there is a need to assess key global trends that have influenced green developments in the South African economy.

Growth in the global consciousness of environmental justice has led to a more responsible approach to industrial activities. This consciousness has been a key factor in shaping emerging socio-economic ideologies. The green trend opens up enormous opportunities in production and marketing which are not only limited to the promotion of products with environmentally friendly characteristics. As more green issues are rising in the industries, firms are equally integrating green solutions into their daily operation. The requirement for green goods and services advances industrial activities which include product modification, innovation in production process as well as packaging.

A recent trend has shown increasing priorities on environmentally mitigating initiatives, especially in areas that includes climate change, soil, air, and water pollution. There have been intense efforts across the globe for increasing the capacity of renewable energy sources, as Figure 1.1 shows. Countries that have pledged a strong commitment to this call includes China, United States, Brazil and India. It is now a conventional business practice for firms whose operations impact the natural environment to seek for a sound environmental management system and waste minimization.

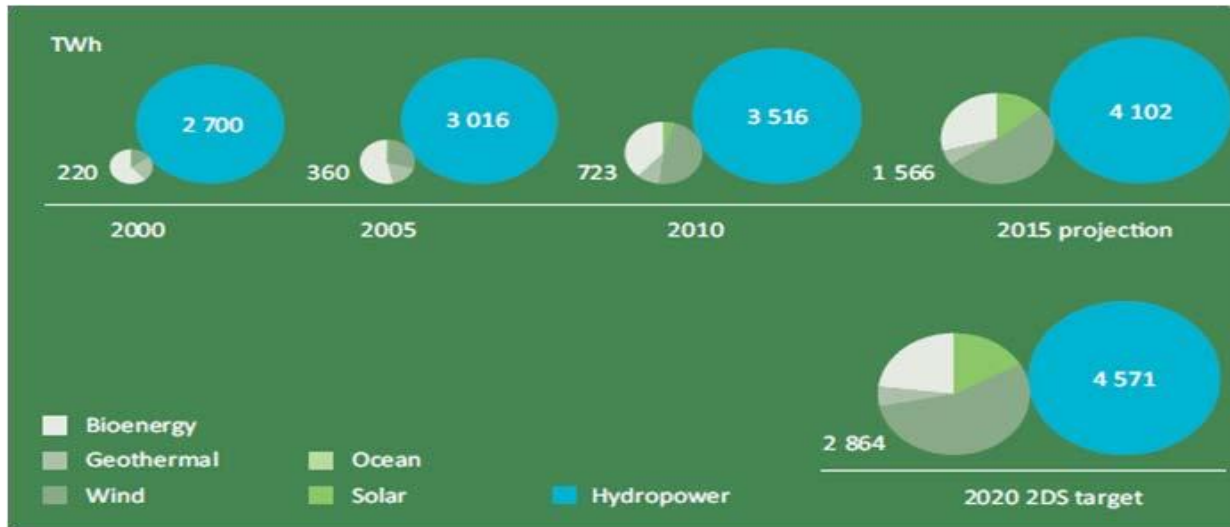


Figure 1.1: Global growth in renewable energy

Source: International Energy Agency (2013), Tracking Clean Energy Progress 2013, OECD/IEA, www.iea.org/publications/TCEP_web.pdf

1.4 Wholesale and retail business model trend

The sector has witnessed a variety of business model innovations in recent years as shops scramble for market shares across a variety of commodities. Oftentimes, business model innovation in the wholesale and retail sector often takes the form of improvement upon the strategic advantages of existing businesses. Technology and its innovation remain one of the key drivers of business model innovation in the sector. Technology is considered an essential tool in advancing the green movement. Green technology has the tendency of influence the logic of trading as well as the way in which values are created and captured within trading networks. Such logic may be adaptable in firms' competition over strategy, even though competition has shown some inhibiting influence on the development of more novelty business models. The majority of the existing business initiatives executed among firms in the sector seem easy to copy, which explains why competition continues to deepen with little or no differentiation in value propositions.

There is a rapid rise in the population of small business start-ups in the wholesale and retail sector, most of whom build upon traditional marketing strategies. Technologies such as the internet and other electronic trading facilities are gaining a stronghold among

businesses across the country. Through the internet, social media has tremendously influenced customer education as well as advancing consumerism. Information Technology (IT) accelerates marketing communication as well as a number of marketing strategies applied in the sector.

A phenomenal challenge confronting small businesses in the sector remains to do with performance sustainability. The cost of doing business in South Africa is on the rise, much of the burden lying on small businesses who barely break-even. This has led many operations to align with the principles of efficient management of business resources in accordance with the green logic of sustainability.

1.5 Legislative framework for skills development

Skills development is considered as a national priority in addressing economic growth. Much emphasis has been given to the growing need for a relevant skills base in support of both the public and private sector. The policy environment for skill development is guided by the aims of the National Skills Development Act of 1998, by which terms are “to devise and implement national, sector and workforce strategies to develop and improve the skills of the South African workforce; to integrate those strategies within the National Qualifications Framework contemplated in the South African Qualifications Authority Act, 1995; to provide for learnerships that lead to recognized occupational qualifications; to provide for the financing of skills development by means of a levy-grant scheme and a National Skills Fund; to provide for and regulate employment services; and to provide for matters connected therewith”. The following policies and legislative frameworks are included to ensure coordinated actions toward the realization of the goals of the national skills development:

- Skills Development Act of 1998
- Employment Equity Act of 1998
- Skills Development Levy Act of 1999
- Labour Relations Act of 1995
- Public Service Act of 1994
- National Skills Development Strategy of 2005 – 2010

- National HRD Strategy for South Africa 2001
- Integrated Quality Management System 2003

1.6 Legislative framework for green initiatives

These mandates serves as the basis for strengthening institutions for harmonious coordination and implementation of government strategic plans in accordance with its commitment to the environment. In contribution towards an environmentally sustainable, low-carbon economy and a climate-change-resilient society, South Africa has set its short-, medium- and long-term visions and goals. These visions and goals are outlined in the National Strategy for Sustainable Development and Action Plan (2014), New Growth Path (2020) and National Development Plan (2030). These policy initiatives are supported by a number of other sector-based policies and strategies that include the Integrated Resource Plan, Industrial Policy Action Plan, Environmental Sector Green Economy Implementation Plan, National Biodiversity Strategy and Action Plan, and the National Climate Change Response White Paper. Relevant environmental legislations that give direct impetus to the drive for green initiatives within the W&R sector include the:

- Environmental Conservation Act of 1989 (Act No 73 of 1989), which provides for the effective protection and controlled utilization of the environment and for matters incidental thereto. It makes provision for generally applicable environmental principles that should serve as for development.
- National Environmental Management Act of 1998 (Act No 107 of 1998), which replaces the Environmental Conservation Act of 1989 by broadening the scope of its applicability. It provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment; institutions that will promote co-operative governance, and procedures for coordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.

- National Environmental Management Waste Act of 2008 (Act No 59 of 2008): the Act reforms the law regulating waste management in order to protect health and the environment by, inter alia, providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

A number of other Acts exist in realizing the green goals alongside the above: these Acts includes the:

- Biodiversity Act of 2004 – provides for the management of biological resources and instils an ecosystem approach to the management of biodiversity issues as well as mainstreaming them into sectoral policy and planning.
- Integrated Coastal Management Act of 2008 – provides a framework that ensures a coordinated management of coastal zones.
- Integrated Waste Management Acts 2006 - among other things, this Act aims to secure ecologically sustainable development while promoting justifiable economic and social development, minimizing waste and waste generation.
- Air Quality Act of 2004 - provides for the establishment of air quality and emission standards and air quality monitoring stations.

1.7 Environmental mandates and strategies

Following global trend, the South African government embraces challenges with regards to the emerging growth paradigm towards the green economy. This global mandate requires efficient application of technologies and skills that aim to promote the mitigation of climate change. South Africa's commitment to international cooperation has yielded a number of international agreements and obligations. This mandate extends to the environmental strategies of its departments and various sectors of the economy.

South Africa was instrumental in the negotiations that culminated in the Paris Agreement. The agreement became a legally binding instrument that gives guidance on processes for universal actions on the threats of climate change within the context of sustainable development and efforts to eradicate poverty.

South Africa played a leading role in the United Nations Climate Change Conference, Durban 2011. The historic treaty on climate change was adopted in France on 12 December 2015. South Africa ratified its Paris Agreement on Climate Change in 2016. This agreement is in line with the National Development Plan, the 2030 Agenda for Sustainable Development and the African Union's Agenda 2063.

A number of other environment-related international agreements and obligations exists with other regional bodies and countries with direct trade links with South Africa such as SADC nations, BRICS nations, Namibia, Mozambique, Botswana, etc. The United Nations Environment considered South Africa as a strategically important country to coordinate and support its activities in the SADC region. These activities include the following:

- Transition to an inclusive and green economy
- Protection of the ecosystem
- Implementation of the Paris Agreement and climate change adaptation and mitigation
- Domestication of the sustainable development goals
- Biodiversity
- Strengthening environmental governance

South Africa's greenhouse emission was globally ranked 12th as well as the 28th largest economy by total GDP in the world as of 2012 (SALGA 2013). Transition to green economy is identified as a mean towards achieving sustainable development.

