SNA MAPPING AND COMPARISON OF THE EVOLUTION OF THE ENTREPRENEURIAL ECOSYSTEM IN GUATEMALA FROM 2018 TO 2022.

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SNA mapping and comparison of the evolution of the entrepreneurial ecosystem in Guatemala from 2018 to 2022.
Swisscontact Guatemala

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Introduction

This report seeks to demonstrate the impacts of the Action Research and AGEE projects, carried from September 2019 to December 2022. Both projects seeked to test and validate different instruments that help strengthen entrepreneurial ecosystems. Through a systems approach, ecosystem organizations are supported to improve their services, performance and thus their sustainability.

Social Network Analysis (SNA) is a powerful and interdisciplinary approach used to study the relationships and interactions among individuals, groups, or organizations within a network. By representing these connections as nodes (individuals or entities) and edges (links or relationships), SNA provides valuable insights into the structure, dynamics, and influence within a social system. Through the analysis of network properties such as centrality, clustering, and connectivity, we can uncover key players, influential nodes, and patterns of communication or information flow.

From July 2021 to December 2022, Swisscontact worked with actors in the entrepreneurial ecosystem to strengthen and cement the interventions developed during the Argidius funded Action Research Project (2019-2021). The "Accelerating the Guatemalan Entrepreneurial Ecosystem" project managed to reach its main goal to foster connections and collaborations between local ecosystem actors in Guatemala, by making the ecosystem more inclusive and equitable, strengthening collaboration, and train Angel investors to mobilize pre-seed capital.

Our approach implied an active collaboration with ecosystem players and relied heavily on their commitment of resources to enable the interventions. When ESOs and other ecosystem players do not invest time, money or other type of resource, the impact of the intervention ends when the funding does, since it is not designed to be sustainable.

To measure the qualitative impacts of the project's interventions, it was neccesary to have a tool that allowed an in depth analysis of the entrepreneurial ecosystem, specifically, the relationships and networks created or strenghtened between ecosystem actors. Therefore, the specific objective of this report is to present the evolution of the entrepreneurial ecosystem by comparing the SNA performed in 2018 and the SNA performed at the end of the AGEE project in december of 2022.

Theorethical framework

Social network analysis (SNA) is a research method developed primarily in sociology and communication science. It is a tool to quantify and visualize relationships between actors in networks.
SNAs are different from actor mapping, as SNA does not only allow researchers to identify the actors in a network (community/ecosystem), but focus on the quality of the relationships, the direction and reciprocity of relationships, the density of the network overall, the flow of resources via those relationships, the centrality of actors and the identification of clusters.
SNA does not only serve for measuring and analyzing complex relational context, but also to track how such networks change over time.
SNA is therefore a very applicable tool for systems mapping and analysis as part of Swisscontact's Inclusive Systems Development (ISD) approach.

Networks (communities/ecosystems) are key for your work, especially as we apply a systemic approach. Instead of identifying and addressing specific problems in isolation we look at the wider picture to understand how and why an ecosystem or market fails to cover needs of its players.
Analyzing systems and relationships help us understand, predict and explain why "things work the way they do". Understanding the connections of the system in question allow us to account for them when designing, implementing, monitoring and evaluating our programs.

While other standard statistical methods do not account for these connections effectively, SNA allows us to quantify them and identify patterns.
These patterns then reveal individuals in populations that bridge social groups, trends, how individuals and organizations divide their energies between different social groups over time, the existence (or lack) of collaboration relationships and the influencers, etc. and allow us to observe how things like beliefs, or even an outbreak of disease flow through the individual connections. To make the most out of an SNA it is key to complement it with additional data to allow for a contextualized interpretation of the results.

In SNA, we distinguish between two different types of networks: whole networks and egocentric networks: in whole networks, we determine for each actor whether or not there are relations with every other actor in the network. Relations outside the network are not considered. For egocentric networks, on the other hand, we determine all relations for each actor in the network. Thereby, we can also identify actors from outside the network (Schnegg/Lang 2002: 9f). The two types of networks differ not only in the methodology of data collection, but also in the possibilities of data evaluation and interpretation.
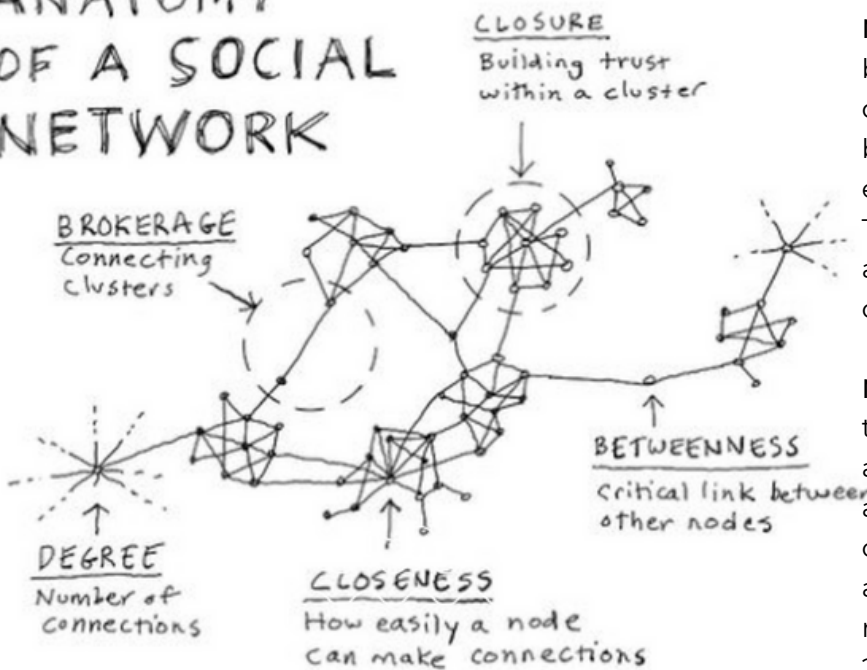
Figure 1: Anatomy of a social network. Click for reference.

Basically, we distinguish three methods of analysis in SNA:

Network arrays: When analyzing by means of arrays, we distinguish in the simplest case between existence and non-existence of network relations. This is represented in a matrix by a 0 or a 1 in the corresponding cell of the matrices.

Network graphs: In the graph-theoretical analysis, networks are graphically represented and analyzed with the help of so-called sociograms. Here, actors are represented as points and relations as lines (Schweers 2002: 10f). With directed graphs (often represented with arrows), asymmetric relations can be identified and displayed. With undirected graphs (often represented with lines) we can only analyze symmetrical relations.

Network metrics: With the help of matrix-algebraic calculations, network analytic measures can be calculated for nodes, sub-graphs or whole networks. Many of these measures can only be calculated if the network under investigation is a whole network.

One can distinguish between actor-related and network-related metrics. *Actor-related metrics* tell us something about the interconnectedness and position of an actor within the network. *Network-related metrics* describe the network as a whole, for example the density of the network, i.e., the observed relations relative to the total of potentially possible connections in the network.

One of the first workshops organized by the Action Research project on 2019.
Source: Archive

Entrepreneurial ecosystems and SNA

An entrepreneurial ecosystem refers to the interconnected network of individuals, organizations, resources, and institutions that foster and support the growth of entrepreneurship within a specific region or industry. It creates an environment where aspiring entrepreneurs can thrive, develop innovative ideas, and launch successful businesses. Key components of a robust entrepreneurial ecosystem include access to capital, mentorship and guidance, supportive government policies, a vibrant startup community, access to skilled talent, research institutions, and a culture that embraces risk-taking and learning from failures.

