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Indigenous knowledge, intellectual property and grassroots innovation in South Africa

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Indigenous knowledge, intellectual property and grassroots innovation in South Africa.

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336117

A research report submitted to the Wits Business School in the University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Innovation Studies

Johannesburg, 2021

ABSTRACT

This study seeks to investigate the relationship that Intellectual property (IP) laws and policies have with grassroots innovation, and how indigenous knowledge is transferred in the innovation process. With the current changes in the IP landscape, no matter how the policies or legislations are drafted, their effectiveness comes down to how much they promote or inhibit indigenous innovation.

The literature suggests that knowledge transfer and diffusion are discouraged in developing countries by the enactment of tighter IP laws that tend to negatively impact grassroots innovation. Tailoring the laws to suit the South African context, which has a serious need of addressing grassroots, is therefore, one of the possible answers to this dilemma. A robust and diligent way of understanding the impact of these policies and legislation in pursuit of grassroots innovation will be used to lay out some of the ways in which such research can be carried out, the appropriate population and sample, and how the data is analysed to eventually ascertain the validity and transferability of the study. The National Systems of Innovation framework was used to look into how indigenous knowledge systems get assimilated to mainstream technological systems, with domestication eventually taking place as these knowledge systems move from the informal sector to the formal sector.

Key findings reveal a huge gap in knowledge transfer among grassroots innovators, as many lack a basic understanding of IP systems. Furthermore, access is a major stumbling block amongst the innovators as resources are scarce for them.

KEY WORDS:

Indigenous knowledge, traditional knowledge, endogenous innovation, grassroots innovation, intellectual property rights.

DECLARATION

I, **MEHLULI NCUBE** declare that this research report is my own unaided work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Innovation Studies at the Wits Business School in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other University.

Signature: ……

On this **28th** day of **APRIL** 2021

MEHLULI NCUBE

DEDICATION

To knowledge, growth and change!

ACKNOWLEDGEMENTS

This research work would not have been possible without the funding from the Companies and Intellectual Property commission. Appreciation goes to my colleagues and classmates for the insights and support and engagements throughout the program. My supervisor who always critiqued my work and made me think outside the box, though challenging yet his insights were a beacon to this accomplishment.

To my dear of friends who believed in me and when I felt like giving up cheered me on; am grateful.

To the love and support from my family who endured the prolonged absence but never lost hope that this too will pass and we will conquer.

LIST OF ABBRIVIATIONS

CBD – Convention on Biological Diversity

CIPC – Companies and Intellectual Property Commission

GDP – Gross Domestic Product

IKS – Indigenous Knowledge Systems

IAP – Inventor Assistance Program

IP – Intellectual Property

IPRs – Intellectual Property Rights

NSI – National System of Innovations

SMMEs – Small to Medium and Micro Entrepreneurs

TK – Traditional Knowledge

TRIPs – Trade-related Aspects of Intellectual Property Rights

WTO – World Trade Organization

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CHAPTER 1: INTRODUCTION

Intellectual Property (IP) has always been viewed as an economic stimulus with a dual purpose of encouraging inventions, while at the same time encouraging diffusion of technologies and consequently transforming the lives of many with the use of such technologies, more so in the developing world. IP can be produced either endogenously or exogenously, where the former entails the development of technologies and knowledge systems from within the local community, locally-embedded and thus "indigenised", while exogenous, mostly refers to imported foreign technologies (Bertelsen & Müller, 2003). Of particular interest is the endogenous innovation, which conveys a meaning of arising from within the society and refers to the specific characteristics, beliefs, concepts, expertise, institutions and practices in any given society. (Maruyama, 1981). Maskus (2000) in his chapter on IP in the global economy alludes to the fact that humans are astonishingly creative in finding solutions to applied technical and scientific problems and put such effort into improving the quality of what already exists to developing new products and services that may have immense economic value, which is regardless of geographical placement (Global North or South). As far as development is concerned, the South has as much potential and competency as some of the countries in the North within their ecosystem to effect creativity and the improvement of their lifestyle indigenously. Bertelsen & Müller (2003) are quick to point out that it is those of us who have a modernisation and exogenous inclination that cannot understand the potentials of such knowledge systems, how they are intricately interwoven and how they promote innovation.

It is from such perspectives that South Africa is seen to embark on reforming its IP landscape with a focus on promoting innovation, technology transfer, research and development (R&D) (IP Policy SA Page 3, 2018). Amongst many issues in the draft policy is how the patent landscape is envisaged to be changed and transformed to foster economic growth and address the needs of South Africans, which can include access to medication through the use of generic medicines, a focus on indigenous knowledge systems (IKS), and access to patented inventions (which involves the working of the patented invention which is reserved for the inventor or his licensee) in the grassroots to meet the daily basic needs through the use of

compulsory licensing. It would be crucial to appreciate how IP can be used in the Global South context and which type of IP can be best suited for protecting indigenous innovation at that level. Indigenous and grassroots innovation can be recognised as a valuable means to empower local communities in order to address developmental issues using the bottom-up approach. When exploring how patents and other formal knowledge appropriation mechanisms and award systems operate within the informal innovation system, Sheikh & Bhaduri (2019) highlight that grassroots innovators are more reliant on intrinsic motivation, which can be self-esteem, satisfaction, community relationships and responsibility. These grassroots innovations can be split into four different categories of motivations: The first category seeks to reduce labour and save time, the second category seeks development of new income-generating activities, the third category addresses unmet basic needs, which can be related to health, sanitation and wellbeing, and finally the fourth category seeks to provide an 'essential service which enables other forms of economic or household activity'.

It should be understood that some of these innovations would not fall in any of these categories as they can be best described as a form of 'vernacular innovation' as they are born from a particular specialised context. Unfortunately, there has always been a perception that indigenous is synonymous with lack of progress and innovativeness. Contrary to that, however, the assimilation of exogenous knowledge with traditional knowledge which birthed modern science, is the basis for continued economic growth, as has been shown historically in both the North and the South. It should be noted from the onset that the indigenous knowledge system, which is the inherent systematic knowledge birthed from within communities can also be the stimulus for grassroots innovations apart from the learning by doing (experience of manufacturing know-how), learning by using (through adoption of use) and learning by interacting (through persistent user-producer interaction, user-user interaction, user-community interaction, etc.) modes (Lundvall et al., 2013)(Lundvall, Bengt-Åke. 2004).

1.1 PURPOSE OF THE STUDY

The purpose of this study is to identify how IP systems can be better tailored to indigenous technological capabilities of countries in the Global South like in South Africa in this case, and particularly in settings that are deemed to be "informal", and how such systems influence grassroots innovation. Based on a general appreciation of how IP from the North has evolved, and how different its impact in the Global South can be, the study seeks to identify how indigenous technologies can be promoted in the face of dominant exogenous technologies. It is worth noting that the formulation of policies and legislation in the Global North and the South have always been informed by diverse reasons, chief among them being political. As such, legislations inevitably impact on innovation in line with the politics of the day, which does not necessarily favour grassroots innovation. When such systems are put in place, the adoption and diffusion of knowledge at the grassroots level will help with the appreciation of the value of such knowledge systems and inherently create mechanisms of better embracing the systems to work for the local communities.

1.2 CONTEXT OF STUDY

The study focused on South Africa, which is a country in the Global South that has a significant proportion of its population subsisting based on the informal sector, both urban and rural. In light of that, it should be understood that the socio-economic challenges of the grassroots in what has been termed the "informal economy" must therefore inform pertinent innovation policies. For this reason, it is critical to identify that the most appropriate type of innovation that could sufficiently address the needs and challenges of a particular community, and the focus in this study is on grassroots innovation.

1.3 RESEARCH PROBLEM STATEMENT

Ideally, grassroots innovators are supposed to be considered as sources of inspiration, creativity, and systemic structures that traditional public and private institutions can use, rather than as a drain on government resources, funding, advice and business goods and services (A. K. Gupta, 2013). Some of the ways of remedying such shortfalls are by cross-

pollinating ideas by promoting people-to-people learning, sharing information whenever possible in the local language; and furthermore, having such knowledge providers not remaining anonymous, but known as they will feel short-changed when their knowledge is taken without their consent. Nonetheless, the South African intellectual property regime pays only inadequate attention to grassroots innovation and it has implications for ignoring such an important knowledge pool of the country. The Ten–Year Innovation Plan (Department of Science and Technology, 2008) neglected to mention grassroots innovation, which could be equated to non-support for grassroots innovators for the whole decade. However, the recent White Paper on Science, Technology and Innovation (Department of Science and Technology, 2019) suggests support for, and a focus on grassroots innovations, but nonetheless with no clear indications and mention of instruments that will foster such intended support as far as the plans indicated are concerned. As such, it is very necessary to consider the criteria for promoting and effectively disseminating creative methods of grassroots innovation into more communities, and possibly, even a world market (Pansera, 2013), and more so how such knowledge systems can be assimilated to mainstream innovations.

As Shiva (2001) puts it, patent structures are the sites of a fundamental dispute between private interests, monopolies and private benefits against the public interest and the collective benefits of science and technology. Some of the few approaches in the literature that Gupta (2013) further highlights which are ways to promote these creative methods of grassroots innovation include; encouraging the growth of venture capital, which is important in providing risk capital to finance emerging innovation pioneers, and by further offering financial incentives to grassroots innovators to increase the public pool of innovations. Further, building partnerships between formal and informal science is crucial, where for instance, as part of their final year projects, undergraduate and graduate students can be inspired to address real-life social problems, thereby establishing open forums, and promoting collaboration.

However, with grassroots innovation being mostly tacit knowledge and as such, not easy to codify, tightening IP laws further disadvantages the grassroots innovators, in addition to

having limited ways of protecting such difficult to codify innovations. Furthermore, the structuring and tightening of the intellectual property legislation in the Global North and South have been seen by some as resulting in the increased transfer of rents to multinational corporate intellectual property holders which are headquartered in the world's most advanced countries, which are primarily in the North (Azevedo et al., 2012) and this has a negative impact on grassroots innovation in the South, as such systems are mostly tailored for the North. A number of frameworks can be used to bridge this gap in grassroots innovation and investigate how best knowledge can be transferred from one sector to another, while having the ability to classify these knowledge systems. The national systems of innovation framework will be useful in better classifying these knowledge systems as well as how these knowledge systems can be transferred, being linked from one system to the other, as discussed by (Jauhiainen & Hooli, 2017).

1.4 SIGNIFICANCE OF STUDY

The study seeks to link different types of IP with innovations that happen at the grassroots, furthermore being indigenous innovations as opposed to exogenous. There is no doubt that IP rights induce innovation, which consequently increase possibilities of technological transfer (Azevedo et al., 2012). Nonetheless, knowing what IP is beneficial in the context of the South is crucial for knowledge transfer too, as well as how grassroots connect to such IP. The links between science and technology on the one hand, and economic growth and employment on the other, cannot be ignored, as these are the fundamentals sought out and envisaged with the promotion of endogenous grassroots innovation (Walwyn & Cloete, 2018). Such linkages essentially highlight the importance of technology transfer.

The innovations that will be looked into are those that offer solutions which are in contrast to mainstream science, those innovations that address the local circumstances and the interests and values of the communities involved (Smith et al., 2016), and which primarily emanate from within the society. There should be a distinction made with that of civil society initiatives at the grassroots level, which involve committed activists who experiment with social innovations and use greener technology that seeks to solve the daily socio-economic

problems using a bottom up approach and simple grassroots-born initiatives. The literature that speaks to policy drafting, relationship between policies, intellectual property legislation, benefit sharing and how indigenous knowledge systems can be harnessed will be useful for this study.

1.5 RESEARCH QUESTIONS

The key questions that require to be answered will be:

- What is the relation between the approach the Global North uses for IP protection for innovations emanating from the grassroots as compared to the South?
- What are the different approaches taken in harnessing indigenous knowledge for the grassroots innovations?
- How does IP protection stimulate innovation in grassroots systems?
- What kind of IP protection will foster innovation and transfer of indigenous knowledge?
- How can grassroots innovation be infused into mainstream research and development?

1.6 DELIMITATIONS OF STUDY

Indigenous innovation in any geographic context seeks to basically sustain economic growth, improve the well-being and quality of life of a nation or region from within, and most importantly reducing the import bill on technologies. In South Africa, the branch of government that deals with local development has an approach towards economic development which allows and encourages local people to work together to achieve sustainable economic growth and development thereby, bringing economic benefits and an improved quality of life for all residents in any given local municipal area. Indigenous innovation will be taken in the context of locally brewed ideas and innovations that mostly use locally-available resources and technologies to promote a better standard of living. The concept of replicability or re-application of technologies with the full participation of local communities, and whose repetition eventually sees social technology achieving wide-scale

influence (Smith et al., 2014) will also be considered in this work, as such likewise influence knowledge transfer. Furthermore, the legislations relating to the type of intellectual property used will be dealt with as far as restrictions and requirements if any for applications, usage, and licencing of relevant intellectual property.

1.7 ASSUMPTIONS

The research focuses on grassroots innovations, how indigenous practitioners are key in knowledge expropriation, and how innovation and protection of IP are linked. It was assumed that the participants provided unbiased information which will impact the findings of the study and are willing to share information. It was also assumed that all participants are fully aware of the knowledge systems they are working in, and have an in-depth understanding and experience of the technologies that they are developing innovations with. It was further assumed that in data gathering, relevant policy instruments and relevant legislations were available for debate and analysis. It was further assumed that the population interviewed was available and that all discussed information will be suitable for publication of the research results with no confidential restrictions on the cases dealt with.