Global awakening to rapid environmental threats urgently calls for a green approach to industrial development. The urgency required in mitigating climate change portends a challenge across the sectors of the South Africa's economy. It is for this reason that policies that propagate green initiatives are beginning to emerge across business ventures. Challenges before this initiative may precede the lack of a shared understanding of the opportunity cost of embracing actions towards the adoption of more eco-friendly technologies with cost implication for business.

Much concern has been raised around the need for innovative attempts by stakeholders' investment capabilities that focus more on long-term implication of changes in

technologies and the turnaround requirements for them. The rationale for the green concept advances the philosophy that business success is much more dependent on environmental success. Therefore, cost is grossly defined by the welfare of the business ecosystem.

1.8 Approaches and methodology

This research was based on a mixed methods study approach consisting of a sequential integration of literature review, questionnaire-based interviews as well as a survey approach. Data triangulation and cross-validation were applied subsequent to the provincial analysis. The literature review carried out relied on related information using existing data and research papers, industrial white papers, commissioned reports, and government technical reports. Useful internet data sources related to the study were included in the review. The review focused on addressing key issues around green occupations and skills as well as technological tools within the W&R sector drawing on international best practice.

Field data mining was carried out in all nine provinces of the Republic of South Africa (RSA) to determine which green occupations and skills are applicable within the W&R sector of the economy. Data collection was concluded between January 2018 and February 2018. Furthermore, with regards to the implementation of green practices within the W&R sector, technological tools considered green were determined. A total of 680 study participants were surveyed, most of whom were drawn from the databases of W&RSETA stakeholders in all nine provinces. The study participants were within the trade categories of wholesale and retail operations. The size categories involved the Small, Medium and Micro-sized Enterprises (SMMEs) as well as the survivalists. This categorization required that a stratified simple sample should be drawn from the sampling population for all surveys. Population parameters and characteristics were estimated and distributed across the nine provinces, business categories, and on the basis of whether it was a wholesale or retail grouping. The provincial spread of the study population is as follows:

Table 1.1: Provincial study population samples

Provinces	Wholesale	Retail	Total
Eastern Cape	8	62	70
Free State	9	69	78
Gauteng	24	78	102
KwaZulu Natal	14	78	92
Limpopo	6	49	55
Mpumalanga	8	42	50
North West	7	68	75
Northern Cape	9	58	67
Western Cape	11	80	91
	96	584	680

The survey ensured that data on occupations, skills, and technologies were differentiated and analyzed according to the respective provinces. The investigations took into consideration the businesses included in the W&RSETA sector as well as enterprise sizes which were sub-categorized. The samples of enterprise sizes and trade categories are as follows:

Table 1.2: Samples of trade categories and enterprise sizes

Trade Categories	Wholesale	Retail	Total
Survivalists	4	17	21
Micro	12	24	36
Medium	35	380	415
Small	14	102	116
Large	31	61	92
	96	584	680

The study was, however, subject to some limitations, which includes the difficulty in obtaining data on a number of green occupations, skills, and technology as most study participants had insufficient records. Finally, statistical data analysis was carried out to ascertain findings. Descriptive statistics were used in presenting evidence-based findings from the study, following which recommendations were made.

1.8.1 Goals and key research questions

This study is guided by a set of goal, specific objectives and key questions as stated in box 1.1:

Box 1.1: Study brief

This study is conducted on the basis of the mandate of W&RSETA to facilitate skills development needs of the wholesale and retail (W&R) sector as outlined in the National Skills Development Strategy (NSDS). The study aims to identify occupations that contribute towards Green Skills within the W&R sector of the South Africa's economy and furthermore, to make recommendations to promote the growth and application of green occupations, skills, and technologies within the sector. The specific objectives of the study are therefore to:

- ✓ Determine which green occupations and skills are applicable within the W&R sector.
- ✓ Determine which technological tools are considered green with regards to the implementation of green occupations and skills within the W&R sector.

Key questions

- ✓ What are the applicable green occupations within the W&R sectors in South Africa?
- ✓ Which green technological tools support the implementation of green occupations and skills within the W&R sector?
- ✓ What findings and recommendations are there for policies that would assist in developing Green Skills within the W&R sector in South Africa?

1.8.2 Green growth path for W&R sector

Environmentally sustainable business practices are increasing across the W&R sector. There is a growing consumer awareness as well as education on the necessity for eco-friendly goods and services. The green growth path is an inclusive pathway to sustainable development that is concerned with adding value to the environment. This path follows a carefully crafted policy framework that aims to maximize benefits for, and minimize costs to, both the environment and firms in the W&R sector. Central to the green growth path is the necessity for a standard performance monitor that can serve as indicators of growth, for example, indicators that may be useful in determining if growth is sustainable in the long run. This path has the potentials to turn the tide of competition and innovation in the sector. The new trend in the marketing campaign that associates the green logic with products in order to appeal to the consciences of consumers may be an example. Greening occupations in the field of marketing tend to increase marketing opportunities for product innovation that advances consumers aspirations for green justice and ensures sustainability. Globalization makes it much easier for society to be up to speed with international best practices driving green innovation.

The requirement for eco-labelling and eco-accreditation of produce and products in marketing are a new path for enterprises in the course of advancing the green agenda. There is greater emphasis on green branding, a practice which has far-reaching consequences on consumer preferences. Green practices requiring the use of labelling have been demonstrated on products such as organic cotton, organic food, low emission vehicles and appliances, energy efficient electric goods, bio-friendly chemical, recyclable packaging.

1.8.3 Integrated drivers of change

Ecological sustainability is an interdisciplinary concern requiring multidimensional approaches that can produce the-much needed solution. Many answers exist as to why skills and training are changing; why they serve the interest of the environment as well as the creation of more opportunities. The need for a collaborative strategy for green skills development has been re-echoed in many fora and remain a key policy focus of

institutions and agencies of government tasked with environmental management. The Department of Environmental Affairs initiated the 2010 enabling draft document for all SETAs for “Integrating Environmental Driver into Sector Skills Plans”. The document spelt out a unified strategy mandate for all the SETAs in line with new opportunities associated with green growth and sustainability.

According to Hofmann and Strietska-Illina (2013), interrelated drivers of change in skills needs identified in *Skills for Green Jobs* included the physical change in the environment which motivates policy decisions regarding the environment; policies and regulation in turn influence the conduct of actors. Also inclusive are the availability of technology and innovation; markets for greener products and services with respect to consumer habits. Over the past years, these drivers of change have evolved with different implications as well as policy mandates. Many developed countries are witnessing diverse changes in skills needs while developing countries undergoing the green transition at its early stages are learning from the trend.

1.8.4 Business activities in the wholesale and retail sector

As contained in the Sector Skills Plan Update 2014-2015, the industrial coverage of the W&RSETA is basically wholesale and retail economic activities. The coverage is based on the fifth edition of Report No. 09-90-02 of the International Standard Industrial Classification of all economic activities (ISIC). The classification considered suitable adaptations for local conditions with respect to types of business activities in the wholesale and retail sector. These activities are as follows:

Table 1.3: Categories of business activities included in the W&RSETA

Wholesale	
SIC Code	Trade Category
61000	Wholesale and commission trade, except for motor vehicles and motor cycles.
61100	Wholesale trade on a fee or contract basis.
61220	Wholesale trade in food, beverages and tobacco.
61310	Wholesale trade in textiles, clothing and footwear.
61391	Wholesale trade in household furniture requisites and appliances.
61392	Wholesale trade in books and stationery.

61393	Wholesale trade in precious stones, jewellery and silverware.
61394	Wholesale trade in pharmaceuticals, toiletries and medical equipment.
61420	Wholesale trade in metal and metal ores.
61430	Wholesale trade in construction materials, hardware, plumbing and heating equipment.
61501	Office machinery and equipment including computers.
61509	Other machinery.
61901	General wholesale trade.
61909	Other wholesale trade not elsewhere classified (n.e.c).
Retail	
62000	Retail trade, except for motor vehicles and motor cycles; repair of personal and household goods.
62110	Retail trade in non-specialised stores with food, beverages and tobacco dominating.
62190	Other retail trade non-specialised stores.
62201	Retail trade in fresh fruit and vegetables.
62202	Retail trade in meat and meat products.
62203	Retail trade in bakery products.
62204	Retail trade in beverages (bottle stores).
62209	Other retail trade in food, beverages and tobacco n.e.c.
62311	Retail of non-prescribed medicine and pharmaceutical products other than by pharmacists.
62321	Retail trade in men's and boy's clothing.
62322	Retail trade in ladies' and girls' clothing.
62323	Retail trade by general outfitters and by dealers in piece goods, textiles, leather and travel accessories.
62324	Retail trade in shoes.
62330	Retail trade in household furniture appliances, articles and equipment.
62340	Retail trade in hardware, paints and glass.
62391	Retail trade in reading matter and stationery.
62392	Retail trade in jewellery, watches and clocks.
62393	Retail trade in sports goods and entertainment requisites.
62399	Retail trade by other specified stores.
62400	Retail trade in second-hand goods in stores.
63122	Retail sale of used motor vehicles.
63311	Sale of tyres
63500	Retail sale of automotive fuel

In the same industrial coverage, the following activities that are included under wholesale and retail in the Standard Classification of All Economic Activities do not form part of the W&RSETA:

Table 1.4: Categories of business activities not included in the W&RSETA

SIC Code	Trade Category
61210	Wholesale trade in agricultural raw materials and livestock.
61410	Wholesale trade in solid, liquid and gaseous fuels and related products.
62310	Specialized retail trade in prescribed pharmaceutical, medical and orthopaedic goods.
62510	Retail trade via mail-order houses.
62520	Retail trade via stalls and markets.
62590	Other retail trade not in stores.
62600	Repair of personal and household goods.
63100	Sale of motor vehicle other than used motor vehicle.
63200	Maintenance and repair of motor vehicles.
63300	Sale of motor vehicle parts and accessories other than tyres.
63400	Sale, maintenance and repair of motor cycles and related parts and accessories.
64100	Hotels, camping sites and other provision of short-stay accommodation.
64200	Restaurants, bars and canteens.