Density is a crucial metric in social network analysis when studying entrepreneurial ecosystems. It refers to the level of interconnectedness and cohesion among the actors within the network. In the context of entrepreneurial ecosystems, a high density of connections signifies a robust and vibrant environment. When the density is high, entrepreneurs, investors, mentors, and other stakeholders are closely linked, creating a web of interactions that facilitates the flow of resources, information, and support. This interconnectedness fosters collaboration, knowledge exchange, and the dissemination of best practices, enabling entrepreneurs to access vital resources and expertise more efficiently. A dense entrepreneurial network also mitigates the risk of information silos and fragmentation, encouraging the efficient allocation of capital and expertise. By understanding the importance of density in social network analysis, policymakers and ecosystem enablers can design strategies to nurture and strengthen the connections within the ecosystem, thereby promoting a thriving environment where entrepreneurship can flourish.

Creating Networks. 2019.
Source: Archive

A well-nurtured entrepreneurial ecosystem not only drives economic growth and job creation but also encourages collaboration, knowledge-sharing, and the overall advancement of society through continuous innovation.

Social network analysis (SNA) is a **valuable tool for analyzing entrepreneurial ecosystems** as it provides a structured framework to understand the intricate relationships and interactions among the various actors within the ecosystem. By mapping the connections between entrepreneurs, investors, mentors, universities, government agencies, and other stakeholders, SNA unveils the network's structure, identifying influential nodes and potential bottlenecks. This analysis helps in identifying key players and their roles, gauging the flow of resources and knowledge, and assessing the overall health and resilience of the ecosystem. Additionally, SNA allows for the identification of information gaps, potential collaborations, and areas that require intervention to foster a more efficient and supportive entrepreneurial environment. Through social network analysis, policymakers, investors, and ecosystem enablers gain valuable insights that can guide strategic decisions to nurture entrepreneurship and drive innovation in a more targeted and effective manner.

Guatemalan entrepreneurial ecosystem: Then

According to the 2018 report Mapping of actors of the national entrepreneurship support ecosystem, by Socialab Guatemala, Ministry of Economy, CENPROMYPE, the density of the connections mapped **was low, of just 0.022**, as seen on the image below. This means the connectivity is low, since the maximum value would be 1.
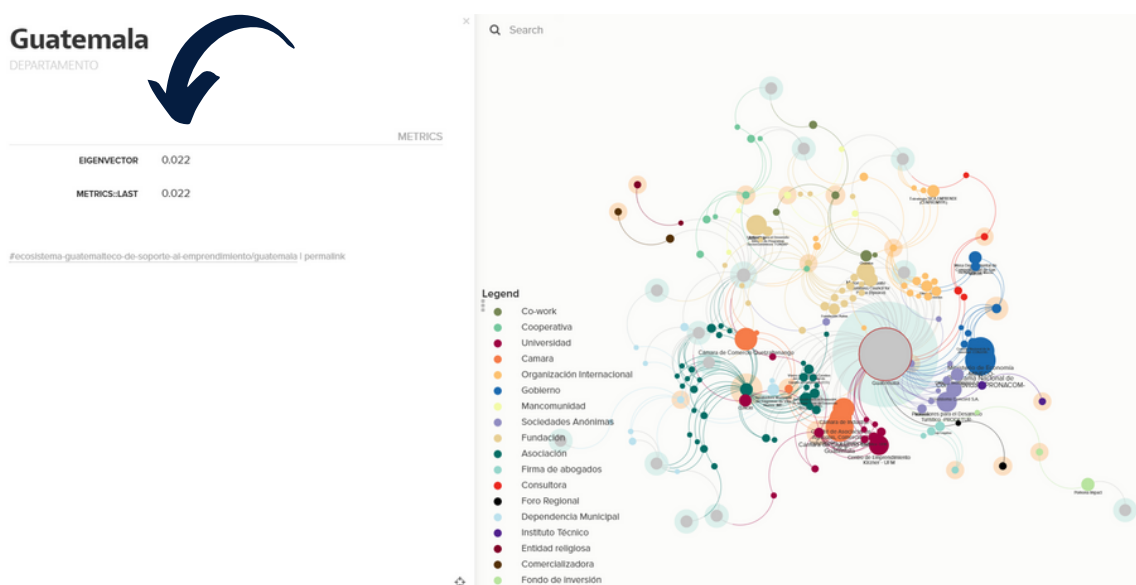
Figure 2: Mapping of the entrepreneurial ecosystem, 2018

However, what does this mean for the entrepreneurial ecosystem, and how does it translate in concrete challenges and opportunity areas? For starters, low connectivity means less collaboration and exchange, and thus, less collective learning.

According to the same study, the main challenges of the entrepreneurial ecosystem can be addressed through the following recommendations:

1. FINANCING: Development of an accessible and decentralized financing system and investment, accompanied by access to capital and strengthening of the capacities of economic self-management.

Guatemalan entrepreneurial ecosystem: Challenges in 2018

INSTITUTIONAL ARTICULATION: Dynamization of institutional relationship networks by developing incentives, capacities and conditions that allow collaborative processes, that guarantee a larger and more transparent presence of public institutions in the territories.

MENTALITY AND CULTURE: Entrepreneurship and innovation culture regeneration from territorial and intercultural development approaches, to ensure relevance, inclusion and participation in regional and global processes.

EDUCATION: Strengthening of the education system through new contents, methodologies and investigations that foster the development of concrete entrepreneurship and innovation processes with scientific and academic foundations.

ENTREPRENEURSHIP SUPPORT INDUSTRY: Diversification, decentralization and industry specialization, through strengthening of their administrative, organizational and methodological capacities.

According to the 2018 paper: *On principle, it should be considered that the entrepreneurship agenda in our country cannot develop by itself, without adequate systemic conditions (social, financial, cultural and institutional) that not only allow entrepreneurial activity, but also its sustainability and impact. The following are desirable conditions to achieve this goal:*

1. *A strong and efficient public institutionality*
2. *Higher priority and investment in education, specially in Science and Technology*
3. *A more open, dynamic and decentralized financial system*
4. *Better logistics and production infrastructure*
5. *More and better intercultural interactions*

In 2018, the researchers also concluded:

- *There is an Entrepreneurship support ecosystem, with nodes, interactions, and hierarchies, which, despite cultural, financial, and institutional contradictions, account for the existence of a complex network of relationships.*
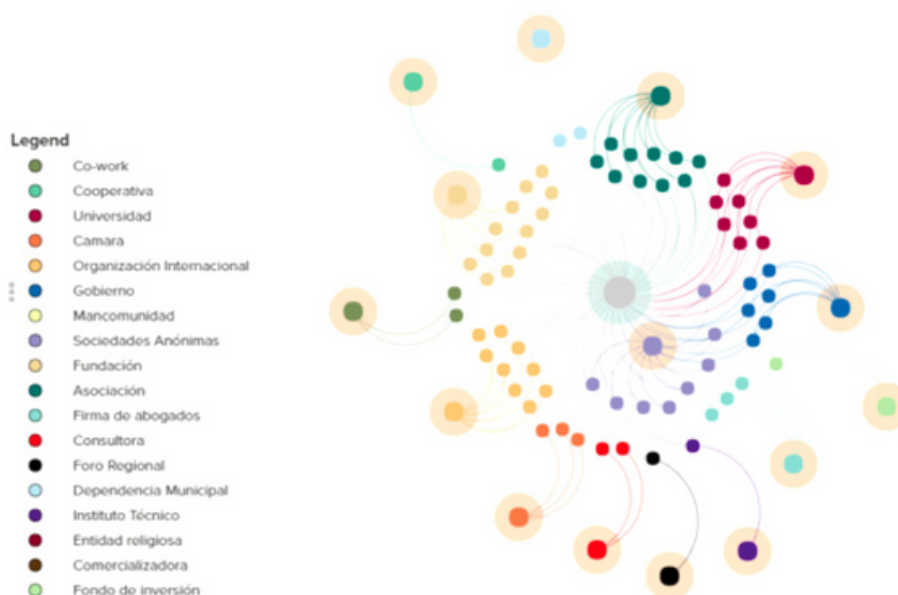

Figure 3: Metropolitan region cluster

Guatemalan entrepreneurial ecosystem: Challenges in 2018

However, there are no sustained processes and dynamics - much less institutionalized ones - of communication, coordination, exchange, learning, cooperation, and influence.