1.8 DEFINITION OF KEY TERMS

In a perfect world, unfortunately, there are those who belong to a class of access, with all the infrastructure at their disposal, while there are those who have little or no access to the basic infrastructure to meet basic human needs. Hua et al., (2007) refers to the grassroots as the generally disadvantaged public who have minimal knowledge and authority as far as social economics are concerned. These are the general masses that do not have the means nor the capacity to foster economic development but are reliant on those in power be it political or economic, to effect and implement service delivery for their day to day communal needs.

Innovation in the context of the grassroots will then seek to realise processes that are socially inclusive to the very disadvantaged as far as knowledge systems, processes as well as outcomes are concerned (Smith et al., 2014). These grassroots innovations eventually seek to

put the community at a competitive level technologically, with the rest of the world in terms of services and infrastructure as these are the very basics in which they lack.

Intellectual property rights (IPRs) are put in place as a way of promoting and acknowledging the creations of the mind which can be both artistic and commercial. The artistic creations are those that are protected by copyright laws, which includes works such as films, music, books and so on, while the commercial IP which is protected by patents, trademarks, industrial designs and geographical indications includes inventions, trademarks and service marks, designs and designations. However, such rights come with exclusions on who uses such creations as well as under what conditions, which can include monetary benefits to the creator of such through licencing as well as royalties.

In the cases of benefit sharing where such IP emanates from IKS, it involves the whole community benefiting from such knowledge systems emanating from within the community. With the knowledge economy occupied by the IPRs, the type of protection for such knowledge systems, the cost of protecting such IP, as well any benefits if ever they are present from these grassroots innovations, will be debated and discussed in the coming sections as far as how all that impacts indigenous innovation.

While innovation can be defined as including all novel developmental, financial and commercial activities which can be undertaken by a firm and solely intended to result in some improvement for the firm (OECD, 2018), in the context of grassroots it can be interpreted that such innovation is intended to economically develop the marginalised and disadvantaged community. It is the very reason for which the World Trade Organization, in line with many other organisations, have emphasised the crucial role that IP plays in enhancing innovation worldwide (Hudson & Minea, 2013). This, however, encapsulates a transition from being simple agriculturally- based to industry based by the adoption of new technologies which improve the livelihood and standard of living of the community, most often than not through a combination of imported technologies with the indigenous knowledge systems.

Such technologies can fall within open access technologies which are readily available to the public while on the other hand, can be proprietary and as such, available for exclusive use through IP protection. Technologies that foster development, are more often than not, those that fall within the ambit of registered intellectual property, which in most cases people consider to be designs and/or patents. Yet, there is more to IPRs besides these two. When innovation then originated by users or common people, in this case as defined above, grassroots communities, to address very practical problems of their daily lives, such innovation is termed grassroots innovation (Seyfang & Haxeltine, 2012).

1.9 OUTLINE AND STRUCTURE OF THE REPORT

Chapter 1: Introduction

This chapter comprises an introduction which relates to introducing the key concepts and context of the study as well as defining terms of reference.

Chapter 2: Literature review

This will be dealing with a review of the literature related to the research question. The literature will primarily focus on the learnings that influence indigenous knowledge systems and how they can be protected. It will focus on the effectiveness of IP in the Global South. It also focuses on issues which include, but are not limited to:

- The role of IP in grassroots innovations
- Factors which influence grassroots innovations
- Possible ways of how grassroots innovations can be protected

Chapter 3: Research methodology

This chapter seeks to lay out the research methodology used and how such a study can be used to understand grassroots innovation as well as forms of IP that can be used in that context.

Chapter 4: Presentation of findings

This chapter presents the summary of the data collected from the interviews held with grassroots innovators and practitioners and IP experts that are involved in the IP space and those who work with these innovators from different technological backgrounds.

Chapter 5: Analysis of results

This chapter presents the research findings from the different interviews conducted and contrasting such findings with the literature, as well as insights from the researcher.

Chapter 6: Conclusion and recommendations

The chapter will draw the curtain to a close by drawing conclusions from the research findings and then providing insights and implications of the research work. Potential opportunities for future research will be pointed out as part of the conclusions.

1.10 CONCLUSION

Intellectual laws bring about monopolistic restrictions that inevitably shut out the public from using the technologies protected without any compensation, and in most cases, the licences are linked to foreign entities. This brings about the interest in carrying out this study on how IP can influence grassroots innovation. In light of the grassroots innovators using exogenous technologies for the benefit of the community, it will still fall under the purview of restricted use, irrespective of the noble outcomes it may create, hence the need to look into how diffusion can be enhanced to promote innovations in grassroots communities.

It is worth noting that policies promoting the IPRs time and again talk of inclusive growth, nonetheless without offering solutions for the grassroots, and thus, looking into how these policies impact indigenous innovations which effectively help in understanding how best

grassroots innovation can be protected, and in turn how diffusion can be improved as modern science and indigenous knowledge are fused together.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Intellectual property rights (IPRs) in the form of patents are said to have their roots in the fifteen century in Venice, but “modern” patents are claimed to have emerged in the United States of America, which saw them as a prerequisite for progress and development, and hence included IPRs in its constitution (Carolan, 2009). It is from such structures that countries sought to have policies and laws which seek to protect and grant exclusive use of the creations of the minds. Shiva (2001) expounds on the roots of IP citing that markets and economic processes intended to be controlled, where knowledge itself is converted into property, much as land had been during colonisation. This is essentially the reason why today, 'patents' are protected by the wider 'intellectual property' or property in terms of 'production of the mind'.

This, however, also closed the free flow of technology transfer in-between countries, and even more so when countries that were members of the World Trade Organization (WTO) acceded to the signing of the General Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPs agreement) in the Uruguay Round from 1986 – 1994 (Dinopoulos & Kottaridi, 2008). With different IPRs created, however, there has always been a need to classify different knowledge systems, hence the formalisation of IP protection for the mainstream innovation and technologies but leaving a gap for the grassroots innovations.

2.2 THE KNOWLEDGE SYSTEMS CLASSIFICATIONS

In the classification of knowledge systems, one thing that is clear is that people who produce knowledge and those who are valuing it have an acute asymmetry in the rights and responsibilities. The National Systems of Innovation (NSI) framework classifies knowledge systems into four quadrants which consist of two dimensions, namely institutional and technological dimensions (Bertelsen & Müller, 2003). The institutional dimension consists of two sectors as shown in figure 1.1 below, which are the formal and informal sector, where the former relates to knowledge systems that contribute to the Gross Domestic Product (GDP) and enjoys a fair share taxation. These knowledge systems can encompass companies

(international and local) as well learning institutes like universities and research centres. The latter sector, however, is neither taxed nor contributes to the GDP which is essentially where grassroots innovations thrives. The technological dimension is split into two: indigenous and exogenous.

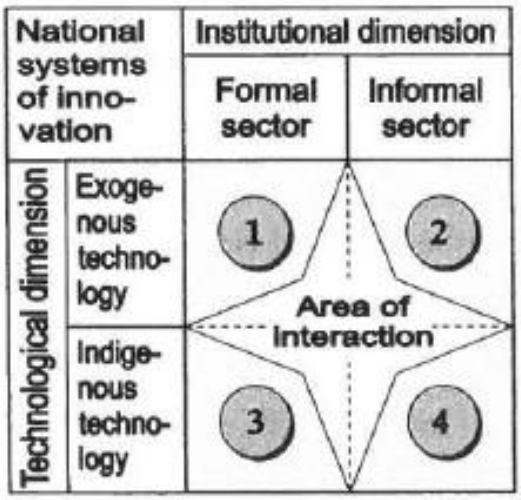


Figure 1.1: Knowledge system matrix (Source: Bertelsen & Müller , 2001)

The combination of these dimensions gives rise to four quadrants where different knowledge systems can be classified, for example the common exogenous technologies which belong to the formal sector, under which mainstream patents can be classified (Bertelsen & Müller, 2003). Jauhiainen & Hooli,(2017) highlights one important aspect that goes with this framework: incorporating the doing-using-interaction (DUI) mode makes the innovation system more accessible and encourages the grassroots communities, which are typically made up of those who often do not have formal schooling and advanced skills to participate. This in turn enhance the ownership of the innovation system among local communities, which is fundamental in terms of IKS and helps to incorporate alternative grassroots initiations into the innovation system.

From the interactions that take place within the network of actors, learning processes take place leading to niche innovations being influenced and aligned to a dominant design towards the sociotechnical regime (Bertelsen & Müller, 2003). It should be noted that policy, culture,

main stream science, industry as well as technology all influence this regime, as it allows for adjustments to occur from the grassroots innovations.

2.3 IP IN THE GLOBAL NORTH v SOUTH, THE DIFFERENCES

Different countries respond differently to the impact of IPRs and related policies and in particular, in relation to whether it is the Global North or South, as that relates to the stage of development. Knowledge transfer being key in catching-up countries, IPRs inevitably become an important factor to indigenous innovation as catching-up countries like South Africa rely on technologies from the forerunning countries to build on them and innovate within the grassroots (Maskus, 2000). With the international harmonisation of IPRs it has brought more questions than answers on how the adoption of these IPR standards from the Global North will benefit the economic growth of the Global South, albeit considering that the Global South countries are vastly plagued with dire livelihood-relevant needs than they care about mainstream Global North innovations into space technologies, gene sequencing and other highly scientific inventions.

As Maskus (2000) would suggest, the TRIPS agreement's intentions somehow seem to promote a transfer of economic benefits from technology importing nations to technology exporting ones and for such a move, many Global South countries are a long way from income levels that would encourage them to adopt stronger rights. They would therefore be impacted negatively in the long run compared to countries like the USA which would have enjoyed technology importation in the meantime. On the other hand, without the Global South tightening their IPRs, the Global North would not produce and develop technologies that are requisite to daily living and needed by the Global South. Furthermore, without the tightening of such legislation, the Global North may react by making their technologies even more difficult to imitate, effectively less efficient dissemination of knowledge will result, and eventually, less innovation will be realised (Chen & Puttitanun, 2005).

From the onset, this setup enabled the developed world to set the pace on what should constitute intellectual property, based on how much should be disclosed in exchange for getting the monopolistic right, say within the patents. The right to monopoly of the patent or to exclusivity of using an invention came at the cost of disclosing how the invention works. However, as Carolan (2009) puts it, it is the naive understanding of IP that once an artefact has been invented and patented, anyone with sufficient expertise can basically work the invention. This then begs the question as to how much the state benefits from such disclosures that may not even be workable by a skilled person to eventually being disseminated by the public after the expiry of the right, let alone the impact on grassroots innovation, as one will have to improve on the technology disclosed. One major component that has always been the driver of working an invention is tacit knowledge as compared to the codified knowledge which is documented in the patent, as the information contained in the patent seems not to be sufficient to work the invention.

One case is when the USA had seemed to have difficulty in producing synthetic organic chemicals from the patents which they seized from Germany during World War I. It is this knowledge (tacit) that is key in patents, and which unfortunately cannot be wholly formalised, nor transmitted solely through written documents (Madeuf, 1984). One thing that is certain is that even with the disclosure expressed in the patents, there will be information that will be missing for one to fully work the invention and as such, the IPR leverage is not wholly utilised by the state. The assumption that patents induce complete disclosure of new technologies thereby fostering a swift and comprehensive diffusion of knowledge is one that is far from reality (Brüggemann et al., 2016).

With most indigenous knowledge passed on from generation to generation in the South like family traditions with herbs for healing, it adds to the difficulty of formalising the processes of how some medicines, for example, are manufactured and as such, even if such medications are lifesaving with the need of creating markets, ways of protecting such knowledge systems are difficult as it is primarily tacit (Jones et al., 2019). Albeit beyond tacit knowledge, there is use of indigenous knowledge of plants that has proven over time to be capable of IP

protection although in most cases it would not have been indigenous innovation and viewed with a different perception. The case of Hoodia, is one case that sparked an international debate on who is supposed to benefit when indigenous systems are not used for the benefit of indigenous people. The IPRs that arise from such indigenous resources eventually tend to exclude the very indigenous community that the resources are derived from, and hence the debate. The question interrogates who owns biological resources, who benefits from them, as the North had for decades, had free access to genetic resources like Germplasm from the South and still wants to continue to retain that free access (Wynberg et al., 2009).

The Convention on Biological Diversity (CBD) adopted in 1992 stipulated that such genetic resources can no longer be regarded as a public good, available for all to exploit. Accordingly, the CBD states that, biological resources fall under the national sovereignty of states which effectively helps facilitate their sustainable use and preservation much more than the common heritage paradigm had done in the past, allowing grassroots innovation to fully exploit their indigenous resources (Carolan, 2009). This is one of the objectives of the CBD which aims for the fair and equitable sharing of benefits that can accrue from the use of such genetic resources with the indigenous people from whom the IP was obtained.

One thing that is certain in this IP enforcement between the North and the South is that a conflict of interest exists as stricter enforcements of IP in the South tend to benefit the North more than the South (Auriol et al., 2019) and as Azevedo et. al put it, imitation and diffusion are decreased with the increase in IPR enforcements (Azevedo et al., 2014). In the last decades, many countries have signed Trade Agreements (TAs) with specific implications and tightening of the IPRs sought to contribute to the strengthening and harmonisation of the IPRs. What seems to be the norm, though, is that the more IP demanding countries are the Global North countries, which have had years of exploiting the lack thereof of such stringent laws, while the Global South countries are the ones that now have to implement these laws or provisions sought.

