

IMPACT IN NETWORKS AND ECOSYSTEMS

Building case studies on innovation
projects that make a difference





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Impact in Networks and Ecosystems

Building Case Studies that
Make a Difference

GENERAL INFORMATION

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ACKNOWLEDGEMENTS

The Southern Africa Innovation Support (SAIS 2) Programme aims to catalyse new businesses and foster the culture of local and regional entrepreneurship, innovation, and ecosystems in inclusive innovation contexts.

A regional SAIS 2 Innovation Fund was established as part of the programme to provide funding for the implementation of local innovation projects in the Southern African Development Community (SADC) Region.

In order to understand the programme's impact, SAIS 2 collaborated with Loughborough University London to develop this toolkit with the aim of documenting what works and what does not when funding innovation and entrepreneurship. The evidence base is established through impact case studies prepared over the duration of the projects to be financed by the SAIS 2 Innovation Fund, covering the pre-, during-, and post-project phases.

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FOREWORD

SAIS Data Collection & Analytics Framework Toolkit

The curation, management, and visualisation of data are some of the greatest opportunities offered by an interconnected world. The buzzword Big Data's incredible promise is always built on many rigorously collected data points that support higher-level interventions such as machine learning, artificial intelligence, and complex analysis. But all of these are simply impossible if someone (like you or me), somewhere (such as the SAIS Programme) is not collecting, managing, and thinking about the data.

The SAIS Toolkit is introduced to all SAIS-funded projects and provides help on all three levels: curating the impact of SAIS-funded projects, managing decisions along the way, and visualising the projects' outcomes in order to support sustainability and impact. The toolkit was presented to each SAIS project beneficiary so they could develop their impact case study of their SAIS-funded project in its ecosystem. More importantly, as the project owners collect data, they get information that enables them to make real-time pivots, communications, and decisions that increase their projects' impact and sustainability over time. This informs the evidence-based design of their impactful interventions in the ecosystems in which the projects play out. All projects are now linked to Sustainability Development Goals (SDGs), particularly SDG9 on building resilient infrastructure, inclusive and sustainable industrialisation, and fostering innovation. It is critical for practitioners and policymakers alike to understand how increasingly favoured instruments

of innovation (such as incubators, business hubs, and accelerators) can improve their services (e.g. business plan competitions and trainings) offered to small and growing business (SBGs). Unlocking such knowledge will be critical to establishing more sustainable businesses, generating the vitally needed new jobs in SADC markets.

The point of departure for this toolkit is to understand that innovations usually happen together with matching social and institutional adjustments that enable the reform of policies and instruments. Innovation ecosystems are in turn constructed by relationships between organisations and guided by policies applied to pool scarce resources and make various sectors work together in coordination. This toolkit describes a method for producing impact case studies over the duration of the projects financed by SAIS. Mapping the ecosystems and conducting social network analysis will provide qualitative data that will enable the understanding of how ecosystems and relationships between role players change over time.

Infusing any business, project, or activity with data gives it wings. This toolkit has the potential to make a difference in SAIS 2 projects' impacts and outcomes. It's up to us, you and me, as the primary thinkers and tinkers of data. **Enjoy it and keep on moving!**

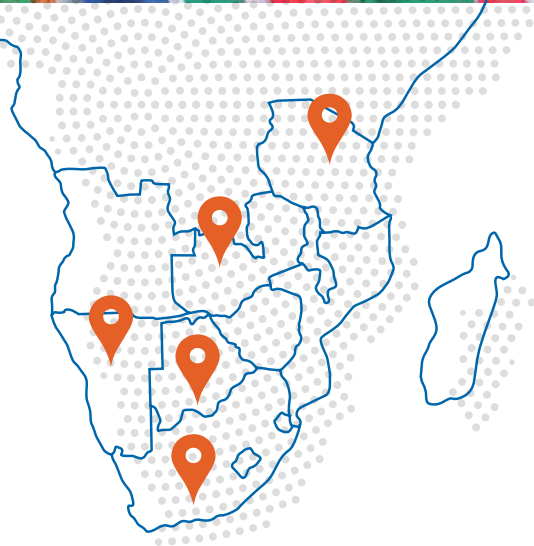
Dr AUDREY VERHAEGHE
Chairman: SA Innovation Summit



SAIS

PARTNERSHIP

The Southern Africa Innovation Support (SAIS 2) Programme is a four-year regional programme (2017–2021) supported by the Ministry for Foreign Affairs of Finland in partnership with the Governments of Botswana, Namibia, South Africa, Tanzania, and Zambia and the SADC Secretariat. SAIS 2 is managed by the Programme Management Office (PMO) based in Windhoek, Namibia, with support from national focal points (FPs) in five SAIS partner countries. The FPs are: the Botswana Innovation Hub (BIH); the National Commission for Research, Science, and Technology (NCRST) in Namibia; the Technology Innovation Agency (TIA) in South Africa; the Tanzania Commission for Science and Technology (COSTECH) in Tanzania; and the National Technology Business Centre (NTBC) in Zambia.



alpineattitude

E.E PHI 222

Indicators	Impact
Understanding and Business	p
Attitudinal	
Economic	
Environmental	

PART

01

INTRODUCTION

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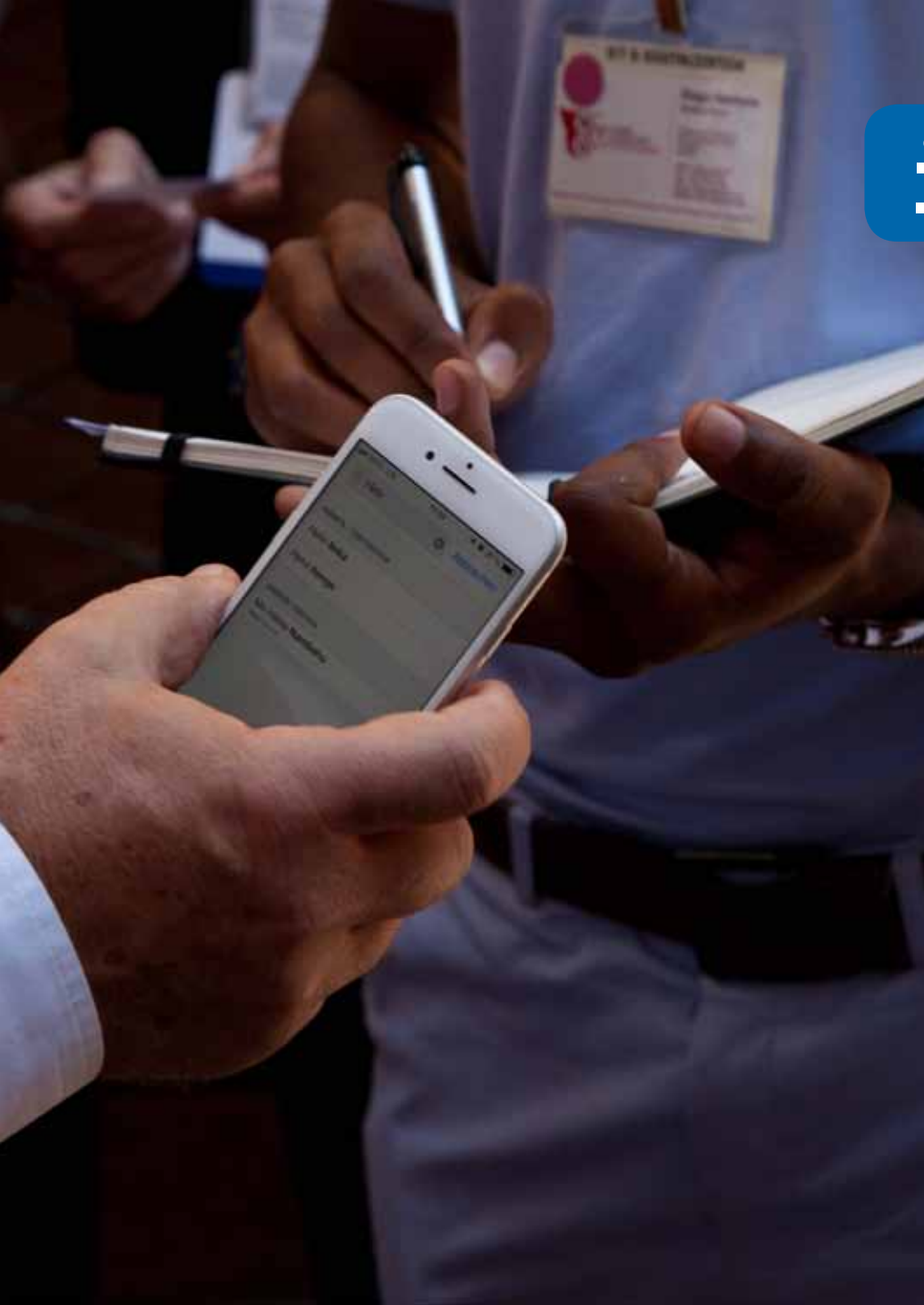
people become aware

A change in attitudes,
attitude that brings the

Monetary benefits, etc
funding, or benefits to

Benefits to general
that human

Indicators	Activities



1.1. Background to the Toolkit

This toolkit aims to support the building up of case studies that show the impact of project activities aiming to promote innovation and entrepreneurship. The case studies respond to the challenge of understanding what kinds of interventions work in the Southern African region, where, and why.

The toolkit has a specific focus on entrepreneurial ecosystems and proposes a method of mapping out the actors and their relationships over time. The aim is to understand the changes that take place in the ecosystems. These changes are seen to be indicators of impact as increased connectivity and activity in ecosystems are key enablers of innovation.

Innovations usually happen together with matching social and institutional adjustments, facilitating the translation of inventions into new or improved products and services. Similarly, the processes supporting entrepreneurship are guided by policies implemented in the common framework provided by innovation systems.

Overall, policies related to systems of innovation are by nature networking policies applied throughout the socio-economic framework of society to pool scarce resources and make various sectors work in coordination with each other.

Most participating SAIS countries already have some kinds of identifiable systems of innovation in place both on national and regional levels, but the lack of appropriate institutions, policies,

financial instruments, human resources, and support systems, together with underdeveloped markets, create inefficiencies and gaps in systemic cooperation and collaboration. In other words, we do not always know what works and what does not.

On another level, engaging users and intermediaries at the local level and driving the development of local innovation ecosystems within which local culture, especially in urban settings, has evident impact on how collaboration and competition is both seen and done.

Enhanced local and regional cooperation promoted by SAIS Innovation Fund projects can generate new data on this little-explored area in Southern Africa.

In this complex environment, organisations supporting entrepreneurship and innovation often find it difficult to create or apply relevant knowledge and appropriate networking tools, approaches, and methods needed to put their processes to work for broader developmental goals. To further enable these organisations' work, it is necessary to understand what works and why in a given environment.

Enhanced local and regional cooperation promoted by SAIS Innovation Fund projects can generate new data on this little-explored area in Southern Africa. Data-driven knowledge on entrepreneurship and innovation support best practices as well as effective and efficient management of entrepreneurial ecosystems can support replication and inform policymaking, leading thus to a wider impact than just that of the immediate reported projects and initiatives.



1.2. Impact Case Studies: Building the Evidence Base

This toolkit describes a method for producing impact case studies over the duration of the projects to be financed by SAIS, covering pre-, during-, and post-project phases, aiming to understand how the entrepreneurial ecosystem has developed over time.

At the very end of each project, a longer, more comprehensive impact case study is to be produced by the project team. The short case studies will focus on the perceived changes in the ecosystems, while the longer ones will examine the capabilities, perceptions, and aspirations of the programme participants. The short case studies report on the changes in the ecosystem while the longer ones have a wider focus, examining the wider impact that results from the ecosystem changes.

The data collection and the case studies will be produced by the key beneficiaries of the grants from the SAIS Innovation Fund as part of their project implementation¹. Following the toolkit standards, both quantitative and qualitative methods will be used and the studies will integrate data from external sources.

¹ The project coordinator can charge for this work in the personnel costs in the SAIS grant

HOW THIS TOOLKIT IS ORGANISED

The toolkit is organised into sections with subsections, examining the theoretical (why are we doing it) and practical (how to do it) considerations of data collection and analysis in building up the evidence base.

SECTION 2.1.

Building the Impact Case Study: The systematic approach to creating the impact case studies informs the ongoing monitoring processes of the programme around short case studies, while the longer impact case studies support the end or project reporting and build-up of the evidence base. Impact tracking software may also be used to capture data for the case studies.

SECTION 2.2.

Mapping the Ecosystems: In order to create impact case studies, it is necessary to map demographic and ecosystem data by using an entrepreneurial ecosystem mode. The primary objective is to identify the principal actors (and their impact) using the six-element ecosystem model. The secondary objective is to build up deep qualitative data using the more complex nine-element ecosystem model.

This toolkit is accompanied by a workshop presentation slide set.

SECTION 2.3.

Interviewing the Role Players: Both semi-structured and open interviews of selected key stakeholders may be needed to triangulate, validate, and complement the previous section's findings.

SECTION 2.4.

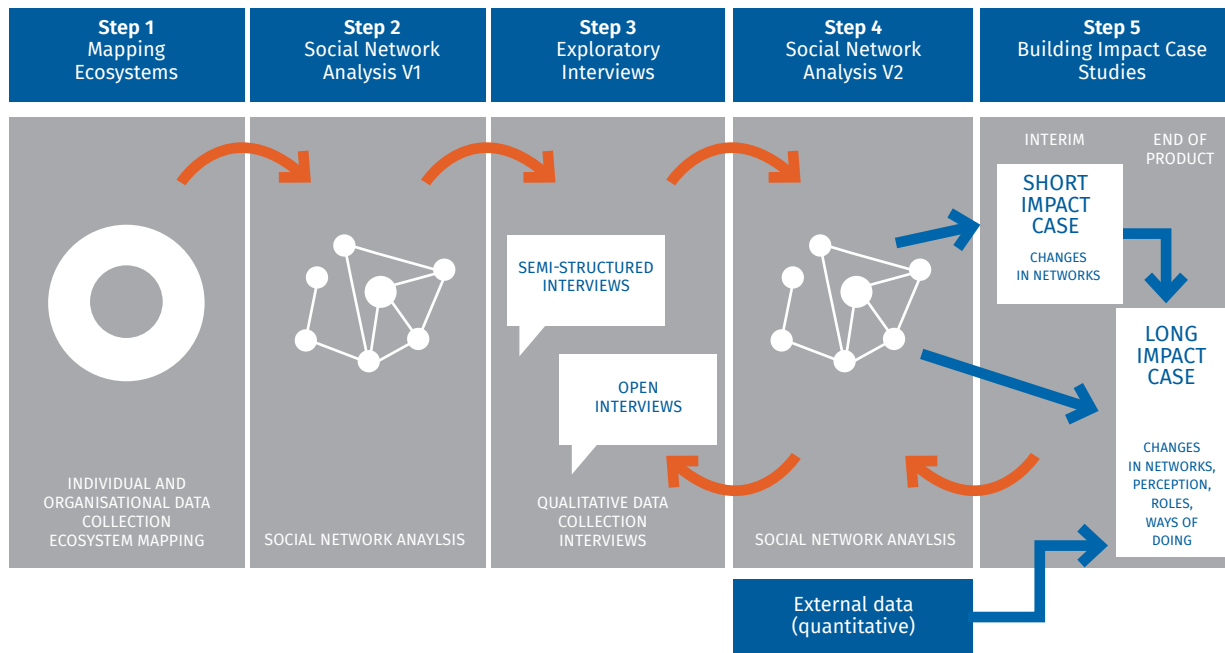
Analysing the Social Network: This involves a social network analysis to understand how linkages and influence exist in the network and how these change over time.

SECTION 2.5.

Incorporating External Data: The impact case study will also benefit from external data from public domain sources, dedicated and proprietary databases, and knowledge generated by the initiative itself. These are seen to mostly benefit the longer case studies.

Impact Case Studies: 5 STEPS

Figure 1.1. The five-step process for building up impact case studies





INCLUSION & DIVERSITY

ROLE MODELS

INVESTING /
ACCESS TO CAPITAL

INVESTABLE SECTORS

ECOSYSTEM

VISION

CULTURE



1.3 Methodology of the Toolkit

The overall aim of this toolkit is to support data collection and analytics for SAIS 2 Innovation Fund-supported project teams as well as their partners, beneficiaries, and stakeholders. The purpose is to build up impact case studies that both capture and transmit the learning achieved in the funded initiatives. This toolkit is initially aimed at the local ecosystem level where innovation support organisations operate, but can be expanded to cover the activities of the intermediaries and even single entrepreneurs through the addition of elements at the transnational level.

At the local ecosystem level – where the funded projects operate – the general aim is to contribute to the understanding of how innovation ecosystems can be further developed through specific interventions (e.g. new financial incentives or training programmes) and what roles, players, and activities are needed in this process. To achieve this, the data collection methodology places an emphasis on capturing the changes over time in the given ecosystem. A social network analysis is employed to measure the changes pre-, during-, and post-intervention. In order to understand who should be engaged in the social network analysis, an ecosystem mapping is proposed and additional interviews may be needed.