- *There is a strong trend towards the centralization of organizations and support services, as well as the spaces for coordination, public programs, and financial resources in the Capital City and Quetzaltenango. This is even more pronounced in services for dynamic and high-impact entrepreneurship.*

- *There is a strong need to strengthen the social, cultural, and territorial relevance of the institutional and methodological frameworks for supporting entrepreneurship, especially outside major urban centers. The majority of support services focus on capacity development and strengthening (workshops, mentoring, counseling, training, etc.), with only marginal attention given to technology development, high-impact financing, research, and institutional influence.*

- *The role of the State is crucial, not only because it has consistently been recognized as a key actor but also because a more transparent, decentralized, and dynamic role is demanded of it in ecosystem revitalization processes.*

- *There is an emerging recognition of systemic approaches in support (territorial development, sustainability, agroecology, multisectoral collaboration, etc.); however, in practice, there is still a disconnect between entrepreneurship activities, social participation, and territorial development.*

Methodological framework

With the help of matrix-algebraic calculations, network analytic measures can be calculated for nodes, sub-graphs or whole networks. Many of these measures can only be calculated if the network under investigation is a whole network. Basically, one can distinguish between actor-related and network-related metrics. *Actor-related metrics* tell us something about the interconnectedness and position of an actor within the network.

Network-related metrics describe the network as a whole, for example the density of the network, i.e., the observed relations relative to the total of potentially possible connections in the network.
The metrics utilized to calculate and interpret the SNA results for the 2022 excercise were the following:

Indicator	Meaning	Importance
Density	It measures the proportion of all possible connections within a network.	It also helps to understand how fast information spreads within a network, and additionally provides ideas on how social capital is managed within it.
Reciprocity	It measures whether the relationships are in one way, or in both ways, between two determined actors.	It helps us to understand if the network in question is a hierarchical network or not.
Centrality (degree, closeness, betweeness)	Measures power relations within a social network.	The distribution of power within a network defines how easy transactions or negotiations are within it, and above all, it helps to identify the key players within a given network.

Source: Hanneman & Riddle, 2005

Table 1: Main SNA Indicators utilized for the 2022 SNA

Afterwards, the main knowledge, attitudes, and practices that are to be evaluated through qualitative methods were defined, and a collection instrument was designed according to said needs. Items to explore included:

- What is the composition of the network like based on geographic, age, gender, etc. criteria?
- Which actors dominate the conversation or dynamic within the system?
- How do members find out about activities, opportunities, news that occur within the system?
- How easy or difficult is it to share information within the entrepreneurial system?
- Which actors do you consider to be invisible or relegated (for whatever reason) within the system?
- What people or institutions must be integrated into the system for it to fulfill its mission?

The SNA quantitative instrument was designed to be filled out online, which facilitated the collection and tabulation of information. In relation to knowledge, attitudes, and practices, semi-structured and in-depth interviews were conducted with 15 key actors. These actors were selected based on their influence on the ecosystem and engagement with the AGEE project.

Lastly, quantitative data was systematized through the main SNA measures (centrality, distance, etc.).

"Collaboration is key in the entrepreneurial ecosystem. Sharing best practices and educating ourselves as investors and entrepreneurs is a great way to understand the role that everyone plays"

Daniel Castillo, Invariantes Fund
And co-vicepresident of CAPCA

Investor Mixer, co-organized with the fintech association and CAPCA (The Central American and the Caribbean VC Association) on 2022.

Results
Context

The Department of Guatemala had a total of 3,015,081 inhabitants in 2018, while that of Sacatepéquez had 330,469. Both Departments have high levels of schooling compared to the rest of the country (8.75 in the case of Guatemala and 7.14 in the case of Sacatepéquez, INE, 2018). Many of the central sector's socioeconomic indicators are much better than those of Alta Verapaz and the rest of the country, although the region has its own challenges: vehicular traffic, access to drinking water, and violence and crime. Within this central sector there are 6 municipalities that are especially active in entrepreneurship issues in Guatemala and one in Sacatepéquez, the capital of Antigua Guatemala.

In terms of competitiveness, the area brings together some of the most competitive municipalities in the country, although important challenges persist in terms of innovation and labor force and human talent (FUNDESA, 2022).

Table 2: Competitiveness in the Central Sector

Municipality	Local Competitiveness Index	Ranking
Guatemala	80.17	1
Fraijanes	69.97	6
Mixco	74.47	2
Antigua Guatemala	68.12	9
San José Pinula	65.6	14
Santa Catarina Pinula	73.42	4
Villanueva	72.49	5

Source: FUNDESA, 2022.

In recent years, the municipalities of Guatemala, Santa Catarina Pinula, and Villanueva have redoubled efforts in their entrepreneurship programs. In Antigua Guatemala there has been a strong movement, promoted by Guatemalan entrepreneurs and international initiatives/organisations such as Pomona Impact. In general, the entire central sector represents a high percentage of the entrepreneurial efforts in the country.

a.Quantitative Results.

Although it is a topic that will be explored further in the report, it is important to mention that most of the institutions report having little or no working relationship with many of the Public ecosystem institutions. The institutions most mentioned as those with which they have the most relationship are the USAC (Universidad de San Carlos), and the CME (Centro Municipal de Emprendimiento) of the Municipality of Guatemala.

Female founders coalition workshop organized on 2022
Source: Archive
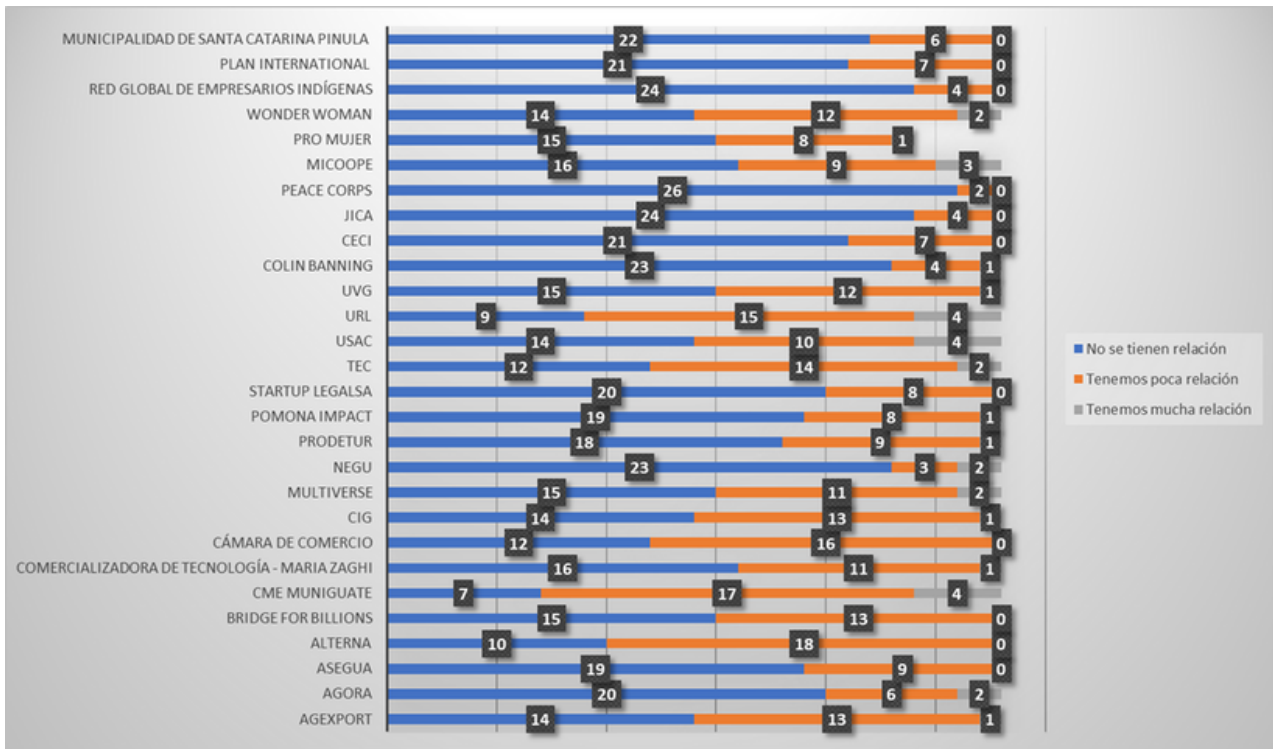
Graph 1: Relationship Between Institutions, Central Sector.