These TAs eventually are the ones fostering significant reforms in the IPRs, as not implementing them leaves the TAs in jeopardy, and hence more complex challenges emerge (Campi & Dueñas, 2019). With these changes, there is observed economic growth in the Global North countries as these IPRs favour them in terms of less copying, less imitation, piracy and infringement of their patents and primarily positively influencing indigenous innovation in the Global North, while leading to less importation of technology as compared to the Global South. The primary goal for the Global South countries is for economic catch-up and as learning is key, which is based on the flow of knowledge from advanced economies to facilitate research and inventions, it gets stifled as the IPRs adopted are not tailored for such cases, and diffusion of technologies is inhibited (Lee, 2014).

Some scholars, however, argue that the taking of stronger IPRs by the Global South can be seen as a way to protect against exploitation from the Global North, and less to do with fostering indigenous innovation, which ultimately gives a favourable economic growth outlook (Pouris & Pouris, 2010). Further, when the strength of the IPR is increased, it has been observed that indigenous economic development is inevitable, albeit reduced strength allows the Global South countries to acquire better abilities to imitate technical information and establish production facilities based on that imitation which incidentally gives the local markets a boost (Pouris & Pouris, 2010).

A number of countries like Korea, Thailand, and Singapore that have made headway in economic catch-up to the Global North countries attribute their success to having a design and strength of IP system that is tailored to their indigenous technological capacities, so as to provide the best appropriate incentives for indigenous innovation (Lee et al., 2013). These much tailored systems that worked for the Global North before, when they refused to institutionalise patent regimes during their development stage, like Switzerland, for example, which had no patent law of any kind until 1888 should be afforded the Global South (Lošonc, 2009). This begs the question of whether South Africa is tailoring its IP landscape to suit its indigenous technological capacities, thereby improving capability and self-reliance, or is it merely driven and motivated by the TAs and bilateral agreements that it has acceded to?

Pouris and Pouris (2010) argue that the strengthening of the IPR system does not produce more domestic innovation, although it induces inventors from other countries to patent more in the country making the changes (Pouris & Pouris, 2010). They further note that nonetheless, this may also induce foreign multinationals to transfer more technology to these countries, which indirectly can stimulate economic growth from within as it influences knowledge dissemination and eventually, a trickle-down effect on indigenous innovation. What this means therefore, is that IPRs are a double-edged sword, and have the possibility of working to one's advantage although there are negative risks involved with the tightening of these.

For countries in the Global North which have above average development, there have been findings indicating that increasing the IPR standards has a positive effect in the exports as a result of indigenous innovation, consequently giving a positive outlook to economic growth. However, such positivity seems to be only restricted to the Global North, as the major drawback with the Global South countries is access to technology and technology transfer, which are the very drivers of innovation (Sweet & Eterovic Maggio, 2015). These findings strengthen the case for tailoring national systems, as opposed to the blanket approach and harmonization of IPRs to be the same across the board from North to South. This, of course, opens up options of flexibilities that exist within the TRIPS which take into consideration the different economic and developmental needs of each country which however, may not be so favourable with a country's trade partners. It is however, impressive to note that lately, not only international organisations and their representatives, as well as member states, but also the main state actors have committed themselves to safeguarding TRIPS flexibilities amongst countries (Ruse-Khan, 2011).

In the recently published draft white paper on science and technology (Department of Science and Technology, 2019), South Africa is looking into possibilities of having utility models. Utility models unlike patents have less stringent requirements for patentability as well as the cost of acquiring them. There is less stringent requirement specifically on the obviousness of the

utility model which allows for incremental improvements on technologies synonymous with grassroots innovations.

Countries such as Japan and China have made great use of these utility models as it allowed the local communities to make use of the utility models boosting the economy as it allows more indigenous technologies being protected. A utility model is a type of intellectual property right similar to a patent that is used to protect inventions. Although similar to a patent, a utility model is generally less expensive to obtain and maintain, has a shorter term, a shorter grant time and importantly less stringent patentability requirements. Japan specifically allows for less stringent requirements on the novelty of the utility model to country-specific novelty only, meaning as long as the invention is new in Japan it can be protected, which eventually promotes diffusion. This approach clearly has the ingredients of promoting grassroots innovation as there are more economic benefits for the communities in working out these technologies and creating rife competition within local businesses. Nonetheless, it should be noted though that these innovations have a lot to do with imported technologies as compared to indigenous knowledge systems.

2.4 MODERN SCIENCE AND INDIGENOUS KNOWLEDGE

Indigenous technology refers to a technology developed, used in a local system of production. This knowledge is available from the ground up, because it is mainly spread throughout society, and production organisation is integrated within local institutional environments (Bertelsen & Müller, 2003). Indigenous knowledge systems would therefore cover all innovations from African potters to India's space industry which can be considered modern science. In most cases, modern science is considered outside of indigenous knowledge and usually never birthed by indigenous systems. Müller defines technology as a means by which mankind reproduced and expanded its living conditions and it involves four inseparable components: technology, information, organisation and product (Müller, 2013). Any qualitative change in any of the four components will foster a supplementary change in any of the other components which ultimately results in transformative move which can be termed technological innovation. This, however, contradicts the mainstream perception of

innovation that it is linear, just like the perception that society is technologically constructed, that technological change takes place and then innovation drives the socio-economic development of society. Such a perception is expressed by Gloria Snively et al., (2001) as they point out that the North can easily acknowledge the existence of all indigenous art, music, literature, drama, and political as well as economic systems in indigenous cultures, but nonetheless fail to apprehend and appreciate indigenous science.

When dealing with indigenous knowledge systems they are defined as comprising of cultural or traditional knowledge that is hereditary and includes all recent and contemporary exogenous information that is gradually indigenised, which is far from what has always been considered as synonymous with lack of progress and innovation. Quigley explains the concept of IK as the acquisition of and practices that are developed by groups with a long standing history of intimate relationship with the very natural environment surrounding them (Quigley, 2009). This incorporates naming and classification systems, languages, utilisation of resources, spirituality, rituals as well as world views.

Scientific processes which include logical observation, classification and solution of natural events are intertwined with every aspect of indigenous cultures. One interesting contradiction that is seen from the North is that there have been many complains of IP piracy in the form of the copying or selling of music, films and pharmaceutical products, while they free-ride on the genetic resources and traditional knowledge (TK) and technologies of the countries in the South (Wynberg et al., 2009). Furthermore, if there were a true understanding of the legality of this intellectual piracy, such works or products ought to have been protected by whatever IP form was appropriated in order for them to be exempt from any copying. If such protection in the said jurisdiction is not effected, the copying of such pharmaceutical products or the like is hardly piracy as in in the legal sense of the word. Nonetheless, TK or IKS has deep roots in the community and any use of such in modern science is worth mentioning and deriving benefits to the community, but more so there is a majority of knowledge systems that need be appreciated and protected from these grassroots, and the only question would be how they can be protected considering that most

IP systems have been designed around modern science which can easily be articulated compared to IKS.

Indoctrination through modernity has a lot of influence in giving an outlook that IKS has no foothold in the present era compared with modern science, as the right to claim that people can function like competent beings is only through such indoctrination (Semali & Kincheloe, 1999). This is further observed through the systematic destruction of indigenous knowledge systems post-WWII Global development project were modern science came in form of new product called "science" like toothpastes that began to replace the indigenously used products and other non-industrial or natures' creations used to cleanse teeth over hundreds of generations. To think that the active ingredients of drugs like Aspirin where discovered by indigenous people on the uses of the bark of a willow tree (G Snively & Williams, 2016) clearly shows that IKS has been and will continue to be instrumental for generations to come in pharmacological development and other areas of innovation and therefore deserves protection and recognition.

2.5 DIFFUSION OF KNOWLEDGE SYSTEMS

Grassroots innovations vary in that they typically have motives for producing social rather than pure monetary gains from technology or business developments. The basic innovation process in the grassroots is usually summed up in a linear model, which is "basic science – applied science – manufacturing – sales" which is not intended to achieve leading-edge technology, nor a technology-oriented innovation but emphasises practicality and economic innovation (Hua et al., 2007). The goal is simple, to solve problems in real life based on the actual needs in the society. Nonetheless, because the solutions are not market oriented unlike mainstream research which has funding through research institutes and science parks, such innovation is low in technology, not very hard to imitate, difficult to be identified in technologies which find less protection though the available channels either in patents or designs considering the stringent requirements.

On the contrary, the not so difficult to imitate yet problem solving technologies that have been innovatively developed in the grassroots will need to be protected in order to promote innovation as well as create a culture of sustainability and improving on the technologies created. The same way that inventors are rewarded for the creations of the minds to stimulate further research and eventually create a trickle-down effect in economic development should be the same way that such grassroots innovations are protected, no matter how low in technology scale they are compared to the mainstream technologies. There is however a need for a trade-off between stimulating investment knowledge creation and promoting growth and innovation by granting exclusive rights for societal benefit of such innovations that seeks to address the needs of the society (S. Gupta, 2019). As such, policies related to enforcement of IPRs are thus required to promote and stimulate further participation of inventive minds to solve the plights of the society, knowing that such contributions are recognized and effectively improving the lives of the society. It would seem that in such a state, IPR would be pro grassroots innovations.

One possible inclusion in such policies that need to be highlighted in this context is in the benefit sharing of the society if the innovation is birthed within and benefits the society, allowing for indigenous economic development from such innovation. Jurisdictions like Taiwan have gone an extra mile by promoting Small to Medium Enterprises (SMEs) as a spin-off of grassroots innovation (Lee et al., 2013) which eventually injects capital back into the same communities where the innovations where nurtured and incubated from effecting the needed change in the communities. South Africa has a growing population of SMEs and coupling these with the communities to find innovative solutions to the plight of the communities is one way that these SMEs can have a meaningful contribution to the local economy. Korean government further continued setting up structures of public funding grassroots innovation which have a bias to socially inclined purpose.

2.6 CONCEPTUAL FRAMEWORK

For indigenous innovation to be effective at the grassroots level, it is imperative to understand that intellectual property is one of the many components that contribute to it effectively

fostering growth and development. Acquiring knowledge from the North is invaluable but not sufficient and adequate to respond to the massive and intensifying disparities and exploitation of genetic and pharmacological resources and depletion of the natural resources in the South. Müller proposes that national systems of production in the South as compared to the North should not only be divided into formal and informal segments only. He proposes that they should be further split between indigenous and exogenous segments with reference to the qualitatively different systems of technologies or dimensions that characterise them (Müller, 2013).

Bertelsen and Müller earlier pointed out one important factor in such a matrix, that the distinction of the sectors should be based on whether the technology has been innovatively assimilated (Bertelsen & Müller, 2003). Such a matrix termed the four segments of National Systems of Innovation (NSI) in Figure 2.1 below will enable an understanding of how grassroots innovation can be influenced and assimilated to be protected as any other IP.

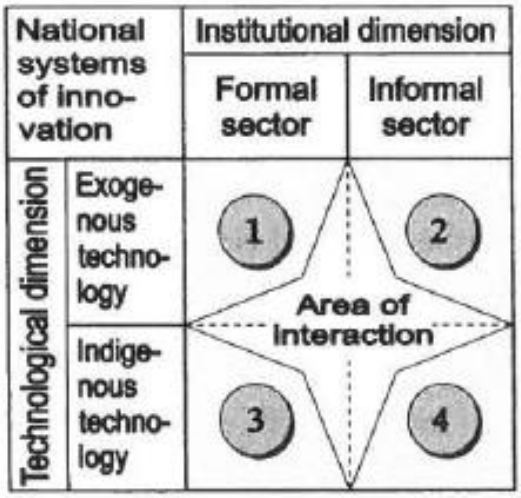


Figure 2: Four segments of National Systems of Innovation (Source: Bertelsen & Müller , 2001)

Most innovation that happens in the South has been seen to be situated either in 1 and 4 where the institution is respectively formal or informal. This could be either foreign IP at play possibly in a formal large scale industrial sector or a small to medium enterprise (SME) of local origin and in an informal sector. In 4, typically, there is social entrepreneurs, whose sole goal is to possibly add value to society, offers solutions to social issues but mostly aims to maximise personal wealth in that context (Martiskainen, 2017). The fact that personal wealth can be

realized, gives a possibility to align such informal grassroots innovations to a point where they either be formal or their technological dimension can change to exogenous. The notion that 4 is informal (poor resources) and as such is lack of knowledge resource is frowned upon by Anil Gupta who considers it as the most inappropriate and demeaning contribution from the Global North, as the Honey Bee project was able to collect more than fourteen hundred innovative practices proving that disadvantaged people mainly from dry regions may lack financial and economic resources, but are very rich in knowledge resources (A. K. Gupta, 1999). He further highlights the consciousness that is growing that some knowledge systems do not always have to be seen as informal, simply because the laws of the formal system fail to explain innovations in another system.

The task at hand is to rightly appropriate such IKS and recast the potentials it represents in the context of equitable and democratic participation for community, national and Global developmental in real time, and appreciate the protection it deserves, which may not be the same as the prevailing norms detect. This framework will help align the indigenous innovations happening at the grassroots, and better explain the protection that will foster such innovations, and the ways in which such IP can be diffused. The interactions that are necessary between these technological dimensions and sectors can include assimilation, adaptation and domestication, which impact innovation.

In assimilation, knowledge systems of segment 2 eventually gets assimilated into indigenous technology systems in segment 4, eventually becoming inputs to the innovations that take place at the grassroots. In cases of adaptation, this is where exogenous knowledge systems are transferred from segment 1 to be adapted to the organisational settings in segment 2, where such learning systems are practised from the grassroots to eventually creating indigenised systems. Finally, with domestication when there is a move from the informal sector in segment 4 to the formal sector in segment 3 where of the grassroots innovation is embraced to formal institutions as shown in Figure 2.2 below.