The default perspective is often to see man-made ecosystems (this set includes the innovation-, business-, knowledge-, and entrepreneurial ecosystems) from a techno-economic perspective.

Typically, innovation management literature sees these ecosystems through the lens of systems theory or as networks that can be analysed through the participating actors, their relationships, and the activity that is undertaken or the value that is created. While the overarching aim is to contribute to the innovation ecosystems, the focus of this toolkit is on a subset of the entrepreneurial ecosystem.

A SAIS 2 impact case study will be produced from a mix of qualitative and quantitative research data in a structured way, applying also the existing data (where/if applicable), and will focus on the capture, storage, and organising of the data that the evidence base requires.

The quantitative research inputs will be derived from baseline exercises and public data sets, which entails revising and consolidating the indicators set out in the programme document. The updated data for the metrics will be produced by the grant recipients.

The qualitative data for the impact tracking system will be generated through an initial low-resolution mapping of the entrepreneurial ecosystem, followed by interviews with key informants. The entrepreneurial ecosystem will initially be mapped out over the ecosystem elements, looking at how the actors in the areas help or hinder innovation activity. This mapping exercise may be done through an interdisciplinary workshop (or a series of workshops depending on need) with key role players from business and enterprise, non-governmental organisations, education, and public administration. The set of identified role players will be validated through further interviews,

and interviews with key informants will further enhance the mapping exercise as required. These building blocks aim to chart the role players, their role performed, and their potential impact on the ecosystem.

Once the key role players have been identified, a high-resolution social network analysis (SNA) will be done through a survey, aiming to establish the connections between role players and the strength of these ties. Social network analysis (SNA) is the process of investigating social structures through networks and visualisations. It characterises networked structures in terms of nodes (individual actors, people, or things within the network) and their ties (relationships or interactions) that connect them, and is widely used in social sciences.

The aim of the qualitative research building blocks is to chart the network of connections that the role players have in the local entrepreneurial and innovation ecosystem. These connections are extremely important for the ecosystem, and the aim is to chart them at three points in time: before, during, and after implementation.

The measurement of SAIS-funded projects' impact is thus seen to be based on how the network between the innovation role players develops over time (enabled by the projects' activities) and on the changes measured by quantitative indicators over time. The impact case study format will enable cross-case and regional comparisons between projects and ecosystems.

Further analysis of the entrepreneurial ecosystem may be done through a high-resolution ecosystem mapping exercise, where the service ecosystem around the entrepreneurial ecosystem can be charted and enhanced.

“
The aim of the qualitative research building blocks is to chart the network of connections that the role players have in the local entrepreneurial and innovation ecosystem.
”

Indicators	Impact indicators: de
Understanding and awareness	People become aware of/and unders
Attitudinal	A change in attitudes, typically of a gro attitude that brings them or others ben
Economic	Monetary benefits, either in terms of mo funding, or benefits to groups of people o
Environmental	Benefits to genetic diversity, species or habi that humans derive from a healthy environn
Health and well-being	Better outcomes for the health of individuals, and improving people's quality of lives. Also i psychological and economic well i
Policy	Contrib

PART

02

TOOLS

Definitions (Reed, 2018)

Definitions

stand an issue better than they did before.

group of people who share similar views, towards a new benefit.

money saved, costs avoided or increases in turnover, profit, or the environment measured in monetary terms.

at conservation, and ecosystems, including benefits to the environment.

social groups, including saving lives and health.

2.1. Building the Impact Case Study



2.1.1. Why Are We Doing This?

Impact case studies are the principal way of capturing and transmitting the learning that projects achieve. They are the core elements of the evidence base that initiatives need to build up to support learning and the diffusion of best practices in and between projects, while also helping to justify the use of applied resources. They are easy to publish in digital outlets and they work as benchmarking and learning tools for other projects.



2.1.2. What Do We Do in Practice?

The key building block of the toolkit, creating impact case studies (both short interim ones during the project and a longer one at the end of the project), can be built on a longitudinal format and on multiple types of data obtained from ecosystem mapping and collaborative workshops, social networks analysis, surveys, interviews, and focus group activities to be done by the focal partners or the beneficiaries themselves.

To this end, the project owners will need to source designated individuals who can undertake both the data collection and the subsequent production of impact case studies.

In order to demonstrate impact and produce good impact cases, organisations must pay attention to impact planning, and this entails the collection of baseline data at the beginning of the project. The baseline data is critical as a reference point of comparison for future data.

Typically, the impact case studies will be built on multiple types of data, obtained from collaborative workshops, surveys, interviews, and focus group activities to be done by the focal partners/beneficiaries themselves. To this end, the project consortium partners are advised to retain designated individuals who can undertake both the data collection and the subsequent production of impact case studies.

Table 2.1.
Overview of Key Impact Indicators (Reed, 2018)

INDICATORS	DEFINITIONS
UNDERSTANDING AND AWARENESS	People become aware of/and understand an issue better than they did before.
ATTITUDINAL	A change in attitudes, typically of a group of people who share similar views, towards a new attitude that brings them or others benefit.
ECONOMIC	Monetary benefits, either in terms of money saved, costs avoided, or increases in turnover, profit, funding, or benefits to groups of people or the environment measured in monetary terms.
ENVIRONMENTAL	Benefits to genetic diversity, species or habitat conservation, and ecosystems, including benefits that humans derive from a healthy environment.
HEALTH AND WELL-BEING	Better outcomes for the health of individuals, social groups, or public health, including saving lives and improving people's quality of life. Also includes wider benefits such as emotional, psychological, and economic well-being and measures of life satisfaction.
POLICY	Contributions to new or amended laws, regulations, or other public mechanisms that help to meet a defined need or objective that delivers public benefit. This goes beyond simply influencing policy to enabling those policies to deliver public benefits.
CULTURAL	Changes in the prevailing values, attitudes, beliefs, discourse, and patterns of behavior, whether explicit or implicit in organisations, social groups, or society. These cultural changes deliver benefits to the members of those groups or those they interact with.
CAPACITY OR PREPAREDNESS	New or enhanced capacity (physical, financial, natural, human resources, or social capital and connectivity) that is likely to lead to future benefits or make individuals or groups better prepared to cope with adverse changes and conditions.
GENDER	Better outcomes for women and girls in terms of access to opportunities, access to capital, access to education and skills, participation in decision-making, and reduction of inequality.

² Reed, M.S. (2018) The Research Impact Handbook, 2nd Ed, Fast Track Impact building on World Bank Development Indicators <http://datatopics.worldbank.org/world-development-indicators/>

As the impact case study is very much tied to the social network analysis, it is necessary to clarify the elements that form the basis of the latter. Table 2.2. below defines the SNA's key elements.

Table 2.2.
Social Network Evolution: Definitions

INDICATORS	DEFINITIONS
MEMBERSHIP	The profiles and number of people and organisations that are participating in the network. Key variables include network density, heterogeneity, and attributes such as gender, discipline, rank, socio-economic status, and industry sector.
STRUCTURE	How connections between the members are structured and what flows through those connections. Key variables to consider include centrality measures such as degree centrality, betweenness centrality, and closeness centrality; degree measures such as degree weighted, in-degree, and out-degree; and network actors' roles.
RESOURCES	Material resources, such as funding, that a network needs to sustain itself.
INFRASTRUCTURE	Physical resources that a network needs to sustain itself.



An impact case comprises five sequential stages and processes: inputs stage, activities, outputs, outcomes, and impacts³. In order to develop a good impact case, these five stages must be mapped and planned for right at the beginning of a project's life.

The inputs consist of the resources required to achieve the project's ultimate objectives. They include the human resources required in terms of the sheer number of personnel and the range of skills and expertise needed to achieve project outcomes. They also include financial and other material resources, and the amount of time needed to execute project objectives. The project organisation must map resource availability against resource requirements, and plan for any gaps that can affect project outcomes.

Figure 1: The Impact Process



Project activities and outputs often overlap. Broadly, activities are the actions of personnel and partners designed to meet objectives. This can include procurement of equipment, organising events, etc. Outputs are, in effect, the end products of project activities. Thus, examples of project outputs can be the number of workshops organised and how many stakeholders and participants were reached. Outputs can be tangible and intangible products (please refer to the cases on the next page). It should be noted that outputs can be measured as (often quantity) indicators of the project activities, but tell very little about the impact of what is being undertaken.

If activities and outputs can be summed up in the question of “what was done”, outcomes can be captured in the question of “what has changed”. In other words, outcomes are about the changes in attitudes, beliefs, and behaviours arising from the activities and outputs associated with an intervention (see box 2.1.).

In practical terms, impacts are long-term outcomes. They are long-term results that typically extend beyond the project life cycle. It is also useful, even within the project life, to create interim impact case studies during the project and a longer one at the project's end. This can be built on a longitudinal online (interactive) format and developed initially through the interactive process between the selected service provider and SAIS beneficiary organisations.

Two key considerations need to be considered in terms of analysing the impact:

1. The relationship between inputs, outputs, activities, outcomes, and impact; and
2. The type of impact and whether it is (to name a few) expected vs unexpected, planned vs emerging, process change vs organisational/structural change.

2.1.2.1. Building Short Impact Case Studies

The primary (short) impact case study version (estimated 4–6 pages) to be written up includes the social network analysis and aims to understand the changes in the network as a proxy indicator of the project's impact. It is possible to make interim impact case studies from initial data feed into the overall programme implementation, with the expectation being that the final longer case study will be written up after all three data collection cycles have been completed. These initial and intermediary case studies may be built on assumptions that will need to be verified at a later date (i.e. when more data is collected and/or further insights have been achieved).

2.1.2.2. Building Long Impact Case Studies

The secondary (more complex) longer impact case study version to be written up includes the open interview data (and potentially the cross-sectional firm surveys). The case study aims to reach behind the changes in the network to look for further explanatory factors besides network size.

³ Barnett et al, 2010; Nogeste & Walker, 2005; Schalock & Bonham, 2003

EXAMPLES OF REPORTING IMPACT

Some examples of case studies and reports that examine impact of activities can be found below.

Mercy Corps Annual Impact Report:

Social Venture Fund (SVF) makes investments in early-stage ventures operating in agriculture, frontier fintech, youth employment, and last-mile distribution and logistics.

https://www.mercycorps.org.uk/sites/default/files/MC_SVF_2018_Report.pdf

International Tree Foundation Impact Report:

Operates globally with communities to reverse deforestation.

<http://internationaltreefoundation.org/wp-content/uploads/2016/06/ITF-Impact-Report-Single-Pages.pdf>

Solar Cookers International Annual Report:

Their mission is to spread solar thermal cooking technology.

https://www.solarcookers.org/files/2513/9170/8475/SCI_Annual_Report_2012-2013.pdf



WHICH ORGANISATION HAS THE BETTER OUTCOME?

EXAMPLE:

Code Planet is a Zambian organisation with the key objective of providing training in coding to young unemployed graduates with entrepreneurial ambitions, with additional support for startups. In 2017, 18,000 participants were registered on its courses, with 12,000 completions.

Ishipo is a South African charity with a strong commitment to bridging the gender gap in ICT education and digital skills. In 2017, 20,000 school girls completed its two-week residential summer school. The classes were run simultaneously in 15 inner city locations in the country.

REFLECTION:

Neither, not from the limited information given! What was described above are project activities and outputs; that is, what was done. There is no information provided in either case about what has changed. Did the participants acquire more knowledge? Did they improve their skills following their participation? What has changed?

2.1.3. Case Study Structure

An impact case study can be structured in multiple ways. As the name indicates, it specifically focuses on the impact produced by the initiative/project.

Below are some of the key points that would warrant consideration. The use of visual media is highly recommended.

A workshop canvas to build up the structure is also given in the Section 2.1.

2.1.4. Impact Case Study Tools: Canvases

LAYOUT OF AN IMPACT CASE STUDY

INSTITUTION(S)

Name the organisations involved.

TITLE OF CASE STUDY

Give a name that tells the reader what the case is about.

1. Introduction:

- An interim impact case study is short (estimated at 4–6 pages), and may include, inter alia, a brief background and context, intervention logic, key actors and activities, and an assessment and description of the impact (as below), based on a mix of qualitative and quantitative research.
- The end-of-project longer case studies will also involve significantly more data and data analysis, and the introduction needs to indicate where this data comes from and why it is included.

2. Summary of the Impact

- The story of the case study. What happened, where, by whom, for whom, and why?
- The end-of-project longer case studies will also have a wider reflection on the long-term expected and verified (when possible) impact.

3. Underpinning Activity/Research

- What was done? And by whom in the SAIS-funded project?
- The end-of-project longer case studies will also reflect on the role players at large that have contributed to the wider context of the case study.

4. References to the Activity/Research

- What were the things that were referred to (literature sources, both academic and trade, artefacts, previous projects, ad-hoc sources)?
- The end-of-project longer case studies will also consider the ways in which the longer-term impact can be established, especially after the end of the project.

5. Details of the Impact

- What are the details of the initiative's impact? (How is the impact created, when and where, and by whom?)
- Bring in here the external data and indicators. (The micro- and macroeconomic data to be added in a table here.)
- Visual information and multimedia can be added or linked.
- The end-of-project longer case studies will also provide more detail of the expected long-term impact.

6. Sources to Corroborate the Impact (all claims referenced in the text)

- How do we verify the impact? What evidence do we use?
- The end-of-project longer case studies will also need to think about how to evidence the impact after the project's closure.

7. Other Sections to be Added (depending on need)

These could consist of data sets, key references, literature, and bodies of knowledge.

A set of canvases can be used to build up the impact case study (full-page printable slides can be found in Section 3.4. of the document). These canvases are intended to be used as workshop/ group work tools to be applied in building up the impact case study.

Typically, for a larger workshop, the canvases would be printed in A1 or A0 size (one for each team), and post-it notes would be used to fill the areas.

CANVAS 2.1.: IMPACT CASE REVIEW TOOL CANVAS

This canvas is useful to chart the big picture and align the role players. It helps to organise the key issues of the case study into the six areas shown.

It is useful to have participants fill in their own views on post-its, then compare notes, eliminate or join similar notes, and then create a priority of the views to be put in the canvas.

The most important issues tend to emerge during the discussion, but the wide range of ideas comes from individual views.

It may be necessary to repeat the steps a few times to arrive at a consensus.

This canvas is used to develop the content for the structure and is a tool to develop the content as indicated in Section 2.1.3. It should be noted that this structure can be used for both the short and long case studies.

IMPACT CASE REVIEW CANVAS

KEY PROBLEMS What are the key problems and challenges?	STAKEHOLDERS Who are your stakeholders? Are they the same as your users? Do ecosystem mapping and social network analysis help in identifying stakeholders?
INDICATORS What are the indicators/impact types?	ACTIVITIES What are the activities undertaken/ planned to achieve impact?
OUTPUTS What are the outputs, and how are they linked to the activities?	OUTCOMES What are the outcomes, and how are they related to/captured in the indicators and activities?

CANVAS 2.2.: IMPACT CASE STRUCTURE TOOL CANVAS

This canvas is useful to chart the big picture and align the role players. It helps to organise the key issues of the case study into the six areas.

It is initially useful to have participants fill in their own views of what to put into the canvas on post-its, then compare notes, eliminate or join similar notes, and then create a priority of the views to be put in the canvas.

The most important issues tend to emerge in the discussion, but the wide range of ideas comes from individual views. It may be necessary to repeat the steps a few times to arrive at a consensus.

This canvas is used to review the links between the impact indicators (see also Table 2.1.) and verification methods, and to develop the the impact case study's content.

IMPACT CASE STRUCTURE

EXECUTIVE SUMMARY	INTRODUCTION Details about the key problems, stakeholders and users, etc.
IMPACT EVIDENCE: EVOLUTION OF SOCIAL NETWORKS How has the network changed in terms of membership, structure, resources, and infrastructure?	IMPACT EVIDENCE: INDICATORS AND ACTIVITIES Details about the indicators and activities, and how they link with outputs and outcomes
IMPACT STORIES Narrative overview of the entire project impact Selected individual success stories	CONCLUSION Details about the indicators and activities, and how they link with outputs and outcomes

CANVAS 2.3.: IMPACT CANVAS

The indicators have been placed on the horizontal axis (see previous section for details).

1. Understanding and awareness look at charting changes.
2. Attitudinal indicators look for changes in attitudes that bring new benefits.
3. Economic indicators examine monetary benefits in wealth creation or savings.
4. Environmental indicators look at benefits from healthy environment, diversity.
5. Health and well-being indicators chart good quality of life and well-being.
6. Policy indicators examine support that created public benefit.
7. Cultural indicators look at changes in values, attitudes, beliefs, discourse, and patterns of behaviour.
8. Capacity or preparedness examine physical, financial, natural,

human resources, or social capital and connectivity that are likely to lead to future benefits and resilience.