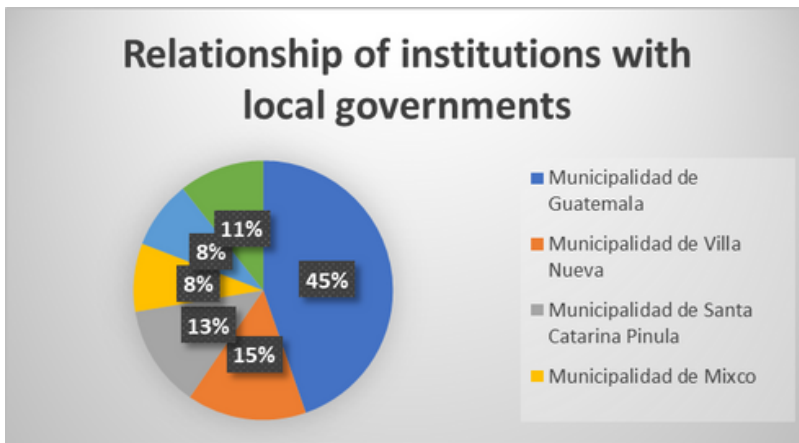Most of the organizations reported having good relations with local governments, although not with the same intensity in all municipalities. The municipality of Guatemala stands out as the most important public actor.

Graph 2 Relationship with Local Governments, Central Sector.
Source: Own data.

Regarding the top of mind (monst mentioned/active actors according to other actors) of the central sector, the mention of New Business Alliance, Grupos Gestores (whose area of influence is in the West of the country), and the National Secretariat of Science and Technology (SENACYT) stand out.
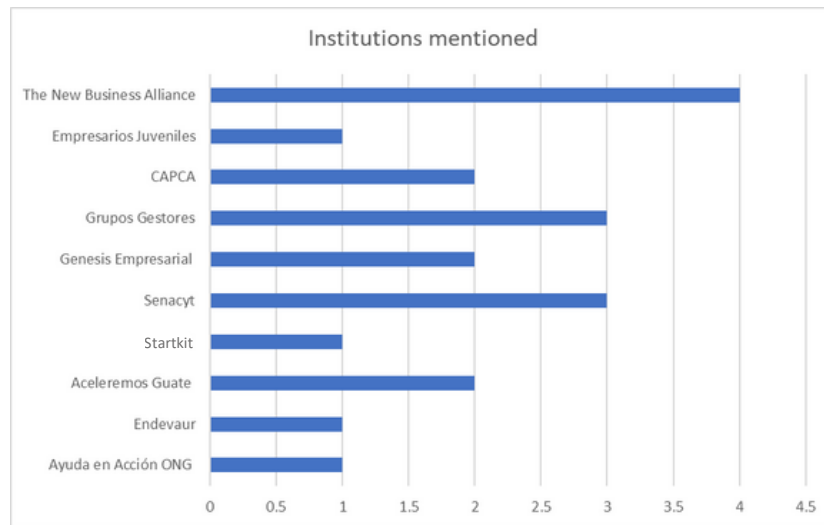
Graph 3: Top of Mind Entrepreneurial Institutions, Central Sector.
Source: Own data.

Due to the size of the Ecosystem in the central sector, there were several mentions in the top of mind about people who are influential or knowledgeable about entrepreneurship. The figures of Josefina Sontay, Andrea Mazariegos, and Diego de León stand out. In this list, the large number of women mentioned is striking. These players have a key role in the collective learning and interconectivity of the ecosystem, and are great nodes for introducing innovation and pushing new initiatives forward.
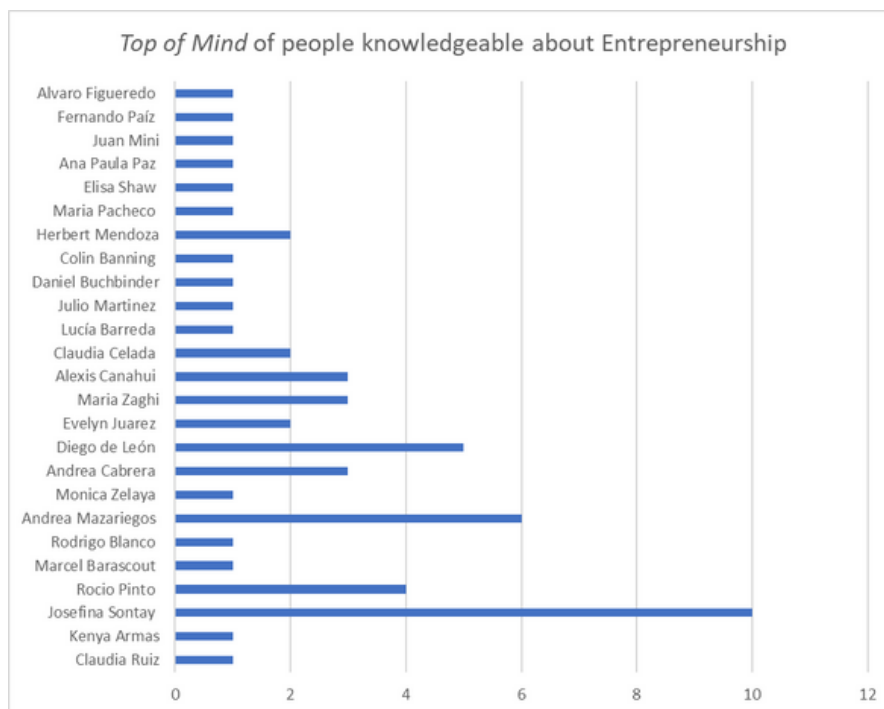
Graph 4: Top of Mind of Active People in the Ecosystem, Central Sector.
Source: Own data.