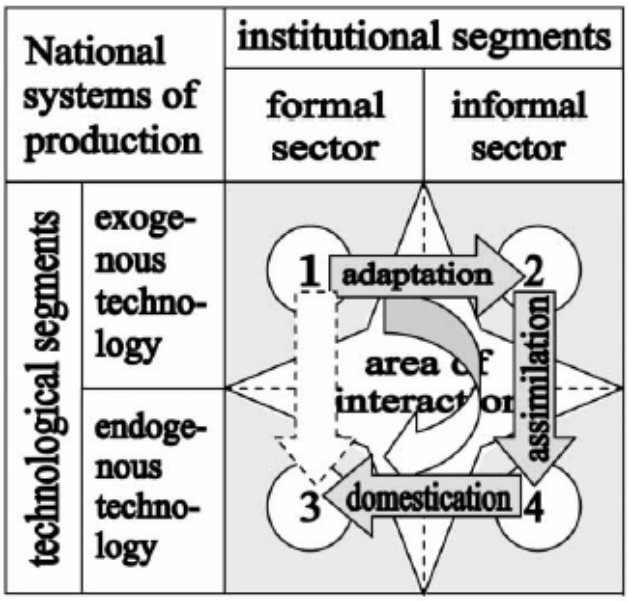


Figure 3.2: The technological assimilation of endogenous systems (Source: Müller, 2013)

One case that can better exemplify the domestication of grassroots innovations is Portia M Skin Solutions (Pty) Ltd which uses our indigenous African oils to make cosmetics products specialising in organic skincare solutions for stretch marks, anti-aging, uneven skin tone, oily and dehydrated skin which has been domesticated to the formal sector from the informal segment 4. A case to contrast with this one however, which follows a top-down approach is that of CSIR Malaria research together with the indigenous community. The differing technological assimilation was of note as it was more to exogenous innovation and narrowly focusing on commercialisation and eventually appearing to not addressing community empowerment, social justice and benefit sharing, considering that the resources where synthesised from within the indigenous community.

Another point of reference that can be of interest taken from (Cooke, 2014) who use the transversality framework, which explores how knowledge can move from one industry to another as well as how the "regime" of organizations are able to facilitate the transfer of knowledge within a region. The framework will enable a better explanation of how the sectors as defined by the NSI framework are connected, who the actors are and what makes them work together and furthermore, how knowledge moves from one industry to another. The advantage of this framework is that is can be applied system wide from national level all the

way to firm level and specifically in this case where R&D and grassroots innovation interact fruitfully.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter, literature on indigenous knowledge, grassroots innovation and intellectual property was reviewed. This chapter seeks to present a research methodology to be used, discussing research techniques and the design approach taken for this study. It provides a summary of the research method and the design of the study, justifying the approach and design as being suitable for the study to resolve the research problem. The aim of the study is to assess the extent to which grassroots innovation can be integrated into the IP regime and afforded the same privileges to some extent with mainstream IP.

3.2 RESEARCH STRATEGY AND DESIGN

The research design outlines the overall strategy for how the analysis was performed. It refers to the overall approach, where the different components of the analysis complement each other in a logical and coherent manner, ensuring that the data collection method is compatible with the research issue. The primary goal of research design is to formulate a structure of an investigation by generation of empirical data that can be used to address research questions. This structure basically shows how the main research elements, including basic approaches, strategies and tools, to work together to resolve research issues (Mcmillan & Schumacher, 2013).

The main types of research design usually include quantitative, qualitative and mixed research methods. In the study, qualitative and quantitative research design will be considered in order appreciate how grassroots innovation and indigenous knowledge can be better integrated considering different knowledge systems in the IP space. This choice of designs and methods was informed by the scope of the analysis and the data required for the study. With quantitative methods involving numerical data analysis, from analysis of legislative documents, qualitative method seeks to emphasise aspects of meaning done through case studies, text interpretation from notes take during interviews, policy documents as well as forum talks and stake holder debates on the subject matter.

3.3 SELECTION OF PARTICIPANTS

As alluded to previously, indigenous innovators in this context can be split into four different categories of motivations: those who seek to reduce labour and save time, those seeking to develop new income-generating activities, those addressing unmet basic needs which can be related to health, sanitation and wellbeing, and lastly those seeking to provide an 'essential service which enables other forms of economic or household activity' (Sheikh & Bhaduri, 2019). These grassroots innovators are some of the most important participants (mostly SMMEs) that were interviewed to offer invaluable insight as to what indigenous innovators have to bring to the table and where they need assistance from the government and or research institutions.

Further to the indigenous innovators, other participants of note were IP law practitioners, IP legislators, IP regulators, UN IP advisory personnel, WIPO inventor assistance program representatives, incubation facility personnel, and science centre personnel too. Listed below is a table of potential participants

Table 1: Participants for interviews

Area of representation	**Capacity**	**Number of participants**
Grassroots innovators	SMMEs, Inventors	10
IP regulators	CIPC, NIPMO, The **dtic**	6
IP practitioners	IP Lawfirm A, IP Lawfirm B IP Lawfirm C	4
Incubator facilities	Seda, , , TIA	4
Research facilities	CSIR, Innovation Hub	2

The above mentioned groups give an oversight and experiences on how grassroots innovation has been dealt with, and how the laws and policies in place are influencing grassroots innovation. The selection criteria was to be to look at people who have a strong understanding of grassroots innovation and are well connected to the bottlenecks of conventional IP offerings.

3.4 RESEARCH METHODOLOGY

The methodology used for this research work is qualitative methods. When data cannot be amenable to counting or measuring but seeks to answer questions relating to experience and perspective, qualitative methods are ideal (Hammarberg et al., 2016). A qualitative approach allows one to have a better insight on the population invited for interviews, as they express their attitudes towards the policies and IP legislations. Attending platforms of debate and consultations also shows such effects as people who comment in such are the people on the ground experiencing the influence of the policies and legislation. From the experiences that inventors and communal members have when trying to use technologies for their benefit, the feedback one can get from them is more descriptive and the inferences can be drawn quite easily from the data that is obtained from such engagements.

3.4.1 DATA COLLECTION

Three sources of data were used in the collection of data. A series of interviews were one of those means from the selected pool who are involved in the IP space and have intimate knowledge of grassroots innovation. Upon getting the consent of the interviewees, written notes were properly recorded and safely stored. For confidentiality and ethical reasons, the actual recording are kept confidential and can be made available to the interviewees upon request. These interviews took any possible form at the convenience of the interviewee, from face-to-face, phone call interviews, or video call interviews. In light of the current Covid-19 epidemic, video calls were generally suitable, giving the interviewee peace of mind and allowing for a more robust conversation. Research questions that streamlined the research were used in addition to the interview questions, as they sought to answer questions inherent in the research, hence addressing the current research problem. In essence, it all goes down

to how the questions formulated as from these, one gets meaningful answers pointing in the right direction (Rossman & Rallis, 2017).

Another means of data collection was based on case studies of at least two cases where indigenous knowledge systems were used and how it impacted the grassroots. The third source was based on the document analysis and will supersede the other sources as the main techniques used for the processing of data. Documents that span from IP policy documentation, reports from incubator systems, case law from indigenous knowledge appropriation and compensation and matter other pertinent document will be used to assess and analysed how exogenous and indigenous innovations have an impact on grassroots innovation.

3.4.2 SEMI-STRUCTURED INTERVIEW (PRIMARY DATA)

The key objective of performing an in-depth interview is to obtain knowledge focused on the points of view of the interviewees. Saunders et al.,(2019) highlights that this process helps the interviewer to gather reliable data that may answer a particular research question. This is a kind of conversation that has one purpose – shed light to the research questions. Adams (2015) proposes that semi-structured interviews are particularly useful when there are open-ended questions which require follow-up queries. Circumstances that favour such kind of interviews are:

1. If there is a need to ask open-ended questions and want to know independent thoughts of each person within a community of interviewees.
2. If you need to ask open-ended questions on subjects that your respondents will not be able to address if they are sitting with peers in a focus group.
3. When there is need to conduct a review assessment and evaluate with key people in a one-to-one setup.
4. When the area being pursued is unchartered territory and has potentially serious issues, and there is need for a full latitude to identify and follow useful leads.

The questions were based on themes that enabled the interviewer to gain insight into the various approaches applied to learning systems used and appreciating grassroots innovation in the space that it currently occupies and seeks to occupy in South Africa.

3.4.3 DOCUMENTS COLLECTION (SECONDARY DATA)

Secondary data is that information which has been collected by someone else besides the researcher which can include both qualitative and quantitative data, which is can be used in descriptive as well as explanatory research (Levine et al., 2008). Such data allows us to focus our findings based on other data available as well as primary data collected, eventually evaluating existing knowledge to give a better understanding. The documents that were considered were:

- National IP Policy;
- Department of Science and technology: 10-year innovation plan;
- Department of Science and Technology – White paper;
- IKS bill;
- Patents Act;
- Case law.

3.5 DATA ANALYSIS.

The main aim of qualitative data analysis is to search for trends in the data. Thematic analysis is a tool for defining, analysing and reporting trends (themes) within the data. It minimally organises and explains the data set in rich detail (Braun & Clarke, 2006). This will involve identifying themes, patterns and relationships between the IP legislation, knowledge systems and grassroots innovation, where there will be a comparison of the findings of interviews and other qualitative data collection methods, compared with the findings of literature review and meaning was sought from that.

Care was taken to search for any missing information or anomalies from any interview on particular aspects of the research questions which were not mentioned by the interviewees, especially when such information was anticipated, based on the literature or any other data source. Furthermore, it was imperative to compare primary research findings to case studies, which may exhibit similar results or particular differences. Finally, summarising all the data by linking the research findings to the research aim and objectives will be done.

3.5.1 INTERPRETATION OF DATA

A single piece of data alone has no use (Rossman & Rallis, 2017). Once the different pieces of data have been collected, one has to assign meaning to them as one marks, codes, and categorises; construct analytical descriptions; compare and contrast; identify patterns; build themes; and consider alternatives. It is this analysing of qualitative data that is a dynamic and exciting method of adding sense to the mountains of information collect from interviews, case studies as well as documentation. Six phases of thematic analysis are used to establish quality of the research which are:

1. Organization and familiarization of data
2. Identifying categories and generating themes
3. Coding the data
4. Interpreting the data
5. Searching for alternative understandings
6. Writing the report

Meaning will be construed through deductive (from theory informed by literature) and inductive (reasoning from particular to general statement) reasoning.

3.6 LIMITATIONS OF THE STUDY.

One of the major limitations was time constrains, considering that there was time needed to examining legal records and accounts, conduct interviews and there was no guarantee that all the relevant interviews and reviews would be done. The rigidness of interview as well as preparations that go into interview have implications of rushing the talks which would

eventually not open up further hidden issue that can be exposed with longer interaction and unconstrained time. Minimising the effects of these limitations was sought through streamlining the interview questions and seeking to focus on the challenges that grassroots innovators faced. This allowed for further engagements with respondents as they opened up a channel of digging deeper into the inherent grassroots issues faced.

Case studies have their limitations as well, in particular establishing the cause-effect connection and as such implications of having an interpretation that may be perceived as biased to the researcher's thoughts and preferences.

3.7 ETHICAL CONSIDERATIONS

The interactions between researchers and participants can be ethically challenging as the researchers are personally involved in different stages of the study. It is therefore imperative that ethical guideline that govern the institution of study be understood and observed in relation to anonymity, confidentiality, informed consent, as well as the researchers' potential impact on the participants and vice versa (Sanjari et al., 2014). As human subjects will be involved, ethical clearance was sought from the institution.

The method of data gathering will be non-invasive albeit consent from the participants will be sought verbally or in writing before any data is collected. Pseudonyms will be used to protect the anonymity of the participants. The responses of the participants will further be treated with utmost confidentiality. Intellectual property arising from such research are also concerns that will need to be addressed and understood by both participants as well as the researcher from the onset, more so considering that the subject matter of this study relates to intellectual property rights and knowledge systems.

3.8 RELIABILITY AND VALIDITY

The study is intended to be conducted in accordance to the norms of acceptable and systematic practice, which will involve having the right kind of questions that seek to understand how indigenous knowledge, intellectual property and grassroots innovation are connected. This will include following relevant procedures in relating with population subjects, being attentive, exact, accurate, sensitive, and particular, having rational decisions and honouring the views of the participants. It is possible that some participants may have a political agenda and as such seek to hijack the true reflections of the policies should they not be in line with what they believe in or subscribe to. Using peer-debriefers can also be used as a way of enhancing the credibility of the study, with the advantage of the fact that they are in the same field of work as such they would understand the questioning as well as note any anomalies that can arise from the questions as well as transcripts from the interviews.

It is expected that the findings of this research should inform policy and any amendments that can be made to IP legislation. As such, the extent to which the logic of the study will go is expected to highlight the clarity as well as sufficiency of study and interpretation and reasoning. The study is primarily focused on South Africa and being a developing country, there will always be expected transferability of the study in similar grouped countries.

3.9 SUMMARY

The aim of this chapter was to outline how the study was carried out considering all the aspect of research methodology that are appropriate for this topic. Grassroots innovation gives the middle to low income societies a lifeline to face the daily challenges of service delivery. In that regard, it is expected to contribute to socio-economic challenged in the grassroots and offer more employment opportunities, safer living conditions, cleaner environment and safe drinking water through knowledge transference. A thorough and diligent way of understanding how indigenous grassroots innovation can have a positive impact and contribution to the local community and more so impact the drafting of IP policies and legislation in pursuit of knowledge diffusion and eventually increased innovation that deals

with daily challenges in the societies. This chapter therefore was laying out ways of how such a study can be done, the population, ways of investigating the relationship and how to ascertain the credibility of the study.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 OVERVIEW OF IP LANDSCAPE

The IP landscape spans a wide area of participants, though relatively sizeable, the players in the field from users of IP all the up to regulators and facilitators, which spans different socioeconomic backgrounds. These include participants from low income, those whose core concern is to put bread on their table to greater opposite high income, whose concern is to exploit systems for their continued profiteering. From this glaring difference of primary concerns, there was presented insightful responses to the questions posed to the participants.

