

GRASSROOTS
INNOVATION: MISSING
LINK IN THE INNOVATION
ECOSYSTEM IN SOUTH
AFRICA



Empowered lives.
Resilient nations.



January 2020





ACKNOWLEDGEMENTS

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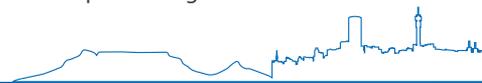


FOREWORD

Dr Ayodele Odusola
UNDP Resident Representative

The United Nations (UN) 2030 Agenda for Sustainable Development, and the Sustainable Development Goals (SDGs) aim at eradicating poverty, reducing inequality and providing decent employment – aspirations that align with the priorities of the South African National Development Plan (NDP). These reflect a comprehensive perspective to promote enhanced human life, resilient society and sustainable development. .

In this, the Decade of Action, we need to fast track and put in place accelerated solutions to emerging and perennial development challenges. The Accelerator Labs are part of UNDP's response to this urgent demand and to rekindle the pace setting role of South Africa in the global innovation ecosystem. The Labs are agile teams that will work with people, governments and the private sector to "future-proof" development. The Labs are pioneering an



approach to development -- by elevating grassroots solutions and using experimentation to radically accelerate learning that will allow us to support partners scaling-up good innovation and practices towards the implementation of the SDGs

We know the world's most pressing issues cannot be tackled single handedly. Our partners will help us co-identify the emerging issues that need to be tackled and co-design development solutions. With the Labs, we are moving away from bi-lateral partnerships and towards a collaboration platform.

This report represents a summary of a very rapid assessment of the innovation ecosystem in South Africa, with a view to helping the UNDP's new Accelerator Lab to identify the entry points to best support South Africa to accelerate the implementation for the SDGs and the country's NDP Plan. The study has revealed that the country's innovation eco-system is relatively well developed and has the key elements and components such as an innovative business sector and world class research organisations. It however points to the fact that performance is poor compared to other countries such as Brazil, China and India, especially in the integration of local innovations into the and national innovation ecosystems..

Key areas of improvement are better coordination, interaction and collaboration among the actors; targeted funding of 'grassroots' innovators especially during the

commercialisation stage; making information about innovation support services more available to potential innovators throughout the country. The assessment has revealed an uneven geographic distribution and that there are still many communities that are not even aware of the existence of support organisations let alone the funding sources and opportunities.

As the UNDP in South Africa we want to respond and work with partners to find ways to help overcome these gaps.

The assessment presents a first step in assessing and comprehensively mapping the national, provincial and local eco-system with a view to strengthening the linkages between local, regional and national spheres (vertical linkages), and within the provinces themselves (horizontal linkages).

Going forward, the UNDP will be working very closely with the actors in the innovation ecosystem to enhance the functionality and effectiveness and the impact of the ecosystem, through effective linkage between local, regional and national innovation mechanisms, in the quest to accelerate the implementation of the country's stated development objectives.

Dr Ayodele Odusola
UNDP Resident Representative

KEY FINDINGS

SOUTH AFRICA'S INNOVATION ECO-SYSTEM IS **RELATIVELY WELL DEVELOPED** & HAS THE **KEY ELEMENTS & COMPONENTS** SUCH AS AN INNOVATIVE BUSINESS SECTOR & WORLD CLASS RESEARCH ORGANISATIONS.

== LACK OF ==
**COORDINATION
INTERACTION
COLLABORATION**
AMONG THE ACTORS
IN THE **ECOSYSTEM**



INFORMATION

ON ACTORS INVOLVED
IN GRASSROOTS
INNOVATION IS
**SPORADIC &
DIFFICULT TO
ACCESS**



**UNEVEN
GEOGRAPHIC
DISTRIBUTION**

**MANY
COMMUNITIES
UNAWARE** OF
THE EXISTENCE
OF **SUPPORT
ORGANISATIONS**

GOING FORWARD

THE **UNDP** WILL BE WORKING VERY CLOSELY WITH THE ACTORS IN THE INNOVATION ECOSYSTEM TO **ENHANCE** THE FUNCTIONALITY AND EFFECTIVENESS AND THE IMPACT OF THE ECOSYSTEM, IN THE QUEST TO **ACCELERATE** THE IMPLEMENTATION OF THE COUNTRY'S STATED DEVELOPMENT OBJECTIVES.



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INTRODUCTION

The United Nations Development Programme (UNDP) has been assigned the role of being the integrator of the Sustainable Development Goals (SDGs). UNDP intends to use innovation as one of its pillars. To translate this mandate into action, the UNDP Administrator launched a global network of UNDP Accelerator Labs in 2019. The Accelerator Labs (Acclabs) are implementing instruments which are intended to create the world's largest and fastest learning network around development challenges, particularly those serving as bottlenecks to achieve the SDGs. Part of the focus is grassroots innovation and the idea that people facing challenges have critical knowledge to design solutions to these challenges living close to the problem have critical knowledge. UNDP will work with partners across sectors as well as business, government, academia and civil society.

Science, Technology and Innovation (STI) are essential in achieving the Sustainable Development Goals (SDG). To eradicate poverty, address inequality, reduce unemployment and re-orient current unsustainable development trajectories, affordable innovative solutions must be developed and implemented. STI features strongly as a tool to achieve many of the SDGs. Specifically, SDG Goal 9 aims to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. STI is also a means to achieve the SDGs through research, development, deployment, and widespread diffusion of

environmentally sound technologies which support more sustainable development trajectories.

In South Africa, STI contributes towards addressing the complex social challenges as indicated in the South African White Paper on Science, Technology and Innovation, which requires a system that is responsive, inclusive and supports all forms of innovation, including effective grassroots innovation programmes for the country. South Africa's National Development Plan (NDP) also entrenches the importance of a capable developmental state for the country's social and economic development.

The launch of the UNDP Accelerator Lab in South Africa, in partnership with the Department of Higher Education, Science and Innovation, is to ensure local and non-laboratory based innovators are not left behind in the country's innovation ecosystem engagements and opportunities. Integrating local innovators into the national innovation ecosystem therefore remains critical.