Regarding care for certain vulnerable groups, the perception stands out that young people and women are the most active, while people with disabilities do not have as much participation. Despite referring to the central sector, the lack of participation of rural groups is an important issue for those interviewed.
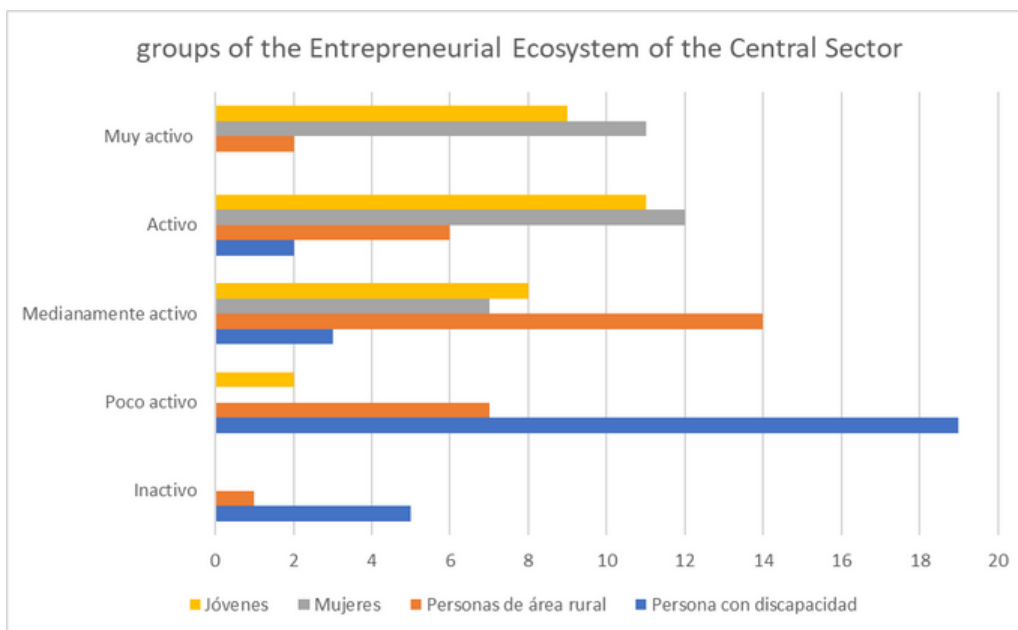
Graph 5: Activity of Different Groups Within the Ecosystem, Central Sector.

Specifically in relation to the participation of women in ecosystem activities, the majority of interviewees perceive that it is above 50% in most cases. It is also perceived that women occupy more spaces of prominence and leadership, and on many occasions they are important figures recognized by many within the ecosystem, as mentioned in previous paragraphs.
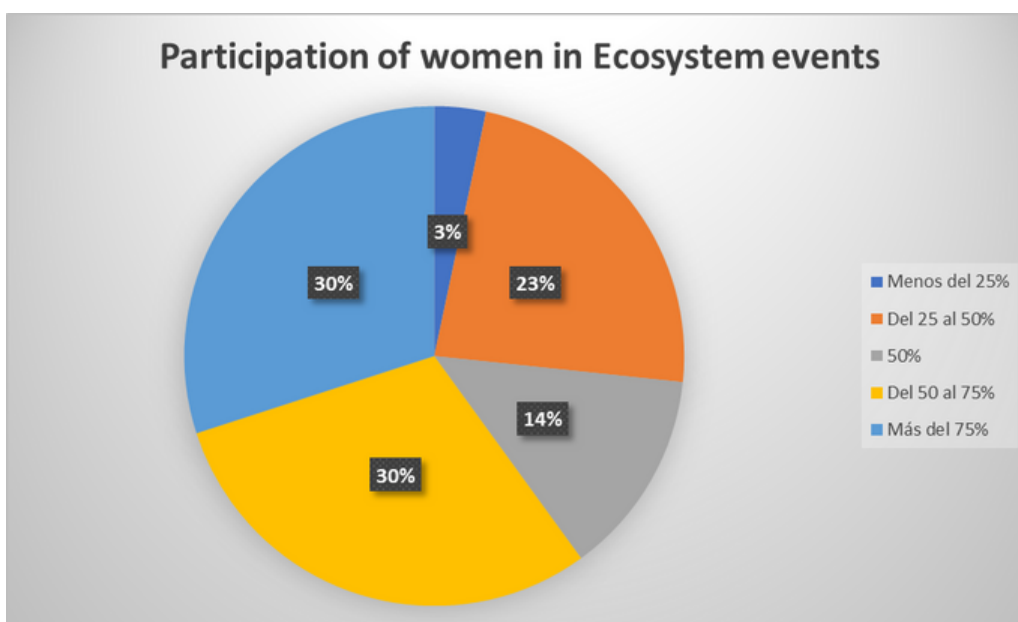
Graph 6: Participation of Women in Ecosystem Activities, Central Sector.
Source: Own data .

Regarding communication within the Ecosystem, a significant percentage considers that it is difficult or very difficult (43%), while only 7% consider it easy. Regarding the media used or preferred, most prefer to use Facebook, WhatsApp groups, or Instagram. The least used media are Snapchat, radio, and Twitter.
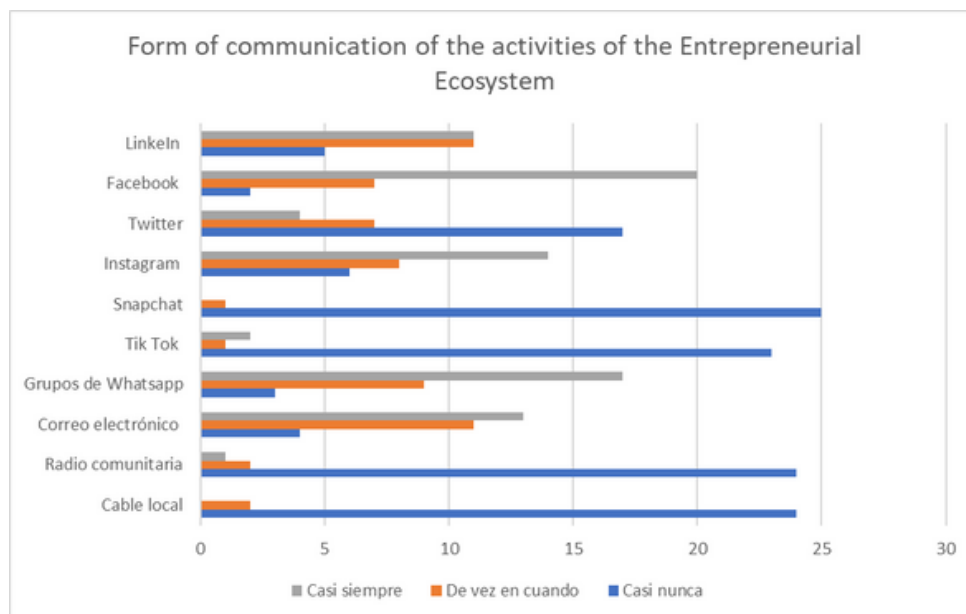
Graph 7: Forms of Communication, Central Sector.
Source: Own data.

In the Central Sector, several elements are appreciated when analyzing the utility of belonging to the network. In the first place, it is considered that belonging to the Ecosystem provides facilities to find work or locate qualified human resources. They also mentioned having contact with the media and locating financing opportunities. To a lesser extent, it is considered that belonging to the ecosystem serves to market products, interact with citizens, and learn about other experiences and methodologies.
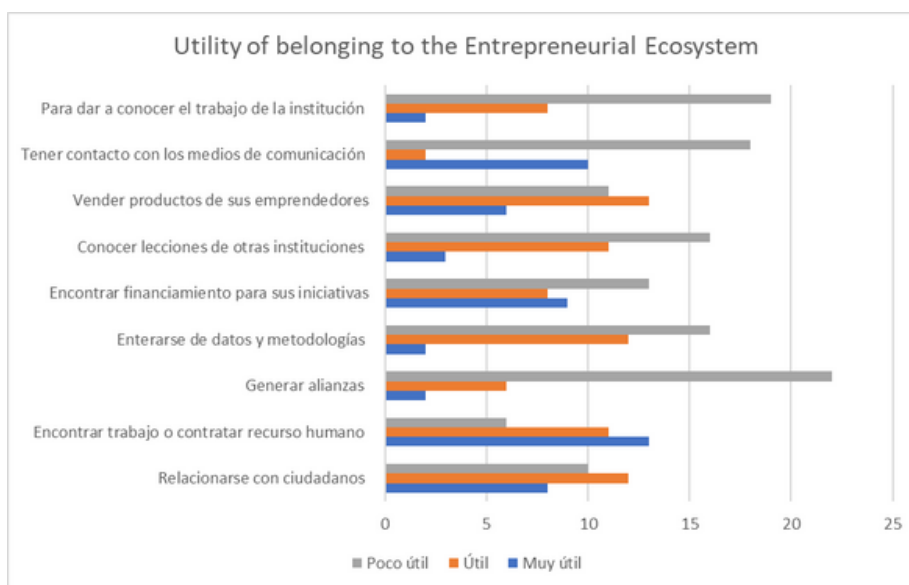
Graph 8: Utility of Belonging to the Ecosystem, Central Sector.
Source: Own data.