4.1.1 BACKGROUND PROFILE OF PARTICIPANTS

This section provides the background profile of the respondents who were selected for the study. The interviews conducted were mostly over the Microsoft (MS) Teams online interface and semi-structured with respondents who are in the IP space from users all the way up to regulators. Respondents were asked to provide information about their general profile, such as the position they hold, the extent to which they are involved with grassroots innovators, and their thoughts on the impact of grassroots innovation in the communities where these innovations are practiced. A total of seventeen online interviews were conducted with grassroots innovators, IP regulators, IP practitioners, incubator facilities managers, Department of Science and Innovation directors, The Department of Trade, Industry and Competition managers. Therefore, the insights and opinions that they shared were relevant to this topic.

Respondents confirmed their willingness for the interviews to be recorded as well as their preference for anonymity prior to the interviews. From the participants that were interviewed, the pie chart below depicts the composition of the respondents within the IP space to make up a fair assessment of the questions answered.

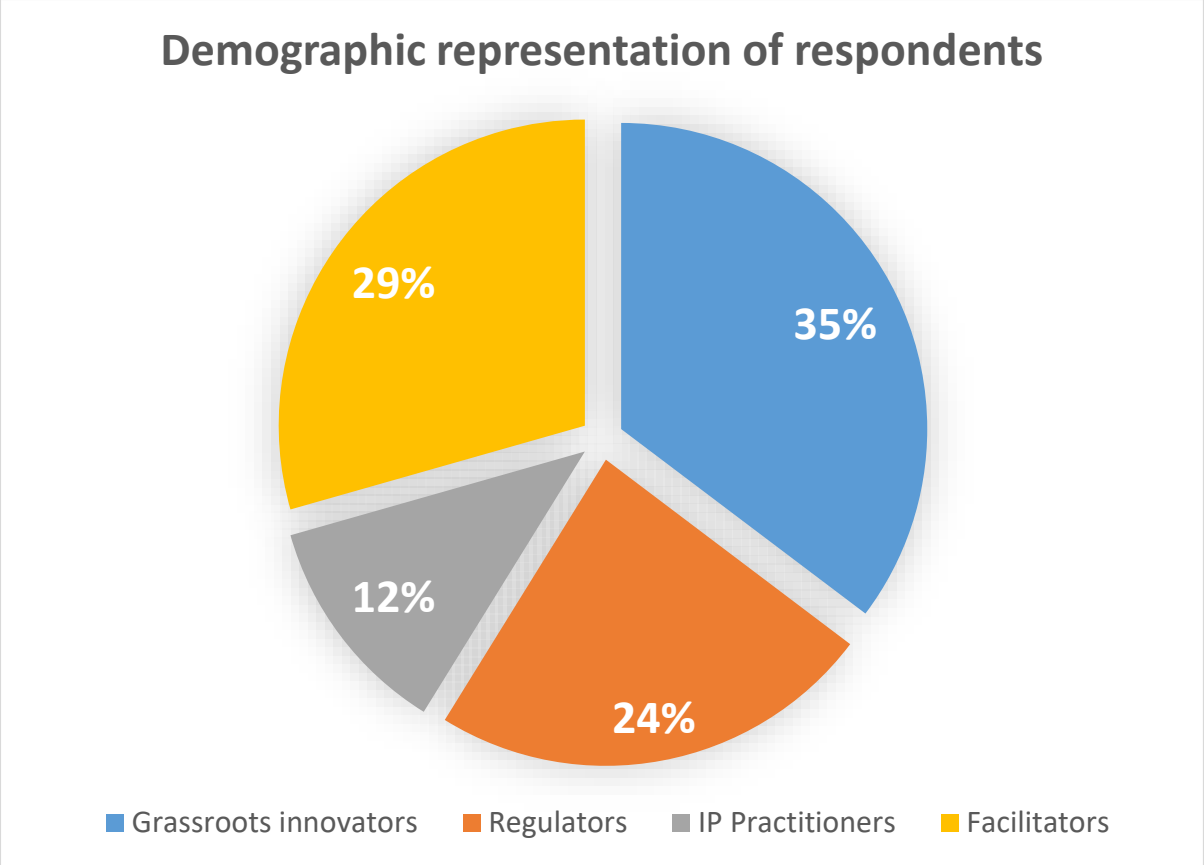


Figure 4.1: Demographic representation of respondents

4.1.2 SUMMARY OF PROCESS

Semi-structured interviews were conducted online with all the respondents but one – an innovator. Challenges of data and connectivity meant there had to be scheduled a face-to-face meeting. These interviews (both face to face and online) appeared to work very well because respondents who did not fully understand the questions or wanted to make sure we were on the same page were able to ask and the questions were clarified. Furthermore, where respondents did not fully answer the questions or provide examples to back up their claims, I was able to ask follow-up questions (DiCicco-Bloom & Crabtree, 2006). Almost all of the respondents were very keen to get a copy of the research as they felt such discourse is important to be in the public domain.

After the interviews were completed, the recorded interviews were transcribed, and this took a long time. Common themes were manually identified from the transcribed responses, which are explored in depth below.

4.2 STIMULUS FOR INNOVATION

CONTEXT: *Respondents were asked to comment on what they think motivates people to innovate in the grassroots.*

Grassroots innovators have many reasons why they innovate. Chief among them is the old adage that necessity is the mother of invention. 90% of all respondents alluded to the fact that the communities where these innovators come from are riddled with socio-economic challenges and there is rife unemployment. For example, one grassroots innovator stated:

> *"The biggest motivation for me, has been unemployment. I wanted to be a part of the solution to unemployment from a young age, we realise that we are we are the guys that are going to be the solution providers to then unemployment"*

From such unemployment, innovators come up with innovations that seek to find an alternative to unemployment, while addressing the societal issues surrounding them. Although there were a few (20%) that pointed out that addressing societal needs is a front for recognition, as they believe the highest issue on the scale is money. One impressive story that had a positive impact on the society was from the North West province where they have a challenge of donkeys that roam the street and cause accidents at night on the road. One innovator came up with a reflector jacket for the donkeys, which would allow motorists to easily identity the donkeys from a distance and effectively less accidents as a result of these animals within the community.

Another example of tackling the societal challenges at the grassroots level is a solution to daily challenges that was developed from KwaTema in East rand. Transport challenges exist for the many people who have to commute to work. With very few resources and low income an ingenious innovation of motorized bicycles for the community was introduced. Further to solving the challenge faced by the community, it is a welcome innovation to the environment (given that the number of cars on the roads have an adverse effect to the environment), as all it needs is muscle, which further on its own is a much needed health benefit.

70% of the respondents further indicated that money cannot be ignored as a driver for innovation. One respondent put it this way:

> *"A lot of that is just an excuse to try and eat somewhere. And doing something for the community is often used as a good excuse, just to fill your own pockets."*

It should be noted, however, that there is a strong nexus between job creation or way of livelihood, and the generation of income as a stimulus. Some innovators are unable to find jobs in the metropolitan areas, and are stuck in the rural areas, so they have to find a way to survive, a way to put bread on the table, which is a means of making money.

4.3 CHALLENGES FACED BY GRASSROOTS INNOVATORS

CONTEXT: *Respondents were asked to comment on whether the grassroots innovators have an impact in their communities and on the challenges they think grassroots innovators face.*

When a question of grassroots innovation impact in the communities where the innovations are taking place was posed, there was a clear unambiguous response: the grassroots innovators are having an impact in their communities. Nonetheless, such an impact comes with a cohort of challenges associated with promoting innovations. Access to resources and funding was one major highlighted challenge faced. Information access for starters is a huge stumbling block as some highlighted data costs for the majority in the rural areas to even trying to get connections for support.

It was highlighted that some of these innovations do require some basic project management skills, which are minimal to none amongst grassroots innovators. The general perception has always been that funding is the key but it is not always money that these grassroots innovators need. It is support in terms of how to run a business, from an innovation, having proper systems in place, the proper setting up of a company, registration account, accounting, financial legal HR, all those things which are the basic building blocks of a business. One regulator alluded to a systematic problem by saying:

"So you find that a lot of these innovators are not geared for formalisation as some are already operating because they have a passion. And now when we want to bring them to our fold, it becomes such a hurdle to formalise, for example, you want to see financial statements that are coherent and you lose them completely, so this systematic thing is big"

Another respondent, an IP practitioner, on formalisation put it this way:

"When you tell them about growth, you go back to that what I said earlier, which is formalization comes into place, there must be HR policies, there must be risk management strategies, there must be all these things, stand up. And they must pay the right salary structure because these people can be unionised. So you're asking them a lot. You see, that for them they just become overwhelmed with the system and all they want is to produce their product and nothings else."

Furthermore, grassroots innovators have not been introduced to a formal system of innovation and intellectual property. Knowledge of the patenting system to most grassroots innovators is a huge challenge, as most do not even understand the concept of IP. One facilitator put it out this way:

"…knowledge of the patenting system, and knowledge of knowing that you shouldn't disclose something before you do your provisional patent, and as a matter of fact how to do a provisional patent and what is required for that provisional patent. So you eventually end up with somebody that might have a good idea, he tells that idea to everybody and in the process loses out"

The fact that grassroots innovators are not the only ones in the innovation space, there were some fears raised of bullying by the mainstream innovators on some of the innovative ideas that the grassroots come up with. Due to lack of resources, grassroots innovators are forced to approach the mainstream innovators either for prototyping or upscaling help and it is at such times that some grassroots innovators can fear sharing the intimate details of their innovations as theft of ideas or side-lining of their contributions can occur. Unfortunately for

some innovators, they open up their innovative ideas to potential funders or investors way more than necessary as they solicit support, which can be a Catch 22 scenario for them as they cannot get the needed support without revealing much of the innovation.

Access to market for many grassroots innovators appears to be another challenge as there is stiff competition, considering that they are not the only innovators. One respondent alluded to fact that government is the one making it difficult for grassroots innovators as it has implemented a supply chain management and tendering system, which does not favour the low-end innovators. While this is one of the access to market challenges, the fact that scaling is a hurdle for grassroots innovators as it goes back to funding and resources, available market, will most often than not require huge quantities of supply, leading to less access.

4.4 THE PROMOTION OF GRASSROOTS INNOVATIONS

CONTEXT: *Respondents were asked to comment on how best they think grassroots innovations can be promoted. They were also asked on how best we can ensure that grassroots innovators are motivated to continue innovating in their spaces and further get recognition for their efforts?*

Innovations as great as they are, unless promoted to have a greater impact, have little effect on the communities. As such, it is undeniable that grassroots innovations need to be promoted in order to have maximum reach and effectively have a greater buy-in from investors, funders and even more so, an effect in the community. The government which is supposedly at the forefront of promoting grassroots has many intervention plans set up. However, one regulator articulated this promotion or challenge thereof this way:

> *"We need to have a myriad of interventions, working together: right now we've got a whole lot of fragmented, ad hoc interventions across the system. So we've got Small Enterprise Finance Agency (SEFA) to a certain level, they will fund some SMMEs on innovation. And then you've got Department of Trade and Innovation and Competition (**dtic**) they've got some grassroots support programs; you've got your Department of Science and Innovation (DSI) working with Technology Innovation Agency (TIA), you've*

got your The Development Bank of Southern Africa (DBSA) who are the new players now also in helping young entrepreneurs develop products, you've got in the private sector, a number of instruments, including those from SAB foundation and many others. So up until we find a way to have these interrelated support programs working as a system with clear linkages, an entry point and exit point, then we're not going to get this promotion working very well."

In essence, the many systems put by the government are fragmented and duplicating mandates and do not work together to bring about clear-cut promotion of the grassroots innovations.

Furthermore, some respondents highlighted that the only time you hear talk of such grassroots innovation it is to drive political or corporate agendas. They highlighted that innovation and IP should be part of the curriculum from early education phases to get awareness for an entrepreneurial society like ours. One particular practitioner noted:

"the whole concept of an entrepreneurial society that can create for itself can only come through recognising the importance of IP and innovation as a long term solution, and how we then support IP ideas and incentivize them even if it doesn't make it to bigger the market"

Programs like IP4SMMEs which are educational workshops administered by CIPC were also highlighted as doing a good job but not effective as they are usually done in metropolitan areas leaving those grassroots innovators in the rural areas with a huge financial burden just to attend the workshops. These programmes promote more awareness around grassroots innovation as well as IP. One interesting outcome from such workshops though, is that they do profile some innovators who can share their innovation stories and in turn motivate others, as one innovator put it:

"…while I was there for the first time I learned that there was a guy from Alexandra township, who came up with this innovation to solve the issue of rats, and that story it

was my first time encountering that story. And I don't think a lot of people in Alex even know that person and such profiling is very important for a wider audience"

One respondent however put forward a very interesting point that most often than not we overlook: the willingness of the grassroots innovators to be promoted beyond their space. The regulator put it this way:

"…nine out of ten times, you know somebody just creates their own business, because they just want to survive, it's a survivalist business. And 9 out of 10 times, they do not have the inclination, or the will to grow beyond where they are. You see, so the problem is not with what we can do for them. It's what they feel they want. I'll give you an example of these two guys from Mpumalanga, as much as we got them the factory, and that space was big, and we were talking about, you know, if they were focused on growth they would have employed many people, it would have been a fully-fledged factory that employs 100 people, you know, running around in the factory production lines and things like that. And the founder said "I have no time for guarding employees, all I want is to come do my thing and sell my product…""

There were further suggestions of how the IP system is changing to accommodate innovations at the grassroots level. There was talk of the country going in the right direction as far as looking at our technology developments with the Patents Act being amended to look at utility models to encourage more incremental innovation. This is in essence another way of loosening up conditions around patentability requirements which currently are too stringent for grassroots innovation. These utility models are essentially where these grassroots innovations are relevant as grassroots innovators are essentially driven to solving local challenges, the communal type of challenges.