Wholesale comprises basically resale (sales without transformation) operations that involves the sales of new and used goods to retailers; to industrial commercial; institutional or professional users; or to other wholesalers; or acting as agents or brokers in buying merchandise to such persons or firms. There are, however, a number of other ways wholesalers can be classified, including:

- Merchant wholesalers
- Agent, brokers, and commission merchants
- Manufacturers' sales branches and offices

Retail outlets are the most accessible market and are well concentrated in shopping venues. Green skills and technologies are less developed among retailers. Many retailers in the survey are yet to leverage opportunities in the green economy. The types of retail outlets indicated in the study survey include:

- Supermarkets
- Discount stores
- Department stores
- Warehouse stores
- Specialty stores
- Malls
- 'Mom and Pop' stores

2 Defining green occupation

Green occupations have been defined in various ways. Some of the definitions are based on the expressions given to the green attributes of jobs, while others focus on the green attributes of industrial activities. The philosophical underpinning of the green movement is with respect to economic activities related to conserving the natural resources and protecting the environment. From the green jobs perspective, the United States Bureau of Labor Statistics (BLS) provides a set of definitions that contains two components: the output, and the process approaches.

By means of the output approach, establishments that produce environmentally friendly goods and services, as well as its associated jobs, are determined. The process approach is more about establishments that apply green processes and practices and counts the jobs involved. The BLS succinctly outlines its definition to imply either jobs in business or associated with workers' duties that are environmentally friendly, benefiting and, conservative.

2.1 Scope of green occupations

Various occupations that contribute towards green skills can be grouped into:

- Industrial occupation (extraction, manufacturing, construction)
- Commercial occupation (buying, selling, distribution)
- Business service occupation (personal or direct, indirect)

Wholesale and retail activities fit better when grouped within the commercial and business service occupations. Both occupations, according to Annen and Tiemann (2015:2303) can be discerned by their basic mercantile contents and the aim governing the work. However, Annen and Tiemann (2015) identified the following occupations, which according to this study fall within the W&R sector:

- Traders
- Sales staff
- Financial service workers
- Service traders
- Clerical assistants
- Management
- Desk work

The number of occupations in the W&R sector may seem endless; however, the International Standard Classification of Occupations (ISCO) is supportive in identifying occupational groups in the sectors (ILO: 2012). This taxonomy identifies boundary issues affecting a broad spectrum of occupations, some with a broad range of tasks and duties. The ISCO-08 included clerical and administrative support, sales, and services in the same group of occupations with a number of sub-major groups in sales. These occupations include:

- Shopkeepers
- Shop supervisors
- Shop sales assistants
- Sale demonstrators
- Door-to-door salespersons
- Contact Centre salespersons
- Service station attendants

- Food Service counter attendants
- Sales workers not elsewhere classified

2.2 Green occupations for a sustainable W&R economy

The green concept is currently taking on a new dimension in a variety of ways as occupations and skills emerge. The outcome of the green debate remains the continued shaping of decisions regarding production, consumption, and even lifestyle. The sequential growth in green occupations and skills can be considered to have the tendency to generate employment opportunities and sustain new and emerging economies. Green occupations and skills have been defined in a variety of ways which speak to environmental friendliness and sustainability. In this section, an attempt was made to provide a conceptual analysis of occupations and skills in the green economy in the context of wholesale and retail activities in South Africa.

The United Nations Environment Program considers Green occupation as any work that promotes the conservation and restoration of environmental quality and natural resources. In some instances, green occupations are often referred to as a “green job”. The United States *Bureau of Labor Statistics* (BLS) describes it as jobs in business that produce goods and services that benefit the environment or conserve natural resources.

According to the BLS, green jobs are categorized into the following: Water conservation, biofuels, environmental remediation, energy auditors, electric vehicles, wind energy, sustainable forestry, geothermal energy, sustainability, recycling, and solar power. Dierdorff, Norton, Drewes, Kroustalis, Rivkin and Lewis (2009:4) indicated that some experts hold the view that it could be more appropriate to focus attention on the greening of occupations rather than tagging some as green. They consider that green economy activities and technology may have different effects across a variety of occupations.

Occupations that seek to support green practices include education, training, and public awareness. Others are those that enforce regulations and support education with regards to green practices for the benefit of the environment.

In another definition, according to the International Labour Organization (ILO), green jobs are jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable (Strietska-Ilina, Hofmann, Haro & Jeon, 2011:4). Their definition covers work in agriculture, industry, services, and administration that contributes to preserving and restoring the quality of the environment. Green related jobs as those that help in:

- improving energy and raw material efficiency
- limiting greenhouse gas emissions
- minimizing waste and pollution
- protecting and restoring ecosystems
- supporting adaptation to the effects of climate change.

A Standard Industrial Classification (SIC) of occupations in the South African context reflects the different sectors designated in the economy. In a nutshell, the 21 SETA sectors represent various occupations in South Africa.

All of these occupations have in a number of ways connections with the wholesale and retail activities. These occupations and skills with great potential for green economy can be improved to address the growing need for a sustainable green environment. Arguably, a coordinated action towards concerns for the promotion of green occupations and skills has the effect of increasing opportunities for small businesses.

The wholesale and retail sector is service-driven and more labour-intensive. The intensity of application of the green approach may vary between the wholesale and retail sector as different technological tools may be considered. The notion and question of what constitutes green occupations and skills within the W&R sector in South Africa are linked to technological tools used in the production of goods and services.

3 Green skills for the wholesale and retail sector

Green skills are referred to as the ability to carry out complex job activity or functions that promote social, economic, and environmental sustainability. Skills profiles for green jobs

within the wholesale and retail sector are developing alongside technologies, and existing skills in science and technology are adapting to the green economy.

3.1. Categories of green skills component

Some of the skills components can be incredibly difficult to quantify as their categorization may seem subjective. Findings from the study survey indicate that green skills components among wholesale and retail operations in South Africa fall into three categories, namely technical, cognitive and interpersonal.

Depending on circumstances, these skills are implementable across occupations in the sector. Skills can be greened as the green concept is developed and imbibed in the job holder, in other words, many skills have the potential to be environmentally friendly as well as support the green goals.

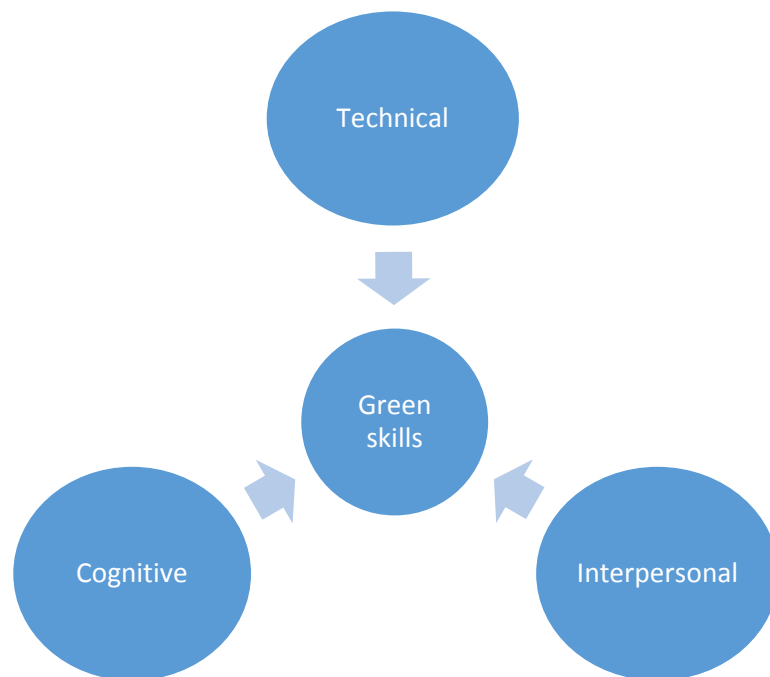


Figure 3.1: Categories of green skills components

3.1.1 Technical skills

Some occupations in the wholesale and retail operations require the support of conceptual knowledge with technical skills. This involves some knowledge and capabilities required to perform specialized tasks, they are more practical in terms of the use of certain tools that may either be tangible or intangible. These are the abilities and knowledge needed in relation to things. The ten most indicted examples of technical skills from the survey conducted among wholesale and retail operations in the nine provinces of South Africa include:

- Communication
- Adaptability
- Leadership
- Time management
- Decision making
- Ability to work under pressure
- Conflict resolution
- Self-motivation
- Efficient operation of specific machinery
- Skills in generating computer programs

3.1.2 Cognitive skills

These skills are referred to as brain-based skills and are required in performing resale functions from the simplest to the most complex tasks. These have more to do with the dynamics of how learning, remembering, and problem-solving are accomplished. They are skills in relation to ideas, and each of these skills has a role to play in processing new information. They can be used as predictors of job-related success. The ten most indicted examples of cognitive skills from the survey conducted among wholesale and retail operations in the nine provinces of South Africa are as follows:

- Thinking skills
- Reasoning skills

- Remembering skills
- Listening skills
- Understanding skills
- Business writing skills
- Judgment skills
- Perception skills
- Intuition skills
- Awareness skill

3.1.3 Interpersonal skills

This skills set involves those used on a daily basis to interact positively with others and they can effectively be green skills in relation to people. They imply a person's ability to communicate or interact well with others in a network of customers and suppliers. Strong and effective interpersonal skills contribute to success in business. The ten most indicted examples of interpersonal skills, from a survey conducted among wholesale and retail operations in South Africa, are as follows:

- Customer service skills
- Skills for handling customer complaints
- Customer calls skills
- Conversational skill
- Emotional intelligence skills
- Confidentiality skills
- Interviewing skills
- Mediation skills
- Negotiation and persuasion skills
- Team-building skills

In the resale business, more emphasis is placed on developing human capital along the lines of conceptual knowledge and skills required for green job functions. Both requirements are co-dependent in advancing the green ambition within the wholesale and

retail sector. Conceptual knowledge speaks of a clear interpretation and understanding of the network of concepts associated with green occupations and technologies. It includes understanding the procedures required in dealing with situations in order to achieve some green outcome. Green skills are requirements for green occupations and technologies and these are essential in producing the desired results that promote environmental sustainability.

3.2 Attributes of green skills

The green skills requirements of jobs are enhanced by technological tools. These skills address the competent excellence in performance or in production activities that promote environmental welfare. The term 'skill' is broadly defined as the ability to excel in performing complex activities or job functions involving ideas, things, people, etc. This ability is derived from a person's knowledge, practices, aptitude, etc.

The European Centre for the Development of Vocational Training (Cedefop) has already undertaken considerable work on green skills. They broadly refer to green skills as 'the knowledge, abilities, values, and attitudes needed to live in, develop and support a society which reduces the impact of human activity on the environment' (Cedefop, 2010a). Cedefop (2012:20) identified some jobs to be clearly central to the green economy, while others may lead to a beneficial environmental impact for reasons owing to specialization and changes in the nature of their work. According to them, changes are in terms of job content and job numbers with respect to low-carbon economic growth. They outlined important dimensions of changes in skill needs as:

- any changes in the level of skill required
- any changes in the type of skill required
- whether the skill is required within an existing occupation or a new occupation
- whether the job is required within a new industry or within an existing industry.

Skill can either be categorized on the one hand as domain-general, which accelerates pre-determined results across jobs in a work environment. On the other hand, domain-specific skills are those which are directly useful and linked to a particular job function.

The Sector Skills Plan 2011-2016 clearly emphasized the need for the multi-skilling of senior managers in the direction of accelerating the green agenda which is in accordance with international climate change agreements. The Plan outlined environmental strategies based on the growth of consumer awareness of environmental conservation internationally and emphasized the importance of green branding and sustainable management practices.

Green skills are spelt out in line with the tenets of the green agenda which are characterized by:

- the need for increased recycling
- packaging challenges
- greater awareness of environmental protection among retailers
- a massive responsibility to effectively implement the green agenda
- solutions to solve the depletion of water resources

3.3 Occupations contributing towards Green Skills in the W&R sector

Different work activities exist that people get engaged or occupied in, some are professional business activities while others may be vocations in line with different occupations. According to Dierdorff et al. (2009:4), the U.S. Department of Labour defined occupation as “group of jobs, found at more than one establishment, in which a common set of tasks are performed or are related in terms of similar objectives, methodologies, materials, products, worker actions, or worker characteristics”.

The vast majority of existing occupations directly or indirectly contribute to environmentally friendly skills that enhance sustainability, as well as promote the use of green technologies within the W&R sectors. It can be considered that almost every occupation has the potential to influence the development of green skills in the W&R sector of the economy, whereas occupations exist that remain direct threats to green skills and a sustainable environment.

The growing global exposure to technological innovations in the renewable energy sources provides an opportunity for skills development. In some instances, progressive

skills moderations are required for new and emerging green economies. This is so that, as new technologies emerge, new skills associated with their application are needed. It is therefore required that green principles be followed through, both in designing and testing of technologies.

This new and emerging set of occupations poses more challenging obligation for research and development. This can be demonstrated through the development of technologies with more potential that could be instrumental to the growth and enhancement of green skills.

The Cedefop (2010) study on *Skills for green jobs* identified the occurrence of green occupations in the following fields, which, according to the assumptions of this study, are W&R-related:

- agricultural occupations that commit to organic products;
- chemical occupations that commit to biodegradable substances;
- traffic occupations that commits to environmentally-friendly mobility;
- energy occupations that commits to renewable energy and energy conservation.

Over the past decade following the inception of the green movement, there has been a rapid growth in the South African resale market. Yet, there seem to be very little awareness of green skills in the retail sector comparable to the wholesale sector. According to findings in the study survey as indicated in Figure 3.4, majority (72%) of occupations in the wholesale and retail sector can be said to contribute directly or indirectly to green skills. However, findings from this study indicate that these skills are not well established and needs some standardization.

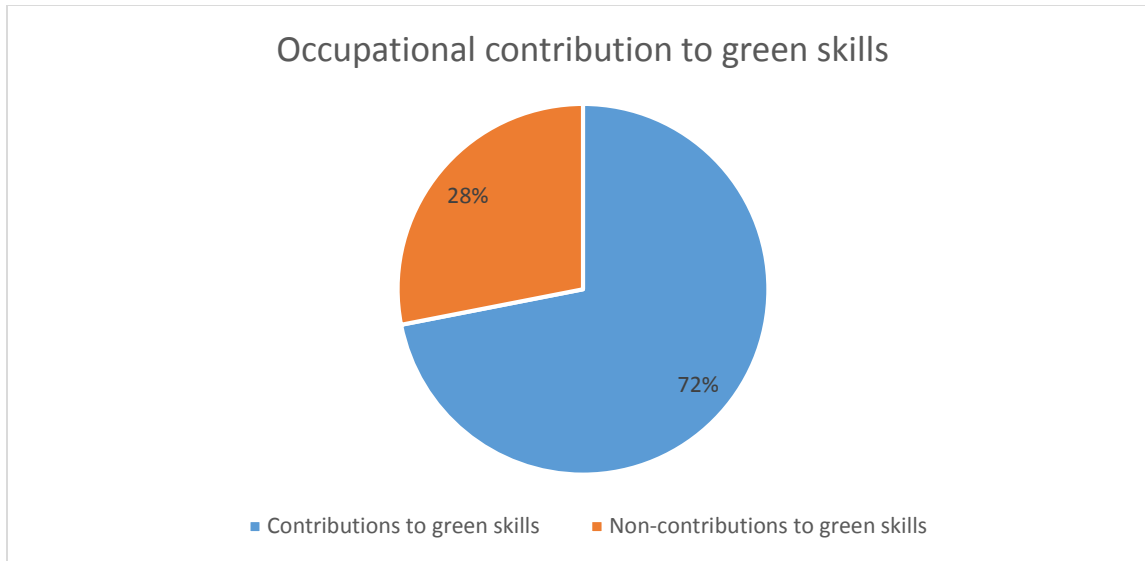


Figure 3.2: Occupational contributions to green skills.

4 Green technologies for the wholesale and retail sector

The concept of green technology is a recent synonym for what was termed ‘Environmentally Sound Technologies (ESTs)’. Based on Agenda 21 of Chapter 34 of the UN Conference on Environment and Development (UNCED), popularly known as the Earth Summit of 1992, ESTs were defined as technologies which (United Nations, 1992):

- protect the environment
- are less polluting
- use all resources in a more sustainable manner
- recycle more of their waste and protects
- handle residual wastes in a more acceptable manner than the technologies for which they are substitutes.

The definition further elaborates that ESTs in the context of pollution are “process and product technologies” that generate low or no waste, for the prevention of pollution. ESTs also cover technologies for the treatment of pollutions after they have been generated.

Other aspects of the definition include the emphasis that ESTs are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as the organizational and managerial procedure

Green technologies are integral to green economy, and enhance the pace of green economy development. The green economy encompasses the economic activity related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas (GHG) emissions, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy (Dierdorff et al. 2009:3).

The Academy of Science of South Africa (ASSAf) categorically re-echoed a statement by Gisbert Glaser in its report on *The State of Green Technologies in South Africa* (2014) that ‘there can be no green economy without green technologies and technological innovation’. For technology to be as positive as possible, public consciousness must be stirred to guard against threats to the environment. This study conforms with the growing consensus in support of a technology-based approach to the green economy. This ideology is driving technological innovation that supports the mitigation of environmental threats.