In relation to the future of the ecosystem, the interviewees suggested the need to draw up a roadmap that allows aligning the initiatives of the different actors, as well as bringing training resources, financing, and the lessons learned to all the actors. On this topic, the governing role of MINECO is emphasized again, the responsibility of the academy in training and incubation issues, and the role of the private sector to ensure financing and the opening of new markets. Another topic discussed was the slow but progressive separation between the national ecosystem and a supranational ecosystem (composed of organizations such as Alterna, Bridge for Billions, etc.).* See recommendations No. 1.

The latter has both positive and negative aspects: On the positive side, more international investment is being attracted to the country, which means more startups and larger companies are being catalyzed. On the negative side, the gaps are increasing between entrepreneurs connected to the supranational system and those who only move within the local or municipal systems. If these entrepreneurs do not access onramps and opportunities, they will be left out of the growth wave.

Right now, Swisscontact is very well positioned as a key player among all players, a position that can be leveraged for the growth and consolidation of the ecosystem.

SNA results.

The networks were analyzed by crossing all the actors together, weighting the relationship level according to its intensity. Data were analyzed with the UCINET software, which provides several useful measures.
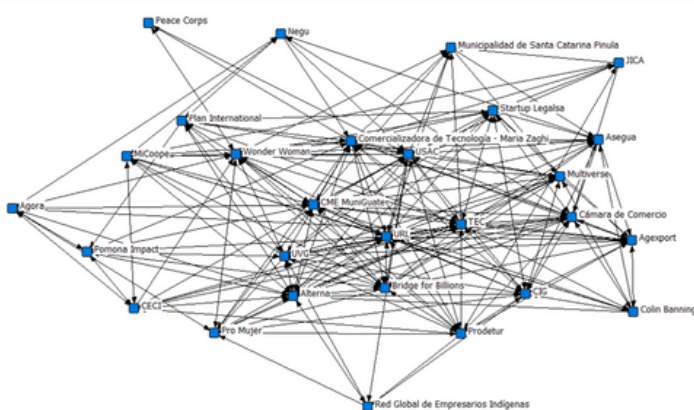
Graph 9: Complete Map Generated by UCINET, Central Sector. 2022.
Source: Own data.

Observe the disconnection between actors on graph 10. That explains the lower density (thus lower collaboration) of the central region ecosystem in 2018.

Graph 10: Complete Map Generated by Kumu, Central Sector. 2018.

Source: Mapping of actors of the national entrepreneurship support ecosystem Socialab Guatemala, Ministry of Economy, CENPROMYPE, 2018

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Of the numerical results of the SNA, the following stand out. First, you can analyze the density of the network, which is a measure of the number of actors and the number of relationships that exist between the actors.

```
DENSITY / AVERAGE MATRIX VALUE
--------------------------------------------------------------------------

Input dataset:                 sector central-deg (C:\Program Files\Analytic Technologies\64bit\sector central-deg)
Output dataset:                sector central-deg-density (C:\Program Files\Analytic Technologies\64bit\sector central-deg-density)


                         1       2       3       4
                      Avg Val  Total Std Dev Avg Wtd
                        ue                    Degree
                      ------- ------- ------- -------
    1 sector central-deg  8.750 979.951  10.590  34.998

1 rows, 4 columns, 1 levels.


----------------------------------------
Running time:  00:00:01
Output generated:  28 Mar 23 08:35:07
UCINET 6.764 Copyright (c) 2002-2023 Analytic Technologies
```

Table 4: Network Density, Central Sector.
Source: Own data.

The other fundamental measure in SNA is reciprocity, which analyzes how well the actors know each other and how much they relate to each other. As we can see, it is a network with considerable reciprocity.

```
RECIPROCITY
--------------------------------------------------------------------------

Input dataset:                 sector central (C:\Users\unote\Documents\UCINET data\sector central)
Method:                        Hybrid
Output dataset:                GroupReciprocity (C:\Users\unote\Documents\UCINET data\GroupReciprocity)

Data are valued. Remember that xij = 3 will not match xji = 2
Overall Reciprocity Measures

                         1
                      Measure
                         s
                      -------
    1       Recip Arcs    222
    2     Unrecip Arcs     83
    3         All Arcs    305
    4   Arc Reciprocity  0.728
    5        Sym Dyads    111
    6       Asym Dyads     83
    7        All Dyads    194
    8 Dyad Reciprocity  0.572

8 rows, 1 columns, 1 levels.


Arc and dyad measures are explained here:
   https://sites.google.com/site/ucinetsoftware/document/faq/reciprocity--arcordyad


Hybrid Reciprocity: 0.5722
```

Table 5: Reciprocity of the Network, Central Sector.
Source: Own data.

Centrality is a crucial criterion influenced by two primary factors: indegree (prestige) and outdegree (influence). In this context, several actors stand out due to their high metrics, notably the CME of the Municipality of Guatemala, URL, Agexport, and the María Zaghi Technology Trader. Institutions with significant centrality play a pivotal role in driving change and leading processes. They also serve as vital information hubs that facilitate connections between diverse groups.

```
                                    1       2       3       4
                                 Outdeg   Indeg  nOutde  nIndeg
                                                     g

                                 ------  ------  ------  ------
 1                    Agexport   21.000  27.000   0.259   0.333
 2                       Agora   18.000  16.000   0.222   0.198
 3                      Asegua   16.000  12.000   0.198   0.148
 4                     Alterna   22.000  24.000   0.272   0.296
 5           Bridge for Billions 18.000  19.000   0.222   0.235
 6               CME MuniGuate   41.000  39.000   0.506   0.481
 7  Comercializadora de Tecno   40.000  16.000   0.494   0.198
 8           Cámara de Comercio  13.000  23.000   0.160   0.284
 9                         CIG   25.000  26.000   0.309   0.321
10                  Multiverse   13.000  20.000   0.160   0.247
11                        Negu   10.000  10.000   0.123   0.123
12                     Prodetur  20.000  15.000   0.247   0.185
13               Pomona Impact    9.000  16.000   0.111   0.198
14             Startup Legalsa   18.000  11.000   0.222   0.136
15                         TEC   26.000  24.000   0.321   0.296
16                        USAC   21.000  24.000   0.259   0.296
17                         URL   29.000  30.000   0.358   0.370
18                         UVG   20.000  20.000   0.247   0.247
19               Colin Banning   14.000   9.000   0.173   0.111
20                        CECI   10.000  10.000   0.123   0.123
21                        JICA    7.000   4.000   0.086   0.049
22                 Peace Corps    3.000   3.000   0.037   0.037
23                     MiCoope   13.000  22.000   0.160   0.272
24                   Pro Mujer   13.000  20.000   0.160   0.247
25                Wonder Woman   24.000  23.000   0.296   0.284
26  Red Global de Empresarios    5.000   4.000   0.062   0.049
27          Plan International    9.000  10.000   0.111   0.123
28  Municipalidad de Santa Ca    6.000   7.000   0.074   0.086
```

Table 6: Centrality of the Network, Central Sector..
Source: Own data.

