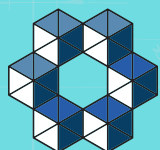


Innovation Ecosystem Management Methodology

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WITH THE COLLABORATION OF

SOURCE OF INNOVATION

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Executive Summary

While innovation is presently an inherent element of the economic growth of states and private companies as well as of quality of life in general, many organizations are not familiar with methods for developing and implementing innovation.

The main challenges innovation faces in the water, sanitation, and solid waste sector in Latin America and the Caribbean can be split into three categories: governance efforts; sector innovation ecosystem (research, development, and innovation), and water, sanitation, and solid waste utilities. In this line, it is key to acquire knowledge of international experiences to enrich the analysis and thematic discussion on the issue.

The Israel Innovation Institute (III) is a Non-Governmental Organization (NGO) that was established in 2011 to promote the development and implementation of innovation addressing global challenges such as transportation, climate change, health, agriculture, aquaculture, and desertification. To this end, the III established innovation ecosystems that connect relevant players with the fields they wish to promote, and created innovation opportunities, always acting objectively and impartially.

Over the years, as the III gained experience, it formed a methodology that can be adjusted to and implemented in other sectors and fields to enhance their potential and address existing obstructions. Such methodology can be adopted by NGOs, countries, and regions according to the barriers their ecosystem experiences. Hence, a strategy that one ecosystem chooses may be different from the strategy that suits another. Yet, while the innovation clusters and ecosystems may vary, a common, organizing operational outline can be found in all.

The methodology includes tools that were designed to match the development of innovation ecosystems facing new challenges and opportunities. Some of the tools introduced in this paper are still under development and others may be altered in the future to match technological improvements or new market needs. However, their underlying rationale serves to develop future tools for promoting local and international innovation communities. Thus, the framework outlined herein serves as a guiding structure for strategic thinking and continuous learning, rather than a rigid constraint for ecosystem developers, who navigate in evolving conditions.

This document opens with a presentation of the positive potential of forming and operating innovation ecosystems and the global trends that make them even more important (section I). The five fields of operation that promote innovation ecosystems are thus presented, each followed by practical examples of relevant tools: (1) market education; (2) social capital creation; (3) access to knowledge; (4) open innovation facilitation; and (5) internationalization in section, alongside practical tools to develop each layer, and the motivation for choosing each, which can assist in selecting from the extensive toolbox (Section II). Finally, some practical tips to start with the right foot are described (Section III).

This document frames III's acquired knowledge, providing parties interested in forming innovation ecosystems with comprehensive concepts, and practical and adaptable sets of tools that can promote innovation in various sectors.



Introduction: Israel Innovation Institute

Governments, funds, and corporations have been investing billions in Research and Development (R&D), seeking solutions for global challenges. Though these efforts produced wide knowledge, converting that knowledge into expandable solutions has been slow going and yielded a high fail rate.

For more than a decade now, the III has been successfully promoting the development of innovation ecosystems that aim at accelerating the implementation of solutions in numerous fields – such as smart transportation, digital health, advanced agriculture, climate change, desertification, and aquaculture. The III sees them as pluralistic environments that acknowledge the various players' needs and aspirations, leveraging them to accelerate the development and implementation of solutions for the main issues that trouble mankind.

The formation of innovation ecosystems may relate to geographic regions, based on existing local infrastructures of skills and knowledge. Such ecosystems rarely evolve without a guiding hand. In most cases, the promotion of innovation environments is a task for central or local governments or parties that intend to promote a field, while showing no preferences for the short-term goals of any business or firm. When this happens, the process mainly focuses on developing infrastructures; on signals to existing and potential players that new opportunities exist in that field; on forming coalitions; and on making funds accessible.

Over the years, the State of Israel has managed to develop several innovation ecosystems (water, agriculture, and security). Since 2011, following an Israel Innovation Institute initiative, the Israeli Government has been supporting the establishment of several innovation ecosystems according to the methodology that the Institute had developed. That methodology is applied by a range of state collaborations which create international communities centered in Israel. The fact that the III acts as a neutral player and only for the good of the ecosystems – has yielded significant success stories. Since the Institute has been active in the fields of smart transportation, digital health, and advanced agriculture for the past 5 years, its success can be quantified. While for climate change, desertification, and aquaculture – the Institute has been active for 3 years or less, thus its results are unquantified yet.



Our Ecosystems



Promoting Smart Transportation technologies – Over \$25 billion invested in relevant local companies and more than 50 Israeli branches of international car companies.



Transformation of health systems to implement innovation – Transformation of innovation management in the local health system with more than 100 innovation executives and some 800 pilot programs.



Addressing the global food crisis – Leading Israel's main Agtech conference, managing to make Israel 7th globally in terms of investments in AgTech, increasing local investors by a factor of more than ten.



Promoting solutions to desert challenges and fighting desertification – The field was defined, local and international partners harnessed, and Israeli solutions located.



Promoting climate challenges technologies' adaptation and mitigation – The field was defined, and a local ecosystem was leading to a conference with over 1,200 Israeli and international stakeholders held in Tel Aviv.



Dealing with ocean health and human nutrition – An Eilat-based environment was established, turning its southern port and beach city into a national and global aquaculture center.





Section I

What is an innovation ecosystem and why developing one is a good idea

1. The main concepts

This chapter defines the term “innovation ecosystem” and explores the necessary conditions required for its proactive development. Innovation is a process in which ideas are distilled into desired solutions, thus promoting economic productivity and social development.