Lastly, the promotion of a reward system was also suggested, where people need to think about innovation as being rewarding. It was articulated that even if there is no reward. innovation plans need to get the right types of incentives to try and promote that innovative behaviour.

4.5 IP LEGISLATION INFLUENCE ON GRASSROOTS INNOVATIONS

CONTEXT: *Respondents were asked to comment on how the present IP policies and laws have an influence on such innovations. Further, they were asked if grassroots innovators as well as mainstream innovators (universities, research institutions, corporates) should be treated the same way in relation to IP protection?*

It should be noted that the IP legislation is currently in the process of being changed for substantive search and examination of patents. On that note, there were interesting insights on whether the legislation as is or as envisaged to be will have any influence on grassroots innovation. To begin with, with legislation as it currently is, a number of respondent felt it has too stringent requirements. However, there were opposing views on whether in its current form it is of any to be of any influence with grassroots innovators. One respondent felt that the stricter the legislation is, the better it enhances innovation:

> *"An improvement in the quality of innovations/inventions/applications would subsequently lead to an advanced/alternative means of solving the current problems faced in our communities rather than focusing on solutions that already exist."*

Essentially, some respondents think an out of the box mentality will help grassroots innovators come up with innovative ideas as long as the laws are stringent. Also by treating the grassroots innovators the same way as mainstream innovators, it allowed for competition and an even ground to play on. However, other respondents felt that the laws are very restrictive for the low technology players where mostly grassroots innovators are innovating and should treat the two different groups separately in terms of IP protection. And empathically so, they pointed out that:

> *"In grassroots innovators, we are looking for low tech solutions, very low tech solutions, not high tech solutions that would that would fit all three requirements of patentability. With the low tech, we don't really need that we need something lighter. So in my view, the IP policies don't assist us"*

On another note, the conversation took a different turn as the issue was not of whether the policies were assisting or not, but primarily on how the policies are packaged. It was highlighted that countries that have been successful at commercialising any form of innovation are rightly so because they would have had the right policies and the right incentives in place for the innovation landscape to actually thrive, and for these grassroots innovations to actually thrive. One respondent pointed out that:

> *"There is no coherent policy. What we do is talk about grassroots innovations how it's going to solve so many of our challenges that we experienced in our communities. But I've yet to see a document that really talks about the grassroots innovation and what do we actually do and how do we make sure that these innovations, essentially become something that is of commercial value. We have a system where innovation in general is for the haves and the have nots. If you are fortunate enough to know about innovation, inventions and ideation you're very much in the minority in this country. If you had to look at all successful industrialised countries in the world, they all started out with incremental innovation, look at China. China, Singapore, Malaysia."*

Furthermore, it was pointed out that most of these industrialised countries started through reverse engineering, in licensing, copying of technologies, over time they were able to build up the skills necessary for the innovative capabilities to the extent that solving local challenges, emanated into using more technology to be more advanced. Over time, such led to more innovations coming out of those communities and high end technologies being developed. It was recommended that as a country we recognise that in many respects, the country is nomadic in the second industrial revolution, and there is need to do something drastically different, to be able to be able to develop local technologies and have them make a meaningful impact. Such drastic measures lie in policies that suit South Africa.

One respondent added to the suitability of the policies by highlighting that while the present IP system may work somehow, it is not sufficiently accessible – not enough capacity and awareness programmes or initiatives by responsible government entities. They, however, felt that the proposed patent examination system will make the system further inaccessible as

the associated costs of patenting innovations also increases due to the increased process to adjudicate the applications. As for treating them the same, it was noted that the fact that a more suiting policy should also reflect an understanding of the different economic backgrounds of grassroots innovators, and as such, the cost of protecting IP should not be the same.

An interesting turn was that most of the grassroots innovators interviewed expressed that the IP policies and laws are ineffective, for starters, as they are not aware or well acquainted with the IP laws. However, they expressed a differing costing for IP protection as they feel the playing field is uneven as they are competing with companies and research institutions that have budgets for innovations, while they have to make ends meet for themselves in order to access the IP system.

4.6 GOVERNMENT INTERVENTION TO GRASSROOTS INNOVATIONS

CONTEXT: *Respondents were asked to comment on how the government, through legislation and policy, can help in fostering relationship among mainstream and grassroots innovators? Further, besides incubator facilities and funder programs, what other kind of assistance do they think grassroots innovators can be provided with, to better advance the communities they live in?*

Many a times during the interviews it was pointed out that the government has some mandates in place for assisting grassroots innovators. However, the question arose as to how much those mandates are really meeting the task at hand. Most of the government structures (offices, incubator facilities, seeder and funder program offices) are in the metropolitan areas and towns. This automatically disadvantages those grassroots innovators who are in the rural areas. One regulator highlighted that there is actually more than funding that is needed along the way, there is hand holding and provision of advice.

> *"You know, I know that in the Northern Province, Limpopo there was a unit within DSI that had science centres in communities like they would use a community hall and set up a science centre there. I'm not sure if that one was getting the whole community or*

just young people to come there and get advice on their ideas, or it was also for the whole community, but they set up different science centres as well for different communities."

This highlights the need to engage at the grassroots level and provide for information sharing through education and awareness of the IP space. One respondent actually highlighted the need for the government to work with the people by consulting them in all the structures it sets up. This is what one facilitator had to say:

"We are putting these structures; did we ask them if it's the structures they want. Let me tell you another project that dismally failed, where government was thinking for them and not with them and not with them in mind, you know these formalised stalls in hospitals. You know, that was a big project at some point we were like super creative shelter and then we can sort of manage them within those shelters. However, because these shelters are managed by bylaws and once you sit there, you must have an assigned number and you must sort of contribute payment, and these small businesses are not interested in those things. So those stalls became white elephants."

Evidently it takes more than just setting up structures to help formalise grassroots innovations; it needs active engagement. The recent white paper from the DSI alluded to the support for grassroots innovation as a policy intent, and as the mandate of the DSI is to drive innovation, it is considered a good start. However, there is need for instruments that will make and bring life to that policy intent from the white paper and one respondent highlighted such an instrument. This will be a grassroots innovation support compact that will bring commitments from research and development institutions, private sector companies, NGOs, and all of these stakeholders who are involved in social entrepreneurship to pledge support and play a role in the system. The facilitator further highlighted that:

"There is need for a funding mechanisms, either from government departments like your DSI, galvanising resources from municipal budget, and to support these types of employment creation programs. The employment fund, they implement a stimulus package from government procurement mechanisms that can be exploited if as part of BEE empowerment points, you are located some points by the fact that in your

supply chain you're supporting grassroots innovations. In short, policy is key, but policy supported by policy instruments that brings resources, stakeholders, and everyone else."

4.7 FROM GRASSROOTS TO MAINSTREAM INNOVATIONS

CONTEXT: *Respondents were asked to comment on how best they think grassroots innovators and mainstream innovators (universities, research institutions, and corporates) can work together on the promotion of knowledge transfer to advance grassroots innovation agenda.*

A number of respondent (40%) felt that one of the ways for mainstream innovators to work with the grassroots is by having publicly-funded IP being made available to grassroots innovators. But a more direct contribution would be where these institutions actually take on these grassroots innovators and mentor them. Another way would be that funding of these public institutions comes with conditions. As part of the funding, it can actually be mandated that these institutions work with grassroots innovators, and support our grassroots innovators through the R&D work.

Perception was considered as another stumbling block in getting the mainstream to work with grassroots especially when it came to traditional medicines. One respondent pointed out that this perception is a huge challenge and gave an example that if one went to a pharmacy like Dischem to get something for a headache between the two products, a Panado versus a product that is coming from Moringa, one would easily go for the former. However, someone with in-depth knowledge of traditional systems will appreciate higher value, high efficacy from something that is based on traditional knowledge. When mainstream innovators have no understanding of these traditional system it makes it hard to work together with grassroots innovators due to their perception of the traditional system, and that requires a cultural change. They went on to explain that:

"No matter how grassroots innovators can develop these traditional knowledge systems and traditional medicines at the end of the day, there's no buyer. Doesn't

really matter how much time they invest. If there's no market for it, there's no point. And the question is, who creates the market? The mainstream innovators have the means and resources to advertise! So, we have to change the culture, we have to change our approach to the systems, and we have to somehow, equate the traditional knowledge systems. And for these grassroots innovations to be on par with more highly advanced technologies, they should be viewed the same way."

One practitioner further expounded on the notion that the mainstream innovators are the key to this working together. They alluded to fact that we need business to support grassroots innovators, there is a need for venture capital, a need for private sector investors. There is a need even for the market to be able to open up for the products that are coming in from grassroots innovators. They said they made a survey, asking grassroots innovators if you were to get equity from a private sector investor, if they would be open to share parts of product or equity in exchange of investment that can help commercialise the product., and most of them were open to the idea of equity.

One message was clear though, that there is a need to have a structured framework that connects support institutions with grassroots innovators. If there are finance support institutions, R&D institutions, prototyping and incubation institutions, there has to be a way of connecting all of these to grassroots innovators in a well-structured systemic framework that can be easily understood by innovator. There should be a defined entry point, and exit point. These are the support institutions that an innovator can access at different stages of the product development, and it can only come about if we can map an ecosystem of players, and then are able to streamline the support services that they have.

4.8 INDIGENOUS KNOWLEDGE AND GRASSROOTS INNOVATIONS

CONTEXT: *Respondents were asked to comment on how best they think that knowledge transfer, which seeks to enhance or add-on to indigenous knowledge in communities can be carried out.*

When it comes to indigenous knowledge systems, one dimension has not always been assigned: monetary value. This has then made it difficult for knowledge transfer in the knowledge economy as valuation automatically happens. When it comes to IKS, the majority of grassroots innovators do not understand the monetary value of that knowledge and as such, there can be no incentive to transfer the skill, knowledge or know-how, as it is part of their cultural upbringing or way of life, and not looked at a means to generate income. One facilitator gave an example:

> *"When a mother knows how to weave a basket and teaches the daughter, they don't attach a monetary value to the whole process, it is just another day or a normal habit that a woman should know how to"*

In some cultures, some knowledge systems and practices are forbidden to be taught to outsiders, no matter how innovative they can be for other societies. It has taken the DSI and the CSIR a laborious amount of time to collect some of these indigenous knowledge databases and formally present those across different communities so that people can understand the value that lies in indigenous knowledge. The present challenge, however, is that there are no monetary intellectual property transfer methods for such systems.

It is paramount to understand the work that has been done by the CSIR in collecting and recording the IKS. The information will go a long way to ensuring that knowledge is retained in the long term thereby allowing for knowledge transfer from records and scholarly inquisitions. Considering the dire times, the nation is currently in, with diseases and viruses that need to be dealt with decisively, making full use of the medicinal products from all innovation circles, to treat or diagnose and solve the present day challenges is key. However, such knowledge transfer will require a lot of investment, a lot of time from government, a lot of efforts to make people aware of these systems, and to actually transfer that knowledge and skills into more tangible projects.

Such products from indigenous knowledge system like pharmaceutical products take time to be seen in the shops and there is no deliberate way of advertising them. One example given of successful knowledge transfer was that of China, for example, where they paid attention to their indigenous medicines, and were most come from plant extracts or indigenous biological resource extracts. This is knowledge that they would have had for many years and really understood how it can be used to improve their communities by maximise the knowledge that was taught from generation to generation. Nonetheless, a lot more investment needs to go into understanding, and innovating around indigenous knowledge systems, biological resources, and their full capability.

One practitioner summed up why the Chinese have prevailed in using their indigenous medicines by saying:

> *"70% of Chinese people go to traditional doctors instead of the western doctors and it is no accident that they have excellent highly developed indigenous products and systems. The Chinese people themselves think there is value in it. But if we as locals don't see the value in traditional knowledge, we always want to opt for what we are comfortable with then we need to work on our perception, and it's only through education, knowledge transfer, skills transfer that we will eventually reverse the tide fast to focus more on using our own indigenous systems understanding that they are safe to use."*

A lot of deliberate effort has to be made in investing in support and awareness of the knowledge systems. Doing so will inevitably increase knowledge transfer and allow buy-in for mainstream innovators working with grassroots innovators who have be in this sphere for a while and have a better understanding of the indigenous systems.

4.9 SUMMARY OF DATA PRESENTATION

The IP landscape with the many players involved opens up a different perspectives that knowledge system can be viewed from. Nonetheless, there is a consensus on a number of

issues. Grassroots innovators play a role in the society, and they have an influence in the socio-economic climate of the communities. The extent of the role of innovators varies depending on the support and access they have to the IP system. It is however clear that there are gaps in how things are done as far as the expectations of policy and there are areas that need a complete overhaul and redress, such as areas like access to infrastructure, access to systems and probably more importantly and alignment of the policies to fit the South African context.