Indicator	Worth	Interpretation
Network Density	0.699	It is a cohesive network, much more so than that of Alta Verapaz.
Network Reciprocity	0.728	It is a network with considerable reciprocity (the actors do know each other and interact with each other), although with less reciprocity than the Alta Verapaz network.
Centrality: Institutions with a High *Indegree Level*	CME MuniGuate: 39 URL: 30 Age export: 39	These three institutions are the ones with the greatest prestige within the network.
Centrality: Institutions with a High Degree of *Outdegree*	CME MuniGuate: 41 Technology Marketer María Zaghi: 40 URL: 29	These three institutions are the ones with the greatest influence within the network.

Source: Own data.

Table 7:Summary of Numerical Data, Central Sector
*Age export is AGEXPORT, the exporter's association.
CME: Centro municipal de emprendimiento
URL: Universidad Rafael Landívar

b. Main insights

According to the research carried out by the external consultant, Andrés Álvarez, the main insights from the ecosystem's analysis were the following:

1. Firstly, the local Entrepreneurial Ecosystem is comprised of dedicated actors seeking more interaction among themselves. The central sector shows a comprehensive and densely connected network, although certain isolation exists based on the types of organizations.
2. Secondly, there are actors with significant prestige. Key institutional actors include the CME (Centro Municipal de Emprendimiento) of the Municipality of Guatemala, URL (Universidad Rafael Landívar), Agexport (National Association of Exporters), and María Zaghi's Technology Trader. Josefina Sontay, Andrea Mazariegos, and Diego de León are prominent at the individual level.
3. Thirdly, progress has been made in the inclusion of women, who play a leading role in entrepreneurship within the Central Sector.
4. A fourth conclusion highlights the perceived necessity for greater integration among the networks. Specific expectations from various sectors have yet to be fully met: · The State (MINECO) is expected to take on a more leading role in coordinating national policies at the municipal government level. The academic sector is expected to conduct more research and systematize the lessons learned and methodologies employed by different groups, as there is currently insufficient information in this regard.
5. Fifth, ecosystem members perceive various benefits from being part of the ecosystem. The network is viewed as a means to approach the media, access financing, and find high-quality human resources.

More on the mentioned institutions:
CME: https://www.cmemuniguate.com/
URL: https://principal.url.edu.gt/
AGEXPORT: https://www.export.com.gt/inicio
María Zaghi: https://www.mzaghi.com/

How has the ecosystem changed from 2018 to 2022?

Over four years, conducting two separate Social Network Analysis (SNA) studies on the entrepreneurial ecosystem unveils dynamic changes and growth trends. Comparing network maps from different time points provides valuable insights into the ecosystem's evolution.

In the initial SNA analysis, we identified key players, central nodes, and clusters within the ecosystem, revealing resource and information flow dynamics. In the second SNA analysis after four years, we assess the emergence of new nodes, signifying fresh support organizations, and possible shifts in the centrality of key players, indicating changes in their influence.

Comparing both analyses reveals collaboration patterns and new connections, demonstrating the ecosystem's adaptability and resilience. Addressing gaps or bottlenecks discovered in the first analysis likely led to a more efficient and connected ecosystem. Some previously central players may have lost relevance while others gained prominence, indicating fluctuations in power dynamics.

Notably, public actors like the Centro Municipal de Emprendimiento (CME) have expanded their influence through private partnerships and promoting venture capital investment for a new segment of entrepreneurs. Some players, like coworking spaces, have exited the ecosystem, and events saw a sharp decline in 2020 due to the pandemic. However, there has been a proliferation of informal, smaller meetings, which is a great sign of the elasticity of the dynamics of the ecosystem: Instead of going back to zero, entrepreneurs, ESOs and other players continued interacting in smaller groups, public places like cafés and restaurants, and overall, the connections continued being created and strengthened despite the pandemic.

Clear examples of this collaboration are Latin American Investors like Alaya Capital, El Trueno Ventures, and others, investing int he country and engaging in events like Volcano Summit, co-organized conferences between women supporting organizations like WonderWoman and Mom Business University, events organized with multiple parties, like the workshops to facilitate entrepreneurs to register their brand, co-led by TEC, Multiverse, CME, BS Legalis and other actors.

Understanding these changes through SNA allows us to assess the impact of our interventions in fostering the ecosystem's continued growth and success

How has the ecosystem changed from 2018 to 2022?

Change No. 1-Improvement in network density: From 0.01 to 0.699

Improvement in network density refers to an increase in the number of connections or ties between nodes (individuals, organizations, or entities) within a social network. In other words, it indicates that more relationships have been established or strengthened among the members of the network.

An improvement in network density can have several implications, depending on the context in which it occurs. In the context of entrepreneurial ecosystems or any collaborative network, an increase in density suggests that more collaborations, partnerships, and interactions are taking place. This heightened level of connectivity can lead to the faster dissemination of information, better access to resources, increased innovation, and overall greater efficiency and effectiveness within the ecosystem.

There are several examples of this improved collaboration. To cite a few:

1. The 'Legal Route to Protect My Trademark' event was co-organized and co-delivered by CME, Multiverse, TEC, Universidad Galileo, and BS Legalis, a private law firm.
2. The collaboration between CAPCA and the Fintech Association included the Investor Mixer and the CAPITAL 101 class for founders, which were co-organized and co-delivered by both organizations.
3. Banco Industrial, the country's largest bank, has been actively engaged in venture capital and fintech discussions.
4. We have seen a proliferation of small entrepreneurship events and pitch competitions where sponsors provide in-kind support to startups, as demonstrated by Enlaza.
5. MIT Reap Participation: Several key ecosystem actors are set to participate in an ecosystem training and development program with MIT. This program involves Universidad Francisco Marroquín, a college; Progreso X, a corporate venture firm; CAPCA, an investor's association; Aly-Ai, a startup; the Vice Minister of SMEs representing the Government; and Tigo, the largest local Telco. The initiative is sponsored by private companies, Tigo and Cementos Progreso. Some of these players have been connected through the project, and their efforts will build upon the interventions developed by the AGEE project.

Higher network density also means there is an increase in trust and social capital among members, as frequent interactions and collaborations often lead to stronger relationships and mutual understanding, which can enhance cooperation and coordination, enabling stakeholders to address challenges collectively and support each other in achieving shared goals.

In summary, an improvement in network density signifies a more tightly connected and cohesive social network, which can be advantageous for the growth, resilience, and overall success of an entrepreneurial ecosystem or any other collaborative community.

**It is important to mention that the SNA from 2022 has a smaller sample of relevant actors, which has an influence in the network density. Nevertheless, there is a clear improvement in the interconectedness of the network. To make it as close and numerically relevant as possible, we obtained the isolated map of the central region for 2018.

Change No. 2-A closer involvement with the public sector

From enhanced interactions with the central government to increased collaboration with municipal governments, it is evident that the ecosystem has transitioned towards closer engagement with the public sector.

1. **Access to Resources:** The public sector has facilitated access to certifications, courses, and seed capital for numerous companies over the past four years. They have strengthened their collaboration with the private sector to provide improved services for entrepreneurs, exemplified by initiatives like the Financial Navigator on Startkit, leveraging the resources and influence of the private sector. There have also been several conferences, and programs (like CANAC) where the public sector funds and codelivers services for entrepreneurs alongside other key ecosystem actors.

2. **Policy and Regulation:** The public sector plays a pivotal role in shaping policies and regulations directly impacting the business environment. Throughout the project's duration, the public sector has actively embraced collaboration with other ecosystem actors to co-create favorable policies, streamline regulatory procedures, and remove barriers hindering business growth. Creating a supportive regulatory environment can attract more entrepreneurs and businesses to the ecosystem. This is why, as a follow-up to the Action Research and AGEE projects, the Advocacy for Economic Growth project will diligently build upon the collaborations established in the initial phases of ecosystem development.

3. **Collaboration in Problem-Solving:** Entrepreneurs have collaborated with the public sector to address societal challenges and public needs through innovative solutions, such as the policy hackathon. These collaborations have led to the initiatives proposed for the Advocacy project.