Both governmental and private-sector executives realized that innovation is the most important factor of growth strategies in their fields. Better human capital is attracted to innovative fields. In addition, innovation-driven organizations and ecosystems unite people working separately, which allows more efficient utilization of resources to find new solutions that are complex and adapted to the needs of clients, increasing the sector’s chances of surviving in conditions of uncertainty, and increasing its activity. Finally, the development of an ecosystem as a promoter of innovation contributes to its ability to compete on a global level and integrate into global value chains.

Alongside these factors, recent global challenges – such as the shortage of natural resources, climate change, and aging populations, that demand creative solutions – made many states realize that innovation is the central tool for the advancement of the economy and society.

Consequently, states and organizations increasingly invest in innovation and adopt comprehensive innovation policies, while past policies focused mainly on science and technology, now the understanding is that solution-finding is based on more than these two, therefore more is invested in innovation-motivating environments. So much so that it is hard to find an Organisation for Economic Co-operation and Development (OECD) state without extensive innovation policies (at least at the declarative level).

Yet, the promotion of solutions for many of the world’s current challenges is difficult due to problematic market structures or regulations, even if those solutions could have local and global influence. These challenges cannot be solved by a single organization, state, or even generation. The spontaneous development of innovation is hindered by current market obstacles such as the absence of critical infrastructures, lack of funds, restrictive regulation, or undefined needs and priorities. Thus, the creation of mechanisms for the development of ecosystems that promote innovative solutions is clearly needed.

Acknowledging the importance of the issue, the United Nations (UN) referred to it as one of the “Sustainable Development Goals” (SDGs) in 2015 as Goal 17 intends to:

“Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries”.

2. Key trends that shape global innovation

2.1. Globalization

Until just a couple of decades ago, innovation activities took place in only a few centers such as the USA, North-European countries, Japan, and Russia. Globalization has redefined the centers of the global economy, making the competition over positioning global innovation systems, access to emerging markets, and financial and human resources grow significantly.

One meaning of this process is that the policymakers must try and identify markets that are about to form while activating plans for ecosystem development to position themselves as global central factors, requiring a variety of action paths. The III believes that local innovation ecosystems must be connected to global environments to locate resources, knowledge, and international contacts that would promote those local ecosystems.

2.2. Multitude of Sources and Multi-disciplinarity

Modern innovation systems integrate knowledge and capabilities, as scientists, entrepreneurs, and developers merge resources in their attempts to offer solutions for complex systemic phenomena. Such activities typically comprise interdisciplinary scientific, industrial, and service-based collaborations. Emerging in almost every field, the information revolution has been reshaping industries and economies worldwide. The III has witnessed breakthrough advancements in the fields of health, agriculture, energy, environment, and transportation that led to dramatic changes as industrial boundaries vanish. The global innovation environment was further affected by the expansion of potential innovation sources. Presently, innovation processes all over the world no longer rely exclusively on the common triangle of academy-industry-government but are the results of far more complex combinations of experts and organizations, following the emergence of new players with diverse track records. This created a challenging need to create interfaces, a common language, interdisciplinary conversions, and trust among the necessary players in the evolving innovation system.

2.3. Shifting from “closed” to “open” Innovation

The fact that modern innovation processes draw from a multitude of sources and are interdisciplinary has led to a profound change in the management perception which pushed the development of organizational infrastructures that support innovation processes. That trend has motivated many to find ways for innovation processes to go beyond the boundaries of individual organizations. Models that combine locating external knowledge and implementing it, and exposing intra-organizational developments to external audiences, are currently standard practices used by the business and public sectors. The literature refers to these collaborative structures as “open innovation”:

Open Innovation: “The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively.”¹

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1. Chesbrough, H.W., West, J. and Vanhaverbeke, W.(2006) Open Innovation: Rese Paradigm. Oxford: Oxford University Press.



Open-innovation concepts have been dealing with emerging complexities, focusing on the need to develop apparatuses that allow a two-way flow of ideas – to and from organizations – creating reciprocal benefits and crossing sectorial and organizational borders. Open innovation helps companies deal with the extensive mobility of talented and skillful individuals, available capital, shorter product life cycles, and supply time. To promote open innovation, the development of new organizational and national capabilities is needed.

Open innovation requires not only large organizations to develop new capabilities of absorbing innovation according to their needs but also the establishment of organizations that mediate the process of transferring knowledge between the various players. These organizations must be familiar with the available technologies and solutions and with procedures creating collaborations between solution providers and challenge owners. As the scope of innovation ecosystems expands, organizations find it increasingly harder to understand the market, making the role of mediating organizations even more important. the III is such a mediating organization, among other things. Its unique position (and edge) is because as an NGO, it has no vested interests – economic or other – in any specific solution, which is why it remains neutral and impartial throughout matching processes.

3. Summary

In summary, almost all states and organizations presently see innovation as a growth engine. The driving force behind innovation-based developments, as in any industrial development process, stems from the competitive powers that connect supply with demand. the III innovation-management methodology as presented here is, therefore, based on a holistic concept which, while addressing the needs of both the supply and the demand sides, focuses on their intersection, that is, the economy itself.

Such mediation must acknowledge three basic concepts: (1) Innovation is not only technological; it relates to business models and behavioral patterns. (2) Interactions based on mutual curiosity and interests between the demand and the supply parties are the main channels of innovation, as they improve learning and development processes. (3) Innovation is a combining process. The biggest breakthroughs do not follow from some single discovery but from the connection of a variety of elements and fields of expertise.