A rapid assessment was conducted by UNDP to explore the current state of South Africa's innovation ecosystem and identify the areas of possible enhancement and improvement to 'accelerate' development. This report, titled, Grassroots Innovation: Missing Links of the South African Innovation Ecosystem is the outcome of this rapid assessment.





OVERVIEW

This compendium provides an overview of the outcomes from the rapid assessment and rapid analysis of South Africa's innovation ecosystem. Its purpose is to provide the United Nations Development Programme (UNDP) an understanding of the innovation landscape as it prepares to launch its Accelerator Labs and to establish an appropriate entry points that would add values to the existing innovation ecosystem. This was carried out through document analysis and interviews with various actors in the innovation ecosystem such as policy makers, research institutions, universities, technology transfer offices and non-governmental organisations.

Status of South Africa's Innovation Ecosystem

South Africa has been playing a pacesetter role in the global innovation ecosystem, which has led to the invention of several devices that have shaped the world innovation landscape. Among the groundbreaking innovations are: the world's first heart transplant; the invention of the Computed Axial Tomography Scan (CAT); the first country in the world to refine oil from coal; invention of the swimming pool vacuum cleaner; and creation of a glue that holds components in an electrical box (which was used in 1969 to hold bits of the Apollo XI mission's Eagle landing craft together). Others include the invention of Dolosse designed to break up wave action and protect harbour walls and coastal installations; design of Q20 to repel water and prevent rust; innovated the Retinal Cryoprobe for cataract surgery which led to the Queen's Award for Technological

Innovation in 1975 by its originator, Selig Percy Amoils; the invention of speed gun and smart lock safety syringe.

South Africa's national innovation ecosystem has the necessary components and mechanisms such as an innovative business sector and world class research organisations. Key areas of improvement are better coordination, interaction and collaboration among the actors. At provincial and local government level, there is a lack of real time ecosystem maps to make a sound analysis. However, progress towards mapping provincial ecosystems is evident from the KwaZulu Natal (KZN) and University of Cape Town (UCT). The Human Science Research Council (HSRC) have been mapping rural innovation systems using its Local Innovation Advancement Tools (LIAT).

Linkage between the Provincial and National Ecosystems

Innovation linkages between provincial and national spheres (vertical linkages) of government are weak. Efforts are being made to strengthen these linkages by establishing provincial innovation platforms in various provinces. It is anticipated that these linkages will mobilise the provincial actors through network formation and will serve as points of contact with the national government. These regional platforms will increasingly play a role in stimulating grassroots innovation.

1 For information on the South African pacesetter role in the global innovation system, please see <https://www.sagoodnews.co.za/top-10-south-african-inventions/>

Key Gaps in the Ecosystem

Grassroots innovations develop through networks of activists, practitioners and organisations generating novel, bottom-up solutions for sustainable development — solutions that respond to the local situation and communities' knowledge, interests and values. Grassroots innovators are generating valuable knowledge and experience. The challenge for scientific research institutions or conventional innovators is to learn how to engage with that diversity.

Given the informality of grassroots innovation, data are patchy. Some of the challenges exist in programmes that provide funds, visibility, guidance, training, services, dissemination, workshops, and advocacy for grassroots innovation.

However, among the many challenges grassroots innovators face, the priority issues are:

- Lack of collaboration and interaction;
- Limited scaling of identified grassroots innovations;
- Inadequate funding of innovators especially during the commercialisation stage and
- Limited or lack of access to information
- Lack of awareness of innovation support services
- Absence of instruments and platforms to identify grassroots innovators within the communities and to connect them to the national innovation ecosystem.
- Inadequate mechanism to protect intellectual property of grassroots innovators.

INNOVATION ECOSYSTEM - STATUS



KEY AREAS OF

DEVELOPMENT

BETTER COORDINATION,
INTERACTION AND
COLLABORATION



KZN & UCT

HAVE BEEN
MAPPING
RURAL INNOVATION
SYSTEMS USING

(RIAT)

The challenge for scientific research institutions or conventional innovators is to learn how to engage with that diversity.

Potential Entry Points for UNDP

United Nations Development Programme (UNDP) is well-equipped to support programmes at the local, national, and regional levels to deliver integrated sustainable development solutions required to meet the SDGs. The nature of social innovation ventures into the rural areas to filter out the most pressing concerns of citizens and help turn those into the new set of goals. They seek to balance social development with economic and environmental sustainability and social inclusion.

UNDP has several potential or possible entry points and partners namely; government, industry, academia and non-profit sectors, who already promote innovation at grassroots level. Nationally, innovation support organisations such as incubators, fabrication and living labs are expanding gradually. A list of innovations has been identified, however, the innovation for inclusive development ecosystem is still at an early stage.

Some general observations from the rapid assessment that could be leveraged as entry points for UNDP in order to add value to the national ecosystem are:

- There is confusion regarding the difference between accelerators and other early stage support organisations such as incubators;
- The ecosystem has a wide range of support organisations. However, the geographic spread is uneven and there are still many communities who are unaware of the existence of these intermediaries, let alone the funding sources. Although these intermediary organisations exist in some locations, their effectiveness and governance are questionable;
- Information on actors involved in grassroots innovation is sporadic and difficult to access;
- There are a few Non-Governmental Organisations (NGO) who are involved in supporting grassroots innovation but very little is known about them; and
- Information on the private sector actors who are supporting grassroots innovators is limited.

Recommendations

For the Accelerator Lab to effectively create a niche that will add substantial value to the innovation ecosystem, it should focus on local and marginalized innovators whose voices are not heard in the current system. To achieve this, the report recommends the following.

- To avoid the prevailing confusion, UNDP in partnership with DSI and other actors will clearly define what the Accelerator Lab will prioritize in order to complement existing support instruments;
- In partnership with stakeholders in

the national innovation ecosystem, UNDP intends to articulate its value proposition, target audience and business model;

- A map of all key players in Innovation for Inclusive Development/grassroots ecosystem should be completed especially at provincial and local levels.
 - The maps will include NGO and private sector actors who are involved in grassroots innovation;
 - Based on this mapping,

- available assets (skills, finance, physical and social) should be compiled;
- The UNDP aims to adopt a true ecosystem approach by developing ecosystem methods and mechanisms;
- Develop capacity in collaborative approaches such as Partnership Activation Tools to catalyse critical partnership conversations among local innovators and between local and provincial as well as national innovators.