CHAPTER 5: ANALYSIS OF RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter focuses on the analysis and synthesis of the data presented in Chapter Four, as well as the knowledge and insights gained from the reviewed literature in Chapter Two. The analysis focuses on three key areas, namely: mechanisms for learning and building technological capabilities; critical success factors; and barriers to learning and technological capability building. The research findings will be compared and contrasted with the reviewed literature to help answer the main research questions of this study.

5.2 BACKGROUND

The discussion of the research findings will be summarised into two main thrusts to ensure alignment with the three research questions but also with segments of the National Systems of Innovation framework.

5.3 DISCUSSION PERTAINING TO RESEARCH QUESTION 1

Research question 1 was thus crafted:

What are the main approaches to the IP protection for innovations emanating from the grassroots as well as that of Indigenous Knowledge in South Africa?

Literature pointed out that IP has always been about control from inception. With the control of property in the early years of colonisation, followed by markets and economic processes, knowledge itself being converted into intellectual property was seen as the controlling factor effectively in comparison to all property types (Shiva, 2001). This control has a way of exclusion, especially to those not privileged, or the uninitiated with respect to IP as witnessed from the results from the interviews, and as revealed by the challenges that are already on the ground faced by the innovators. Such challenges range from being as basic as having no knowledge of IP laws and policies to as being high as having little or no access to facilities within IP protection.

Grassroots innovators are on a different dining table as far as enjoying the spoils or proceeds of IP. The fact that many grassroots innovators are not initiated with the ins and outs of IP is not by mistake or the misfortunes that befell the grassroots innovators. Access is a deliberate control measure to the centrally-placed incubation facilities. As it was learned through the interview process, there is a need to have massive outreach, and this should not be done in metro areas or cities but right in the rural areas. It goes against the promotion of grassroots innovation to have such innovators travel for hundreds of kilometres just to do a feasibility study on their idea and then work towards a prototype so that they can get an incubation space.

It was argued in literature (Pouris & Pouris, 2010) that strengthening of the IPR system does not produce more domestic innovation, although an increase in foreign patents application can possibly occur. In 2019 alone, of the many domestic applications per annum that are filed with the South African patent office, about 8% of those applications originate locally as compared to the 91.8% which are from non-residents. This alone highlights the fact that there is less involvement from the locals, particularly the grassroots innovators, as it was learned through the interview process that most of the innovators learn of IP along the way of trying to perfect their innovative ideas and plans. Further, by soliciting funding, they end up sometimes not getting the recognition due to them as innovators, as the benefactors take the credit, which is a huge drawback against motivating grassroots innovators.

Indigenous knowledge, as explained by Bertelsen & Müller (2003), is available from the ground up, and primarily transferred throughout society, while production organisation is integrated within local institutional environments. It has been gathered that a lot of deliberate effort has to be made in investing in support and awareness of the indigenous knowledge systems, to effectively increase knowledge transfer, and further allow buy-in of these traditional knowledge systems by mainstream innovators. This was further alluded to in the literature, as it was seen that most indigenous knowledge is passed on from generation to generation, thereby adding to the difficulty of formalising, for example, the processes of how some medicines are manufactured. When it comes to indigenous knowledge systems,

one thing has not always been assigned, which is an attachment to monetary value for most of these knowledge systems with most grassroots innovators. This less monetarily-inclined value system effectively makes it difficult for knowledge transfer to occur in the context of a knowledge economy, where valuation automatically happens, ultimately creating less incentive to transfer the skill, knowledge or know-how.

Lee et al., (2013) has shown that Taiwan, for example, promotes Small to Medium Enterprises (SMEs) as a spin-off of grassroots innovation emanating from these indigenous knowledge systems. Unfortunately, such trends are not seen within the South African context, as it was noted that it is challenging to get local indigenous products into shops like DisChem or Clicks for known and proven indigenous products in fighting known ailments. Furthermore, there is no deliberate intent in promoting these innovators or rather SMEs through advertising these IKS products that they offer.

It was expressed through many innovators that one of the disadvantages of soliciting funding and resources for innovators was the fear of replication of their work as there are no protection lifelines for the grassroots innovators, considering the costs associated with protection. This somehow seems to agree with the observation by Azevedo et al.,(2014) who noted that there is a decrease in imitation and diffusion with the tightening of IPR policies. Such a decrease is a culmination of how the mainstream innovators consider indigenous systems, how the policies are not aligned to promote aggressively these systems and offer them a competitive advantage as given to exogenous systems. This effectively sees less of domestication, which is the embrace of the grassroots innovation to formal institutions as depicted by a move from the informal sector in segment 4 to the formal sector in segment 3 as given by the assimilation of endogenous system given by Müller (2013) in Figure 2.1.

5.4 DISCUSSION PERTAINING TO RESEARCH QUESTION 2

Research question 2 was thus crafted:

How do IP policies and laws enacted promote knowledge transfer of indigenous knowledge effectively enabling or impeding grassroots innovation?

The IP policies are ideally supposed to be seen to promote and further stimulate participation of inventive minds to solve the challenges faced in the country and promote economic growth. That being said, it is the feedback from the ground up that there is seen the effect of these policies either as enabling or stifling innovation. What has been observed is that the policies are not designed to encourage innovation, per se, but are seen as a reaction to exploitation from the global North. It was mentioned during the interviews that some policy changes are seen to curb the ever-greening experience within the pharmaceutical industry as a result of the depository system, which evidently blocks the creation of generic medicines. Pouris & Pouris (2010) alluded to the fact that tighter IPRs in the Global South are actually seen as a way to protect against exploitation from the Global North and less to do with fostering indigenous innovation.

One would further get that sense from how the pricing system is set up for protection of IP, which is expensive for the majority of the working class, and further pointed out by grassroots innovators, that they cannot afford the cost of a patent attorney for filing a complete patent specification, which is required to legally engage on. All this points to one thing: the IP protection process is cumbersome, hierarchical and very difficult to navigate, let alone being expensive for the average person. The fact that the same knowledge systems in which these grassroots innovators are trying to have breakthroughs in also encompass mainstream innovators, some of whom are neither taxed nor contribute to the GDP like universities and yet, are well financed to compete with the resource-less grassroots innovators, is far from enabling.

The primary goal for the Global South countries is for economic catch-up where learning from advanced economies in the Global North is key to facilitate research and inventions (Lee, 2014). The tightening of IP laws like the imminent introduction of substantive search and examination of patent, without possibly introducing less stringent utility models is not tailored for advancing learning and diffusion of technologies. Most innovations that happen

in the grassroots, should they seek IP protection, face high patentability requirements, which are widely seen as a huge stumbling block. Facilitators and innovators alike have advocated for having a design and strength of an IP system that is tailored to their indigenous technological capacities so as to provide the most appropriate incentives for indigenous innovation as literature showed it (Lee et al., 2013). This has been seen to be the way to advance innovation through a number of countries like Korea, Thailand, Singapore, which in turn have made headways in economic catch up. There is hope though, as the recently published Draft White paper on Science and Technology (DST, 2019), makes a policy intent to the possible introduction of utility models.

Informal sector innovation, as envisaged by the national systems of innovation framework, appears to have a challenge in the assimilation phase as many innovations which are supposed to eventually become inputs to the innovations that take place at the grassroots, are stifled by the present policies and laws. As such, very few innovations are domesticated to the formal sector, and for those few, there is more than IP that is needed to have them see the light of day like advertisement and a total buy-in from benefactors. One of the very reasons for this is the same treatment of both mainstream and grassroots innovators as far as IP protection is concerned and sadly, the grassroots innovators are even more disadvantaged, as far as access is concerned. The IPR Act unfortunately is proving not to be designed to be pro-grassroots innovation. As it stands, it is an act and an instrument that assumes a capability at a particular level in a business, an instrument which could work for a well-established business rather than entry level, in this case grassroots innovators. This is the view that stands, and there is need for it to be reviewed, for the stringent barriers to IP protection be lowered and made easier for innovators.

Indigenous knowledge can be found in a variety of contexts, including cultural and religious ceremonies, agricultural practices, and health interventions (Jones et al., 2019). Indigenous knowledge is commonly used interchangeably with traditional and local knowledge to distinguish between the knowledge developed by and within indigenous communities from

exogenous knowledge system which can be generated through educational facilities, research centres and industry.

African perspectives must be integrated and celebrated in South Africa's knowledge systems, as they aid in the development of new research paradigms and mental maps, as well as the enrichment of existing ones. Much of the IKS that has survived has shaped and informed African thinking on topics such as art, music, religion and theology, governance, justice, health, and agriculture, to name a few (S. Gupta, 2019). It should be noted, however, that despite the hostile socio-political environment, personal and cultural identities, including social belief systems, have remained strong and vibrant through repeated practice and observance of IKS tenets.

It is critical to finance IKS for economic growth, and most importantly, it requires credible financing in order to grow and develop, with the primary goal of funding linkages and access to existing programs that will augment grassroots innovations by providing opportunities for experimentation, scaling up, prototype development, and the establishment of relevant infrastructure. From financing IKS, the main purpose of its knowledge transfer is then to affirm, promote and debate IKS, and to create a sense of community across a diverse range of practitioners. Amongst the IKS Policy drivers as spelled out in the (Department of Science and Technology, 2004) in the South African context, some worth noting include:

> *"The affirmation of African cultural values in the face of globalisation – a clear imperative, given the need to promote a positive African identity;*
>
> *Underpinning the contribution of IK to the economy – the role of IK in employment and wealth creation; and interfaces with other knowledge systems, for example IK is used together with modern biotechnology in the pharmaceutical and other sectors to increase the rate of innovation."*

One example of affirming the cultural values was found through one of the respondents as a grassroots innovator who found a way of promoting and preserving the cultural heritage by

creating a clothing line. The goal has been to open a conversation about identity first, who we are as a people, as young people, the language that they use and through trendy clothing that has cultural undertones, they sought to preserve the culture, but in a modern way which would relate with the younger generation.

The fact that up to 80% of the African population use traditional medicine to help meet their healthcare needs is a testament to the fact that there is a need for knowledge transfer in that sphere, as the widespread use of traditional medicine is frequently attributed to its ease of access and low cost (Attaran, 2004). China alone has traditional medicine use accounting for around 40% of all health care services and because of historical circumstances and cultural beliefs, populations in Asia and Latin America continue to use traditional medicine. In light of such information, and the recognition of the important de facto role of traditional medicine in South Africa, the Traditional Health Practitioners Act was enacted by the Department of Health and a proposal of the formation of a regulatory body is underway, which will without a doubt promote the transfer of indigenous knowledge systems in key sectors, enabling grassroots innovation to thrive.

In essence, there is a level of promotion of transfer of knowledge, as IP in itself is a rewarding system in terms of rights accrued with the protection and thriving from the monopolistic nature of the rights. Nonetheless, a balance has to be achieved as the more stringent the laws tend to be, the more discouraging to the grassroots innovators, and ultimately less transfer of knowledge occurs, which is not enabling. What is yet to be seen is how best the playing field could be made level for both mainstream and grassroots innovators. The introduction of programs like the inventor assistance program by the CIPC in 2017 is a glimmer of hope for grassroots innovators as it gives that very chance to play on the big stage with the mainstream innovators. However, it is clear that this is just a drop in the ocean lifeline as the pairing rate for the innovators is very low, compared to the applications that go through for the program. True as it may be that most of the applications would not be meeting the patentability requirements, which may indicate that the requirements are too high, and that more outreach programs to teach different types of protections and increase awareness is needed.

Further to that, the Nuts & Bolts narrative (Sibanda, 2021) speaks towards inclusive innovation and entrepreneurship and one way that policy can influence innovation is simple; create more access through legislation and bring such resources like innovation hubs right to where the grassroots innovators are. Sibanda proposes mechanisms which seek to leverage indigenous knowledge in a wider sense, which will support the multiplication and incubation of ideas within townships, and will seek to commercialise grassroots innovation.

5.5 DISCUSSION PERTAINING TO RESEARCH QUESTION 3

Research question 3 was thus crafted:

Under what conditions might IP promote the integration of R&D-based innovation and grassroots innovation?

Gupta (1999) has been at the forefront of highlighting the consciousness that is growing, which realises that some knowledge systems do not always have to be seen as informal, simply because the laws of the formal system in the technological sector fail to explain innovations in another system. This is true as seen with indigenous medicines that would not get approval for being sold in the pharmacies or any form of advertising, not because such medicines do not work or are inferior, but simply because the formal system has failed to explain how they work or fit within the system. Vast numbers of grassroots innovators or entrepreneurs are battling to have a breakthrough with their innovative products which have been used within the indigenous communities from time immemorial, yet cannot be domesticated to be in the formal sector.

A mainstream perception that has been in the literature (Gloria Snively et al., 2001) looks at innovation as linear, that is, the same way that society was technologically constructed, and that technological change takes place first and then innovation drives the socio-economic development of society. This is still the same setup seen in South Africa, where indigenous products mostly in the healthcare sector, like medicines, are being perceived as less effective as compared to the exogenous products. Such a perception, which posits that the North can easily acknowledge the existence of all indigenous art, music, literature and drama, as well as economic systems, nonetheless fails to appreciate indigenous science.

A change of perception through learnings of appreciating indigenous knowledge systems is one condition under which the promotion of indigenous systems can be encompassed with research and development and made to work for the South African case. It is through adoption and learning from other jurisdictions like China, for example, in relation to how they got research and development. How they harnessed their indigenous medicines, of which most come from plant extracts and indigenous biological resources extracts. The creation of the indigenous knowledge systems database through the CSIR and DSI is one that is envisaged to bring about the awareness and effectively promote integration with the grassroots innovators as they are in the eye of such innovations.