Lastly, both individuals and organizations usually shy away from innovative moves and prefer to maintain business as usual. Developing an innovation ecosystem demands deep cultural change both in the participating organizations, as well as between them. Therefore, to promote a transformative process in an ecosystem, the leading player must show commitment to the process to show key players they are not alone. One approach to deal with this obstacle is to position leading individuals to be the heroes of the process, which will motivate and walk hand in hand with the organizations.

In the following chapters, the way the III creates effective and significant innovation ecosystems is explained.



Section II

Five layers where III's activity promotes innovation ecosystems

With time, the III identified five activity layers that promote the establishment and development of innovation ecosystems. The activity mix was tailored for each ecosystem based on its needs, the nature of the bodies comprising it, and the relevant sector's level of maturity. The layers will be presented from the most basic one, referring to definitions and expansion of the number of stakeholders, to the most advanced layer, turning a local ecosystem into a global one.

the III doesn't refer to them as chronologically ordered, but as development milestones that should be addressed as layers that are both built one on top of the other and simultaneously.



PLANETech
Academy
Carbon Markets
Course

1. Market education

Bolstering each interest group that could impact the effectiveness of the ecosystem. Ecosystems comprise a wide variety of stakeholders – mainly entrepreneurs, investors, and multinational corporations, but also service providers, local and national governments, students, academia, companies with potentially related technologies, NGOs, and more. When building a strategy for an ecosystem, the key question is: Who are the main target audiences? Next, one needs to map the challenges they face, and the solutions others propose. Lastly, to characterize actions that expand the number of participants in interest groups of the ecosystem, and the depth of their involvement.

1.1 Tools

A. Defining the field and relevant interest holders

I. Defining and characterizing the field – defining the various players that form a given field is the foundation of activity. Initially, definitions are based on community leaders' knowledge and interviews with key interest holders. These definitions grow as progress is made, the field evolves, and the community becomes more familiar with the needs of the various stakeholders. A definition, therefore, follows a dynamic process that evolves over time to match the community's challenges and strengths. **For example**, EcoMotion added drones to the smart mobility sector as they identified they became more relevant and promising.

II. Mapping interest holders – in a world of excess information, we create value by mapping relevant players so that parties approaching the field will know the goals, skills, key interests, and experience levels of the various players. These may include corporations, startups, researchers, government ministries, hospitals, local governments, investors, and social groups. One must first track parties that already operate in that ecosystem to locate existing entrepreneurs in the field. With time, III's communities published maps of available solutions, investors, research organizations, and governmental funding tools. Such maps save everyone's time

and promote collaborations. Furthermore, community maps alert potentially relevant stakeholders that have not yet entered the field of its importance and size. **For example**, DeserTech formed a map of Negev resources that can help entrepreneurs adapt their solutions to desert climates.

III. Branding and publicizing – After defining the main activity fields, a website should be launched to brand the field and locate entrepreneurs who develop solutions in the field. At the same time, it is important to use social media and public relations (PR) to promote the key topic of the global challenges the community wishes to deal with. **For example**, PLANETech published a report that helped to promote public discussions about specific challenges of climate change, and technologies that tackle them.

B. Expanding the scope of interest holders' activities in the community

I. Directing relevant students toward the field – In view of the harsh competition over employment in key fields on the market, innovation communities need to actively reach out to students to motivate them to select their field of study while educating them on its potential. **For example** – AquaculTech hosted a day-long jobs fair event connecting students studying biology and biotechnology to jobs in the aquaculture tech world.

II. Connecting potential entrepreneurs with a specific field:

i. Training programs that offer practical information on the market and facilitate integration. **For example:** PLANETech hosted a 12-hour course on carbon markets for entrepreneurs who could develop such a business model.

ii. Mapping new challenges and needs – As noted, our dynamic communities are attentive to market needs while involved players may change, and out on the watch for technologies from other fields that could tackle them. **For example:** HealthIL created a map for COVID-19 challenges when the pandemic first started to create a common language around the new circumstances.

iii. Hackathon competitions on specific subjects: **For example:** GrowingIL held a process in which data scientists and agronomists collaborated to tackle an essential farming issue. That gave experts from the data world an opportunity to learn about ag-tech needs.

iv. Accelerators: **For example:** EcoMotion operated an accelerator that brought entrepreneurs from industries related to transportation closer to the smart transportation issue, exposing them to the field while training in it.

III. Connecting companies with relevant solutions to ecosystems' challenges – sometimes the solutions for specific challenges exist in other sectors. Then, the communities present these sectors the significant business opportunities in joining the field. **For example:** HealthIL promoted technologies for a virtual hospital using technologies from hotel and network management.

IV. Locating investors is by nature one of the toughest challenges when developing ecosystems. Over the years, the III has developed and operated a variety of tools for investors to find interest in innovation ecosystems:



- i. Investor meetings** – III's communities host events in which the ecosystem's potential as well as specific technologies are introduced to potential investors. The meetings generally included maps of investors outlining investing parties, their foci, and previous investments in the field, to emphasize the field's potential. Such events may be held virtually to allow foreign investors to join.
- ii. Offering accompaniment and advisory services for funds in new fields.** **For example:** PLANETech provided consulting services to VCs (venture capitals) for mapping the climate aspects of their portfolio companies. In addition, they established a climate fund forum.

V. Expanding the number of service providers

- i. Establishing a platform of needed services** to present the service providers and indicate the existing need to other relevant parties. **For example:** holding meetings mapping the needs of organizations in the fields.
- ii. Encouraging collaborations** – **For example:** DeserTech launched a competition in which only pairs of entrepreneurs and pilot sites could participate, while the prize funded their collaboration, to encourage R&D organizations to work with entrepreneurs, and vice versa.
- iii. Forming a unit that promotes deals between international entrepreneurs/companies and research organizations.** That unit's goal is to promote deals with research groups, learn about their problems, and then address them while creating quality services for end users. **For example:** DeserTech appointed a designated staffer who works on staying constantly updated with the status of the various desert R&D centers and closing deals between the research groups and international parties.