9. Gender better looks at equitable access to opportunities, capital, education and skills, participation in decision-making, and reduction of inequality.

On the vertical axis, one finds some of the activities that are typically undertaken (these can be added to as required and on a case-by-case basis). Workshops, surveys, interviews, focal groups, and media (social and traditional) typically form the key sources of verification.

THE IMPACT CANVAS

Indicators Activities	Awareness	Attitudinal	Economic	Environmental	Well-being	Policy	Cultural	Capacity	Gender
Surveys	Baseline data obtained from participants about awareness level on digital enterprises	Data collected about changes in participants' attitudes to digital enterprise	Unemployment, employment, and income data at different stages in the life of the project	Data about carbon footprints and green activities of the new ventures supported by the project	Data to track changes in key indicators: health & fitness, emotional & social well-being	Data to document any change in policy and interventions to support digital enterprises	Data on national and local level of awareness, use of, and influence by, digital products	Data on new knowledge and competencies and skills provided by project activities	Data on the gender profile of participants and stakeholders
Workshops	100 participants received new information about opportunities for digital enterprises.	40 participants felt more confident about launching digital enterprise.	15 unemployed participants were linked up with investors, following review of their business plans.	A session in the workshop focused on information on environmental enterprise.	The workshop highlights the impacts of digital technology on health care and well-being.	Four government representatives attended the workshop, two of them making presentations.	One workshop session includes practical and reflective tasks on how digital tech influences culture.	Participants were introduced to new tools for digital marketing.	45% of the participants were female.
Interviews	In-depth interviews of beneficiaries and stakeholders, to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above	Interviews of beneficiaries and stakeholders to support survey above
Focus group	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format	Similar to interviews, but with a different format
Social media	Awareness levels generated about project activities on various social media platforms	Changes in levels of social media use for digital enterprise	Information about income generation and co-creation activities via social media	Project's use of social media to support environmental causes	Extent of social media use to drive well-being indicators	The project's use of social media to drive policies that support digital enterprise	Use of social media to engage the wider populace and influence national culture	Training sessions delivered or supported via social media	Profile of those engaging with project via social media
Traditional media	Level of publicity on newspapers, radio, TV, and other traditional media.	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above	Different media but indicators similar to social media above

CANVAS 2.4.: IMPACT CANVAS TRACKING CHANGES IN SOCIAL NETWORKS

This canvas is used to review the links between the elements of the social networks (see also Table 2.2.) and the three stages of verification during the project.

The idea is to chart and update the changes from the initial situation, the midterm, and end-of-project situations in terms of the social networks through the following four elements:

- 1. Membership:**
The profiles and number of people and organisations that are participating in the network.
- 2. Structure:**
How connections between the members are structured and what flows through those connections.
- 3. Resources:**
Material resources, such as funding, that a network needs to sustain itself.
- 4. Infrastructure:**
Physical resources that a network needs to sustain itself.

THE IMPACT CANVAS: TRACKING CHANGES IN SOCIAL NETWORKS

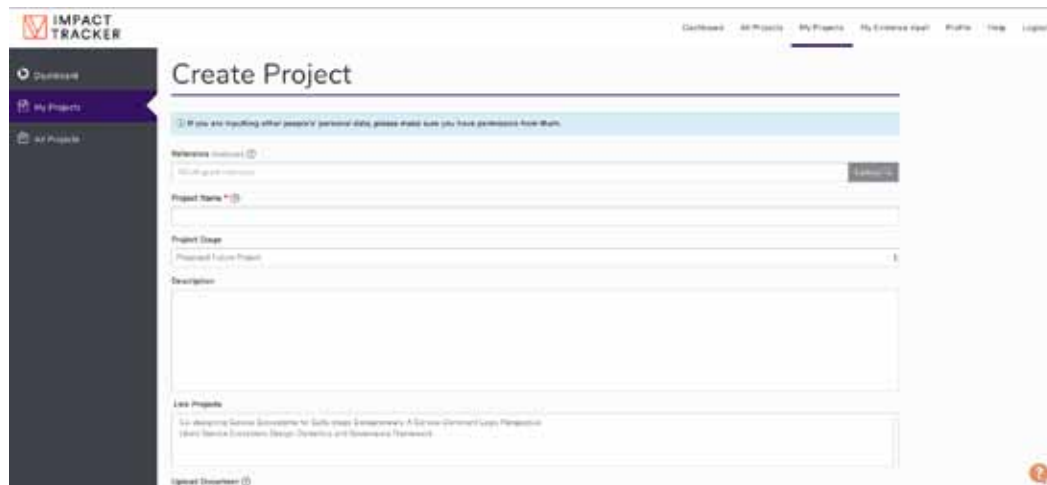
	Membership	Structure	Resources	Infrastructure
Initial	<ol style="list-style-type: none"> 1. 40 Beneficiaries, 12 females 2. Five project team members 3. Three partnership organisations 4. Two local governments 5. Two investors 	<ol style="list-style-type: none"> 1. Degree centrality: how many highly connected individuals (who are connected to at least 25% of the entire network) 2. Betweenness centrality: who are the individuals who most influence the flow of information? 3. Closeness centrality: who are the best broadcasters who can spread information across the network the quickest? 	<ol style="list-style-type: none"> 1. Funding sources: e.g. SAIS, RSA Govt, two investors 2. Physical facility for project operation: one rented office; hired spaces for training as and when required, etc. 	<ol style="list-style-type: none"> 1. Means of dissemination and information sharing. 2. Protocols and operational processes for beneficiaries and stakeholder engagement
Midterm	<ol style="list-style-type: none"> 1. 75 beneficiaries, 32 females 2. Eight team members 3. Five partnership organisations 4. Five local governments across two provinces 5. Eight investors 	Repeat the above to see what has changed from the initial stage	Repeat the above to track what has changed.	Repeat the above to track what has changed.
End of Project	<ol style="list-style-type: none"> 1. 130 beneficiaries, 60 females 2. Nine project team members 3. Nine partnership organisations 4. 11 local governments across three provinces 5. 20 investors 	Repeat the above to track changes from initial and midterm stages.	Repeat the measures from the initial stage.	Repeat the measures from the initial stage.

2.1.2.3. Using Impact Tracking Software

The impact case studies can be produced with the aid of an impact tracking system, which involves a multimedia database holding both qualitative and quantitative research data in a structured way. A number of online systems, such as the Vertigo Impact Tracker, exist for this purpose, but organisations can also develop simplified customised systems in-house. The proposed system for SAIS 2's impact case study will need to parallel the programme's existing management information system and will focus on the capture, storage, and organisation of the data required by the evidence base.

An impact tracking system needs to have both the flexibility and the adjustable interface to enable the input of multiple sources and types of media and files, with the needed capacity and access to services. The projects should establish bespoke data entry protocols to facilitate the collection and organising of the impact case study data.

The advantage of digital data collection is that, at the end the project, the partner and SAIS 2 will have both a comprehensive set of digitally stored data and the results of the data collection. This enables longitudinal and crosscutting analysis of the development of the innovation ecosystems in the region⁴.

The image shows a screenshot of the 'Create Project' page in the Vertigo Impact Tracker (VIT) web application. The interface has a dark sidebar on the left with navigation links: 'Dashboard', 'My Projects', and 'All Projects'. The main content area is titled 'Create Project' and includes a GDPR notice at the top: 'If you are tracking other people's personal data, please make sure you have permission from them.' Below this, there are several input fields: 'Reference Number' (with a dropdown arrow), 'Project Name' (with a red asterisk indicating it is required), 'Project Stage' (with a dropdown arrow), and 'Description' (a large text area). At the bottom, there is a 'List Projects' section showing a table with columns for 'Project Name', 'Project Stage', and 'Project Description'. The table contains one entry: 'Co-creating Science Solutions for Sustainable Employment: A Science-Driven Legal Framework'. The bottom right corner of the page features a red circular icon with a white question mark.

An example of a tracking system that could be used to collect and store the data is the Vertigo Ventures Impact Tracker (VIT) (see <http://www.vertigoventures.com/vv-impact-tracker/>). The VIT allows external collaborators, research users, and stakeholders to upload evidence.

⁴ SAIS as programme will comply with the EU General Data Protection Regulation (GDPR) regarding the collection, using, and storing of data.

2.2. Mapping the Entrepreneurial Ecosystems



2.2.1. Why Are We Doing This?

The primary aim of mapping is to identify the role players in the ecosystem around the project on whom the project may have an impact. This is important not only for the social network analysis but also forms the groundwork to understand the relationship between the actors, the relative importance of the players, and their key activities. A set of surveys has been created for this purpose. These feed directly into the social network analysis introduced in Section 2.4.

The secondary aim of the ecosystem mapping is to find out relevant activities implemented in the ecosystem and to create a baseline of these to understand what the role players are doing and why. It should be noted that the interviews (Section 2.3.) aim to further deepen the knowledge of the ecosystem actors through semi-structured and open-ended interview questions.



2.2.2. What Do We Do in Practice?

The building blocks of mapping the ecosystem and starting to capture the evidence base of the project's perceived impact can be organised around a workshop format, preferably organised as a face-to-face activity. The workshop also serves the functions of bringing the actors together, getting to know them, breaking the ice, and enabling the researchers to monitor the quality of the data that is being collected. The relationship building will enable further iterations to be done.

There are three key tools that can be used to map out the ecosystem: an ecosystem canvas used to map out actors and their relative impact; survey forms used to collect demographic data about the organisation; and survey forms used to map out demographic data about the ecosystem.

These can all be used in and through a workshop format, inviting the key actors to participate in a co-creation exercise around identifying actors and the relationships. It is evident that a workshop cannot capture all of the actors, thus complementary interviews or other follow-up exercises are usually needed.

2.2.3. Ecosystem Mapping Tools 1

2.2.3.1. Ecosystem Mapping Canvas

The ecosystem mapping canvas, developed from the entrepreneurial ecosystems model, is initially used to map the key role players (individuals and organisations) in the system and their perceived impact.

Using the six-element canvas of an entrepreneurial ecosystem⁵, the key activity is to map out who the key actors are that have an impact on the project/initiative in each area (policy, finance, culture, support, human resources, and markets) .

The simplest way to start is to identify the actors and then establish whether they have a positive or negative impact on the initiative. At the simplest, we can ask, “Does the ecosystem help us or stop us from achieving the set impact?”

One way to do this is to use coloured post-its. Using red for negative, yellow for positive, and naming the actor in the post-it allow the team to see visually which areas in the ecosystems need to be addressed.

It is good practice to start with participants filling in their own views on the post-its and then comparing notes, eliminating or joining similar notes, and then creating joint views to be put in the canvas.

The initial mapping can be followed up by subsequent more detailed work, and tools such as SWOT and PESTLE analyses can be applied to each actor.

THE ECOSYSTEM MAPPING CANVAS

CULTURE Is the ecosystem inward or outward looking? How do the players behave inside the ecosystem? How does the ecosystem react to disruptive innovation?	MARKETS Are players capable of networking inside and outside? What kind of customers and consumers exist? Are the markets open or closed?
POLICY Are there feedback loops, and does the government listen? What kind of leadership is the government offering? How do policies support the development of new ideas?	HUMAN CAPITAL What kind of human resources exist in the ecosystem? How do the educational institutions support the ecosystem? How much are new ideas and entrepreneurship encouraged?
SUPPORTS How developed is the ecosystem's infrastructure? Are there any support professions available? Do supporting non-governmental institutions exist?	FINANCE How is the government supporting the ecosystem? Are new ways of financing enabled? How easy is it to find emerging services/business ideas?

⁵ Isenberg, D.J., 2011. The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship. Babson Entrepreneurship Ecosystem Project

2.2.3.2. Demographic Data of Individual Role Players

WORKSHEET 2.1. PRELIMINARIES: DEMOGRAPHIC DATA

The demographic data form enables the capturing of stakeholders’ individual data, their key organisational affiliations, and their immediate connections.

What is your gender?

- Male
- Female

Which age bracket do you fit into?

- 20 years or younger
- 21 to 30
- 31 to 40
- 41 to 50
- 51 to 60
- 61 years or older

What is the highest qualification you have completed?

- School leaving certificate
- Diploma or Advanced Diploma
- Bachelor’s Degree
- Graduate Certificate or Graduate Diploma
- Master’s Degree
- Doctorate
- None of the above

What is your current job title?

.....

When was your organisation established/founded?

.....

How many people does your organisation currently employ?

.....

How long have you worked for this organisation?

- Less than six months
- Six months or more, but less than a year
- One year or more, but less than three years
- Three years or more, but less than five years
- More than five years

How long have you worked in your present job?

- Less than six months
- Six months or more, but less than a year
- One year or more, but less than three years
- Three years or more, but less than five years
- More than five years

2.2.3.3. Demographic Data of Role Player Organisations

The aim is to create a list of potential role players that participate in the local entrepreneurial ecosystem. The worksheets 2.1. to 2.10. are used to capture the participants’ demographic data. This can then be used as the basis for the social network analysis, to build up both short and longer impact case studies.

This activity can be completed in many ways (individually, in pairs, groups, or through workshops), and the ecosystems analysis feeds into identifying the role players at hand.

WORKSHEET 2.2. DEMOGRAPHIC DATA/ORGANISATIONS

Please identify up to 10 organisations that are important to your organisation. These can be organisations that provide information, are involved in collaborations, or provide funding to help your organisation achieve its operational and strategic goals. These may or may not be organisations that you communicate with on a regular basis. By importance here we mean organisations that are more influential, for example, as knowledge gatekeepers in the sector in which your organisation conducts its primary business.

Name of Organisation	Contact Person	Contact Information
Organisation 1		
Organisation 2		
Organisation 3		
Organisation 4		
Organisation 5		
Organisation 6		
Organisation 7		
Organisation 8		
Organisation 9		
Organisation 10		

WORKSHEET 2.3. DEMOGRAPHIC DATA/ORGANISATION

Please identify up to 10 organisations that are important to your own. These can be organisations that provide information, are involved in collaborations, or provide funding to help your organisation achieve its operational and strategic goals. These may or may not be organisations that you communicate with on a regular basis. These can include:

- A. Other enterprises within your enterprise group

B. Suppliers of equipment, materials, components, or software

C. Clients or customers from the private sector

D. Clients or customers from the public sector

E. Competitors or other enterprises in your sector
- F. Consultants or commercial labs

G. Universities or other higher education institutions

H. Government, public or private research institutes

I. Funding organisations, national, regional, or international

O. Other organisations

Name of Organisation	Type	Contact Person	Contact Information
Organisation 1			
Organisation 2			
Organisation 3			
Organisation 4			
Organisation 5			
Organisation 6			
Organisation 7			
Organisation 8			
Organisation 9			
Organisation 10			

WORKSHEET 2.4. DETAILED DEMOGRAPHIC DATA/ORGANISATION

For each organisation you have identified, please indicate their importance in your network relative to your own.

	Higher	Same	Lower
Organisation 1			
Organisation 2			
Organisation 3			
Organisation 4			
Organisation 5			
Organisation 6			
Organisation 7			
Organisation 8			
Organisation 9			
Organisation 10			

WORKSHEET 2.5. DETAILED DEMOGRAPHIC DATA/ORGANISATION

For each organisation you have identified, please assign a score based on the amount of contact your organisation has with them. 10 is the most contact; 1 is the least amount of contact. Each score should be different. Please rank each of the organisation by circling one number for each only.

Organisation 1	1	2	3	4	5	6	7	8	9	10
Organisation 2	1	2	3	4	5	6	7	8	9	10
Organisation 3	1	2	3	4	5	6	7	8	9	10
Organisation 4	1	2	3	4	5	6	7	8	9	10
Organisation 5	1	2	3	4	5	6	7	8	9	10
Organisation 6	1	2	3	4	5	6	7	8	9	10
Organisation 7	1	2	3	4	5	6	7	8	9	10
Organisation 8	1	2	3	4	5	6	7	8	9	10
Organisation 9	1	2	3	4	5	6	7	8	9	10
Organisation 10	1	2	3	4	5	6	7	8	9	10

WORKSHEET 2.6. DETAILED DEMOGRAPHIC DATA/ORGANISATION

For each organisation you have identified, please indicate the frequency at which they provide you with relevant information that your organisation uses to do work.

	Never	Occasionally	Frequently	Very Frequently
Organisation 1				
Organisation 2				
Organisation 3				
Organisation 4				
Organisation 5				
Organisation 6				
Organisation 7				
Organisation 8				
Organisation 9				
Organisation 10				

WORKSHEET 2.7. DETAILED DEMOGRAPHIC DATA/ORGANISATION

For each organisation you have identified, please indicate the value of the information they provide that helps your organisation do its work.

	Very Valuable	Valuable	Occasionally Valuable
Organisation 1			
Organisation 2			
Organisation 3			
Organisation 4			
Organisation 5			
Organisation 6			
Organisation 7			
Organisation 8			
Organisation 9			
Organisation 10			

In the last six months, which organisation did your organisation turn to most often for input prior to making an important decision?