Science, Technology and Innovation (STI) policy in South Africa has not been adequately inclusive and has favoured “big science”.

Lessons Learned

Although grassroots innovation is still a relatively new field in South Africa, policy lessons learned are:

- The National System of Innovation (NSI) has difficulty in ensuring the creative use and efficient management of broad-based innovations. This is partly attributed to the series of obstacles which are linked to the linear nature of the NSI. These include the poor coordination of innovation activities, the lack of partnerships by all stakeholders including intermediaries, and absence of clear government involvement;
- Science, Technology and Innovation (STI) policy in South Africa has not been adequately inclusive and has favoured “big science”. This is evident from the Ten-Year Innovation Plan, which focused on space and other mission-oriented programmes (e.g. biotechnology, nanotechnology, hydrogen economy). Innovation is a complex process that requires participation and engagement of different actors at different levels of the systems of innovation;
- Significant gaps in literature are evident in advancing the knowledge of innovation as a mechanism for inclusive development;
- There is an absence of specific public policies and policy supports for local innovation, especially those operating in the periphery, for inclusive development. There is no published policy for Innovation for Inclusive Development (IID) in South Africa –there is a draft, which is still work in progress. South Africa does not have a documented policy on local innovation.



2. WHAT ARE INCLUSIVE INNOVATION ECOSYSTEMS?

Innovation is defined as a new or improved solution to a challenge, which could be a new product, service or process that solves a problem. While there are many definitions and types of innovations from a development perspective, the International Development Innovation Alliance (IDIA) defines innovation as “a new solution with the transformative ability to accelerate impact.” Innovation fuelled by science and technology, can improve ways of working with new and diverse partners and can involve new social and business models or policy, creative financing mechanisms, or path-breaking improvements in delivering essential services and products.

Innovation for inclusive development seeks to improve living conditions and creates employment opportunities for the poor through the development of new products, services, processes and business models aimed at resource poor communities.

Grassroots innovations are a form of inclusive innovation that solves personal and community challenges of marginalised, low income communities. Grassroots innovations can be understood as products and processes developed in response to challenges and opportunities in a local context. These grassroots innovations provide social value and have the potential to be turned into entrepreneurial ventures and generate a livelihood for the innovator and for others in the community. Grassroot innovation can also be scaled to make impact in other ways beyond

commercialisation. The knowledge and experience of grassroots innovators can help guide the development of national innovation policies, as well as programmes within government or developmental agencies. In addition, the promotion of grassroots innovation can also help seed deep positive shifts in societal/cultural behaviour.

Grassroots innovation is created at the bottom of the income pyramid and in the developing world, usually originates due to necessity, hardship and various challenges, which seeks to find solutions to address localised problems, usually without a conducive and formal platform. Many grassroots innovators use indigenous or traditional knowledge to develop their products or services, and as a result, the need to explore appropriate mechanisms to govern and support grassroots innovation processes. A grassroots innovator innovates in an unstructured, informal method, someone in a township, a rural area or a garage, who has had no formal education or access to formal facilities. For such innovators at grassroots level, there are negligible market opportunities available, mainly due to the absence of early stage financing and limitations in using prospects of local markets.

Within some organisations, co-development of solutions alongside local communities is accepted as grassroots innovation since the developed solutions cater to the challenges and opportunities highlighted by locals.

Several organisations also define grassroots innovation as working to promote the voices of informal workers and businesses in the development of the policies and regulations that govern their working conditions.

In this regard, an innovation ecosystem that excludes or does not give adequate attention to grassroots innovators is not inclusive. Ensuring no innovator segment is left behind in the national innovation ecosystem is critical.

INNOVATION ECOSYSTEMS

The innovation ecosystem describes a set of producers and users around a focal organisation which contributes to its performance.

An innovation ecosystem is generally defined as a “the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation”.

An innovation ecosystem is made up of different actors, relationships and resources that play a role in taking a great idea to transformative impact at scale. The effectiveness of each part within the innovation ecosystem is moderated by other parts of the system (e.g. entrepreneurs depend on being able to access financing). A change to one part of the innovation ecosystem leads to changes in other parts of the innovation ecosystem (e.g. an increase in internet connectivity will accelerate the design and testing of new technologies). Innovation ecosystems are important for facilitating sustainable socio-economic growth and stakeholder cooperation. Grassroots innovations ecosystems are

location based and supports the efforts of the innovators who have used their ingenuity and knowledge to create products at the individual and collective level. The ecosystem approach produces a consistent set of benefits for local innovators, entrepreneurs, and localities, including:

- Common assets, including physical assets such as workshop and co-working spaces and financial assets like new savings and loan funds for innovators;
- Shared infrastructure, including communication infrastructure and “relationship infrastructure,” such as new networks and linkages between members of the system;
- New resources, including information, new know-how, and a workforce with enhanced skills specific to certain industry and innovation niches;
- Favourable operating conditions for local innovation, including changes in norms, rules, and policies to create a more-level playing field;
- New capacities within the system—such as large-scale production, distribution, and collective action capacities that enable coalitions to achieve results that no single member of the ecosystem could have achieved on its own.

In summary, innovation thrives best when facilitated by a strong ecosystem of favourable enabling conditions, including better policy and regulatory frameworks, and access to open data, standards, and resources for innovators. The primary purpose of the ecosystem is to produce innovative products, methods, approaches, or processes.





3. MAPPING OF **INNOVATION ECOSYSTEMS** IN **SOUTH AFRICA**

The maps identify key organisations that are relevant for supporting innovation. Initiatives that are underway to stimulate grassroots innovation are captured in this section.

3.1 MAP OF SOUTH AFRICA'S INNOVATION ECOSYSTEM

South Africa is one of the first developing countries to adopt and embrace the National System of Innovation (NSI) framework as an organising principle for innovation policy formulation. These include developing and publishing the White Paper on Science and Technology, National Research and Technology Strategy, Ten Year Innovation Plan, Bioeconomy Strategy and new institutions. The country aims to generate productivity gains through innovation and demand by domestic consumption. This is the context in which South Africa's innovation ecosystem is evolving as a dynamic and complex system.