VI. Connecting multinational companies – As the III and its communities are nonprofit and therefore neutral, they can present a complete picture of sectors in Israel and introduce the needs of multinational companies to all local entrepreneurs, thus facilitating the companies' entrance to the Israeli market. As noted, this can be done through meetups, seminars, and competitions. **For example:** AquaculTech scouted for Middle Eastern food companies looking to collaborate with Israeli solutions for a wide range of Eilat-based tech companies.

VII. Promoting government activities – Communities collaborate with governments and regulators in their fields. Communities need to make government bodies familiar with their work, encourage the promotion of supportive regulation (and eliminate regulatory restrictions and hindrances), locate sources of government funds, and connect entrepreneurs with government plans. If there aren't enough governmental funding tools, they should create them, to present first success stories that will attract more entrepreneurs to the field. **For example:** DeserTech arranged a meeting of Negev entrepreneurs, Israel's Innovation Authority, and the Ministry of Economy to discuss regulation challenges and opportunities for scale-up in the region.



IDB's Reflections

In Inter America's water case study context, the focus on market education, has been instrumental in addressing non-revenue water (NRW) challenges. Key actors including water operators, regulators, customers, and international cooperators play pivotal roles. Study tours to Costa Rica have provided invaluable insights and knowledge about the potential of developing and moving the sector forward. Understanding the root causes behind water loss has been paramount in guiding targeted interventions, and helped identify the relevant stakeholders that should participate in the innovation ecosystem. As many Inter-American countries have similar water challenges, they can be inspired by other innovation ecosystems to learn their structure, and participating stakeholders.

2. Social capital creation



AquaculTech's Innovation Authority & Entrepreneurs Session

Forming a network of relationships among parties that operate in similar fields creates value for all. The operative meaning of social capital in innovative contexts is exchanging knowledge, developing resources, and forming collaborations. Innovation follows from professional collaborations and informal encounters (conferences and meetups) in which the players forge trust. Such connections, which could not have been formed without ecosystems, lead to the creation of new ideas and breakthrough solutions that benefit all parties. Hence, one of the main goals of innovation communities is to know the interest holders, connect them with relevant others, and help them realize they could profit from unexpected collaborations. Such connections may be formed within the groups of stakeholders, or between them. For these connections to become effective, ecosystems must be familiar to all interest holders, their challenges, and their strengths. It is not enough to connect them, in many cases, an ecosystem leader needs to facilitate their discussions to lead the conversation in the most productive, important, and meaningful directions.

2.1. Tools

A. Community meetings

- I. **Community conferences** – the ILL communities usually hold annual conferences in which challenge owners and solution providers get together. This is a business conference designed to promote deals and get relevant parties to discuss future challenges in the field. **For example:** EcoMotion hosts an annual conference around smart transportation technologies, bringing thousands of interest holders together, and promotes discussions between solutions and other stakeholders, as well as round tables of challenge owners.
- II. **Learning meetings** – dedicated to specific issue within their field, that gathers stakeholders operating in it from different angles. If the issue is too specific, it might reduce the number of participants and fail to create value, but if it's too wide the common ground might be not relevant enough. Thus, the subject of the meeting should be closely examined to make sure the issues discussed in it balance these two components. **For example:** DeserTech hosted a meeting on

trends in desert infrastructure from various perspectives in the coming years, where a specialist architect, a materials scientist, and an engineer presented their points of view.

III. Promoting events that combine different content worlds – designed to stimulate conversations, connections, and reciprocal understanding between the parties to learn about their tangent points. **For example:** PLANETech and HealthIL initiated a competition on Zero-Carbon Hospitals, matching hospital needs with climate issues and climate-tech solutions and promoting collaborations between these two fields.

B. Promoting deals

- I. Arranging meetings of industry players with interested parties.** Subject to an early analysis of needs, this framework serves as a meeting point between relevant technologies and clients'/investors' needs. **For example:** GrowingIL and DeserTech organized meetings between Agtech startups and Negev desert farmers, after understanding the farmers' biggest needs and finding the right solutions, who adapted their presentation to farmers' audience and met with them on 1:1 sessions after the presentations.
- II. Investor conferences** – As noted in the previous chapter, these are events where innovative, under-the-radar technologies are presented to investors, who are introduced to the field. These events aim to promote an environment of trust between investors and startups.
- III. Presentations of companies' needs and capabilities** – After a thorough sorting work of both challenges and facilities with a company, the community can introduce it to the ecosystem and connect it with other relevant parties. In some of those encounters, after a screening process, the community might host B2B (business to business) meetings. **For example:** GrowingIL promoted a process of connecting Israeli companies to Nestlé's challenges.
- IV. Harvesting technologies from the academia** – In this framework, the community identified pre-commercialized technologies and introduced them to interested entrepreneurs to achieve a better network of scientists and businessmen. **For example:** AquaculTech organized a meeting between researchers and industrialists, to create interfaces between the two.
- V. Presentations of government funding or support plans** – Meetings in which policies, programs, and work tools are presented for feedback purposes. Government working frameworks are not accustomed to such discussions with entrepreneurs, which is where the communities step in. **For example:** AquaculTech organized a meeting between Israel's Innovation Authority and Eilat companies that shared their challenges with existing tenders, to improve their effectivity.
- VI. Mentoring programs (paid or volunteers)** – Many players developed skills that they are willing to share, free of charge or for a small fee, to create meaningful value. **For example:** HealthIL and EcoMotion established programs for mentors who support entrepreneurs, they get exposure to the most advanced and new technologies, and the entrepreneurs learn from more mature player's experiences.