.....

WORKSHEET 2.8. DEMOGRAPHIC DATA/ORGANISATIONS

How long has your organisation had a relationship with each of the organisations you have identified?

	1-2 years	2-3 years	3-4 years	4-5 years	>5 years
Organisation 1					
Organisation 2					
Organisation 3					
Organisation 4					
Organisation 5					
Organisation 6					
Organisation 7					
Organisation 8					
Organisation 9					
Organisation 10					

WORKSHEET 2.9. DEMOGRAPHIC DATA/ORGANISATION

How would you describe the overall intensity of the relationship with each of the organisations you have identified since your organisation first established contact?

	Growing	Constant	Decreasing
Organisation 1			
Organisation 2			
Organisation 3			
Organisation 4			
Organisation 5			
Organisation 6			
Organisation 7			
Organisation 8			
Organisation 9			
Organisation 10			

WORKSHEET 2.10. DETAILED DEMOGRAPHIC DATA/ORGANISATION

For each organisation you have identified, please indicate the primary benefit that your organisation currently receives from them.

	Information that helps your organisation solve problems or capitalise on opportunities	Access to decision makers that allow your organisation to move its plans ahead	Political support that allows your organisation to move its plans ahead	Collaborations that help accelerate the development of new products and/ or services	Collaborations that help accelerate the improvement of existing products and/ or services	Access to funding that helps your organisation implement new projects or improve existing ones	Informal networking to improve the visibility of your organisation in the network
Organisation 1							
Organisation 2							
Organisation 3							
Organisation 4							
Organisation 5							
Organisation 6							
Organisation 7							
Organisation 8							
Organisation 9							
Organisation 10							

2.2.3.3. Demographic Data about the Ecosystems 1

This task involves the organisations’ perceptions in terms of how they see themselves in their ecosystems. The data is captured through a Likert scale (1-5) with the aim of understanding how the ecosystem supports the activities of the organisation in question.

This data supports the analysis of the results of the social network analysis. This is mainly used to build up the longer case study through deep knowledge of the role players in the ecosystem.

WORKSHEET 3.1. DETAILED DEMOGRAPHIC DATA/ECOSYSTEM 1

For each organisation you have identified, please indicate their nature and position in the ecosystem.

	The organisation is well established	The organisation is a newcomer	The organisation is a market leader	The organisation is a disruptor	The organisation is a niche player	The organisation is a specialist	The organisation is a gatekeeper	Other key position in ecosystem	What?
Organisation 1									
Organisation 2									
Organisation 3									
Organisation 4									
Organisation 5									
Organisation 6									
Organisation 7									
Organisation 8									
Organisation 9									
Organisation 10									

WORKSHEET 3.2. DETAILED DEMOGRAPHIC DATA/ECOSYSTEM 1

For each organisation you have identified, please indicate their key role in the ecosystem.

	Key role is to create and sell products	Key role is to create and sell services	Key role is to facilitate business enterprise	Key role is to regulate business enterprise	Key role is to finance business enterprise	Key role is to educate for business	Key role is to advocate for communities	Other key role in ecosystem	What?
Organisation 1									
Organisation 2									
Organisation 3									
Organisation 4									
Organisation 5									
Organisation 6									
Organisation 7									
Organisation 8									
Organisation 9									
Organisation 10									



2.2.4. Ecosystem Mapping Tools 2

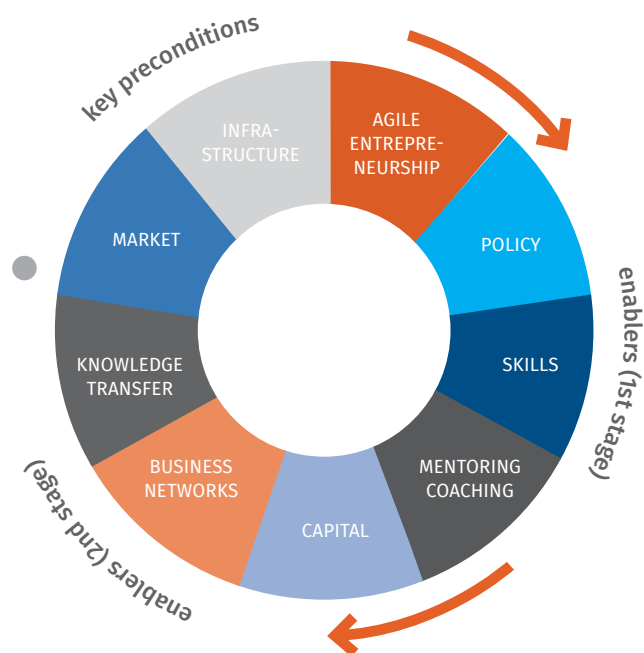
2.2.4.1. Ecosystem Mapping Tool 2

The second ecosystem mapping tool uses a nine-element model created for the SAIS 2 project (see figure below). The model's intended use is to deepen the understanding of the ecosystem; and it should be mainly used to create the longer case study.

The initial text here is used to explain the model, and Worksheet 4.1. Detailed Demographic Data/Ecosystem 2 is used to capture the information.

The model enables each project to map the *key preconditions*, *launch enablers*, and *growth enablers*, which are further divided into nine elements.

Figure 2.2.1. Ecosystem Elements



KEY PRECONDITIONS

The **Market** section of the ecosystem includes market needs, location, and early-stage accessibility for early-stage entrepreneurs. This component has a top-down approach on the macro level needed for establishing an enterprise. The market need is crucial for startup creation. The location of early-stage entrepreneurs and their enterprise is largely influenced, affected, and driven by the entrepreneurial conditions that make the growth, acceleration, and scaling of the startup possible. The accessibility of the resources is also conditional to the further development of the startup.

Infrastructure as the second section of the ecosystem and the key preconditions include creative hubs, mobility, and connectedness. This component is another precondition either initiated by top-down structures or established from the bottom-up level. It is primarily a physical precondition for the emergence of early-stage enterprises. The connectedness enables communication, setting up of, and dissemination of enterprise features to immediate and wider audiences. Creative hubs are the connecting and reference points for the startups in terms of accessing resources and establishing connections with other entrepreneurs, experts, etc. The creative hubs also provide information about possible partnerships and resources that are key to the success and further development of initial ideas, proposals, prototypes, and like. Mobility is also a key issue in any emerging economy context as many employees work far away from where they live, and therefore the locations of accommodation, business, and commuting methods become the key preconditions or constraints in the development of enterprises.

Agile Entrepreneurship, as the third section of the ecosystem, refers to development from a grass-roots level and includes enterprise affordability, promoting youth entrepreneurship, and creative experimentation. Enterprise affordability relates to what extent the enterprise is feasible in terms of succeeding on the market and being sustainable in the long term. Creative experimentation

is an important element as it is a way to learn from prototyping and experimenting on-field in order to test, iterate, and improve a solution, either as a product, service, or product-service system (PPS).

LAUNCH ENABLERS

Innovative **Policies** enable entrepreneurial activities and creative services, and potentially allow for more efficient coordination within the ecosystem itself. Ecosystems enable the initiation and coordination of entrepreneurship, and innovative policies enable the monitoring and evaluation of the ecosystem design itself.

Skills include a triad of key competences that are necessary for successfully setting up any enterprise. These are technological competences that relate to the technological setup of products, services, and PSSs, and include coding, platform creations, digital networks, and the like. Business sense refers to business modelling, business planning, and the financial coordination of a business. Finally, design innovation applies design thinking, user-centred research, empathy, and customer experience design to address real user needs for long-term socio-economic impact.

Mentoring/Coaching using bottom-up approaches includes idea accelerators, mentoring networks, and business coaches. These are localised services that enable entrepreneurs to find adequate support for developing their business ideas, proposals, and prototypes. Accelerators are physical spaces where services such as mentoring and coaching about technical, financial, and legal aspects may be addressed by external experts. They offer expert advice on business feasibility, desirability, and viability. This also forms part of the mentoring networks that become readily available in support to the entrepreneurs through diverse mentoring programmes. Lastly, business coaches can offer business support to entrepreneurs and also be the connectors between businesses and new ventures that seek to spot potentially innovative proposals.

GROWTH ENABLERS

Capital as a top-down approach includes microloans as a means to financially inject capital to entrepreneurs who are starting their businesses on a small scale. The microloans can come from diverse sources, including microcredit banks and peer-to-peer lending platforms. Secondly, capital partly comprises alternative financial models that enable entrepreneurs to exchange services using complementary currencies. These can take form as digital credits or currencies, paper vouchers, and other types of self-organised community currencies. Finally, grants can be additional support mechanisms that enable enterprises to receive initial funding in order to set up and develop their business. These tend to come from public funding bodies or the private sector.

Business Networks include business test beds, collaborative networks and fast-track regulations. Business test beds allow the prototyping of business ideas, technical testing, and/or role playing of services in order to understand where possible iterations can help enhance or improve the innovative proposal. Collaborative networks enable services and consumption models that benefit all actors within a business network. Fast-track regulations enable businesses to flourish with minimal constraints. These regulations also enable quick failure as a way to save investment in the long term.

Knowledge Transfer includes collaborative research and consultancy, cross-pollination, and academic entrepreneurship. Collaborative research enables academic knowledge to be transferred and applied within industries. This can be achieved via diverse open innovation approaches where research and development (R&D) is being commercialised. Consultancy allows the cross-pollination of knowledge across sectors. Finally, academic entrepreneurship builds on knowledge acquired within universities and through diverse “enterprise through curriculum” academic

programmes that foster entrepreneurship by supporting early-stage enterprises of students and/or graduates. These cohorts consider setting up their own companies and developing their enterprises after their formal academic degrees.

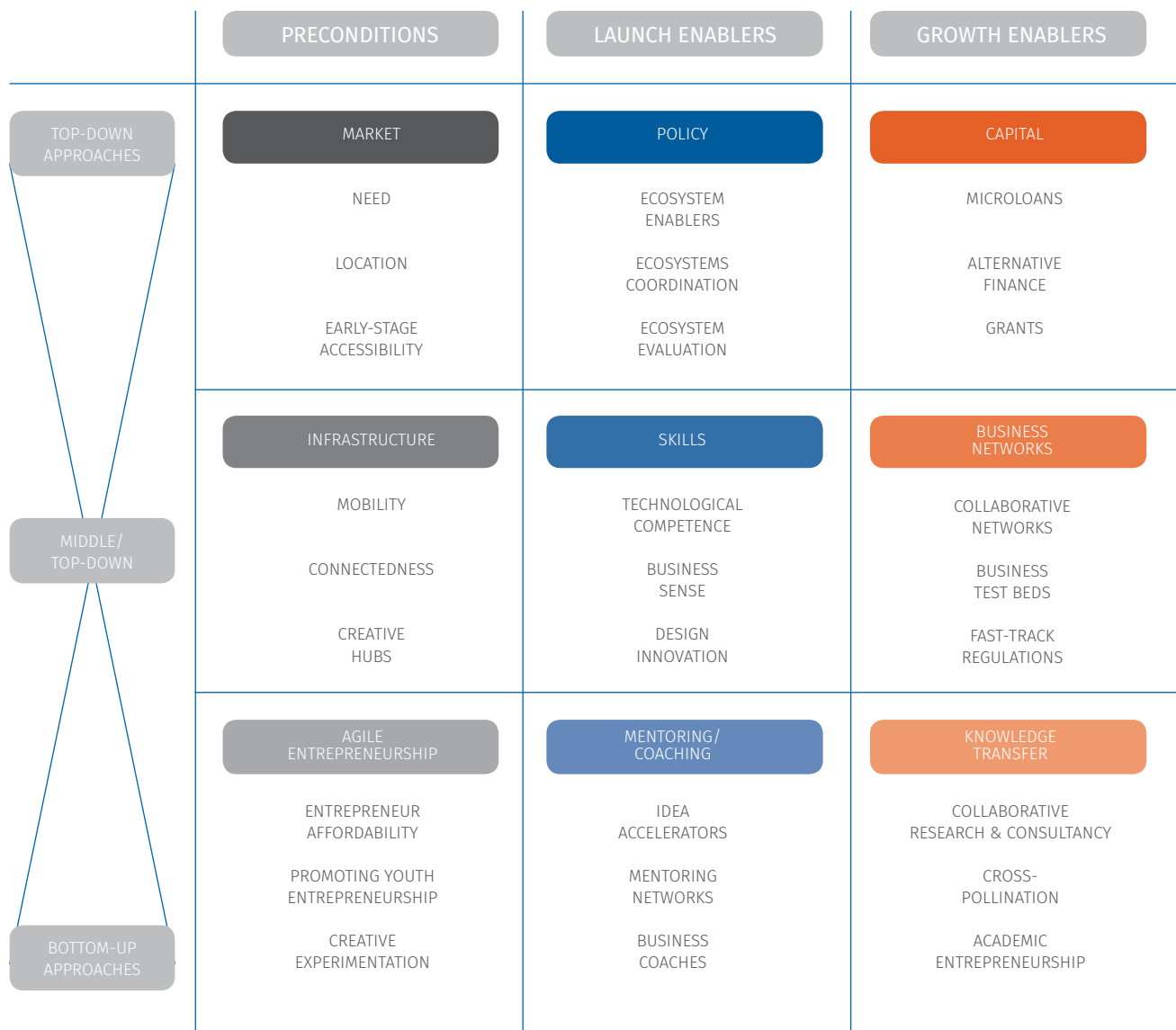
PRACTICAL CONSIDERATIONS

The 3x3 ecosystem matrix with the three subcategories is expected to be a useful tool to position the actors in the ecosystem mapping exercise and to verify whether they are incumbents or challengers in their area. This starts to paint a picture with some degree of granularity that has a degree of explanatory power foreseeing the impact case studies.

Overall, policies related to systems of innovation are by nature networking policies applied throughout the socio-economic framework of society to pool scarce resources and make various sectors work together in coordination. Most SAIS 2 countries already have some kinds of identifiable systems of innovation in place, both on national and regional levels, but the lack of appropriate institutions, policies, financial instruments, human resources, and support systems together with underdeveloped markets create inefficiencies and gaps in systemic cooperation and collaboration.

On another level, engaging users and intermediaries at the local level drives the development of local innovation ecosystems, especially in urban settings, within which local culture has an evident impact on how collaboration and competition is both seen and done. In this complex environment, entrepreneurship and innovation support organisations often find it difficult to create or apply relevant knowledge and the appropriate networking tools, approaches, and methods needed to put their processes to work for broader developmental goals. To further enable the work of these organisations, it is necessary to understand what works and why in a given environment.

Figure 2.2.2. Ecosystem element relationships



2.2.4.1. Demographic Data about the Ecosystems 2

The secondary objective is to gain knowledge about the positioning of the organisations and their role in the ecosystems. The positioning includes perceptions of the organisations being well established or newcomers, being market leaders or disruptors, niche players, specialists, or gatekeepers. The role players' contributions include creating and selling products and/or services, facilitating business enterprise, regulating it, educating for business, and advocating for communities (business or other). This data supports the analysis of the results of the social network analysis.

This canvas is built on the entrepreneurial ecosystem model explained in the previous section. It aims to capture detailed information mostly for the longer case study through the nine elements of markets, agile entrepreneurship, policy, skills, mentoring and coaching, capital and financial resources, business networks, and knowledge transfer.

WORKSHEET 4.1. DETAILED DEMOGRAPHIC DATA/ECOSYSTEM 2

Each organisation is to fill this in from their own perspective

		Answering Likert Scale 1: Fully Disagree 5: Fully Agree				
MARKET		1	2	3	4	5
Need	My organisation has a clear understanding of how to fulfil the market's needs.					
Location	My organisation knows where the markets are located.					
Early-Stage Accessibility	My organisation knows how to get to and enter the markets.					
INFRASTRUCTURE		1	2	3	4	5
Mobility	My organisation finds it easy to travel for work purposes.					
Connectedness	My organisation is well connected to the work internet.					
Creative hubs	My organisation is able to access working spaces that help our business.					

AGILE ENTREPRENEURSHIP		1	2	3	4	5
Entrepreneur Affordability	My organisation is feasible and sustainable in the long term.					
Promoting Entrepreneurship	My organisation knows where to get support for entrepreneurs.					
Creative Experimentation	My organisation is able to prototype and test my ideas with users in order to improve a solution.					
POLICY		1	2	3	4	5
Ecosystem Enablers & Inhibitors	My organisation understands the policies that support and/or inhibit our activities.					
Ecosystem Coordination	My organisation knows who coordinates activities in the local entrepreneurial ecosystem.					
Ecosystems Evaluation	My organisation knows who monitors and evaluates activities in the local entrepreneurial ecosystem.					
SKILLS		1	2	3	4	5
Technological Competence	My organisation has the necessary technological competence for the activities that we do.					
Business Sense	My organisation has the necessary business competence for the activities that we do.					
Design Innovation	My organisation has the necessary design competence to apply design thinking, user-centred research, empathy, and customer experience design to address real user needs.					