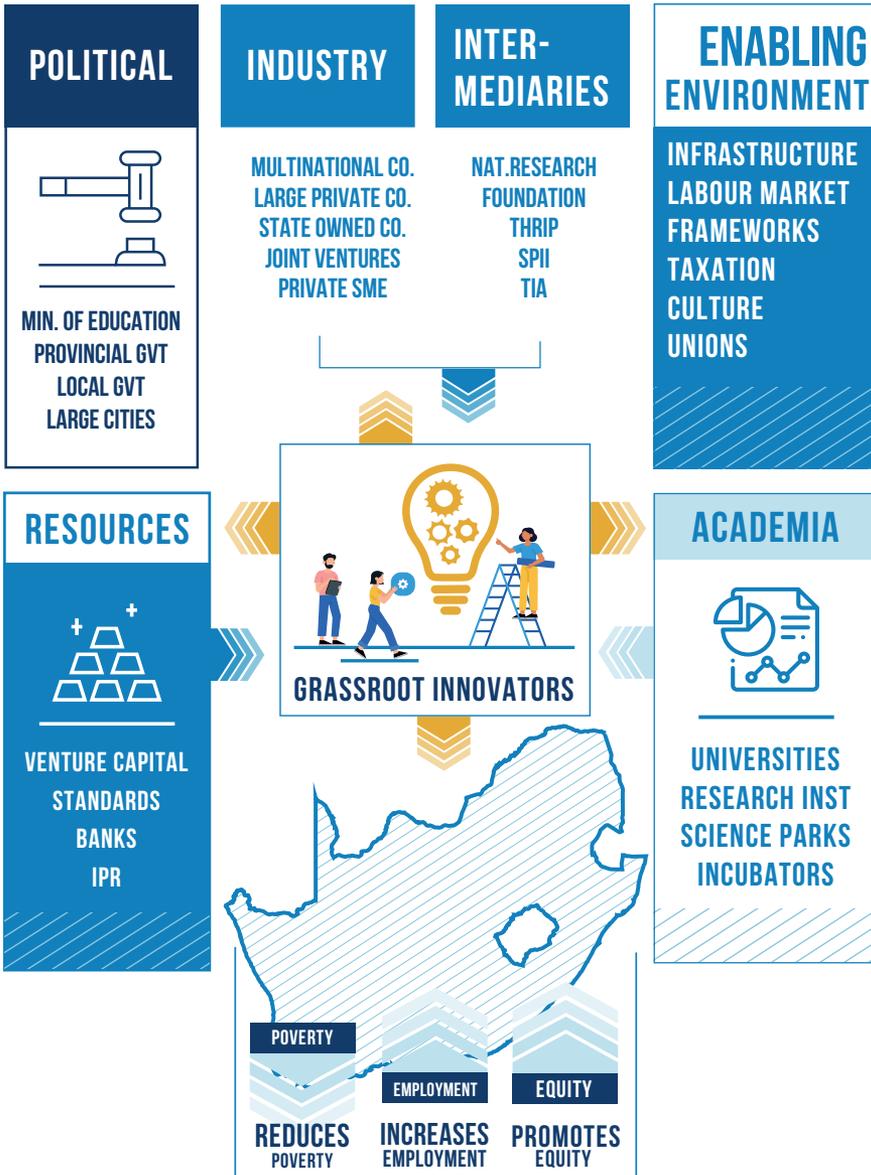
South Africa's innovation ecosystem is strongly centralised at national government level. Public research organisations such as universities and science councils play a key role. While there has been a disconnect between academic and industrial research, universities are increasingly pursuing innovative joint projects with the private sector. Public funding instruments such as the Technology and Human Resources

for Industry Programme (THRIP) were formed to supply human capital that is needed by industry. Other departments such as the Department of Trade and Industry (DTI) and Department of Small Business Development (DSBD) are also key supporters of technology development and innovation. Most of the leading universities realise that they can, and must, contribute to society and the broader economic environment. Legislation that obliges recipients of public research funds to identify, protect, manage and commercialise their research outputs has also provided an impetus for these activities at publicly funded institutions. Support and development of skills in intellectual property protection has been provided to universities to develop commercialisation capacity.

As a result, universities are now no longer focused only on teaching and research but are paying increasing attention on commercialisation of the products, services and offerings. They are also setting up their own technology enterprises and university-based incubators. In fact, most of the universities offer classes in entrepreneurship and are gradually becoming entrepreneurial universities.



PROVINCIAL ECOSYSTEM - KEY ACTORS



Despite the efforts that have been made to develop and continuously upgrade the national innovation ecosystem, there are major gaps, namely:

- South Africa has been ranked the 63rd most innovative economy in the world in 2019, declining by five steps from 2018 by the Global Innovation Index (GII).
- The private sector funding of research and development continues to decline and there are no early stage venture capital players.
- The skills shortage remains a structural problem and there are too few areas with a critical mass of high-quality research.
- There are limited areas with appropriate start-up infrastructure and support systems.
- The most persistent weakness identified in South Africa's national innovation system is the lack of vertical and horizontal policy integration and co-ordination.

INNOVATION SUPPORTING ORGANISATIONS

Along with the improvements in innovation, capacity and skills development, there are several innovations supporting organisations such as science parks, incubators, technology stations, fabrication labs, accelerators and living labs that have been created.

Science Parks

The Innovation Hub is a joint initiative between the Gauteng Government and the University of Pretoria. The Science Park has become a hub for innovators, and it has managed to attract Sappi to build its research facility at its premises. Later a Bio park was built to house life science companies.

A second Science Park at Vaal University of Technology (VUT) in Southern Gauteng was developed and plays an important role as it is located next to a township and serves the marginalised community of Sebokeng Township. A third Science Park is located at the East London Economic Development Zone in the Eastern Cape province. Other provinces are currently planning to establish their Science Parks.

DSI Technology Stations

The Technology Stations Programme (TSP)

was established to enable universities to provide technology development services to small, medium and micro enterprises (SMMEs). Housed within Technology Innovation Agency (TIA), the TSP is a management and systems-wide support unit responsible for all Technology Stations across the country. TIA as the implementing agency, provides financial support to Technology Stations to provide innovative science engineering and technology solutions for complex engineering challenges within the relevant industrial sectors.