C. Specific connections

In most cases, the III creates connections based on cases in which interest holders in a given ecosystem directly address the community head, seeking answers to specific questions such as: Who operates in a certain country? Who works with multinational companies? Or which technologies exist in a given field? Since the community is at the junction of the ecosystem, having connections with a variety of players, community leaders can serve as reference points as they can easily locate knowledge-holders in the community and simply connect the dots. Hundreds of such specific connections are made annually.

IDB's Reflections

Social capital creation could be addressed by digging deeper into each country's local communities. Tailored communication strategies, attuned to diverse stakeholders, are necessary. **For example**, effectively managing IDB's projects of treating polluted basins in Colombia, by building connections and trust with communities relying on river water, forms a cornerstone of the engagement for a well-adapted plant in both the short and long term. IDB should learn about the local ecosystems and build relationships between the leading players of each and the planning committee, engineers, and water experts for fruitful projects that will be a result of the effective connections of all participating stakeholders.



DeserTech Solutions Table

3. Access to knowledge

The overwhelming amounts of data and knowledge contribute to the formation and development of new sectors yet can be confusing and disturb the players when not organized properly. In addition, difficulties arise when entrepreneurs' ideas do not meet the needs of the companies, while companies often do not know how to define their challenges in a language that entrepreneurs can understand. Therefore, the idea of this layer is to break monopolies of knowledge, organize it and make it accessible to the ones who need it, while spotlighting burning needs and issues. The role of innovation communities is to manage knowledge on both ends and serve as objective professionals that distribute it to the interest parties. This helps communities guide markets toward future challenges or fields that could serve as key engines for advancing ecosystems by forming a language that connects challenges with solutions. Thus, we conceptualize the main challenges of a given field, locate solutions, and guide markets to bridge those gaps with both existing and future technologies and tools.

3.1. Tools

A. Creating a common language – drawing maps of relevant challenges and technologies in the field. When launching activities in a given field, it is particularly important to define the bulk of relevant issues. Thus, communities collect, arrange, and publish maps of associated challenges. **For example:** DeserTech, which addresses global desertification challenges, collaborated with various desert researchers to build a

table of the significant global challenges in the field, and the most promising solutions. This table connects the main desert challenges with the main sectors that could solve them, which defined the borders of this ecosystem, and created a common language for challenge owners and solution providers. GrowingIL, PLANETech, and EcoMotion have similar maps as well.

B. Training clients and entrepreneurs

I. Courses and seminars on core issues to entrepreneurs, potential clients, innovation officers of organizations, and professional executives in which they learn all about challenges, solutions, and implementation. **For example**, EcoMotion trained innovation officers from Israeli municipalities about the existing solutions they can implement in their systems, and the ways they can work with them.

II. Refining horizontal challenges shared by several organizations and identifying solutions. To help organizations join forces around challenges they didn't know they shared. **For example**, HealthIL pinpointed several central issues that impact the digital transformation of Israel's health system. It examined issues such as fairness, adult treatment, and logistical systems, to promote discourses between Israeli and international organizations and relevant government activities, sharing experience with existing technologies, and spotlighting the missing ones to encourage the development of new solutions.

C. Policies

Communities play an important role in understanding government policy processes on the one hand, and the people and systems in the field on the other. Being closely associated with most interest holders, communities can bridge the gaps between the two, and promote policies that address the actual needs and minimize hindrances. **For example:** HealthIL supported the development and implementation of a cloud-based health policy by organizing existing and potential gaps based on discussions with all relevant interest holders and built a recommendations document so that the policy will be as fit to the needs and barriers of the field as possible.

IDB's Reflections

A fateful matter such as water management of traditional communities should be based on trust, and therefore ensuring access to knowledge is central to the initiative's success. A Challenge Map has been developed to chart progress and to relate the government's actions to the situation in the field. While benchmarking reports highlight potential monetary losses. Proactive leak reporting and participation in commercial aspects are key strategies to keep adapting the solutions to the specific challenge and conditions each country and region have.



Pilot
Design
Workshop

4. Open innovation facilitation

Large and non-technological organizations are often based on a multi-generational workforce, and work practices that pass from generation to generation in a marginal way. These organizations are required to undergo a transformation to adapt to the new era of innovation, they need to know the language, understand the technological interests and potential, and the opportunities for the specific content area, adjust their regulatory processes and work processes, and more. Part of the challenge is to develop tools that shorten response time and enable the assimilation of ideas and solutions from the market. In response to this, the role of an innovation community is to support, accompany and train organizations to specify their needs and locate and implement innovative solutions that meet them. In order for them to operate effectively, they are required to develop an appropriate organizational infrastructure that will allow them to characterize their challenges, develop solutions independently through internal entrepreneurship, or locate existing solutions in the ecosystem and absorb them, and implement them in practice. These processes don't happen spontaneously and need a guiding hand to make them better and faster. Once solutions are being implemented wisely both the organization wins, and the solution provider, but also the entire ecosystem which receives the signal that the field has business potential and attracts more stakeholders to it. This is a win-win-win situation.