MENTORING & COACHING		1	2	3	4	5
Idea Accelerators	My organisation has access to physical spaces where mentoring and coaching are provided.					
Mentoring Networks	My organisation has access to mentoring programmes that support our business and help us connect to other businesses.					
Business Coaches	My organisation has access to business coaches who can help us improve our business performance.					
CAPITAL & FINANCIAL RESOURCES		1	2	3	4	5
Microloans	My organisation has access to microcredit banks and peer-to-peer lending platforms where we can get microloans.					
Alternative Finance	My organisation has access to alternative ways of getting finance for our activities.					
Grants	My organisation has access to public/ private funding bodies that offer grants as initial funding in order to set up and develop our business.					
BUSINESS NETWORKS		1	2	3	4	5
Business Test Beds	My organisation knows the place(s) where we can test whether our product or service will work on the market.					
Collaborative Networks	My organisation knows the collaborative network(s) that benefit all.					
Fast-Track Regulation	My organisation knows the regulations that enable a business to flourish with minimal constraints.					

KNOWLEDGE TRANSFER		1	2	3	4	5
Collaborative Research & Consultancy	My organisation knows with whom we should collaborate to gain new knowledge.					
Cross-Pollination	My organisation knows where we can share new knowledge if we need it.					
Academic Entrepreneurship	My organisation knows how to access academic programmes that foster entrepreneurship.					

2.3. Interviewing the Role Players



2.3.1. Why Are We Doing This?

The primary objective is to identify, through the semi-structured interviews, the principal actors that should be engaged in the social network analysis exercise. This is a complementary validation and triangulation of the ecosystem mapping exercise (mostly the initial mapping number 1 in Section 2.2.3.), aiming towards a robust and meaningful set of interviewees for the social network analysis. These role players are the key nodes in the ecosystem. Their roles and activities are of core importance in understanding how the ecosystem develops and is shaped through its participants' actions. It is the researcher's task to identify the initial set of role players and to expand the list through the mapping and other exercises.

As a secondary objective, the open interviews present an excellent opportunity to understand the capabilities and aspirations of a sample of regional stakeholders, complementing the narrative in relation to meaning-making, collaborative practices, roles as rule makers and takers, governance structures, role of social skills, external and internal drivers, and the required build-up processes in the local contexts.

Over the three interview sessions, the aim is to capture the lived experience of the participants in terms of how the various activities that constitute the SAIS 2 project have helped (or hindered) their innovative and entrepreneurial efforts. These insights are expected to inform the longer impact case studies.

2.3.2. What Do We Do in Practice?



This building block of the toolkit will involve a limited set of semi-structured and open (in-depth) interviews (noting that this is a labour-intensive activity, to be repeated three times, with transcriptions) of selected key stakeholders of the innovation ecosystems, targeting especially actors that are involved in the local entrepreneurial ecosystems, seen to be a subset of the wider innovation ecosystem. These actors are expected to include, but may not be limited to, entrepreneurs (both advanced and early-stage), university and R&D representatives, government officials (local/regional/national) and members of civil society.

Data collection will be in the form of semi-structured and open interviews that would be ideally recorded on video and audio (open interview only) to ensure their validity and reliability. Each country's sample size is to be determined once the project is ongoing. As such, purposive sampling is preferred within the segment

Handwritten notes on sticky notes:

- White note: *What is a positive influence?*
- Pink note: *What is a negative influence?*
- Blue note: *Anything that makes you feel good or bad*
- White note: *Positive, Negative, Good, Bad, (make a list)*

A POSITIVE OR NEGATIVE INFLUENCE
THAT CAN BE MEASURED OR DEMONSTRATED

of the population with the most interest in the area. Examining the participation patterns in the ecosystem provides a means of determining which participants are more able to assist with the study's objective.

2.3.2.1. Semi-Structured Interviews

The semi-structured section of the interview will address the primary objective of deciding who to invite for the social network analysis. The data input will consist of filling a survey protocol online. It is perfectly feasible that third parties are indicated to be interviewed.

The interview protocol would be simple:

1. Identifying the actor;
2. Locating them in terms of their role (incumbent/challenger/governance actor); and
3. Establishing the perception of their importance as network actors (enabler/inhibitor).

The semi-structured interviews may be captured directly into the impact tracking system online (see Section 2.1.2.3. Using Impact Tracking Software).

2.3.2.2. Open (In-Depth) Interviews

The open (or in-depth) interviews probe the entrepreneurship topic, the dynamics of participation, potential benefits, and any suggestions for improvement. Whilst we want the interviewees to construct their responses by drawing on their lived experiences, a limited topic prevents them from straddling too far away from the boundaries of interest. The semi-structured interview opens the conversation and subsequent questions are then based on interviewee responses.

This type of interview provides greater depth and breadth both in responses and in providing the capacity to understand. Interviews range from 45 minutes to about an hour and a half in length and

are recorded. Notes of key points of discussion can be taken to complement the audio and video recordings.

Once an interview is completed, the digital interview files are transferred to the impact tracking system; each interview corresponds to a single MP3 file. Next, interviews are manually transcribed using a basic transcription software package (e.g. Express Scribe, which has the capability to play the MP3 files at a slow enough rate as to enable efficient and accurate transcription). After transcription, each transcript is saved as a Word document on the impact tracking system. Once named and saved, transcripts are imported into the relevant folder in NVivo (or an equivalent coding software), ready for analysis.

2.3.2.3. Focus Groups

As a third method of engaging with key informants, focus groups may also be used to complement the data that is used. It essentially consists of a facilitated group discussion, and can be a time-efficient way to discuss a series of topics with a group.

A focus group is a small but demographically diverse group of people. As an example, such a group could have entrepreneurs, policymakers, community members, and academics as participants.

Focus groups are a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs, and attitudes towards a product, service, concept, advertisement, idea, or packaging.

Questions are asked in an interactive group setting where participants are free to talk with other group members. During this process, the researcher either takes notes or records the vital points he or she is getting from the group.

Researchers should select members of the focus group carefully for effective and authoritative responses. On occasion, group dynamics tend to limit this approach's usefulness when discussing complex issues.



There are three key tools that can be used to map out the ecosystem: an ecosystem canvas used to map out actors and their relative impact; survey forms used to collect demographic data about the organisation; and survey forms used to map out demographic data about the ecosystem.

These can all be used in and through a workshop format, inviting the key actors to participate in a co-creation exercise around identifying actors and the relationships between them. It is evident that a workshop cannot capture all of the actors, thus complementary interviews or other follow-up exercises are usually needed.



PLEASE NOTE:

The interviewees or focus group participants will need to give their consent as participants, using ethics and consent forms that fulfill the legal requirements of data protection in the country where the activities take place.

2.4. Analysing the Social Network



2.4.1. Why Are We Doing This?

The analysis of the changes in the network will act as a proxy indicator of the SAIS 2-funded project's impact. This building block involves doing the first version of the social network analysis to identify the most influential role players in the ecosystem and understand how their influence is exerted in the network as well as how these change over time. Social network analysis is a widely used tool for investigating interactions and linkages that run between role players in a relational system.

Unlike variable analysis, where attribute data is organised in a case-by-variable matrix, relational data in social network analysis is organised in a case-by-affiliation matrix, often using binary measures to indicate the presence or absence of relationships. The cases are “particular role players that form the units of analysis, but affiliations are the organisations, events, or activities in which these role players are involved” (Scott, 2000, pp. 39).



2.4.2. What Do We Do in Practice?

The data for social network analysis will be mainly drawn from the Part 1.3. Detailed Demographic Data/Organisation, which acts as a unified instrument for all of the subsequent surveys. The sample size, identification, and geographical reach of the representative participants will be established through the survey, determined by the local conditions related to the focal partners.

The study itself can be conducted as an online survey and the data will be stored directly onto the impact tracking system. This survey can potentially also include cross-sectional data on organisations (to be defined). Both survey formats and questions will be built up in the next stage of the project. Complementary research methods are used in various building blocks to ensure representativeness of the sample data and the overall reliability and validity of the data.

In terms of the data analysis, entrepreneurial organisations will be considered as the principal units of analysis. This does not suggest they are necessarily the main influencers, but simply the main points of interest/reference. Other ecosystem actors are the knowledge creators (universities and R&D organisations), governmental bodies, and civic organisations.

To measure the influence of actors in the system, we will use two centrality measures: “betweenness centrality” and “eigen centrality”. Betweenness centrality identifies the nodes, or role players, which act as bridges with other nodes in a network. Eigen centrality identifies agents who have the biggest influences over the entire network, not just those directly connected to it (Cambridge Intelligence, 2014).

In a system of innovations, firms and, by extension, the entrepreneurs who own or lead them can be considered the principal role players in the networks. Other organisations, institutions, and markets are the main affiliations. These designations are, of course, fluid, depending on the research’s design and objectives. There are, for example, scenarios in which institutions can be framed as agents and firms as affiliations.

2.4.3. Social Network Tools



NOTE:

The initial data collection for the SNA is presented in Section 2.2. The focus in this section is to present an example of how a SNA can be done in practice.

2.4.3.2. Social Network Analysis Case Study – Mapping the Initial Ecosystem of SAIS 2 with Gephi

1. DATA COLLECTION AND PREPARATION

This example is based on the initial questionnaire survey circulated to all participants prior to the workshop organised in December 2018 in Pretoria (SAIS 2 Data Collection & Analytics Workshop). SurveyMonkey was employed to conduct the survey; however, a number of other survey platforms can be used for this purpose such as REDCap and Qualtrics. The data used in this exercise is based on the question related to the 10 organisations that are important to the source organisation.

The data was prepared and saved as a csv.file, under file name Saish mapping.csv. Table 1 represents the format of the data. In its most basic form, input data for conducting SNA with Gephi should have three properties: a source, a target, and type. In the case of SAIS 2, the source was the 12 projects and some of the key partners. The targets were the organisations that were identified as important to these main stakeholders, for the purpose of the initial mapping the main stakeholders were asked to identify 10 key partners. Type can either be directed or undirected. Directed entails specifying the direction of the relationship. In this case, we assumed reciprocity in the relationship and therefore selected undirected type.

Table 1
Data Input for SNA with Gephi (see full table on page 80)

SOURCE	TARGET	TYPE	SOURCE	TARGET	TYPE
Injini	BongoHive	Undirected	NTBC Zambia	MoHE	Undirected
Injini	NBII-NUST	Undirected	NTBC Zambia	NSTC	Undirected
Injini	The Launch Pad	Undirected	NTBC Zambia	Uni Zambia	Undirected

2. PRODUCING THE INITIAL NETWORK MAP

Gephi is an open-source social network analysis software. It is relatively easy to install and is one of the most popular SNA software available. Other software that are comparable include Pajek and UCI net; however, Gephi provides a good balance between analytics and visualisations compared to the others. Gephi is launched by clicking on the Gephi icon (instructions were issued as to how to download and install the software). Once the application is launched, the next step is to locate and import the data into the Gephi space. To do this, click on “File”, then “Import” the spreadsheet as shown in Figure 1.

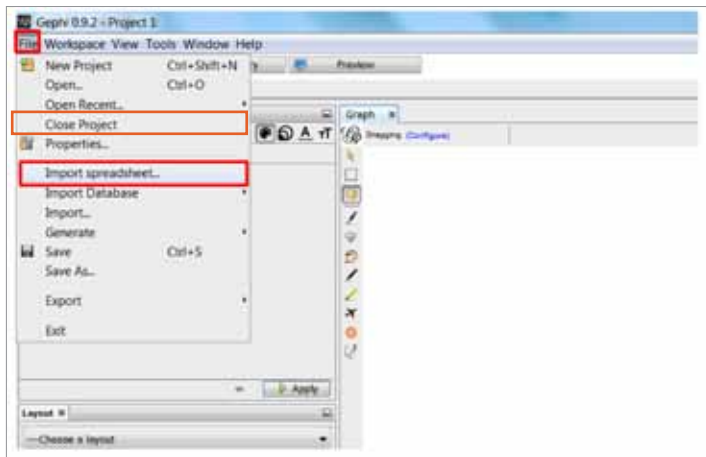


Figure 1: Locating the CSV file

Another window opens that allows you to locate the csv file where the data is stored. In our case, the file was saved as SAIS II mapping.csv. Once the file is located and is visible in the “CSV file import” dialogue box, click on “Next”.

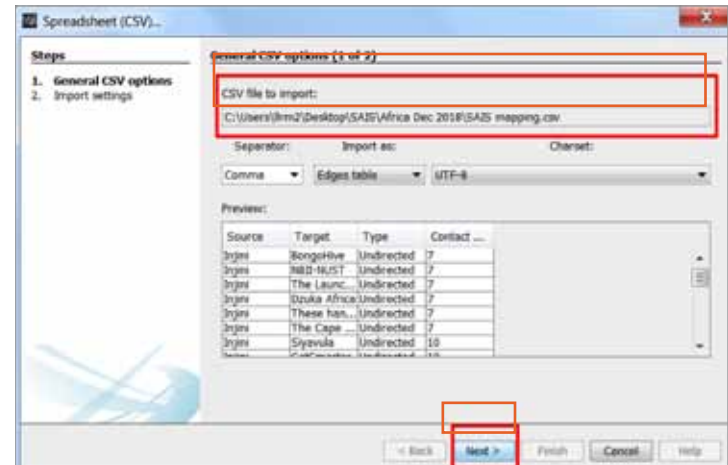


Figure 2: Uploading the CSV file

On the next two windows, click on “Finish”, then “OK”. This will bring up an initial map as shown in Figure 3 below.

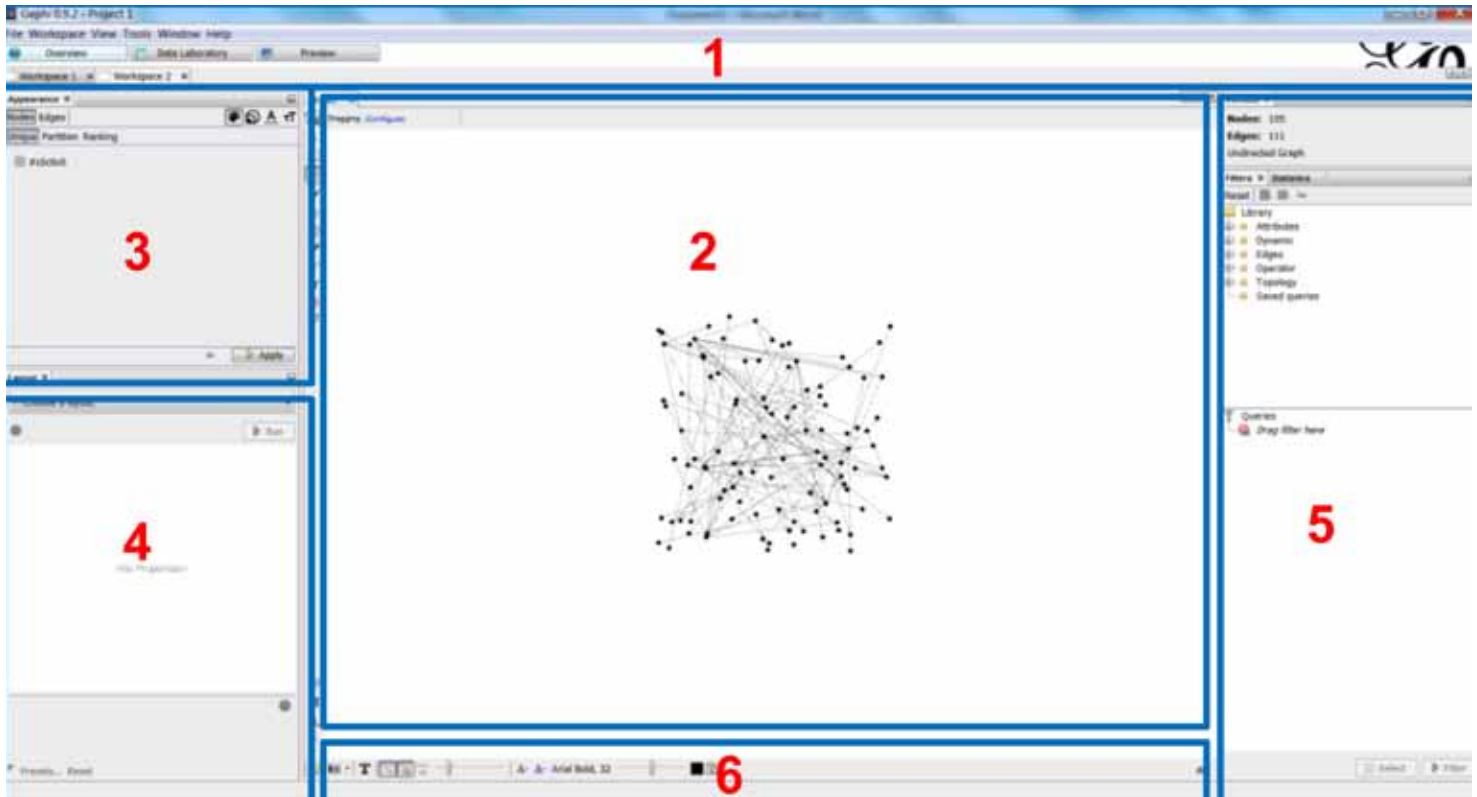


Figure 3: Initial map of the ecosystem

The Gephi window can be separated into six distinct areas enumerated as in Figure 3 and these correspond to:

1. The change of view task bar
2. The central area
3. The area classification and partition
4. Spatial zone
5. Statistics and filter
6. The data display

3. REFINING THE INITIAL MAP

As it stands, the graph in Figure 3 can be improved to more closely reflect the nature of the relationships by employing the algorithms found in the spatial zone (area #4). A number of different algorithms can be employed for this purpose. However, given the type of data we are dealing with, the force atlas algorithm is recommended. Thus to improve the layout, the following operations should be completed: click on the “Layout” tab (Zone 4), choose “Force atlas” from the drop down menu. Change the “Repulsion strength” to “5000” then click “Run”. This will cause the shape of the map to change. Click “Stop” once the new shape has stabilised. The new structure of the map should closely resemble what is shown in Figure 4.