There are currently 18 stations that are distributed throughout the country. An attempt has been made to build stations in urban areas and rural areas. The stations are therefore crucial infrastructure for grassroots innovators.

DSI Fabrication Laboratories

The Department of Science and Innovation introduced the Fabrication Lab (Fab Lab) concept which consists of a suite of off-the-shelf, industrial grade, digital fabrication tools, an electronics workbench, computers, programming tools, and is supported by open source design software. Fab Labs are a small-scale version of a production factory and can be used by individuals to create prototypes from arts and crafts to engineering and architecture



models. Computer based design or drawing software, in most cases Open Source software, is used to create designs that are then automatically manufactured by an appropriate cutting, milling or forming machine.

They are used to enable grassroots inventions by providing communities access to advanced tools that help innovators make products which address local needs. The environment created in the Fab Lab enables peer-to-peer learning. There are currently six fixed Fab Labs and one Mobile Fab Lab in South Africa.

DSI-Living Labs

Living Labs are open innovation environments in real-life settings in which user-driven innovation is fully integrated within the co-creation process of new services, products and societal infrastructures in a provincial harmonized context. It encourages cooperative learning that involves stakeholders from diverse backgrounds and disciplines and is aimed at addressing complex societal problems to develop sustainability in South African society.

Living Labs have been successfully running for several years in rural communities in the North West, Gauteng, KwaZulu Natal, Eastern and Western Cape provinces in South Africa.

Department of Small Business Development Incubators

The Small Enterprise Development Agency (SEDA), an agency of the Department of Small Business Development (DSBD), whose core mandate is to implement national government's small business strategy by supporting SMMEs, has set up an extensive network of incubators throughout the country.

SEDA's incubators are categorised according to various industrial sectors such as ICT,

Technology and Energy; Manufacturing; Construction; Agriculture, Bio and Chemical clusters. There are currently 76 incubators.

Innovation support organisations such as science parks, incubators, living labs and fabrication labs are designed to support grassroots innovation and marginalised communities. The efficiency and effectiveness of these new organisational forms is important in driving innovation. There is no evidence of government accelerator labs. This provides an entry point for UNDP to create infrastructure that is limited or lacking.

3.2 MAP OF PROVINCIAL AND LOCAL INNOVATION ECOSYSTEM

To develop and build science, technology, engineering and mathematics (STEM), the DSI creates awareness through partnerships with science centres. The goals for the science centres are to promote science and technology literacy, particularly among young people. They also seek to contribute towards enhancement of learner participation and nurture youth in STEM.

Innovation ecosystems can be classified as national, provincial or local depending on the scale. Having an overview of who, where and what exists in this ecosystem, makes it easy to provide resources, guidance and to establish linkages with key role players. Mapping the activities is essential to the success and sustainable outcomes in advancing innovation in grassroots developments. Maps provide important data to the ecosystem. The innovation ecosystem of both the provincial and local spheres of government reveals that there are few accelerators. It could be that there are not enough actors in the system to support innovations that are at different stages of the innovation pathway. Furthermore, there are very few funders, which reveals that there are



limited organisations to fund innovators at provincial level.

The value of the maps cannot be underestimated. They are an important knowledge source that assist the actors in the system to find each other and enter collaborative interactions where necessary.

The maps also reveal actors that are lacking in the system. This allows innovation ecosystem builders to be aware and address such gaps. However, for the maps to be useful, linkages among the various actors must be established with clear channels of communication.

3.3 MAPPING OF KEY ACTORS AND INITIATIVES IN GRASSROOTS INNOVATION

It is necessary to provide the landscape in which innovation for inclusive development and grassroots innovation occurs, where specific initiatives and key actors who are directly involved in fostering grassroots innovation.

Government Departments

The Department of Science and Innovation (formerly known as the Department of Science and Technology) and its entity, the Technology Innovation Agency (TIA), launched the Grassroots Innovation Programme (GIP) in 2019. The programme is designed to identify and support innovators and inventors who do not have a formal education or access to

formal innovation facilities. The GIP intends to provide grassroots innovators with technical skills development, access to technical expertise and intellectual property protection.

Following a search for grassroots innovators in rural and township areas, valuable knowledge and experience exists in communities generated by grassroots innovators, where there was a shortage of infrastructure and proper services. These innovators continuously seek solutions to local problems using limited local resources.

Public Research Organisations

The Human Science Research Council (HSRC) has developed a tool known as the Local Innovation Assessment Toolbox (LIAT). LIAT assists to understand the



Figure 1: Original mealie cooking methods with drums/pots and open fires



following about the nature of rural systems of innovation:

- The actors involved and linkages within and across spatial innovation systems;
- The main types of innovation activities or processes;
- The roles of economic sectors within rural innovation systems;
- The presence of networks and the use of local resources in innovation activities;
- The nature and potential of linkages to the National System of Innovation (NSI).

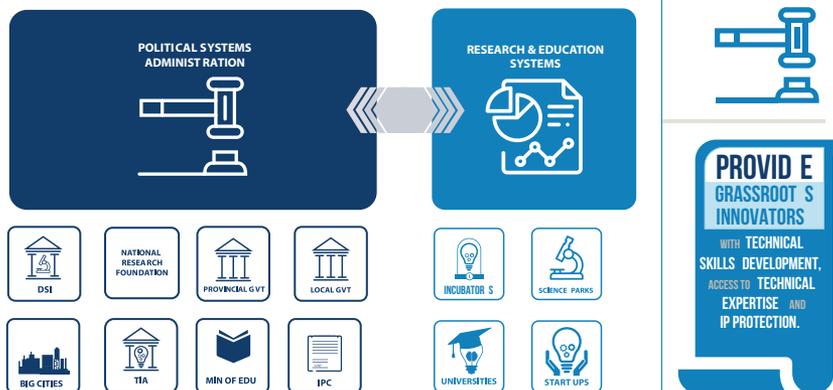
University of Pretoria Sustainable Development Goals Hub provides an interface for decision and policy makers. It seeks to reach this goal by sharing relevant, useful and reliable knowledge, providing policy advice and facilitating dialogue between South African actors responsible for the implementation of the SDGs. It is involved in building capacity amongst South African leaders in government, the private sector and civil society to implement the SDGs. The SDG Knowledge Hub will serve as a national coordinating mechanism.