4.1. Tools

A. Focusing the organizational innovation strategies – Referring to innovation as an organizational value might be confusing because some organizations “fall in love” with “cool” innovation processes but ignore issues that could create organizational value. The ILL has chosen to accompany organizations as they define their innovation strategies vis-à-vis their goals on the one hand and capabilities on the other. **For example:** HealthIL characterized various models of innovation management in Israel's health organizations.

For example, These are some of the tools that promote such processes:

- I. A tool for evaluating existing innovation situations in organizations:** a questionnaire that reveals real gaps between organizations' aspirations and their current state.
- II. A tool that characterizes innovation strategies,** which eventually presents organizations with the bulk of components they may need when formulating innovation strategies.
- III. An organizing model for forming strategic partnerships,** which helps organizations analyze the relevance of partnerships with their potential solution providers, presenting ways to formalize collaborations so that they effectively benefit both parties.

B. Challenge identification – As stated above, the leading concept when promoting innovation in large organizations and ecosystems is **challenge-oriented innovation**. This is why organizations need to understand their challenges and the conditions required for choosing a solution.

Below are several ways to pinpoint challenges:

- I. Workshop** – locating organizational challenges – An initial key problem is the fact that organizations that should implement solutions are not always capable of identifying and defining the significant challenges they are facing. As a result, organizations might waste time and resources running innovative solutions that do not perfectly match their needs. In this workshop, varied interest holders from inside the organization get together and define them. **For example:** a HealthIL workshop for Israeli health system officials helped find a focal point for their innovation center activities.
- II. Competition for locating organizational challenges** – Challenge identification competitions help organizations define the main challenges they face, based on the broad participation of all organization members in the selection process, which promotes two goals: focusing solutions by defining the organizations' main challenges and promoting a culture of innovation at every organizational level.
- III. Locating opportunities and solutions** – Solutions might arise within the organization or outside of it. Working inside organizations is an opportunity to train people in innovation, build in-house accelerators or innovation hubs, and even run hackathons on the issue at hand. When looking for solutions outside the organization, the following tools apply:
 - i. Marketplace** – creating an online platform that relevant parties can directly access to learn about the specific challenges and find potential solutions, and connect the dots.
 - ii. Challenge competition** – a relevant tool for addressing new challenges in which solutions are imported from other areas. In such competitions the organization must define specific challenges, and then work with potential solutions to adapt them for their systems. **For example,** DeserTech conducted a challenge competition in which a variety of water solutions were adjusted to match water-pumping challenges in rural Africa.
- IV. Solution assessment** when examining technologies, there is room for training players in decision-making practices that address issues such as understanding the technology and determining the ripeness of solutions and ways they match the organizational challenges. The community instructs organizations to not necessarily choose the most advanced or shiny technologies but to opt for those that create the most value for them, by using -
 - i. Technology assessment tools** with which organizations identify the bulk of aspects that need to be addressed in the process, from technological suitability to legal and commercial aspects.
 - ii. Tools for adapting solutions from one field to another** – for which parties need to be familiar with the challenge field and the solution field and examine whether the transition from one world to another works.
- V. Planning pilots** – Creating a pilot is itself a project that comprises goals and success indexes. The process must be conducted correctly, organized properly,

and require the lowest expense possible. Therefore, the III developed tools for creating a common language among entrepreneurs; tools for the detailed planning of pilots; and tools for planning collaborations between organizations and technology-producing parties.

VI. Organizational culture and work processes that promote innovation – a comprehensive toolset designed to support organizations' innovation mechanism. Among other things, **For example**, it includes training innovation executives or trustees who motivate managerial work processes in the organization.

VII. Improving the capabilities of innovation officers and agents of change in organizations – In this context, the institute creates systems for learning, consulting, and collaborating that organizations cannot develop on their own, intending to empower agents of change and help them succeed in their missions. **For example**, the following is a list of tools the III developed in that context:

- i. Training innovation officers for specific organizations** – HealthIL trained health organization officers in managing innovation in their field, and Ecomotion trained municipalities officials in managing innovations pertaining to smart transportation.
- ii. Distribution of open innovation-management tools** – all the tools mentioned so far are defined as open source and are free for use by any organization according to its needs to promote innovation processes.
- iii. Managing a community of agents of change** – managing a community of innovation officers in a given field improves their professionalism in the field and creates relevant networking. HealthIL manages a community of innovation officers of health organizations from Israel and Europe. They meet for peer learning, exposure to relevant opportunities, and common needs identification.
- iv. Meetups on horizontal challenges** – a meetup around a horizontal challenge for a variety of players, that brings together potential solution providers with all challenged organizations.

IDB's Reflections

To promote the implementation of new solutions and open innovation processes, it's useful to assist the managing players in challenge identification, scouting, pilot design, and innovation culture, to support the entire open innovation cycle, and help the best solutions get to the field in the best way possible. Focusing on specific water management challenges could improve these efforts, such as leveraging wastewater for farming as a continental project. Engaging with companies to identify their challenges, scout for startups and tech companies to find the best solutions, pilot design processes to start implementing them, and public awareness campaigns for innovative culture building will foster a collaborative and innovative environment. On a broader level, establishing an innovation unit that will facilitate these actions for the entire region could be meaningful.