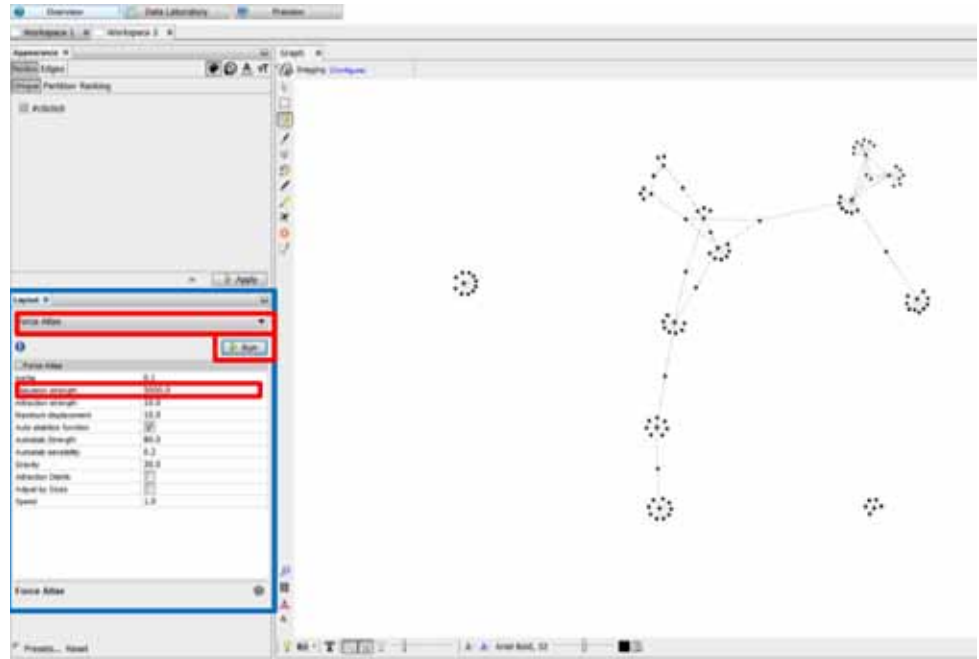


Figure 4: Application of the force atlas algorithm

4. DISTINGUISH ACTORS BY DEGREE OF CONNECTIONS

Now that the graph has begun to take shape, it can be refined to further illuminate the specificities of the relationships. A good place to start is by distinguishing between highly connected nodes and less connected ones. Highly connected nodes in this case are simply those organisations that have more links with other organisations in this initial ecosystem. This can be achieved by ranking the nodes on the basis of degree of connections. The tools to perform this characterisation are found in the area classification and partition.

Go to area #3 in the “Appearance” window and click on “Node”, then click on the “colour palette icon”. Then click on the “Ranking” tab and choose “Degree”. Click “Apply,” as per Figure 5. Depending on the colours chosen, this should produce a coloured map. The more connected nodes appear darker than the least connected ones. In our case, the main stakeholders appear darker.

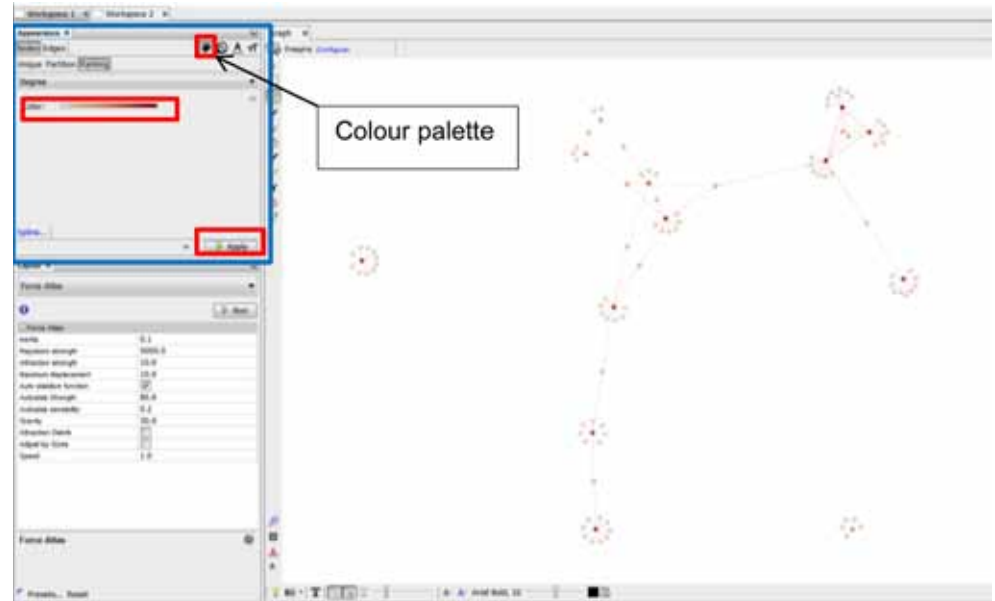


Figure 5: Ranking by degree of connection

5. SOCIAL NETWORK STATISTICS

A number of interesting statistics are used to investigate the characteristics of a network, and these include:

- Betweenness centrality
- Closeness centrality
- Modularity
- Eccentricity
- Density

The first three statistics are particularly relevant due to the nature of the task at hand as they help to identify the key actors and commonalities between actors in a network.

- Betweenness centrality: Measures the frequency of occurrence

of a node on the shortest paths between network nodes. Betweenness centrality is also an indicator measuring the extent of a node's roles as broker (Abbasi et al., 2012), and has also been used in several studies as a proxy for social capital (Tsai & Ghoshal, 1998).

- Closeness centrality: Measures the average distance between a node and all other nodes. It measures how many steps on average it takes for an actor to reach everyone else in the network. Actors who have high closeness centrality measures can most efficiently make contact with others in the network (Freeman et al., 1979).
- Modularity: Identifies groupings to highlight the communities in a network (Muff et al., 2005). The connection (density of edges) is greater between the nodes of the same cluster compared to those of different clusters.

It is possible to calculate those statistics in Gephi. Once calculated, these can be used to further refine the map, thus more clearly identifying key players whilst distinguishing between communities. The calculation tab for these statistics is located in the Statistics window in area #5.

To calculate the betweenness and closeness centrality, click on “Statistics”, then click on the “Run” tab next to “Network Diameter”. Click “OK” and in the dialogue box “Graph Distance Settings”. In the next window, click “OK”. This action will store the calculated statistics in the area classification and partition.

6. APPLYING BETWEENNESS CENTRALITY TO THE NETWORK

We can now rank the size of the nodes on the basis of betweenness centrality. In the “Appearance” window, select “Node”, then the “size icon”, then “Ranking”, then “Betweenness Centrality”. Set minimum size to 20 and maximum size to 100, then click “Apply”. In the “Layout” tab, check the box “Adjust by sizes”, then select “Run” (see Figure 7). Click on “Stop” once the network has stabilised. The nodes’ size can be further proportionated by ticking the box “Adjust by Sizes” found in the spatial zone (area #2). The resulting map should look very similar to the one shown in Figure 7. Note that with the varying node sizes, the larger the nodes indicated, the higher the betweenness centrality.

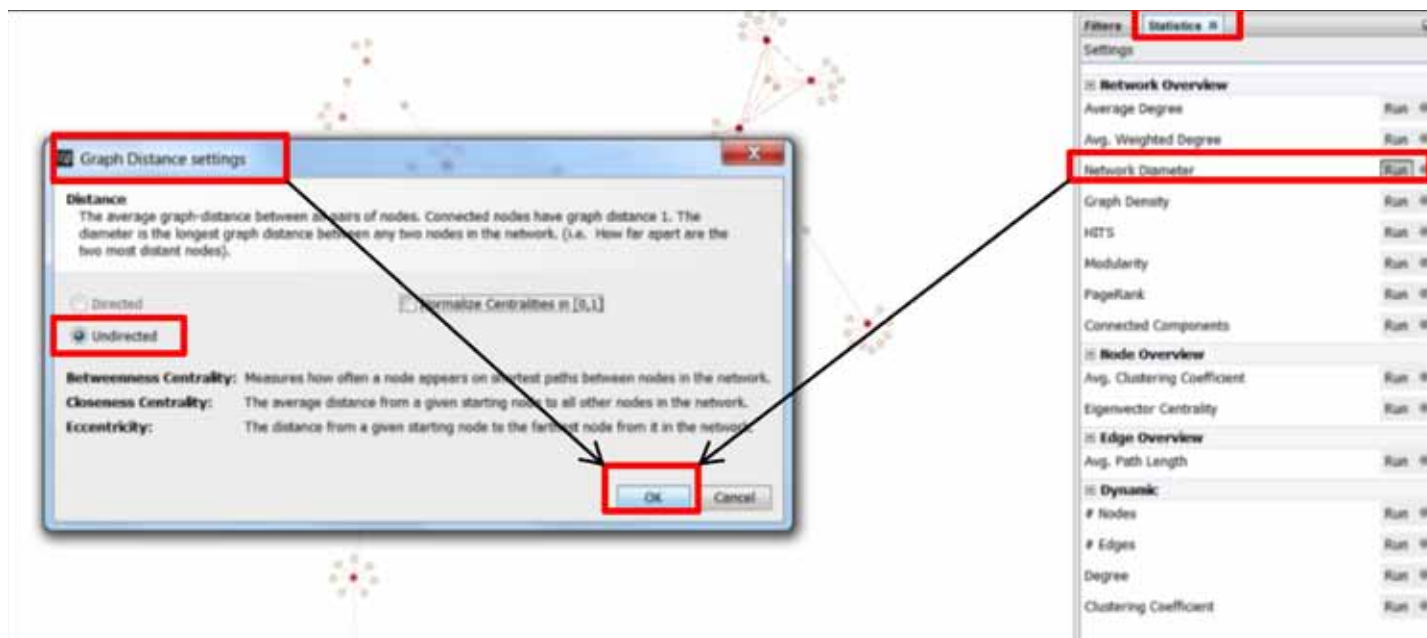


Figure 6: Computing betweenness centrality

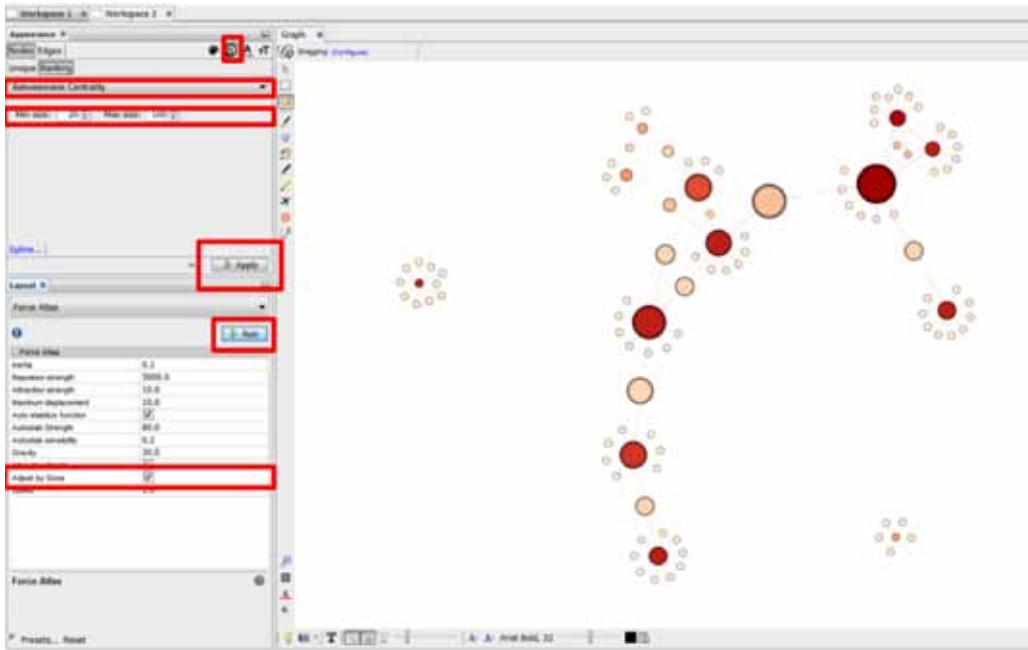


Figure 7: Network based on betweenness centrality

8. CREATING COMMUNITIES

To distinguish between communities, that is, sub-groups with similar characteristics, the “Modularity” function under the “Statistics” tab is employed. Click on “Statistics” then “Run” next to the “Modularity” function. Click “OK” in the dialogue box “Modularity settings”, then “Close” in the next dialogue box “Modularity Report”. The modularity report essentially displays the number of clusters created. A close inspection reveals that nine clusters were formed. See Figure 8.

Modularity varies between 0 and 1, thus a value of 0.773 indicates a relatively high modularity. This suggests that the ecosystem consists of several internally dense groups that are relatively loosely connected to each other as indeed can be observed in previous figures.

To distinguish between communities, use the “Appearance” window to apply different colours to the different communities. Click on “Node”, then the “colour palette” icon, then “Partition”. Scroll all the way down the list to click on “Modularity”. A range of colours will appear. Click “Apply”. This should produce a multi-coloured network similar to that in Figure 9.

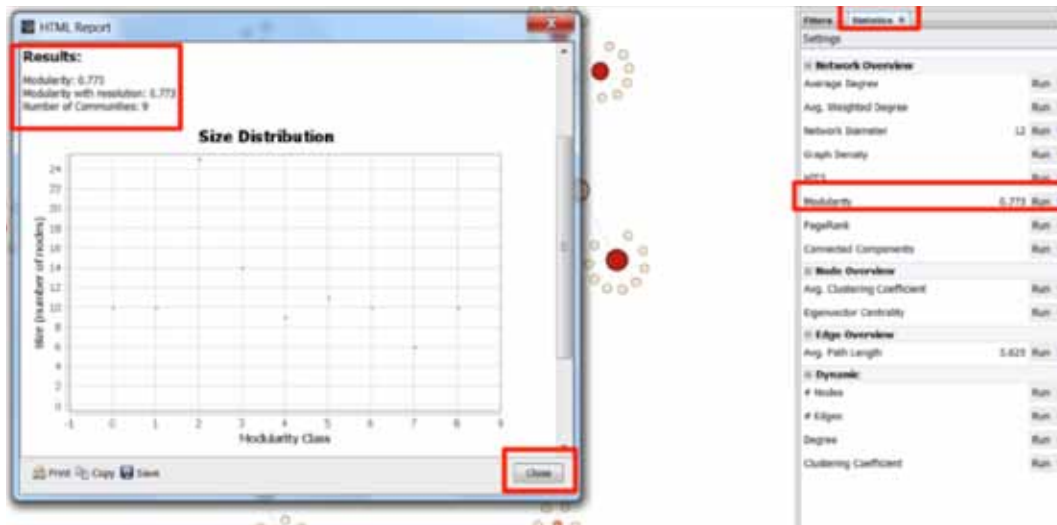


Figure 8:
Computing
modularity

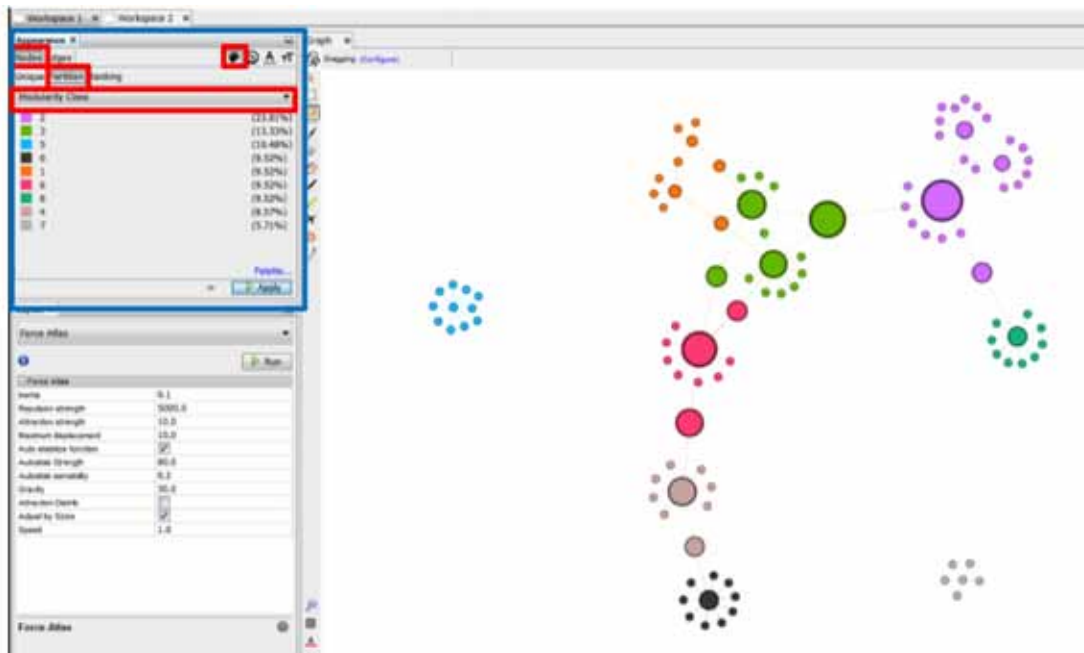


Figure 9:
Communities of
the network

9. ANNOTATING THE NETWORK MAP

We can now label the nodes by using the task bar at the bottom of the central area. Click on the icon “T”. The size of the text can be adjusted relative to the size of the node by clicking on the icon “A” and choosing “Node Size”. You can also use the slider to vary the text size. See Figure 10.