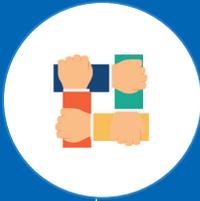
University of Stellenbosch is involved in several projects in grassroots innovation. These projects examine inclusive innovation systems dynamics, university driven innovation for inclusive development and Innovation for Inclusive Development (I4ID) platforms and intermediaries.

Asiye Etafuleni is a NGO which supports informal traders, and others who use public spaces for their work, by providing design and development expertise. It has focused on promoting and developing good practice and process around inclusive urban planning and design. It collaborates with informal workers and allied professionals to develop inclusive urban spaces that support sustainable livelihoods for informal workers.

Innovate the Cape: hosts a high school innovation competition in Cape Town which offers high school students the opportunity to dream of their own solutions to their own challenges and students receive free advice from local and international expert mentors from highly reputed institutions, and financial support to promote their ideas.

GRASSROOTS INNOVATION - KEY ACTORS





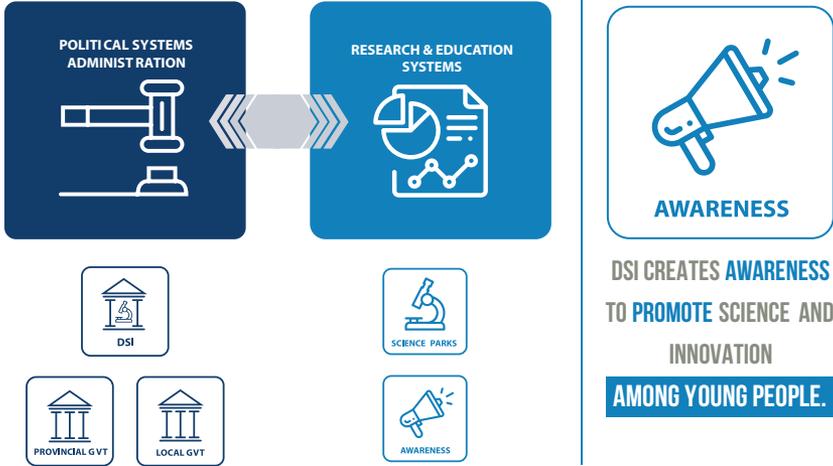
4. INTEGRATION OF LOCAL, PROVINCIAL AND NATIONAL INNOVATION ECOSYSTEMS

The conceptual discussion on innovation ecosystems, emphasising the importance of interaction between actors, institutions and policy elements for supporting innovation has been marked by separate debates on issues of national, provincial and international systems. It has become apparent that for the system to function effectively, the interdependencies must be considered. The question is how systems on different spatial scales—from the global to national to the provincial could be linked and coordinated for achieving positive effects.

The linkages of national, provincial and local innovations systems in South Africa have not been given adequate attention. Efforts to link these spheres of government have been weak and the national level dominates innovation policy. There is still a lack of conceptual clarity and there is no differentiation between provincial and local innovation ecosystems. Overall, there is a need to study local and regional ecosystems in South Africa to better understand their strengths and weakness and how they can contribute towards regional and local economic and social development.



PROVINCIAL ECOSYSTEM - KEY ACTORS





5. ANALYSIS OF FINDINGS

5.1 THE INNOVATION ECOSYSTEMS

Since innovation ecosystems are dynamic and evolving, there is no optimal system and there is a need for continuous diagnosis of systemic failures and for the design and implementation of appropriate policy interventions. This will indicate the areas that require system strengthening. Besides the well-known weaknesses, collaboration and coordination (horizontal and vertical) are persistent challenges. Although the innovation system has adequate actors, some are not fulfilling their roles adequately. Moreover, they are not familiar with assisting grassroots innovators who innovate differently.

“the well-known weaknesses, collaboration and coordination (horizontal and vertical) are persistent challenges.”

At the local and provincial level, except for KZN and UCT maps, well researched maps do not exist and therefore an in-depth rapid analysis is hindered. Suffice to say the KZN and UCT maps are a good start and other regions should be encouraged to develop their ecosystem maps.

The overall purpose of an innovation ecosystem is to produce innovations, and this is the ultimate measure of the health of the system. South Africa's performance compares poorly with other BRICS (Brazil, Russia, India, China, South Africa) countries.

5.2 LINKING OF LOCAL, PROVINCIAL WITH NATIONAL INNOVATION ECOSYSTEMS

The links between the local and national innovation ecosystem are weak. To strengthen the links, provincial innovation networking platforms have been established to serve as the links between the different spheres of government.

5.3 GAPS IN THE INNOVATION ECOSYSTEMS

Grassroots Innovators:

- Access to data on grassroots innovators is lacking and few intermediary organisations are needed to undertake the search;
- Many grassroots innovators lack awareness of the schemes and programmes which are available to promote innovation;
- Grassroots innovators lack formal mentors, advisors and coaches to assist them with the complex innovation processes so that their project can be successfully commercialised;
- Grassroots innovators need access to basic infrastructure, such as computers, and access

- to knowledge centres such as universities;
- There is a gap in capacity building a need to develop business skills to support grassroots innovators;
- Although grassroots innovation is increasingly receiving attention, it is not at the forefront of innovation discussions;
- The grassroots innovation ecosystem currently has little capacity, resources and financing and needs investment in these areas to be developed;
- Grassroots innovators struggle to gain access to market.
- Access to data on grassroots innovators difficult, few intermediary organisations to undertake the search.
- Grassroots innovators lack the awareness about the schemes and programmes which are available to promote innovation;
- Grassroots innovators lack mentors, advisors and coaches to assist them with the complex innovation process so that their project can be successfully commercialised.
- Grassroots innovators need access to basic infrastructure such as computers and access to knowledge centres such as universities.
- Capacity building is a gap and there is a need to develop business skills to support grassroots innovators
- Although grassroots innovation is increasingly receiving attention, it is not at the forefront of innovation discussions
- The grassroots innovation ecosystem needs to be developed and additional resources are needed. Currently there is very little capacity, resources and financing.