Living Lab Tool Kit

Strategic focus	Challenges identification	Opportunities & Solutions Search	Solutions evaluation	Pilots, POC & implementation	Culture & infrastructure
Innovation Management Navigator	Challenges identification workshop	Intrapreneurs training	Adaptation Navigator	Pilots and POC Design	Org. Innovation facilitation tools
Innovation team mentorship	Challenge Identification competition	Organizational Accelerator	Technology evaluation tool	Innovation Projects Prioritization criteria	Innovation enablers training
Innovation Management Canvas	Challenge identification toolkit	Startup speed dating	Solution evaluation methodology	Collaboration Calculator	Innovation officers training
		Incubation process		Stakeholders' Value: What's in it for me?	Innovation enablers community
		Challenges competitions		Buzzword Dictionary	Innovation management structure and processes
		Hackathon		What does a startup mean..	Infrastructure Checklist: IT, legal, funding & HR
		Market Search		Collaboration checklist	Ecosystem strategy and Management
		Marketplace development			



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5. Internationalization

New solutions for global challenges are required and developed everywhere, that is why this layer refers to ways of gathering and expanding all parts of global ecosystems when seeking to strengthen a local ecosystem. The strength of an ecosystem is measured by its ability to attract and create value for international players. The development of a closed-loop ecosystem is limited, and as long as it's not connected to the rest of the world, it won't be able to move forward and innovate significantly. Given the rapid transition of capital and capabilities over national boundaries, positioning an ecosystem as a global formation is essential for its success. Although we can refer to internationalization as an aspect that is reflected in each of the other four fields, it needs unique attention and special tools that help the international connections deepen even further. Ever since it was established, the III has focused only on global challenges whose solutions could create value for organizations and companies all over the world. The Institute's message to local entrepreneurs is: properly dealing with local challenges could create value in other places. The Institute has, therefore, invested numerous resources in connecting local ecosystems with global parties. This layer covers some activities mentioned in previous layers, but geographic distances require the development of unique tools.

5.1. Tools

A. Introducing the local ecosystems to international players – As an impartial organization, free of economic considerations, the III can objectively introduce ecosystems to and promote deals with foreign companies. **For example**, this is done with the following tools:

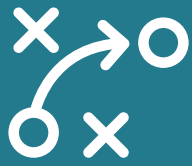
- I. Global conferences** – the Institute communities wish to become international innovation ecosystems centered in Israel. Therefore, they actively bring international participants to local conferences where the local players are positioned as a holistic and advanced ecosystem.
- II. Global investors' conferences** – virtual or physical conferences where Israeli capabilities are presented to international investors.
- III. Solution maps** – presenting the full picture of the local companies in a certain field.
- IV. Escorting foreign players while in Israel** – scouting for them and connecting them to local players that meet their needs.
- V. Providing services to foreign companies and organizations for a fee** is meant to enhance the activities of these players in Israel. **For example**, III gave seminars about innovation ecosystems development to European ecosystems' managers where they were provided with innovation management tools and connected the institute's communities.

B. Creating global presence for communities to interest foreign organizations in promoting joint activities. **For example:**

- I. Infrastructure for digitally transforming community activities** creates opportunities for community members and international organizations to join activities. Using the infrastructure, the communities further define challenges for each field, map Israeli companies that operate in the field (later adding international companies as well) and publish materials for international use.
- II. Shared services for foreign and Israeli companies** – **For example**, HealthIL has been promoting collaborations with international health organizations to introduce its unique activities and promote the development of solutions for global issues, which otherwise wouldn't be addressed by Israeli companies.
- III. Forming a global community of professionals** – HealthIL develops a global community of innovative officials in health organizations worldwide, that although similar to the local community, it has some unique characteristics making it relevant to international players and enabling global knowledge sharing and collaborations.

IDB's Reflections

Connecting each country to its neighboring Inter-American countries, and the world could lead to better and faster solutions. To foster such collaborations IDB could host an international seminar to discuss both the challenges and developments of technologies and practices, to serve as a platform for sharing global technological advancements. Addressing the intricacies of local and international collaboration, as well as regulatory policies, forms a critical aspect.



Section III

Determining community strategies in practice

All ecosystem leaders encounter obstacles that prevent the field from evolving spontaneously. Although the tools listed above can help promote various activity fields and serve various goals, they should be used wisely to reach their full potential. Therefore, they can be treated like tactical moves, but what about the community's strategy? This chapter discusses guidelines for focusing strategies of innovation ecosystems and provides some practical tools to start its development on the right foot. In short, first – map the ecosystem, second – make this knowledge also available to others, third – create meaningful collaborations, and fourth – never stop adapting to the dynamic conditions. In long:

1. Mapping

First, one should map the existing ecosystem, no development program starts in a vacuum. It is essential to learn who are the key players already active in it, and what are their main barriers. Initial research and “toes dipping” always include meetings that seem like a waste of time at the beginning, yet many times turn out to be beneficial in the long run, as unmediated connections and relationships are built. In the same way, some of the players that seem to be the most pivotal ones will turn out to be not very useful to the ecosystem as they don't cooperate or are open to innovative approaches. Nevertheless, this is the time to make all these mistakes. By mapping, we refer to:

1.1. Development hindrances: assessing the impact that a given challenge has on the evolution of the ecosystem. The more an issue hinders operation, the more important it is to address it. Yet, although this is a necessary condition, it isn't sufficient, as one needs to assess how mature the ecosystem is to deal with that hindrance. Given that ecosystem leaders have limited abilities to deal with numerous challenges in the short run, it should address the most significant ones, with the highest potential to tackle.

1.2. Assessing potential short-term change: The dynamic nature of innovation ecosystems requires simultaneous work over three time scopes: short, medium, and long. Ecosystem leaders need to act within a short timeframe while learning and quickly adapting their activities to meet the needs of their ecosystem. At the same time, they should engage in mid- and long-term (up to 3 years) operations that allow for harnessing large players and creating significant impact, while clearly demarcating fields and systemic hindrances, which require long-term treatment.