Green technologies, therefore, refer to the application of devices that are instrumental to sustainable management of natural environment and resources. There are various definitions of green technologies. The term broadly embraces products, services and procedures that are used in green production and consumption processes (UNESCAP, 2012). Green technologies are also referred to as clean technologies and are technologies intended to mitigate or reverse the effect of human activities on environmental sustainability.

4.1 Scope of green technology within the wholesale and retail sector

The place of green technology in wholesale and retail activities may seem uncertain if not carefully scrutinized. The increasing need for green technologies has equally been identified across different sectors of the economy. Green technologies in the context of the wholesale and retail sector may be categorized in terms of their relationship with devices, machinery, and equipment that facilitate the execution of sales. This can be in

the form of operating supplies and techniques that facilitate sales activities. This definition can be extended to the trading stock as it applies to green technologies. On the basis of the knowledge of the importance of green technologies, rational selections of trading stock are made.

The scope of green technologies in relation to the wholesale and retail operations covers other key areas requiring increasing demands for green technologies which include the following:

4.1.1 Energy

Much emphasis has been placed on the need for energy-efficient technologies as well as renewable energy technologies in South Africa. These technologies are considered to be environmentally friendly; they have the potential of accelerating economic growth with minimal ecological impacts. Sources of South Africa's renewable energy include solar, wind and bioenergy. The high rate of energy consumption in South Africa remains a concern for the government. The supply of energy has been heavily dependent on coal and other conventional fossil fuel-based energy sources. The classification of industrial and consumer products that constitute energy-efficient technologies within the wholesale and retail sector includes:

- Lighting
- Water heating
- Insulation
- Motor
- Variable Speed Drives
- Photovoltaic

4.1.2 Water

The provision of quality water for human consumption remains a global challenge. Millions of people in South Africa are experiencing water quality shortage. The supply of water is a necessity in supporting poverty alleviation. A large part of the population lack access to piped water in their dwellings. There are a number of green technologies for water

management within the wholesale and retail sector. These technologies perform different functions, such as:

- Chemicals for water treatment
- Solar technologies for water pasteurizers as well as those used to decontaminate water by heating above 60°C
- Nanotechnologies that support water purification in terms of treatment and remediation as well as sensing and the detection of biological and chemical contaminants included in water.

Other technologies exist such as collection system, flush diverters, storage tanks, and flow meters, water level indicators, solar power supply machines, filtration materials that enhance water re-use, recycling, and desalination. These materials are among wholesale and retail trading stock. Rooftop rainwater harvesting (RWH) is another method of promoting water conservation and can be supported by the use of rainwater storage tanks and pipes. Water pumps and other irrigation technologies are essential in many usages, including areas such as agriculture and constructions.

4.1.3 Waste

Technological development in waste management provides yet another set of opportunities for the wholesale and retail sector. Waste management has advanced alongside technologies aimed at promoting sustainable development and the greening of the South African economy. Over the years there has been a paradigm shift away from the traditional approach of waste management. There has been more emphasis on the economics of waste products, whereby forms of waste are regarded as valuable resources for further production purposes. Therefore, as the green concept develops, technological innovations are progressing in line with the hierarchy of waste: prevention, reuse, recycling, and recovery (ASSAf, 2014).

Figure 3.2 shows the levels of interventions in waste management. Different green technologies may be applied at every level of the waste hierarchy. More opportunities in waste business are being identified. These opportunities are supported by technological

innovations that accelerate the processing of waste for alternative uses. One example of such technologies include Energy-from-waste (Efw) technology, which can be used in generating energy that is converted to electricity as well as fuel. Efw includes both thermal and no-thermal technologies. As contained in ASSAf (2014), some examples are:

- Conventional incineration or combustion
- Gasification
- Pyrolysis
- Plasma gasification
- Thermal depolymerisation
- Anaerobic digestion
- Fermentation
- Mechanical biological treatment
- Landfill gas recovery

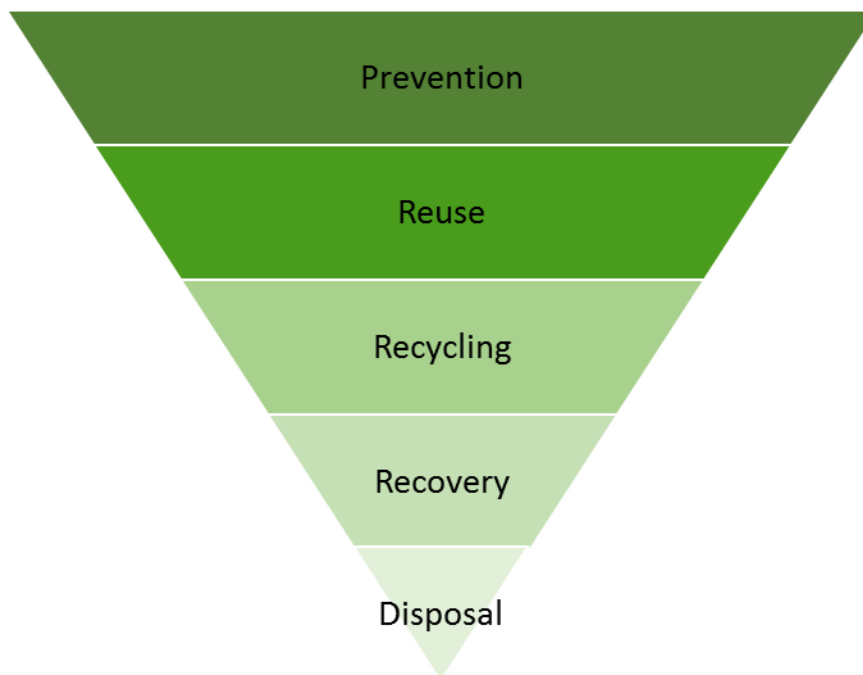


Figure 4.1: Waste hierarchy (Source: ASSAf, 2014, with adaptations)

The emphasis on environmental waste and costs must reflect the implication of industrial activities on the long-term yield of the environment.

4.1.4 Sanitation

A number of factors contribute to ecosystem pollution of many kinds which pose health risks to human, animal and aquatic lives. Sources of pollution include inadequate sanitation. Exploring green technologies within the wholesale and retail sector that promotes green sanitation is essential to the preservation of lives. Sanitation problems affect both households and industries. There are a number of waste treatment materials in the wholesale and retail market that guarantee eco-sanitation. There is a connection between the management of sanitation and waste, as in both cases the aim involves ensuring the mitigation of the natural environment. A waste management system that is cost-effective is one that achieves optimal eco-sanitation. Recycled wastes could serve as resources that support a sustainable agriculture.

Green technologies address sustainable development challenges derived from industrial as well as domestic activities. These technologies are applied on the basis of a set of ecological principles. Green technologies often result in more efficient operations and are associated with workforces that will, in most instances, require a completely different skills set. The scope of green technologies applying to the wholesale and retail sector includes those that serve the following functions (UNEP, 2003):

- *Monitoring and assessment:* these functions are compatible with technologies that are useful in terms of the need to establish the actual and expected conditions of the natural environment with respect to level of impact that may result from dangerous industrial activities.
- *Pollution prevention and control:* these involve technologies that avoid or mitigate ecologically hazardous substances in production processes. Prevention may involve the application of alternative measures that are less harmful to the environment than sticking to certain predetermined approaches. Control may either be reactive or proactive; however, it is always best to render hazardous substances harmless before application.

- *Remediation and restoration*: these are associated with technologies that improve ecosystems as well as reduce anthropogenic effects on the natural environment.

4.2 Technological tools for environmental sustainability

At the core of the green technology initiative is the concept of waste and cost optimization. Green orientations for industrial organizations may be a source of progressive learning about innovations in technological tools that contribute to the green economy. These technological tools ensure the minimization of industrial costs as well as wastes. This section examines technologies having the potential to accelerate the development of a green economy. Existing technologies will be evaluated to calibrate their effectiveness towards the mitigation of environmental threats.

Technological innovations that take industrial cost-efficiency into account may in some respect be contributing to the advancement of the green concept. Figure 4.2 shows key characteristics of environmentally sound technologies which fall within the three pillars of sustainability: environmental, economic, and social and cultural sustainability. All three pillars describe factors which includes the protection of ecosystems, protection of resources, low operating and maintenance costs, long-term resource productivity, preservation and enhancement of social and cultural values, and protection and enhancement of health.