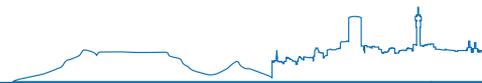
- Grassroots innovators struggle to gain access to market.

National Innovation Ecosystem:

- Poor co-ordination remains a problem and there is a need for coordinating organisations;
- Access to key infrastructure in the digital space is not always available and it is expensive;
- Although a few Non-Profit Organisations (NPO) are involved in innovation activities, their participation is still limited;
- Policies on Innovation for inclusive development, that will provide guidance and stakeholder alignment, is still under development;
- Lack of a one-stop-shop information centre for innovators;
- Red tape, especially from government, and changes in government.
- There are many innovation support organisations (incubators, accelerators and hubs), but they operate in silos and supported innovators miss the opportunity to learn from each other and network;
- There is a lack of monitoring and evaluation frameworks to measure the impact of innovations;
- Some organisations such as Technology Transfer Offices which are based at local universities might not be well prepared to deal with grassroots innovators.

Funding:

- There are a few innovation challenge programme (both private and public). However, after the challenge funds have been awarded, there is no follow up funding;
- Due to poor coordination,



innovators can receive funds from several organisations for the same innovation activities resulting in duplication – a phenomenon that denies other access to funding;

- Funding especially for scaling is a problem and as a result many promising innovations do not reach the marketplace;
- Completing and submitting funding applications places a large time and administrative burden for grassroots innovators. Funding calls and application requirements exclude grassroots innovators who do not have access to networks, internet and various support services;
- There is a gap in funding for later stages such as commercialisation and growth. Funding instruments for grassroots innovators provide relatively small amounts which focus on the earlier stages of the innovation value chain. There is little funding available at the later stages. There is low risk capital and low risk appetite for innovative projects in South Africa; and
- There is the misperception that social innovation, geared towards social or environmental challenges cannot be profitable. Perception needs to be changed to increase funding for innovations that produce social good.

Priority issues that require attention are:

- Ensure strong coordination and collaboration among the various actors for synergy and better impact;
- Institutionalize scaling of

promising innovations;

- Establish mechanism for funding and supporting scale up of promising ideas especially at commercialisation stage;
- Promote access to information including available support and
- Accelerate business development support, mentorship, and coaching.

Summary of feedback from stakeholders' interviews:

While there are many challenges in the strategic, structural and implementation systems of innovation in South Africa, there is a growing appreciation for what it can achieve in the areas where it is most needed. Sustained awareness, interactions and coordination are needed to solidify the efforts of the various players to enable a growing and thriving inclusive innovation ecosystem.

Collaboration in this regard is the impetus that is required to establish a co-ordinated and supportive environment to make meaningful impact which is measurable both from a usefulness perspective and from a funding perspective. This will demonstrate the creative and innovative solutions to societal challenges which are unique to the various regions and communities who face them.

It is evident that communication, proper processes and data collection is integral to the success of innovation in all stages of its lifecycle. Leadership and sound policies from a national level is integral to the success and sustainability of the innovation ecosystem in South Africa.





STAKEHOLDER'S REFLECTIONS ON UNDP ACCELERATOR LAB VALUE ADD TO SOUTH AFRICA'S INNOVATION ECOSYSTEM

Stakeholders across the public institutions, private sector, academia, CSO and local innovators provide some reflections on what UNDP should be prioritizing. They enjoin UNDP to adopt a multi-pronged model of innovation in a more synergistic manner.

Overall approach for UNDP

- UNDP prioritises innovation for social value;
- Identifies key actors and assists in creating an enabling environment;

Government

The key entry points for UNDP are government departments such as DSI and DTI who have started grassroots innovative initiatives. DSI together with its agencies such as the HSRC and the TIA have existing activities which UNDP can build on. Key partnerships with actors who have a strong national and local footprint will boost UNDP's efforts.

Innovation intermediaries especially those in townships are not well resourced and have limited capacity. They can be capacitated to identify promising local innovation and serve as a point of contact

with marginalised communities and provide them with information.

NPO/NGO

The Accelerator lab should also work with NPOs who address social challenges and have first-hand experience at grassroots level. Asiye Etafuleni have developed expertise in grassroots innovation where they have developed solutions with reputable organisations such as MIT D-Lab.

Private Sector

The private sector has programmes that can serve as entry points. Many large companies have Corporate Social Responsibility Programmes that can support grassroots innovators. This opportunity should be explored for the common good of local innovators.

Academia

Local universities provide expertise to grassroots innovators at their facilities. In some cases, the innovator does not need financial support, but access to knowledge and learning. Greater use of institutions of higher learning - universities and technical and vocational training colleges (TVETs), and work through them



**Specific entry points for UNDP that were revealed by the stakeholders include:
For example;**

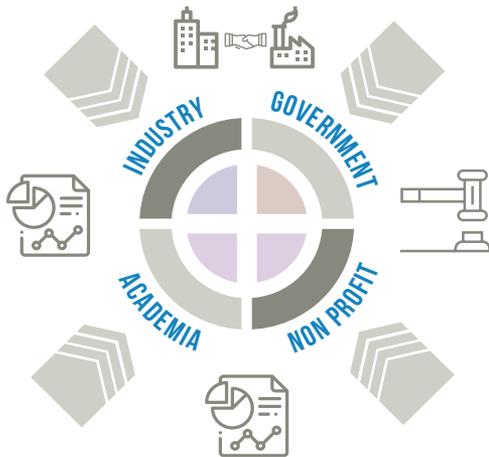
- UNDP as a neutral agency which no vested interest, can play the role of a convener to bring together local innovators and organisations that can provide training, capital and other needs;
- UNDP could establish a platform that will be “a one stop shop” for all the stakeholders in the innovation ecosystem, increasing the visibility of grassroots innovation;
- The AccLab could capture lessons learned from its interactions with communities and other actors in the ecosystem and feed these lessons to the policy making process for government;
- The AccLab could provide guidance through global best practices from similar contexts on

how to engage with grassroots innovators by designing methods and tools that can assist organisations that support innovators. Best practices in grassroots innovation can be documented for use by the actors