1.3. Players identification: while meeting various stakeholders, we not only learn from their experience but also about them: their characteristics, in-house challenges, and goals. Websites only show the top of the iceberg, and to get the full picture, an ecosystem leader must know its people personally.

2. Access to knowledge

Then, after collecting and mapping quality information about key players and obstacles, it is very effective to share it in different mediums such as reports, online maps, meetups, lectures, and meetings with relevant officials. This will not only provide the local ecosystem with useful information but will expand the number of participating players, after learning that they can take part in it. By doing so, the ecosystem leader also positions itself as a focal point of the ecosystem.

3. Market education & social capital creation

Then, the ecosystem leader should collaborate with key organizations to leverage their capabilities, and reputation to push big moves. Other players will join the ecosystem only when it will be beneficial and serve their interests, therefore, it is important to create valuable opportunities in collaboration with important organizations to attract more stakeholders. The ecosystem leader should opt for goals that could attract process partners who, with time, could invest their time and capital in the issue. In some cases, strong ecosystem members should be given credit for their activities, at the expense of the ecosystem-leading organization's PR, to make them even more interested in promoting the ecosystem.

4. Never stop innovating!

Lastly, after forming and positioning the new ecosystem, the ecosystem leader should continue working on dynamic research and new opportunities leverage. Things keep evolving and to be an ecosystem leader, one should always be updated and educated on its ecosystem. By doing so, we refer to:

4.1. Finding and seizing opportunities: If a market opportunity that could be a game changer arises, it should be seized while forsaking the predetermined strategy. In this respect, running innovation ecosystems resembles guerilla moves of seizing opportunities, and less following long-term strategic plans.

4.2. Daring to raise new ideas (that we believe in): Organizations tend to become conceptually fixated. One purpose of innovation ecosystems is to raise new issues that could be relevant to its members. If one finds a relevant topic, it should be addressed with suitable caution, while knowing that new ideas bear both opportunities and dangers.

A few tips to start on the right foot:



Identify your ecosystem's strengths first; don't focus solely on challenges.



Understand the current obstacles and barriers within the ecosystem after assessing strengths.



Connect with key players personally; face-to-face interaction builds trust like nothing else.



Create opportunities that add significant value for stakeholders, to connect them to the ecosystem and create positive PR.



Keep innovating continuously as new challenges and opportunities emerge.



Section IV

DeserTech's case study



A recent example is DeserTech Community which was established in 2019 to position Beer Sheva and the Negev region as a global hub of desert technologies. Below are the initial steps we took to form its strong infrastructure:

Mapping

First, the team met various players who either already operated in the field or potentially will. This way the joint venture of the Israeli Ministry of Environmental Protection, the Ben Gurion University, Merage Foundation Israel, and the III was established, forming the founding board of DeserTech. Then, meetings with executives from the desert research center helped define the sector, based on the most major global desert challenges, and promising fields of solutions. With this map, we approached the local hubs and accelerators and learned which companies are active in this field, and which could pivot to take part in it. At the same time, we met challenge owners such as municipalities and corporations to learn what has already been and what struggles they face to understand where the organizing force of the community is most needed. Lastly, we met players who would want to collaborate on specific projects.

Access to knowledge and market education & social capital creation

The premier project the community hosted was the Merage DeserTech Competition. This was a startup competition with a grant prize, achieving four goals: first, it helped the community expand its network of startups. Second, it strengthened the startups already operating in the field. Third, it spotlighted this emerging field to the wider ecosystem, attracting more companies. Fourth, it positioned the community as the center of this local ecosystem. Following the competition, with the knowledge it gathered, the community built an online platform showing the variety of available solutions to desert challenges. This online platform, called The Marketplace, exposed local companies to global markets. And gave another incentive for other companies to join the field.

The next key step was the second Merage DeserTech Competition, which was open to Dutch and British companies, who competed for a ticket to an adaptation seminar in Israel's Negev. The 20 winners got to participate in a week-long seminar aimed at adapting their technologies to arid environments using the Negev facilities, and by so expanding their target markets exponentially. This helped the community expand both its international network and its local network while building the seminar and introducing foreign entrepreneurs to local stakeholders. Lastly, it once again, spotlighted the emerging field of desert technologies, and the Negev as its center, only this time – globally. Similarly to the first competition, we built another online platform, this time dedicated to the Negev resources, such as R&D centers, pilot sites, hubs, and more, making the knowledge we gained while building and operating the seminar more accessible to the public. The platform allowed easier and faster networking and enabled collaboration building.

Lastly, based on its experience from the adaptation seminar, the community hosted another seminar, this time providing tools for innovation implementation. 30 African innovation leaders with diverse desert challenges participated in 6 online sessions followed by a week-long Negev seminar, providing them with practical tools in open innovation and tailored connections, as well as 1:1 support in the process. This program positioned Negev as an international solutions leader and attracted more Israeli entrepreneurs and players to do business with the participants, and to the field in general. In addition, this project dealt with the hindrance of lack of implementation, referring to the layer of open innovation facilitation.

Never stop innovating!

To conclude, three years after its establishment, DeserTech already has a global reputation and managed to position desert challenges and solutions as a key aspect of adaptation to climate change. With its guidance, the Negev built the infrastructure to support the development of new technologies. Nevertheless, the community keeps adapting itself, with one eye on the existing ecosystem, and the other on potential challenges and solutions. DeserTech continues to work hard, grow, and push the Negev, which was affected severely by the ongoing Israel-Hamas war, to be a global hub for desertech.



DeserTech's GGW Seminar





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