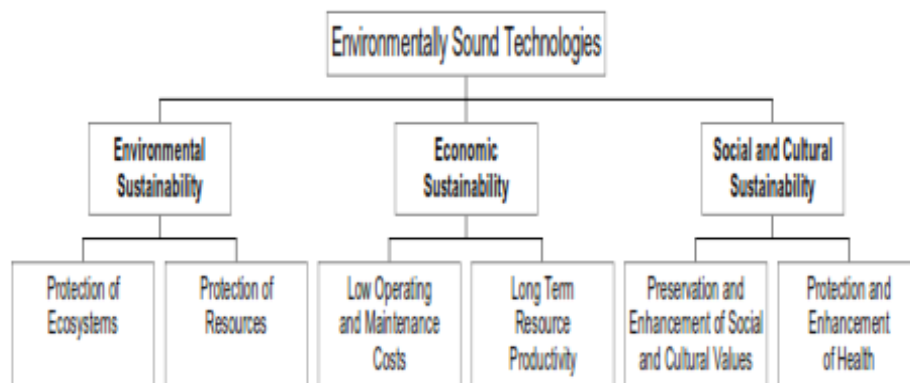


Figure 4.2: Sustainability-related characteristics of ESTs (UNEP, 2003)

The application of new technologies is required in addressing emerging environmental challenges in the efficient implementation of green economy (Aoyi, Khoza, Modiba, Pete Oteno & Mabuza, 2017). The new industrial dispensation calls for environmentally-minded innovative approaches in the development of technological tools for green occupations as well as the skills required for production operations.

4.3 Implementation challenges of green technologies

Even though environmentally sustainable technologies have been regarded as essential for ecosystem preservation, a number of variables may inhibit their selections and implementation. Green practices are relatively unpopular in many occupations within the wholesale and retail sector. However, there is a growing conceptual knowledge of green practices. According to findings from a survey, as indicated in Figure 4.3, most (67%) of the study population indicated that their occupations support green practices. It is also evident from the study survey that to a moderate extent, consumer habit remains a key driver of green practices. The slow pace in the development of skills and technical knowledge that are environmentally friendly across various sectors of the economy indicates a limitation in the uptake of green technologies, particularly within the wholesale and retail sector.

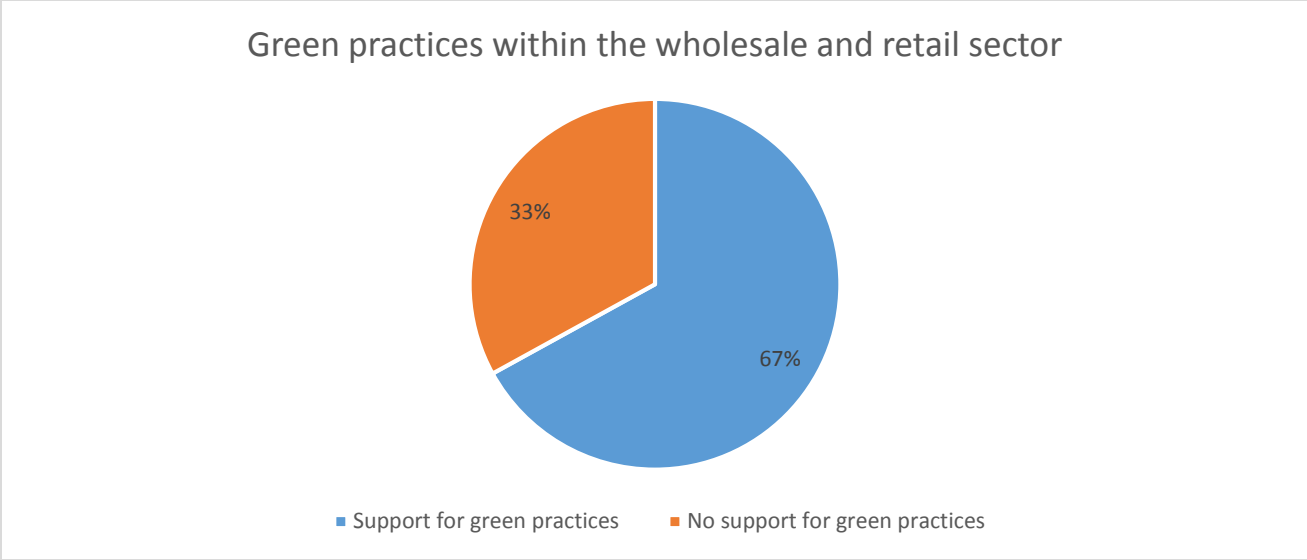


Figure 4.3: Occupational support for green practices within the W&R sector

The wholesale and retail sector has very little knowledge of the performance histories of certain green technological tools, which affects the market for them. In some instances, some green technologies may be less compatible with many people and organizations, for various reasons. In selecting green technologies it is, therefore, equally important that the following variables are considered (UNEP, 2003):

- **Values and perceptions** – societies may have differences in values and perceptions over what constitutes environmentally sound technologies. Sometimes derivable benefits of these technologies with respect to the environment may be doubtful.
- **Technological context** – the functions of some technologies may be conceived differently and in some circumstances, green technologies may be alternated by other existing technologies in a way that results in environmental soundness.
- **Location and scale** – in many instances, it may seem difficult to ascertain the sphere of usage of some technologies. The scale of a given project may be a strong determinant of the choice for green technologies as well as the location, climate, and availability of resource.
- **Rate of change** – as society evolves, migrating from one technology to another may have some implications. Development of green technologies may equally require

innovations in existing technologies. Changes expected to align with green standards may include behavioural patterns, institutions and infrastructures as well as the growth of population, production and resources.

- **Time** – the timing of technological innovation and application must be considered alongside the evolutionary nature of sustainable development.

4.4 Enabling technologies for green occupations

Advancement in knowledge and scientific understanding of the environment has focused on existing and emerging technologies. Innovation in technology is a critical determinant of the requirements for skills. Technological changes remain one of the major external environmental influences on the industrial production activities. Technology supports skills that are required in executing productive tasks. The mode of application of existing technologies presents the question of how enabling technologies are to environmental sustainability. The major concern is about how the methods of application of technologies can raise productivity and living standards and conserve the natural resource base.

Technology innovation that advances the green logic must be focused on methodology and skills development. Industrial responsibility to society has continued to guide the intensity and dynamics of technology innovation, application, and its interaction with society. The mode of application has an overwhelming influence on the consequences of technologies with regards to the promotion of the green economy. Understanding of human role towards enabling technologies calls for the need for effective policies and regulations to enable the application of technologies to guarantee green economy.

The awareness of environmental impacts and their implications seem to have an overwhelming influence on the choices of industrial technologies. These technologies are developed in ways that support green processes and practices as well as having a positive conservative impact on the environment and natural resources. The following categories of green technologies may be considered in relation to the wholesale and retail operations:

4.4.1 Information and communication technologies

This set of technologies remains conventional in supporting improvement in productivity and resource efficiency. The W&R sector has recently witnessed a proliferation of Information and communication technologies contributing immensely to efficiency. One example includes the geographic information system (GIS) that can facilitate the monitoring and assessment of changes in climate

4.4.2 Automation technologies

In line with improvement in productivity and resource efficiency, automation technologies have made rapid advances in trade transactions, it has encouraged a more efficient process in wholesale and retail activities. Point of sales automation has led to customer interface with artificial intelligent devices that execute actions at some command.

4.4.3 Advanced materials and process technologies

These environmentally friendly technologies support the conversion of raw materials and other semi-finished goods, in some instances through the distribution channel. They are much better than conventional technologies in terms of resource and energy efficiency. At the wholesale and retail level products such as beverages may still be subject to process refinements to attain some improved quality. Process technologies can be in the form of machines, equipment, and devices that have a very significant effect on quality, speed, dependability, flexibility and cost. Process technologies include the following:

- **Material-process technologies:** these are technologies that transform, transport, and add values to materials. They include multi-function machines such as welding machines, coffee machines, etc.
- **Information-process technologies:** this form of technologies includes procedures, equipment, and software designed to process information according to programmed format. The online shopping devices and e-commerce software are some examples.

- Customer-process technologies: this form of technologies simplifies the actions performed by humans in the exchange process. They include telephone answering machines, ATM, shopping carts, etc.
- Integrated-process technologies: involving a series of actions that processes a combination of materials, information and customer functions.

4.4.4 Biotechnology

This enabling technology is another breakthrough innovation that offers opportunities in “any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use” (Article 2 of the United Nations Convention on Biological Diversity, 1992:3). This technology cuts across various industries and involves the improvement of the value of materials and organisms. Biotechnology has the potential for the management and treatment of solid and liquid wastes as well as offering a number of alternative solutions to products and processes

Major industrial aspects of biotechnology application includes health care (medical), crop production and agriculture, none-food (industrial) uses of crops and other products (for example biodegradable plastics, vegetable oil, and biofuels) and environmental uses. Biotechnology has also been found useful in recycling: the technology is used for remediation (bioremediation) due to hazardous spills from industrial activities. It has been argued that the environmental consideration of biotechnology is in terms of both application and a corresponding implication.

4.5 Accelerating influence of technology education

A broad approach to ensuring public education of sophisticated environmentally friendly technological tools for industrial purposes is essential. This approach may entail the share understanding and values of various role players in environmental affairs such as government, enterprises, consumers, etc. Society’s collective stake in the environment involves everyone in the drive to achieve green goals. An educational system that mainstreams environmental topics in its curricular as a prerequisite may be creating

environmental awareness (Martinez-Fernandez, Ranieri & Sharp, 2013). This can be a proactive step towards equipping people for anticipated environmental challenges. The government, through its relevant agencies, can enforce consumer education and influence corporate strategies towards the green goal. Likewise, government and business can initiate and enforce legislations that ensures that consumers are educated on environmental issues relating to goods and services.