Now that the actors are clearly labelled, it can be observed that a few stakeholders already display a high level of betweenness centrality. These are shown as the larger circles on the map, and examples include UNAM, CSIR, BetterWorld, and NTBC Zambia. These are actors that are connected to multiple clusters and are likely to have a brokerage role in the initial ecosystem. A typical example would be NTBC Zambia, which is one of SAIS 2’s partner agencies. Whilst not the custodian of any project, it acts as the national facilitator for more than one project.

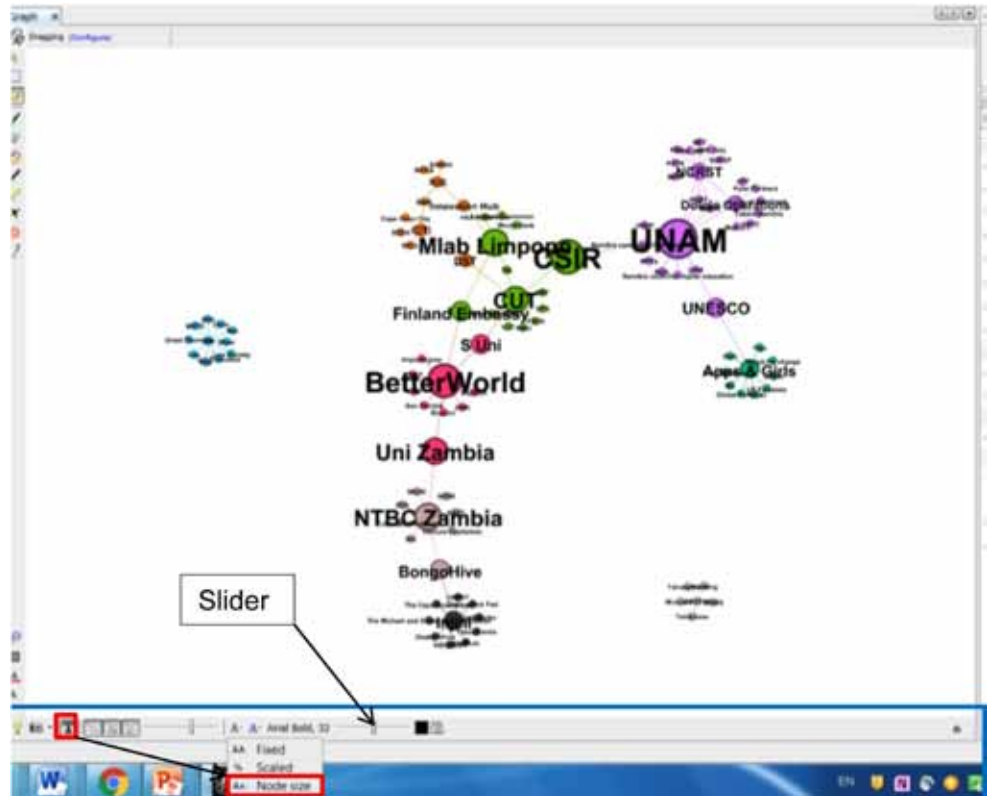


Figure 10: Annotated network

10. SAVING THE PROJECT

Open the “Preview” window. If the central area appears blank, click on “Refresh” in the “Preview settings” window. To save the diagram, click on the tab “SVG/PDF/PNG”. A new window will open; choose a file name and extension for the diagram (see Figure 11). The final

saved image is shown in Figure 12. To save the project as a whole, simply select “File” from the task bar, then “Save As”. Enter a name with a .gephi extension. This will ensure that all the settings are saved for the next time you wish to access the project.

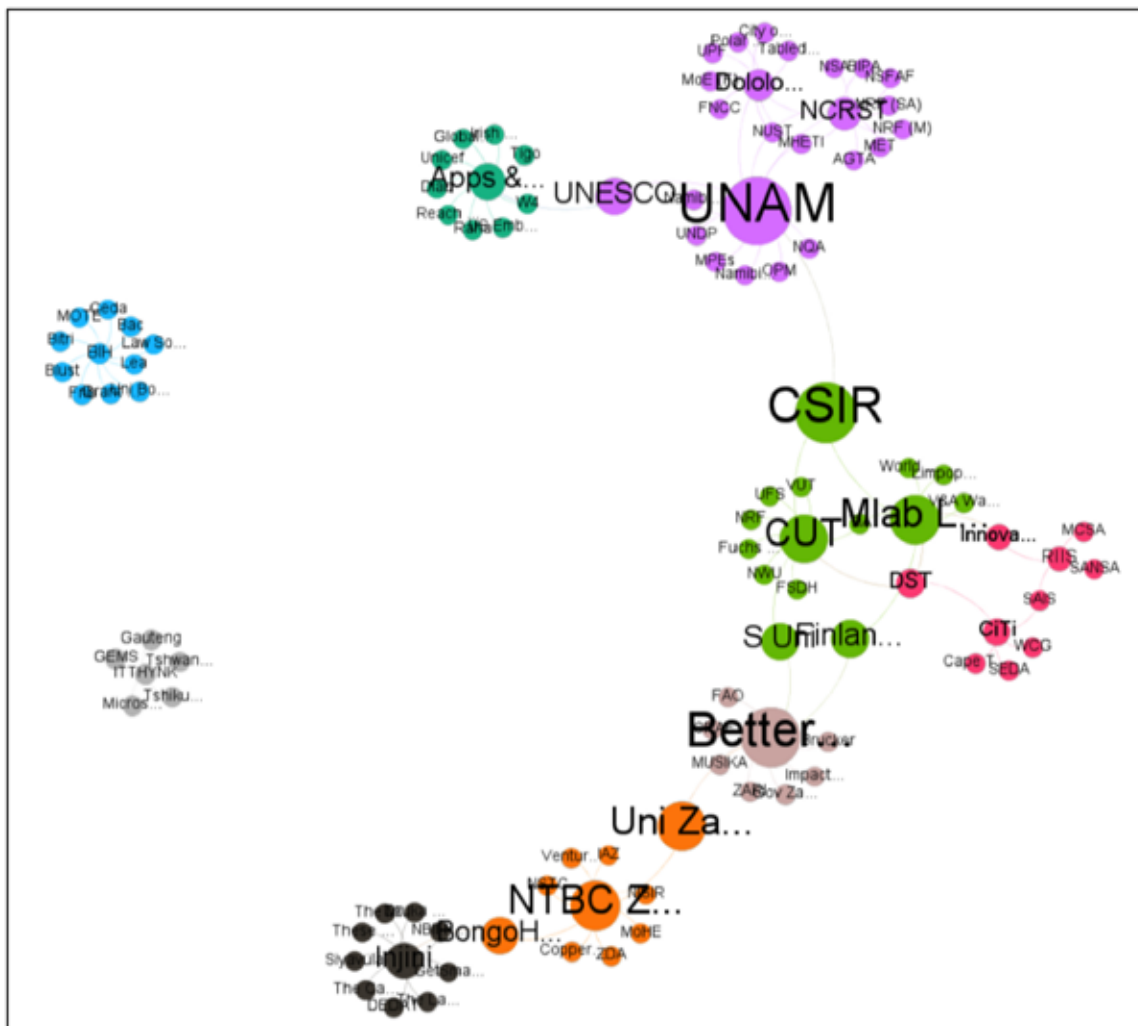


Figure 12: Final Network Map of the SAIS 2 Programme Initial Ecosystem, based on the data collected from selected SAIS Innovation Fund projects

2.5. Incorporating External Data



DATA FROM EXTERNAL SOURCES

Important sources of data for the impact case studies are the multiple public and access-restricted databases that exist outside of the SAIS activities.

Whilst the data included in these databases cannot be directly verified by SAIS 2, one can still use them to demonstrate the impact on a broad range of the programme's activities. That said, the researcher must understand the nature of each database/source of data and the limitations that may exist in the reliability and validity of the each database.

This can include data sources such as:

1. Industry-level databases/sources of data, regional and global reports (e.g. data from industry associations, chambers of commerce, public-private agencies)
2. Local and global research institutes, universities, and agencies
3. National-level statistics, usually obtainable from public sources (e.g. national statistics offices)
4. Regional databases and sources (e.g. SADC, African Development Bank)
5. Global sources (e.g. World Bank databases, reports)
6. Local and global media sources (social media, traditional media)

In the case of this toolkit, relevant data could be data on (see also the nine-element model for ecosystems):

1. Accessibility and location of markets
2. Quality and resilience of infrastructure
3. Incubators, accelerators, tech hubs, and innovation labs, both in the private and public sectors, which support the emergence and culture of entrepreneurship
4. Local and global policy, legislation, and decrees that enable ecosystems
5. Education sector actors that create capabilities and capacity
6. Mentoring and coaching activities that support emerging activities
7. Financial support systems that enable launch and growth activities
8. Business networks that enable connectedness between actors
9. Research activities, projects, plans, and strategies that enable knowledge transfer and spillovers

2.6. Mapping the Value Created

As part of the analysis of the impact, a value mapping exercise may be useful. Based on the work of Den Ouden (2011), the value canvas presents a way to join the four levels of value (users, organisation, ecosystem, society) to economic, psycho-social, and ecological values.

The key observation is that until now, it has been difficult to place sometimes very contradictory values into a joint framework. The idea is to ask oneself, “How, where, and to whom am I proposing to create value, and what is the nature of that value?” The insight of the framework is to create a multiple-level approach to value. As we note, business profit is only one of the many boxes. For some organisations (e.g. social enterprises) profit may be important for survival, but the key value is the social responsibility in the activities. Similarly, users may give weight to happiness or the activities’ eco-footprint.

It is evident that not all of the values will receive an equal weight in the process, but the argument is that each one should be considered, when we are heading towards an economy where the meaning of things is of importance.

When we are thinking about the value we intend to create, it is useful to think about the meaningful innovations that we aim for.

	ECONOMY	PSYCHOLOGY	SOCIOLOGY	ECOLOGY
SOCIETY	Financial wealth	Mental well-being	Access to a meaningful life	Livability of environment
ECOSYSTEM	Stability in the ecosystem	Shared drivers between parties	Reciprocity by the actors in networks	Sustainability of the activities in the network
ORGANISATION	Profit in cash or in kind	Core values of the party	Social responsibility in the activities	Eco-effectiveness in the operation
USER	Value for money for the user	Happiness in engaging	Belonging to a group	Eco-footprint of own activity
				den Ouden, 2011

REVIEW CANVAS

Dissonance =
Cognitive
dissonance =
not at hand

Canvas 3

REFERENCE MATERIAL

3.1. Glossary



Entrepreneurship

Entrepreneurship is “the process of assimilating various resources for creating a product or a service that can serve the need of the customer” (Sharada and Parameshwar, 2015). Therefore, established entrepreneurs are actors who create products, services, or PSSs (product-service systems) by responding to users’ needs. On the other hand, early-stage entrepreneurs are actors who, consciously or unconsciously, start their own enterprise to offer a certain product/service to the market. Entrepreneurs do not operate in silos since their activities affect the communities in which operate, and also vice versa. The societal structures in which the entrepreneurs are centred directly influence the success or failure of that business. Therefore, entrepreneurial ecosystems comprise many different elements that surround the entrepreneur’s direct network. It is important to understand what this ecosystem looks like and what the position of the entrepreneurs within that ecosystem means. It is crucial to identify which ecosystems already exist, how they work, and how local systems are built up.

Ecosystems

There are numerous definitions of different types of ecosystems in the management, economics, and business literature. The term is primarily derived from biological ecosystems, coined by Roy Clapham in 1930, and is defined as a “system that includes all living organisms (biotic factors) in an area as its physical environment (abiotic factors) functioning together as a unit” (Biology Online). Similarly, these concepts can be translated into the enterprise arena with regards to mapping, developing, replicating, and scaling entrepreneurial ecosystems. Entrepreneurial ecosystems are key to understanding how the “biotic” and “abiotic” factors influence each other in the same manner as plants, animals, microorganisms, soil, atmosphere, etc. interact with one another. It is about understanding the relations and interactions between all units involved in the successful functioning of an ecosystem. The key difference between a natural and man-made ecosystem is that all actors are intelligent and task-driven at a high level in man-made systems.

Some of the earliest definitions categorise four types of ecosystems: Business Ecosystem (Moore, 1993); Innovation Ecosystem (Adner and Kapoor, 2009); the Entrepreneurial Ecosystem (Prahalad, 2005; Stam, 2015; Brown and Mawson, 2019) and; most recently, the Knowledge (Based) Ecosystem (van der Borgh et al., 2012), ecosystems as platforms (Autio and Thomas, 2014) and, finally, Service Ecosystems (Akaka & Vargo, 2014; Vargo & Lusch, 2017). In order to understand each ecosystem type, a few definitions, sub-categories, and main elements are provided.

Business Ecosystems

Business Ecosystems can be defined as “loose networks – of suppliers, distributors, outsourcing firms, makers of related products or services, technology providers, and a host of other organisations – that affect, and are affected by, the creation and delivery of a company’s own offerings. Like an individual species in a biological ecosystem, each member of a business ecosystem ultimately shares the fate of the network as a whole, regardless of that member’s apparent strength” (Iansiti and Levien, 2004, p. 2). Recent literature indicates three dimensions of the business ecosystem: Context (Lu et al., 2014; Moore, 1993; Rong, 2011), Configuration (Iansiti and Levien, 2004; Rong et al., 2013a), and Cooperation (Chen et al., 2014; Moore, 1996; Rong et al., 2013b). Business context includes six phases, which are: *Emerging, Initiating, Diversifying, Converging, Consolidating, and Renewing* (Lu et al., 2014).

Business configuration considers different roles, connections, and interactions between various ecosystem stakeholders (under different contexts). Iansiti and Levien (2004) described the four typical ecosystem roles, which include: Keystone, Niche Player, Dominator, and Hub Landlord. Business cooperation is the connector of the context and configuration, by focusing on the macro roles that each ecosystem stakeholder plays in the different phases. This dimension of the business ecosystem has two types of cooperation within an ecosystem. The first one is the ecosystem’s strategy for nurturing the ecosystem (Iansiti and Levien, 2004; Rong et al., 2013a) and expressing the interactions between the keystone, focal firms, and their complementors. The second type of cooperation is a collective, process-based strategy that covers adjustment, adoption, and convergence (Rong et al., 2013b).

Furthermore, there are a few characterisations of business ecosystems, such as:

- loose network or horizontal and vertical actors;
- a platform;
- an evolution/coevolution of these actors (Li, 2009);
- inter-organisational networks (Moore, 1993);

- emphasis on the business-related value-creation process that emerges due to close collaboration between various firms (Scaringella & Radziwon, 2017);
- having a main purpose to create and capture value through innovation (Basole, 2009) and achieve competitive advantage through collaboration that leads to economies of scale (Clarysse et al., 2014; Iansiti and Levien, 2004).

Finally, a business ecosystem can be defined as “an economic community supported by a foundation of interacting organisations and individuals [...] produces goods and services of value to customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders. Over time, they coevolve their capabilities and roles, and tend to align themselves with the directions set by one or more central companies” (Moore, 1996, p. 26).