- The AccLab’s methodology of engaging directly with communities to source innovations is a niche area. The AccLab could serve as a link between innovators and innovation support organisations in marginalised communities with technical support and funders – playing a brokerage role;
- act as brokers;
- UNDP should consider facilitating the development of a monitoring and evaluation framework and to regularly map local innovations; for the country’s innovation ecosystem
- The Fab Labs, Living labs and some incubators are located within marginalised communities and would be ideal partners for UNDP.
- Over the years, many grassroots innovations have been uncovered especially by the HSRC and CPSI on behalf of DSI and DPSA respectively. Since the AccLab is meant to accelerate innovations, a logical starting point would be to evaluate existing projects and advocate for scaling up of promising innovation; and
- UNDP should explore tools and techniques that are available to support collaboration among actors who are involved in grassroots innovation.
- The UNDP AccLab could facilitate the incorporation of learnings identified within the grassroots innovation and informal business sectors into policy making.



ENTRY POINTS FOR UNDP



REGARDING **DIFFERENCE**
BETWEEN **ACCELERATORS**
AND OTHER SUPPORT
ORGANISATIONS;
INCUBATORS

- As a barrier to collaboration at a local level is competition for resources (e.g. funding and space) the AccLab could assist in the development of matrices/criteria that help government promote collaboration during resource distribution.
- UNDP can facilitate training workshops to educate communities on what innovation is. This awareness will help to unearth innovation and solutions lying deep within communities.

APPENDIX A: ACRONYMS

ACRONYM	DESCRIPTION
AeT	Asiye Etafuleni
ARC	Agricultural Research Council
BRICS	Brazil, Russia, India, China and South Africa
CSIR	Council for Scientific and Industrial Research
DSBD	Department of Small Business Development
DSI	Department of Science and Innovation
DST	Department of Science and Technology
DTI	Department of Trade and Industry
ECSECC	Eastern Cape Socio-Economic Consultative Council
Fab Lab	Fabrication Laboratory
IDIA	International Development Innovation Alliance
IPR	Intellectual Property Rights
KZN	Kwa-Zulu Natal
MIT	Massachusetts Institute of Technology
NGO	Non-Governmental Organisation
NPC	Non-Profit Company
NPO	Non-Profit Organisation
NSI	National System of Innovation
OECD	Organisation for Economic Cooperation and Development
SDG	Sustainable Development Goals
SEDA	Small Enterprise Development Agency
SG	Sustainable Goals
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
TIA	Technology Innovation Agency
TSP	Technology Station Programme
TUT	Tshwane University of Technology
UKZN	University of KwaZulu-Natal
UCT	University of Cape Town
UFH	University of Fort Hare
UNDP	United Nations Development Programme United Nations Development Programme

APPENDIX B: LIST OF PROVINCIAL INNOVATION NETWORKING PLATFORMS

Applicants	Category	Contact person	Email	Region/ Province
STP Park - Limpopo	Feasibility/Business Plan - STP	Prof B Nindi	nindib@lcx.co.za	Limpopo
ELIDZ RISP	Provincial Innovation Networking Platform	Ludwe Macingwane	ludwe@elidz.co.za	Eastern Cape
CUT RISP	Provincial Innovation Networking Platform	Prof Ryk Lues	rlues@cut.ac.za	Free State
Sol Plaatje University	Provincial Innovation Networking Platform	Prof Patrick Fitzgerald	patrick.fitzgerald@spu.ac.za	Northern Cape
Innovus - Stellenbosch University	Provincial Innovation Networking Platform	Camilla Devilliers	cdevilliers@sun.ac.za	Western Cape
Mahikeng Innovation Hub-University of North West	Provincial Innovation Networking Platform	Joseph Ndaba	jndaba@mafihub.co.za	North West
University of Johannesburg	Feasibility/Business Plan - STP	Arneshtel Telukdarie	arnesht@uj.ac.za	Gauteng, Devland Soweto
Tshwane University of Technology	Provincial Innovation Networking Platform	Dr Hamilton Mphidi	mphidimh@tut.ac.za	Gauteng, Pretoria North townships
University of KwaZulu-Natal	Business Plan for development and expansion of a Science Park	Shamantha Moodley	shamantha@sigmaintl.co.za	KwaZulu-Natal, Durban
CSIR		Nare Mashamaite	NMashamaite@csir.co.za	KRISP PMU Co-ordinator

Source; DSI Local Innovation Unit.



APPENDIX C: LIST OF ORGANISATION CONTACTED

ORGANISATION
AeT
Assumption Development Centre (ADC)
Dept of Economic Development Environmental Affairs & Tourism (DEDEAT)
DSI
DTI
DTI
ECESECC
Environmental Learning Research Centre – Rhodes University
Technology Transfer Centre - Rhodes University
HSRC
HSRC
Propella Business Incubator
East London Industrial Development Zone (ELIDZ)
TIA
TUT
UFH
Rhodes University – Technology Transfer Centre
Propella Business Incubator
Environmental Learning Research Centre – Rhodes University,
Mr. Garry Rosenburg – Research Leader -V
The East London Industrial Development Zone (ELIDZ)
KZN Technology Hub (Richards Bay) - Algorithm Lab
Innovate Durban
Siyazisisa Trust (Community Farmer Network)
Moses Kotane Institute



University of Zululand
Prolinnova Network
InQubate UKZN
RLabs
SustNet
Bertha Centre for Social Innovation and Entrepreneurship
Western Cape Provincial Community Development Workers
Launch Labs





About UNDP

UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in nearly 170 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations.

UNDP South Africa is working with the Government and people of South Africa, the private sector, academia, Civil Society Organisations and partners to address the triple development challenges of poverty, income inequality and unemployment. This is done through promoting better governance, inclusive and people-centred growth, energy access, climate resilience and sustainable development.

Let's make this happen

We're looking for partners to join us in investing and contributing knowledge to this country effort.

For more information, please contact:

Email: Acceleratorlabs.za@undp.org

Follow us: @UNDPAccLabs and @UNDPSouthAfrica

Website: www.za.undp.org and www.acceleratorlabs.undp.org/

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