Variables to be considered when determining green technologies within the W&R sector include the following (UNEP, 2003):

- *Cultural values and perceptions*: cultural background and perspectives remain key to the adaptation and implementation of green technologies. Societies vary with respect to technologies considered as environmentally sustainable.
- *Technological context*: this involves considerations to the modification or changes to be made to existing technologies. Resolving the contest in balancing socio-economic benefits with environmental sustainability is a major concern.
- *Location and scale*: the adaptability of certain technologies to different geographic conditions is considered as well as the scale of industrial activities requiring the application of green technologies.
- *Rates of change*: the rate of technological change in many respects is highly limited. This includes changes associated with institutions and infrastructure, and pattern of behaviour.
- *Time*: a more efficient environmental outcome of green technology innovation requires proper timing.

4.6 Technology life cycle assessment in the W&R sector

The life cycle concept has been associated with the issue of technology and its environmental as well as socio-economic impacts right through all its life cycle stages (UNEP, 2003). Understanding life cycle impact will help in the management of technologies with a view to a sustainable environment. The life span of technological tools is, therefore, a factor to be taken into account when determining the magnitude of impact. The life cycle of technologies may be categorized into different stages with different

characteristics and consequential effects on the environment. At every given stage of a technology life cycle it is important to determine the corresponding environmental and socio-economic costs. An impact assessment is considered right through all stages of the life cycle of a given technology, product or service. The assessment of environmental impact of technologies includes the evaluation of:

- solid wastes
- hazardous wastes,
- air emissions,
- water effluents
- energy consumption
- water consumption, and
- ozone depletion.

5 Findings

This section presents relevant findings from both qualitative and quantitative research which were complementary to literature findings.

5.1. Trade categories and operational sizes determine green implementation

Trade categories and operational sizes were found to determine the extent of green implementations. Owing to differences in the characteristics of the study population, it seemed necessary to differentiate trade categories and operational sizes of enterprises included in the sample, as shown in Figure 5.1. These were, namely: survivalist, micro medium, small and large-sized wholesale and retail enterprises in the South African context. In terms of operational sizes, the majority (49%) of the retail enterprises covered were micro-sized enterprises, followed by survivalist (30%), and the least comprised 3% of large-sized enterprises. In the wholesale category, the majority (55%) of small-sized enterprises were captured in the survey. The medium-sized enterprises were next, with 23%. The wholesale category had the least survivalists (2%), who seem to be in their early stages of their operations.

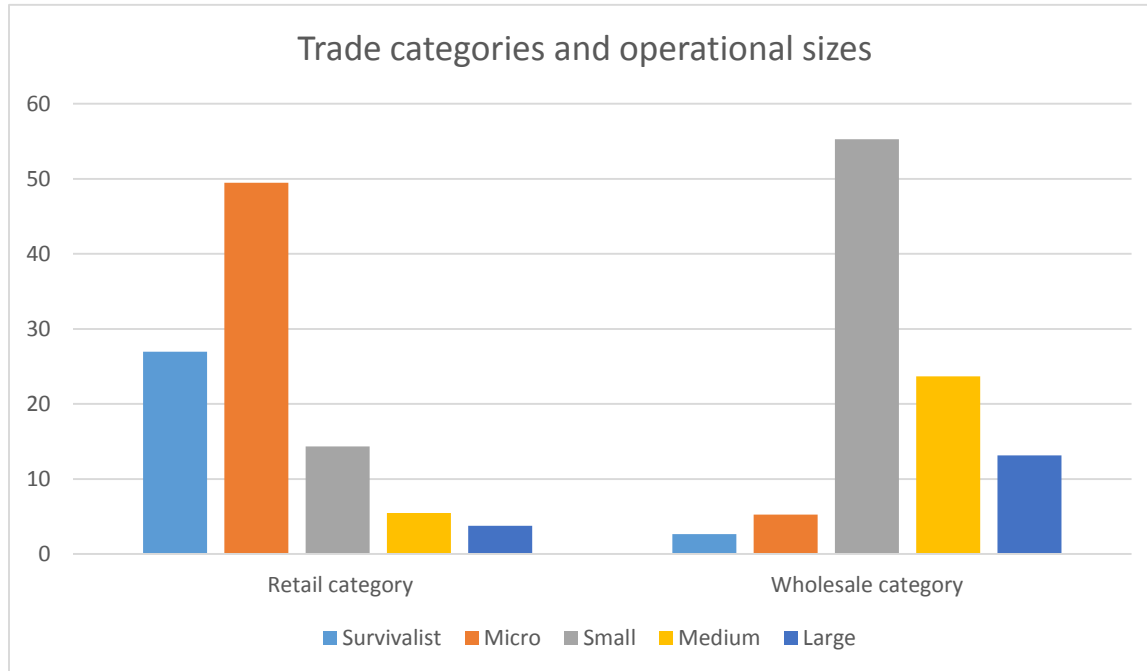


Figure 5.1: Trade categories and operational sizes

5.2. Shared values for green occupations, skills, and technologies

The study identified some shared values occurring most among the study population. In terms of green practices, occupations, skills, and technologies, there was a common consensus that there are generally acceptable green practices such as re-use, recycling, and recovering of materials, equipment or other forms of devices, which are mostly tools for operations. The reverse seemed to be the case for trading stock as the consensus indicated that to a moderate extent, consumers' habits were drivers of green practices among the majority of the respondents while, the same applied to the evidence that client requisitions were mostly in favour of green technologies.

5.3. Occupational, skills, and technological impact on the environment

It is common knowledge that human activities often contribute to the destruction of the ecosystem, even though humans constitute important components of the environment. Occupational therapists are often concerned about environmental influences on employees. They carefully consider the environment as having to offer more to the

wellbeing of humans than the contrary. A person’s daily interactions with the natural environment, by reason of forms of occupation, alter its formation. It is the assumption of this study that firms’ interactions with the natural environment are a set of derivatives of the motive for profit. In the long run, the natural environment often depletes values when considered as a resource for industrial operations. Occupational, skills, and technological impacts on the environment are central to the issues often associated with the green movement.

In this section, attempts were made to provide an empirical extraction from the study population regarding operational practices that may have positively or negatively contributed to the alterations of ecosystems. Consequently, the majority (53%) of the respondents remained neutral to the question whether their occupation would have in any way contributed to the protection or prevention the environment.

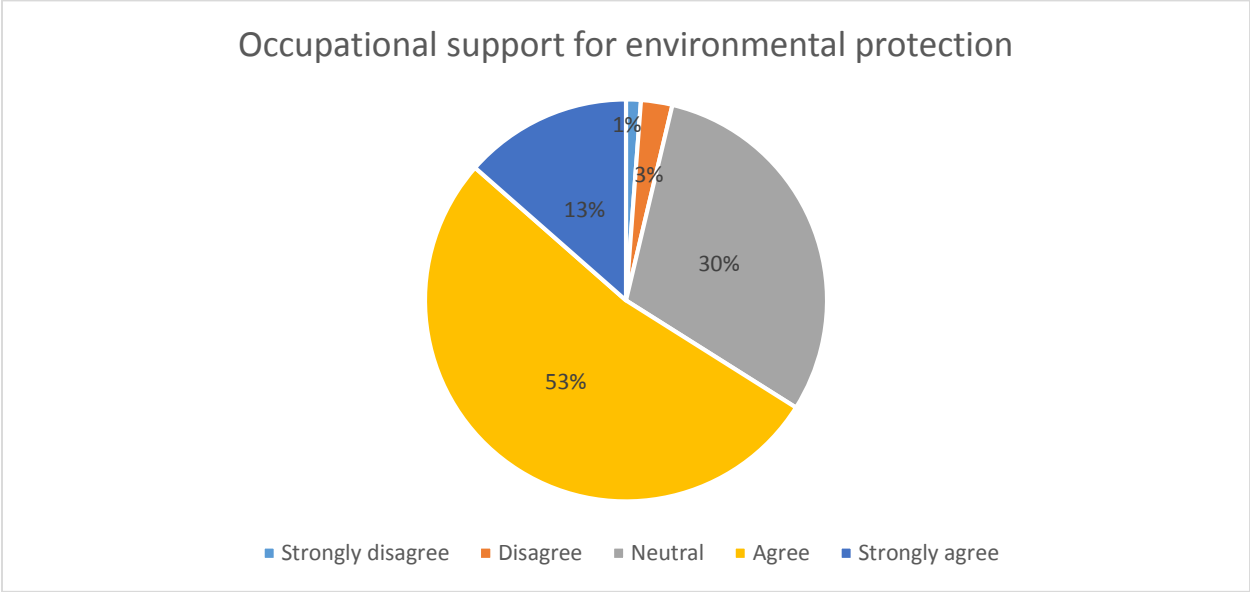


Figure 5.2: Occupations supporting environmental protection

5.4. Market influence on green practices

Green practices, as well as implementations, were found to be generally regarded as a noble and responsible manner of conducting activities. A number of market-related factors have the potentials to influence both consumers and firms to adapt to the joint responsibilities of green practices. In past few years, the market has witnessed the growth of innovative green products as well as complex environmental issues arising in the society. These have remained the joint responsibilities of both consumers and marketers. On the one hand, business organizations have the responsibility to be up to date with the requirements for marketing environmentally safe products that are well branded. Furthermore, they are required to support consumers with information regarding available green products and usages.