Innovation Ecosystem

A system of innovations can be defined as “all important economic, political, social, organisational, institutional, and other factors that influence the development, diffusion, and the use of innovations” (Edquist, 2006, p. 14). Innovation ecosystems in turn can be defined as a “network of interconnected organisations, connected to a focal firm or a platform, that incorporates both production and use side participants and appropriates new value through innovation” (Autio & Thomas, 2014). These types of ecosystem are also “collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution. Enabled by information technologies that have drastically reduced the costs of coordination, innovation ecosystems have become a core element in the growth strategies of firms in a wide range of industries” (Adner, 2006, p. 1).

As outlined in the project briefs, an innovation ecosystem approach seems most appropriate to the project because it incorporates organisations, institutions, and markets into an integrated model

explaining the development, diffusion, and use of systems of innovations. At the core of the systemic concept of innovations is the fundamental idea of interactions between the components. These components are populated by agents and actors whose roles and influences illuminate how the systems function, and how it can be enhanced or transformed for better effectiveness and improved efficiency.

The main difference between business and innovation ecosystems is that the latter have a more intangible approach to the customer where there is a high uncertainty of supply and demand (Scaringella & Radziwon, 2017). An innovation ecosystem consists of firms, governmental and non-governmental organisations, funders, etc. where all actors are interconnected within the system (Adner, 2006; Carayannis and Campbell, 2009; Li and Garnsey, 2014; Wright, 2014). In these types of ecosystems, stakeholders play different roles in the value creation process (Adner and Kapoor, 2010; Eisenhardt and Galunic, 2000; Moore, 1993; van der Borgh et al., 2012; West and Bogers, 2014) that occurs through collaboration. This collaboration is usually led by an ecosystem orchestrator (Adner, 2006; Adner and Kapoor, 2010; Rohrbeck et al., 2009) and this role enacts the creation of a strategy for coordinating the knowledge flows within the collaborative network. The concept of innovation ecosystems, either as platforms, virtual spaces, etc., usually have keystone companies play a significant role in the direction and development of the ecosystem.

Knowledge Ecosystems

Knowledge ecosystems' activities are usually centred on universities and a dense network of surrounding companies. They are usually geographically co-located and focus on knowledge generation. However, knowledge that is sourced from a particular territory does not automatically include a firm as a member of the business ecosystem (Scaringella & Radziwon, 2017). Van der Borgh et al. (2012) defines a knowledge-based business ecosystem as an interdependent set of heterogeneous and knowledge-intensive organisations. Knowledge-intensive companies will usually be

centred around a so-called anchor tenant, such as a university or a public research organisation (Clarysse et al., 2014). This will serve as a geographic hotspot and whose purposive action is centred on knowledge. The main role of the anchor tenant is to facilitate research commercialisation processes and connect all players from diverse organisations (Scaringella & Radziwon, 2017). This type of ecosystem acknowledges the intersection of the business world and academia in value creation.

Entrepreneurial Ecosystems

The term “entrepreneurial ecosystem” was introduced by Prahalad (2005) and mainly focuses on economic wealth and the generation of prosperity. “The market-based ecosystem allows private sector and social actors, often with different traditions and motivations, and of different sizes and areas of influence, to act together and create wealth in symbiotic relationship. Such an ecosystem consists of wide variety of institutions coexisting and complementing each other” (Prahalad, 2005, p. 65). This type of ecosystem includes a wide spectrum of actors, including individuals, entrepreneurial teams, firms, and supporting organisations (Autio et al., 2014). Additional ecosystem actors include venture capitalists, law firms, accountants, etc. as part of the entrepreneurial support network (Kenney and Patton, 2005). Entrepreneurial ecosystem development involves enterprises, universities, the non-profit sector, and government with the role of establishing policies for creating business-friendly environments centred on entrepreneurship for long-term growth (Scaringella & Radziwon, 2017).

This innovation ecosystem approach is based on four key pillars (Carayannis and Campbell, 2012) of government, universities and research centres, industry, and civil society. Civil society often targets the poorest socio-economic groups in emerging economies. Overall, the entrepreneurial ecosystem appears to be the most effective way of describing a task-driven network, especially in emerging markets and developing economies. For the purposes of this study, entrepreneurial ecosystems are systems that are centred on an entrepreneur or entrepreneurial team and supported and

nurtured by the government and its leaders through direct or indirect support.

The ecosystem is centred around the successful interaction between all actors at both the national and individual level (Nambisan and Baron, 2013). As Isenberg (2010) notes, it is composed of a set of individual elements – such as leadership, culture, capital markets, and open-minded customers – that combine in complex ways, emerging at the intersection of national culture, legal and political systems, and entrepreneurial cognition.

Services Ecosystems

Service ecosystems are based on shared institutional arrangements and mutual value creation through service exchanges (Akaka & Vargo, 2014; Vargo & Lusch, 2017) in interactions between resource-integrating actors and systems (Ng and Wakenshaw, 2017). Service ecosystems are understood as multi-actor networks (Tsujiimoto et al., 2018), with no dominant single actor, where both public and private parties operate (Autio and Thomas, 2014), and where early-stage entrepreneurs are the users (van der Borgh et al., 2012). As an extension of Service-Dominant Logic, service ecosystems are seen to exist as platforms for value co-creation, where resources in competences, relationships, and information connect the actors (Vargo and Lusch, 2017). They are self-contained, auto-adjusting, integrating resources, and are connected through institutional logics and value co-creation (Ng and Forbes, 2009; Bitner et al., 2012; Spohrer et al., 2012, 2013; Vargo and Lusch, 2017). These interconnections can only partially be designed, with ecosystem dynamics that require effective governance, rules, principles, and enabling platforms (Jégou and Manzini, 2008). Building on Maglio et al. (2009), Vargo & Lusch (2017), and others, service ecosystems can be defined as providing a purposefully designed and organised system of services that enables multi-layer value co-creation in a multi-actor network.

Social Network Analysis

Social network analysis (SNA) is the process of investigating social structures through the use of networks and graph theory. It characterises networked structures in terms of nodes (individual actors, people, or things within the network) and the ties, edges, or links (relationships or interactions) that connect them. Examples of social structures commonly visualised through social network analysis include friendship and acquaintance networks, business networks, social networks, and collaboration graphs. Visualisations provide a means of qualitatively assessing networks and changes in them by varying the visual representation of their nodes and edges to reflect attributes of interest. Social network analysis has emerged as a key technique in modern sociology, emerging from the work of early sociologists who wrote about the importance of studying patterns of relationships that connect social actors.

3.2. Bibliography



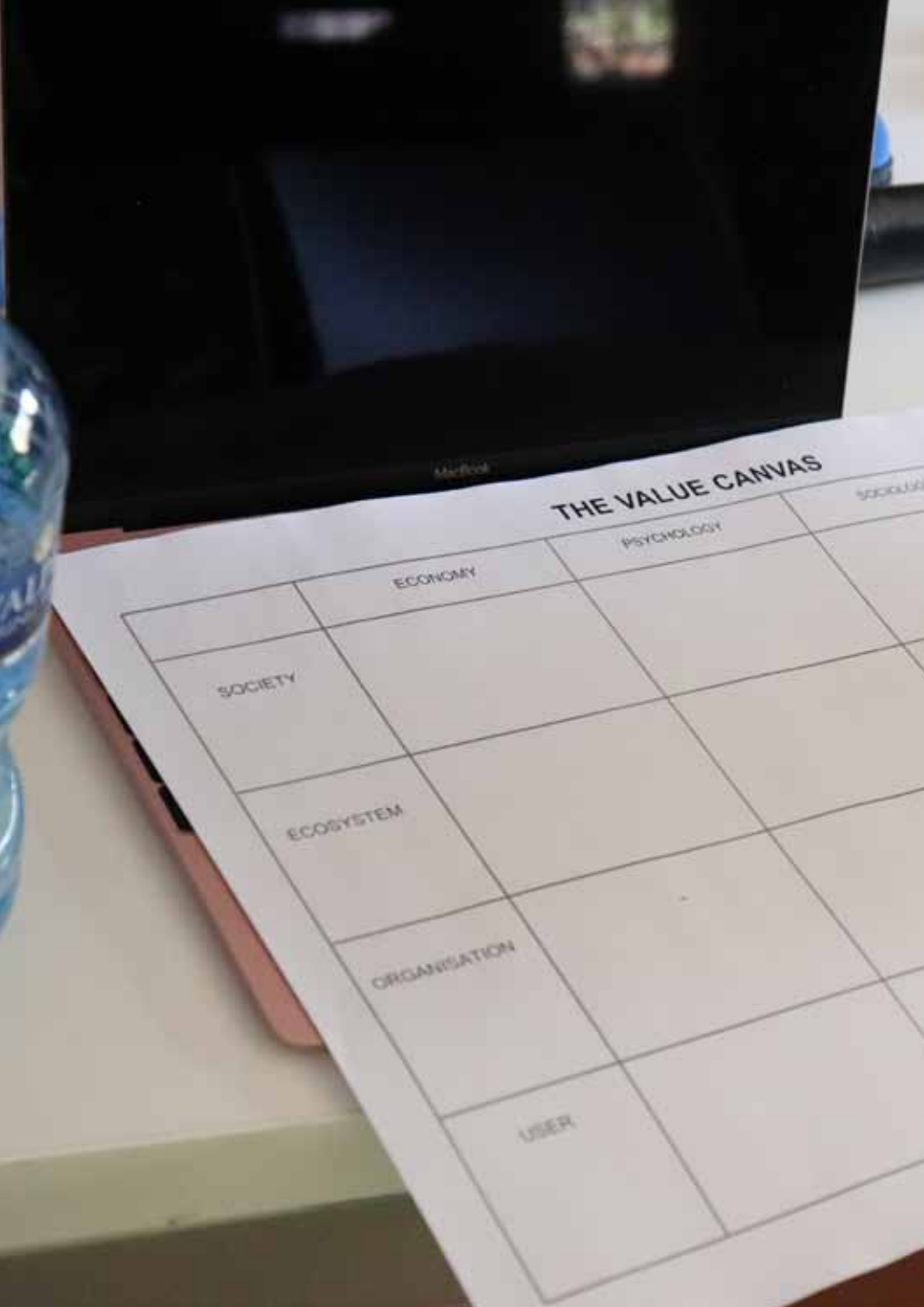
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3.3. Working Canvases



IMPACT CASE REVIEW CANVAS

KEY PROBLEMS	STAKEHOLDERS
INDICATORS	ACTIVITIES
OUTPUTS	OUTCOMES

IMPACT CASE STRUCTURE

EXECUTIVE SUMMARY	INTRODUCTION
IMPACT EVIDENCE: EVOLUTION OF SOCIAL NETWORKS	IMPACT EVIDENCE: INDICATORS AND ACTIVITIES
IMPACT STORIES	CONCLUSION

THE IMPACT CANVAS

Indicators Activities	Awareness	Attitudinal	Economic	Environmental	Well-Being	Policy	Cultural	Capacity	Gender
Surveys									
Workshops									
Interviews									
Focus Group									
Social Media									
Traditional Media									

THE IMPACT CANVAS: TRACKING CHANGES IN SOCIAL NETWORKS

	Membership	Structure	Resources	Infrastructure
Initial				
Midterm				
End of Project				

THE ECOSYSTEM MAPPING CANVAS

CULTURE	MARKETS
POLICY	HUMAN CAPITAL
SUPPORTS	FINANCE

ANNEX

DATA INPUT FOR SNA WITH GEPHI

SOURCE	TARGET	TYPE	SOURCE	TARGET	TYPE
Injini	BongoHive	Undirected	NTBC Zambia	MoHE	Undirected
Injini	NBII-NUST	Undirected	NTBC Zambia	NSTC	Undirected
Injini	The Launch Pad	Undirected	NTBC Zambia	Uni Zambia	Undirected
Injini	Dzuka Africa	Undirected	NTBC Zambia	NISIR	Undirected
Injini	These hands	Undirected	NTBC Zambia	Venture Capitalists	Undirected
Injini	The Cape Innovation	Undirected	NTBC Zambia	ZDA	Undirected
Injini	Siyavula	Undirected	NTBC Zambia	Copperbelt Uni	Undirected
Injini	GetSmarter	Undirected	NTBC Zambia	BongoHive	Undirected
Injini	DEDAT	Undirected	NTBC Zambia	IAZ	Undirected
Injini	The Michael and Susan Dell Foundation	Undirected	BIH	Uni Botswana	Undirected
UNAM	Namibia commission of research	Undirected	BIH	MOTE	Undirected
UNAM	Namibia council of higher education	Undirected	BIH	Bitri	Undirected
UNAM	NUST	Undirected	BIH	Blust	Undirected
UNAM	MHETI	Undirected	BIH	Ceda	Undirected
UNAM	UNDP	Undirected	BIH	Lea	Undirected
UNAM	UNESCO	Undirected	BIH	Fnb	Undirected
UNAM	OPM	Undirected	BIH	Bac	Undirected
UNAM	CSIR	Undirected	BIH	Law Society	Undirected

SOURCE	TARGET	TYPE	SOURCE	TARGET	TYPE
UNAM	MPEs	Undirected	BIH	Grant Thornton	Undirected
UNAM	NQA	Undirected	BetterWorld	Brucker	Undirected
CiTi	SAIS	Undirected	BetterWorld	ImpactAgree	Undirected
CiTi	WCG	Undirected	BetterWorld	ICRAF	Undirected
CiTi	SEDA	Undirected	BetterWorld	S Uni	Undirected
CiTi	DST	Undirected	BetterWorld	MUSIKA	Undirected
CiTi	Cape Town City	Undirected	BetterWorld	FAO	Undirected
RIIS	MCSA	Undirected	BetterWorld	Finland Embassy	Undirected
RIIS	SANSA	Undirected	BetterWorld	ZARI	Undirected
RIIS	SAIS	Undirected	BetterWorld	Gov Zambia	Undirected
RIIS	Innovation Hub	Undirected	BetterWorld	Uni Zambia	Undirected
NCRST	MHETI	Undirected	Mlab Limpopo	DST	Undirected
NCRST	UNAM	Undirected	Mlab Limpopo	CSIR	Undirected
NCRST	NUST	Undirected	Mlab Limpopo	Innovation Hub	Undirected
NCRST	AGTA	Undirected	Mlab Limpopo	Finland Embassy	Undirected
NCRST	NSA	Undirected	Mlab Limpopo	Limpopo Connexion	Undirected
NCRST	MET	Undirected	Mlab Limpopo	TIA	Undirected
NCRST	NSFAF	Undirected	Mlab Limpopo	V&A Waterfront	Undirected
NCRST	NRF (M)	Undirected	Mlab Limpopo	World Bank	Undirected
NCRST	BIPA	Undirected	ITTHYNK	Microsoft	Undirected
NCRST	NRF (SA)	Undirected	ITTHYNK	GEMS	Undirected

SOURCE	TARGET	TYPE	SOURCE	TARGET	TYPE
Dololo Operations	Polar Partners	Undirected	ITTHYNK	Tshikululu	Undirected
Dololo Operations	UPF	Undirected	ITTHYNK	Gauteng	Undirected
Dololo Operations	MoE (F)	Undirected	ITTHYNK	Tshwane Uni	Undirected
Dololo Operations	FNCC	Undirected	Apps & Girls	Tigo	Undirected
Dololo Operations	Tabled Namibia	Undirected	Apps & Girls	US Embassy	Undirected
Dololo Operations	City of Windhoek	Undirected	Apps & Girls	Irish Embassy	Undirected
Dololo Operations	NUST	Undirected	Apps & Girls	Unicef	Undirected
Dololo Operations	UNAM	Undirected	Apps & Girls	Dlab	Undirected
Dololo Operations	MHETI	Undirected	Apps & Girls	Global Fund (w)	Undirected
Dololo Operations	NCRST	Undirected	Apps & Girls	UNESCO	Undirected
CUT	VUT	Undirected	Apps & Girls	W4	Undirected
CUT	NWU	Undirected	Apps & Girls	Reach for change	Undirected
CUT	S Uni	Undirected	Apps & Girls	Raha	Undirected
CUT	CSIR	Undirected	CUT	DST	Undirected
CUT	NRF	Undirected	CUT	UFS	Undirected
CUT	TIA	Undirected	CUT	FSDH	Undirected
			CUT	Fuchs Foundation	Undirected

Innovation in Africa depends on the strength of the continent's innovation and entrepreneurial ecosystems, but very little is known about them, especially in the Southern African Development Community (SADC) region. Without this knowledge, it is nearly impossible to know which interventions by governments and development organisations work and which ones do not.

Developed by the Southern Africa Innovation Support Programme (SAIS 2) and Loughborough University London, Impact in Networks and Ecosystems serves to provide a timely reference and framework for reporting on the impact of innovation initiatives.

Initially aimed at creating the evidence base for SAIS 2 supported projects in Botswana, Namibia, South Africa, Tanzania, and Zambia, the presented methods provide a standardised means to gather and study network and ecosystem data and build impact case studies within on a little-known area of innovation intervention in the SADC Region and, if applied elsewhere, beyond.

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