The NSI framework shows a possible embracing of grassroots innovation from sector 4 in the informal sector and through domestication of such innovation, opens up to embracing and scaling through research and development. There are cases that have seen such a similar trajectory from assimilation to domestication, one particular case is the use of the indigenous plants and extracts by Portia M, a beauty product which eventually got scaled up, and through research and development, it moved from the informal sector to the formal sector. This is one proof that research and development can be coupled with grassroots innovation and feasible products can be put out in the market and go beyond just being within communities. As seen in segment 4 of the assimilation of endogenous systems where there are social entrepreneurs, whose sole goal is to possibly add value to society, and offers solutions to social issues, but at a personal level, also aims to maximise personal wealth in that context (Martiskainen, 2017). The fact that personal wealth can be realised, gives an added impetus to the possibility of aligning such informal grassroots innovations to the point that they can be formal, or more so, engage with the exogenous technological dimension.

Research is showing that there is a need for more support, which goes beyond incubation and innovation centres. The current setting in South Africa is that even with incubation, the grassroots innovators have a sense of being thrown into the deep end without proper tools, and being fully indoctrinated on how best to make use of the different types of IP. What is

expected mostly is that beyond incubation, these innovators will eventually inject capital back into the same communities where the innovations where nurtured and incubated, as evidenced in Taiwan (Lee et al., 2013). The fact that such is sparingly happening in South Africa suggests that the incubation process needs to be overhauled and adjusted to suit the South African condition and address the very needs of these innovators. Simple business management practices need to be taught to enable the innovators to be self-sustaining and be able to manage their innovation pipelines and practices. This appears to be one of the many things the innovators seek training in, and being able to speak the appropriate language, should they seek investors who can buy in to the innovation. Further to that, programmes like IP exploitation, where publicly financed institutions like universities and the science councils can provide IP that they have no interest in commercialising can be used to help grassroots innovators.

Through this non-commercialised IP, innovators can hone their skills and find ways of commercialising these, in turn making use of the publicly financed IP which would end up neglected. This system would take grassroots innovators through different processes which are beyond incubator and innovation hub facilities, with important learnings being achieved, while capitalising on the already exhausted research and development on the particular IP. This would also align with the transversality framework, as knowledge would be transferred from one form of industry or business unit to be used in a different setting. For example, learning about various business models could enhance how to navigate the IP landscape and eventually develop a funding mechanism that would be sustaining.

Policies that are pro-partnership will effectively promote integration of research and development with grassroots innovators. One example is the “buy local concept”, which has been championed by the Department of Trade, Industry and Competition.. This is a partnership with the innovators themselves from the bottom up to government procurement systems, which can be designed to absorb the innovations coming from the grassroots. Ideally if the government cannot have the faith and inclination to absorb these innovations, it would even be harder for private companies to consider such partnerships. Unfortunately, as with the CSIR malaria research in the literature, if the system is top-down it tends to not address the issues on the ground, as the agenda being pushed will be that of the benefactors instead

that of the grassroots. Research has shown that most innovators are left with white elephants with respect to infrastructure and buildings, which they have no use for nor plans for, as such infrastructure that had been placed in their midst was not aligned with the issues on the ground. As was heard mostly during the interviews, the government needs to be agile, and not think for the grassroots innovators, but instead with them, in order to see innovation working for the communities.

5.6 SUMMARY OF RESULTS

The analysis in this report strongly suggests that there is an urgent need to align the indigenous innovations happening in the grassroots and the need for access to systems and infrastructure. This will support the innovations better, while designing a protection system that will that foster such innovations and effectively create new ways of how such IP and in particular, indigenous knowledge systems, can be diffused. It is one thing to have IP policies and another to have them understood, as well as speak to the South African socio-economic context itself. As long as such policies are not designed for the local context, they will not serve the grassroots and eventually, IP will be classified as being for the select, as it will not be serving the vast majority of the population. By nationally establishing decentralised innovation hubs which will be at the heart of the grassroots communities, this will foster growth and knowledge diffusion, and ultimately for a catching-up economy, this will be favourable in the long run.

Lastly, the government has to take a proactive role in promoting and supporting innovations by being deliberate and inclusive in procurement and supply chain policies, in order to absorb the innovations that come from grassroots.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The current changes to the IP landscape through the publication of the IP policy and recently published DST White Paper on Science, Technology and Innovation open up a dialogue on how best these laws and policies address grassroots innovation, and the transfer of indigenous knowledge.

This research will offer invaluable insights to the many stake holder engagements around the amendment of the IP laws. It will better inform the policy intent, with respect to the gaps that need to be covered to foster grassroots innovation and transfer of knowledge, as indigenous knowledge systems are being probed for the benefit of communities.

6.3 KEY FINDINGS

The major finding for this research project can be summarised below:

- Grassroots innovators are indeed acknowledged and have an impact in the communities in which they pursue innovations.

- Grassroots innovators have access challenges, which is primarily a result of the lack of awareness and knowledge of the IP system. Additionally, access to infrastructure like innovation hubs, incubation centres, and prototyping facilities is a huge stumbling block in carrying forth any innovative ideas from birth to actualisation.

- IP policies and laws are not aligned to aggressively promote indigenous knowledge transfer and grassroots innovations and furthermore, the indigenous innovators lack a competitive advantage compared to exogenous systems when it comes to access to market.

- The IP protection system may be considered to be anti-grassroots innovators, in practice, as the majority of supported innovators are within the low to middle income

bracket. Furthermore, the patentability requirements are too stringent for most grassroots innovations.

- Government has many agencies with mandates to promote innovation in grassroots and SMEs, but there is little coherence amongst all the agencies and furthermore, the government procurement systems are not designed to support small businesses and innovators who are just starting out.

- There is a call to have the mainstream innovators and grassroots innovators work together, and a number of research facilities have started opening doors to such collaborations.

6.3 KEY CONCLUSIONS

The South African IP landscape in its current form is in need of change in order to accommodate grassroots innovation. It is apparent that the IP policies and laws need to be tailored for the South African context bearing in mind the socio-economic demography of its IP users, in particular the grassroots innovators. The introduction of utility patents, for example, is one way of encouraging innovation among the grassroots, considering that utility patents are less complex to obtain, while changing laws governing the registration of IP creates more access to grassroots innovators.

Policy intent for the support of grassroots innovations is not enough without structural change that seeks to address such policies. There is need to set up structures which do not duplicate the mandate and having the sole focus of addressing the innovations that emanate from the grassroots. Access to resources, but strategically having facilities placed in the townships and rural areas will go a long way in assisting innovators. Furthermore, increased awareness through knowledge sharing platforms like the Inventor Assistance Program will vastly increase the knowledge base of the innovators in IP matters, allowing them to nurture their innovation through all possible forms of IP protection.

There is need to finance and promote transfer of knowledge of indigenous knowledge systems as this will deal with the perception that needs to be changed in order to view our

indigenous systems at par with, if not greater than exogenous knowledge systems, which more often than not rely on our indigenous biological resources extracts. The perception that the local traditional medicines are sub-par to the western medicines is a view that needs to be dealt with, through deliberate research funding and marketing of such innovations.

Through the IPR Act, mainstream innovators, especially those that benefit from public funding, should be challenged to work together with grassroots innovators and possibly incubate the upcoming innovations. Furthermore, patents which have been funded through public finances and are not being used, should be put in a pool where grassroots innovators can make use of them though commercialising and solving specific social needs.

6.4 RECOMMENDATIONS

These recommendations are considerations towards access to IP, learning and enhancing grassroots innovation.

- Incubator facilities and innovation hubs: The current approach needs to be changed and there is a need to be deliberate in such efforts to have accessibility of the incubation centres all around the country. An approach followed by Sibanda, (2021) in the introduction of eKasi Labs, which allowed more access to incubation facilities in the location areas where most grassroots innovators stay should be scaled up.
- Introducing IP learning at primary schools all the way to secondary and tertiary education should be considered as it gives these grassroots innovators a fair footing as they navigate the IP terrain.
- Assimilation can be increased by making a concerted effort to increase IP awareness and training of grassroots innovators, particularly in the different ways of IP protection, considering that it is not only patents that can protect one's innovation. Further, by establishing more community prototype spaces, this will allow more learning and adaptation to take place.
- Assist with commercialisation or market access assistance.
- Provide incentives for people to buy or embrace grassroots innovations.

6.4 LIMITATIONS OF THE RESEARCH

- The research for this study was conducted around a particular point in time when IP landscape laws and policies were changing. There is a need to conduct a more comprehensive study a few years later when the laws have been in effect for a while to capture the effect of the implemented laws.
- The research was conducted at a time when Covid-19 was affecting the nation. Availability of respondents was greatly affected and as such, the interview pool was lower than anticipated.

6.5 SUGGESTIONS FOR FUTURE RESEARCH

This research looked into how IP influences grassroots innovation, and how indigenous knowledge fits into the bigger picture as from such indigenous knowledge many innovations are birthed. Future research could possibly focus on the following:

- When people talk of innovations, they most often think of patenting, which unfortunately is not the only way one can protect innovations. Future research could look into the different types of IP protection that South Africa provides, considering the trends and why such trends are thus.
- There have been a number of grassroots innovators who have made a mark and succeeded. Unfortunately, there are some who have faced great challenges. Case studies of grassroots innovations and how they succeeded or failed could be done and from these studies, there could be important learnings for the next innovators and facilitators alike

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APPENDICES

A. INTERVIEW PROTOCOL

Interviewee:

Date:

Interviewer: Mehluli Ncube

Topic: Indigenous knowledge, intellectual property and grassroots innovation in South Africa

Objective of the Interview:

- To interrogate how the intellectual property (IP) legislation and policies impact indigenous knowledge as well as influence grassroots innovation.

Structure of the interview:

- Qualitative research.
- Use of semi-structured interview.
- Should approximately take one hour.

Key information about the interviewee's involvement in IP:

- Get information that briefly explains area of IP in which the interviewee is involved and interaction with grassroots innovators.

Key points for introducing interview:

- Start the interview by establishing the interviewee's credentials as this helps affirm the interviewee's suitability or relevancy for the interview
- Direct questions to how innovators and policies interact as well as how indigenous knowledge is a factor and how learnings are adopted from it. This will be in line with the National systems of Innovation framework – how knowledge moves from informal to formal including all actors and networks.
- Will move to consideration for the future.
- Round off with contextual questions about factors that could be relevant but that may not have been asked, or people who the interviewee may feel ought to be interviewed

Documentation plan (Additional notes):

- Access publicly available information on policies relating to IP and IKS before interview.

B. INTERVIEW REQUEST LETTER

Dear Sir/Madam

I am writing to request for an interview with you to obtain some relevant information regarding Indigenous knowledge, intellectual property and grassroots innovation in South Africa. My name is Mehluli Ncube and I am a Masters student for the program of Masters of Management in Innovation Studies (MMIS) at Wits Business School, University of the Witwatersrand, while also under the employment of the Companies and Intellectual Property Commission (CIPC). I am required to conduct research as part of the fulfilment of the requirements for the degree.

The purpose of my research project is to investigate Indigenous knowledge, intellectual property and grassroots innovation in South Africa. The aim of this research project is to interrogate how the intellectual property (IP) legislation and policies impact indigenous knowledge as well as influence grassroots innovation. Insights on this study will contribute to the body of knowledge that can influence legislation and policies affecting grassroots in addition to influencing innovativeness within these grassroots.

As part of this research project, I will be interviewing respondents who are knowledgeable about the issue under investigation and you have been identified as a qualified source of information and insight on the subject matter. I would therefore like to invite you to take part in an interview, which will take about 30 - 60 minutes of your time. With your permission, I would also like to record the interview using a digital device. Information resulting from the interview will be used for academic purposes only and will be treated with utmost confidentiality. Individual privacy will be maintained in all data resulting from the study. Your identity will remain anonymous, a pseudonym (false name) to represent your participation in the final research report will be used, unless otherwise expressly indicated by the respondent.

For more information, please do not hesitate to contact me or my supervisor Dr Diran Soumonni, (diran.soumonni@wits.ac.za) should you have any queries regarding the interview process. I do look forward to engage with you to make the necessary arrangement for a suitable and convenient time and means to undertake this interview with you at your earliest convenience.

Yours sincerely,

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Researcher:

Mehluli Ncube (MMIS Wits Business School)

C. INTERVIEW QUESTIONS

A. Introductory Questions

1. What is your work position/title in the IP arena (user/innovator/facilitator/regulator) and what are your responsibilities in that area?
2. To what extent in this IP arena have you engaged with grassroots innovators?
3. Would you think these grassroots innovations have an effect in the communities from which they are developed?

B. Addressing key Research Questions

1. What challenges do you think grassroots innovators face?
2. What do you think motivates people to innovate in the grassroots?
3. Do you think present IP policies and laws have an influence on such innovations? Elaborate.
4. How best do you think such innovations in the grassroots can be promoted? Elaborate.
5. Do you think grassroots innovators as well as mainstream innovators (universities, research institutions, and corporates) should be treated the same way in relation to IP protection? Elaborate
6. How best do you think knowledge transfer which seeks to enhance/add-on to indigenous knowledge in communities be carried out?
7. How do you think grassroots innovators and mainstream innovators (universities, research institutions, and corporates) can work together in promotion of knowledge transfer to advance grassroots innovation?
8. How best do you think the government, through legislation and policy can help in fostering these relations (mainstream and grassroots innovators)? Elaborate.
9. Besides incubator facilities and funder programs, what kind of assistance do you think grassroots innovators can be provided with to better advance the communities they live in?
10. How best can we ensure that grassroots innovators are motivated to continue innovating in their spaces and further get recognition for their efforts?
11. Any closing comments? Could you kindly suggest any other persons who might have different perspectives, to possible interview?