Well-informed consumers are more likely to make wise purchase decisions that are environmentally oriented. Consumer purchase decision-making processes can serve as a systematic approach through which several factors such as social, cultural, marketing mix, psychological as well as behavioural, are subjected to scrutiny. This approach can serve the best interest of the environment.

Green practices are supported by technologies, based on a set of principles that promote the wellness of the environment. Consumers have an increasing variety of green choices as the market provides. The action of choosing from multiple alternatives may be dependent on factors including economic conditions, group influence, personal preferences, marketing campaigns and purchasing power.

The foregoing analysis was demonstrated in accordance with findings in the study survey as indicated in Figure 5.2., the majority (72%) of the study are of the opinion that to a little extent market forces influence choices for green technologies.

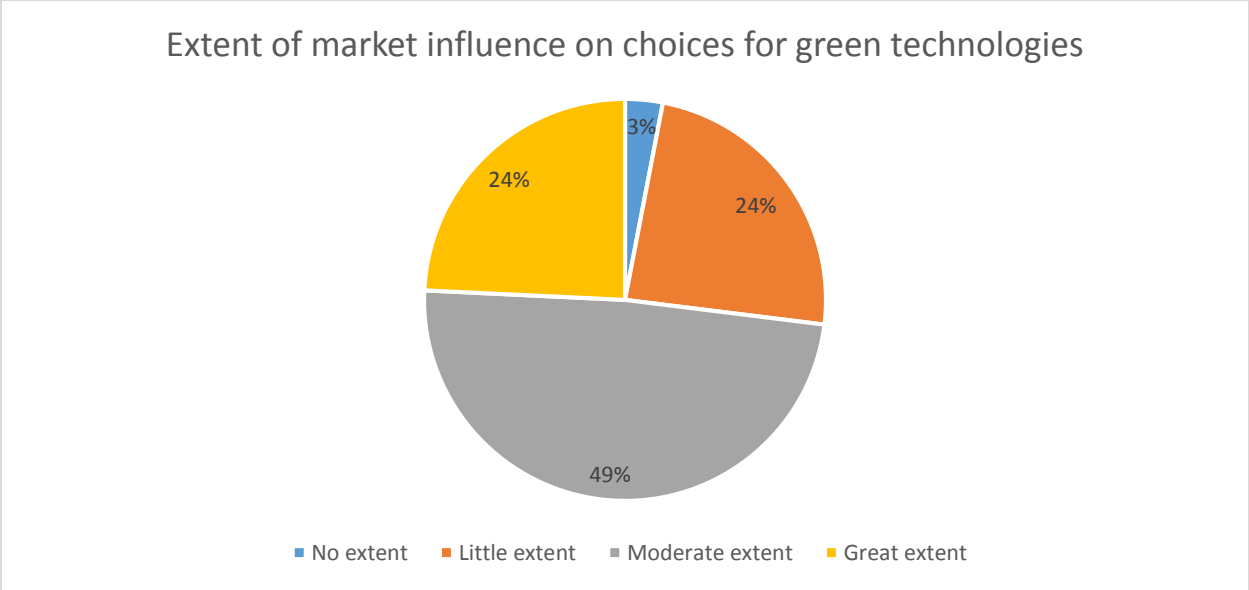


Figure 5.3: Extent of market influence on choices for green technologies

6 Conclusions and recommendations for policy and practice

The green concept is yet at its development stage among enterprises in South Africa. The majority of survivalist to small-sized wholesale and retail enterprises are yet to embrace the opportunities in the green economy. This can be attributed to the unforeseen profitability in venturing into green products as compared to other conventional products. The majority of the study participants were drawn from the cities of the nine provinces. Responses from Gauteng, KwaZulu Natal, and Western Cape were more outstanding, despite their large population sizes. Enterprises in these provinces are in the forefront of the green movement in terms of occupations, skills, and technologies. Some socio-economic factors were linked to the growth pace of the green occupations, skills, and technologies. It was found that the forces driving the green uptake were in consideration of the balance between the social and economic impact associated with occupations, skills, and technologies.

Given that the wholesale and retail enterprises are found to be more concerned about market prospects, achieving the green mandate must involve a multidimensional approach that considers more of a social campaign. Much of the policy instruments regarding the implementation of a green economy in South Africa concentrates at the

national levels of government. The green ideology is yet to saturate among wholesale and retail enterprises in the rural areas of all the nine provinces covered, given the poor responses received. It is evident that the South African governments has shown commendable commitments to the mandate for the global green movement.

6.1 Summary of findings on key study questions

This section systematically presents a number of findings which were derived from various approaches of the study as touching key aspects of the research questions as indicated in Box 1.1 in Section 1. The summary of findings justifies the extent to which the study addresses these key questions:

Key question 1: What are the applicable green occupations within the W&R sector in South Africa?

In Section 2, the study examined various definitions of green occupation that were provided in literature. The term 'green occupations' and 'green jobs' were concepts used interchangeably in literature. Applicable green occupations within the wholesale and retail sector were identified, even though the list seemed endless.

The Standard Industrial Classification of Occupations was supportive as it was initially used in identifying occupations within the wholesale and retail sector. Furthermore, the study proceeded in identifying occupations that are green as well as those that are potentially green in nature. The study considered the emerging view held regarding the appropriateness of greening occupations rather than tagging some to be exclusively green.

Findings in the empirical research corroborated with those of literature in the sense that green occupations included clerical and administrative support, sales and services in the same sub-group of occupations. The majority of these were found to be in the sub-major groups in sales includes: Commodity brokers, Street Vendors, Door-To-Door Workers, Retail Sales Workers, First-Line Supervisors, Commodity Sales Agents, and Sales Engineers.

Key question 2: Which green technological tools support the implementation of green occupations and skills within the W&R sector?

In Section 4, there was more focus on green technologies, considered to be clean technologies. The study conforms with the growing consensus in support of a technology-based approach to green economy. Some analyses were done regarding the attributes of green technologies, following the definition that the concept refers to the application of devices that are instrumental to sustainable management of natural environment and resources. In broad terms, the concept refers to products, services and procedures that are used in green production and consumption processes

Green technologies in the context of the wholesale and retail sector may be categorized in terms of their relationship with devices, machinery and equipment that facilitate the execution of sales. They were, therefore, understood to include trading stock in wholesale and retail operations. The scope of green technologies in terms of trading stock in the sector covered areas such as energy, water, waste and sanitation. Furthermore, they were considered as serving the following functions in the wholesale and retail operations:

- Monitoring and assessment
- Pollution prevention and control
- Remediation and restoration.

A number of variables were found to have the probability of inhibiting the selection and implementation of green occupation within the wholesale and retail sector, considering the fact that green practices in the sector are relatively unpopular in many occupations in the sector. It was also found that the slow pace in the development of skills and technological knowledge that are environmentally friendly, indicates a limitation in the smooth uptake of green technologies within the sector. A number of enabling technologies were categorized, which include: information and communication technologies, automation technologies, advanced materials and process technologies, and biotechnology.

Section 3 focused more on green skills, elaborating on a number of definitions that were provided in the literature. It was found that green skills develop alongside technology and

are implementable across occupations in the sector. Three categories of green skills components identified were technical, cognitive, and interpersonal skills. Furthermore, the study identified ten skills for each of the categories.

6.2 Recommendations for policy and practice

The wholesale and retail sector is positioned to grow in the path towards green transformation. Following the narratives contained in the literature and empirical findings, recommendations for policy and practice are therefore presented:

1. Recommendation for institutional policy coherence

A unified policy framework that supports green strategies across occupations in the wholesale and retail sector is required. It will be in the best interest of W&RSETA that the wholesale and retail enterprises follow suit in ensuring that green ideologies are given adequate expressions. The existence of different levels of national green policies has been supportive of the development of an environmentally friendly economy. However, it is equally imperative that all sectors of the economy take a unified strategic route in the implementation of the green occupation, skills, and technologies.

2. Recommendation for innovation capacity development

A collaborative strategy among a broad network of stakeholders in the wholesale and retail sector is required. A lot can be achieved through skills and technology innovation within the sector. The W&RSETA must be positioned in terms of policies and strategies in the development of local entrepreneurs with creative attributes that are needed in areas that resonate green potential. This strategy could provide support in building innovative capacity that accelerates the implementation of green skills and technologies.

3. Recommendation for adaptive local knowledge system

This study considers the imperatives of harnessing local knowledge system that have the potential to support the green skills implementation strategy. Green practices were often times identified with environmentally friendly cultural values of society. Curricular development that takes into consideration the state of local knowledge system is required

to drive the green movement. Greening local skills and technological tools is a necessary approach for adaptation and must form part of a key strategic component of W&RSETA.

4. Recommendation for inclusive green policy framework along trade categories and operational sizes

The study identified the need for an inclusive green policy framework that can address the peculiarity of trade categories of the wholesale and retail operations. This may have the tendency to strengthen the commitments on both sides. The sizes of these enterprises should be taken into consideration when crafting green policies as the capacity for implementation in terms of resources may vary among enterprises.

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