4. **Credibility and Reputation:** The open collaboration experienced with the public sector during the AGEE project significantly enhanced the credibility and reputation of startups and entrepreneurs. Working with government entities can validate the legitimacy of a startup's offerings and increase trust among customers, investors, and other stakeholders. Additionally, there were tangible benefits for government and public entities, as they were able to engage with partners that were previously out of reach.

In summary, collaboration with the public sector enriched the entrepreneurial ecosystem by providing access to resources, influencing policies, offering market opportunities, developing supportive infrastructure, and fostering a positive impact. By combining efforts and leveraging each other's strengths, the public sector and entrepreneurs can create a thriving ecosystem that supports economic growth, innovation, and social progress.

Policy Hackathon, 2021.
Source: Archive

Change No. 3-Better inclusion and representation

The increased inclusion of women in the Guatemalan entrepreneurial ecosystem from 2018 to 2022 has yielded substantial benefits. As more women participate as entrepreneurs, investors, mentors, and leaders, the ecosystem has experienced a noticeable surge in innovation, creativity, and effective problem-solving. Women entrepreneurs bring unique perspectives and experiences to the table, fostering a diverse range of ideas and business models.

Furthermore, their inclusion has significantly enhanced the functionality of the ecosystem for all ecosystem actors, including an expanded talent pool and increased availability of role models for aspiring women entrepreneurs. As a tangible example of this inclusivity, we are pleased to note that several ecosystem leaders and enablers are now women, a change from the situation in 2018. Additionally, funding for women-led and women-oriented development programs in the country has substantially increased, although this cannot be solely attributed to our project, we acknowledge that our efforts played a relevant role in promoting women leaders and fostering strategic alliances to facilitate this transformation. Example such as the exponential growth of WonderWoman, an organization dedicated to promote female entrepreneurship, or the Juntas Contamos program, as well as efforts delivered by programs like CANAC, show this shift towards a more inclusive ecosystem.

It is worth mentioning another positive outcome of these inclusion efforts: Several banks have developed financial products that do not require guarantees, and can be accessed with a business plan. This signifies that more women and vulnerable populations now have access to seed financing to develop their businesses.

This inclusivity has created a more supportive and collaborative ecosystem where women can access resources, funding, and networking opportunities that were previously limited. By dismantling gender barriers and fostering a more inclusive environment, the Guatemalan entrepreneurial ecosystem has unlocked its full potential, driving economic growth and social empowerment. Embracing and sustaining this progress is vital for long-term success, as it paves the way for a more equitable, dynamic, and resilient entrepreneurial landscape in Guatemala.

Female founders coalition event.
Source: Archive

Conclusion

In conclusion, our interventions to develop the entrepreneurial ecosystem in Guatemala have yielded remarkable success in several critical areas. Firstly, we have effectively promoted collaboration between ecosystem actors, fostering a more connected and supportive network. This has facilitated the exchange of resources, knowledge, and opportunities, stimulating innovation and growth within the ecosystem. Secondly, our initiatives have been instrumental in promoting inclusion for women in entrepreneurship, resulting in a more diverse and dynamic ecosystem. By breaking down barriers and providing targeted support, we have empowered women entrepreneurs, expanding the talent pool and creating a more equitable entrepreneurial landscape.

Furthermore, our systemic approach has proven to be highly effective in addressing structural issues within the ecosystem. The establishment of independent interventions such as Startkit and CAPCA has contributed significantly to overcoming challenges related to lack of specialization and access to finance. These initiatives have become recognized entities in their own right, separate from Swisscontact, further enhancing the impact and sustainability of our efforts.

Collaboration with the public sector has undoubtedly improved, opening up opportunities for startups and entrepreneurs to access resources and markets. However, there remains substantial work to be done to fully capitalize on these established relationships. Continued engagement with the public sector is crucial for shaping policies that promote business growth and support long-term sustainability.

The importance of these achievements for entrepreneurial ecosystem development and the creation of sustainable businesses in Guatemala cannot be overstated. By fostering collaboration, promoting inclusion, and addressing structural issues, we have laid a solid foundation for a thriving and resilient entrepreneurial ecosystem. This ecosystem is poised to drive economic growth, create employment opportunities, and foster innovation, ultimately contributing to Guatemala's sustainable development and prosperity. However, sustained efforts and ongoing collaboration with all stakeholders, including the public sector, are essential to realize the full potential of the ecosystem and to build a future where entrepreneurship flourishes, and sustainable businesses thrive in Guatemala.

Recommendations

To continue developing the entrepreneurial ecosystem in Guatemala and further support the growth of sustainable businesses, the following recommendations are crucial:

1. **Socializing learnings and taking collecive steps is key.** Sharing good practices and lessons learned in developing the ecosystem over the last four years, as well as collectively prioritizing the unsolved gaps and actions to mend the asymmetries, should be a continuous practice in the ecosystem.

2. **Access to Finance:** The ecosystem should encourage the creation of more venture capital funds, angel investor networks, and impact investing opportunities to provide early-stage funding and support innovative ventures. Government policies can incentivize venture capital (VC) and impact investing. These may include tax incentives, reduced regulatory burdens, and favorable investment structures. Policies that encourage long-term investment and provide legal protection for investors can attract more private capital. Governments should also establish or support venture capital funds that co-invest with private investors. These funds can help de-risk investments and attract private capital. Over the past four years, banks have developed more inclusive financial products, so it's recommended to continue working actively with them in the efforts for inclusion, by leveraging innovation and new technologies such as fintech.

3. **Education and Skill Development:** It is key to foster entrepreneurship education and skill development programs at all levels of the education system. Equipping aspiring entrepreneurs with the necessary knowledge, business acumen, and digital skills to navigate the modern business landscape effectively is a must, leveraging the collaborations and tools built during the AGEE project. Two key aspects that need to be reinforced are financial education and soft skills, since the lack of them in entrepreneurial programs often affects business development.

4. **Women Empowerment:** Continue promoting gender equality and inclusion within the ecosystem. Support women-led initiatives and businesses by providing targeted mentoring, networking opportunities, and access to resources, thereby enhancing women's representation and leadership in entrepreneurship. It's key to continue allocating resources to women-led companies to balance the scales in terms of capital access, especially in the technology sector.

5. **Collaboration and Networking:** The ecosystem should continue to strengthen collaboration among ecosystem actors, including startups, investors, corporations, academic institutions, and the public sector, by actively promoting networking events, innovation hubs, and entrepreneurship forums.

6. **Policy Advocacy:** Continue advocating for policies that foster a supportive entrepreneurial environment. Address regulatory barriers through small reforms to existing challenges to move towards a collaborative approach that allows streamlining business registration and operation, reducing red tape, and fostering the creation of enabling environments for innovation and entrepreneurship.

Recommendations

7. Ecosystem Data and Research: Continue to invest in collecting and analyzing data on the ecosystem's performance and impact. Conduct research to identify emerging trends, challenges, and opportunities, allowing for evidence-based decision-making.

8. Corporate Engagement: The ecosystem should facilitate and encourage corporate engagement in the entrepreneurial ecosystem (such as financing learning and development initiatives that gather ecosystem actors, like the MIT Reap Program example described in page 20). Foster partnerships between established companies and startups for mutual learning, innovation, and market expansion, replicating exercises such as the Financial Navigator, a tool codeveloped with the public sector to allow entrepreneurs to compare the financial products and services offered by financial institutions, to find the one that best fits their needs.

9. Social and Environmental Impact: The ecosystem should promote and support startups with a focus on social and environmental impact. Encourage the development of social enterprises and sustainable businesses that address pressing societal challenges, by creating public standards and certification that allow businesses to account for and demonstrate their impact.

10. Internationalization: Facilitate the internationalization of startups by providing support for market access, international partnerships, and participation in global events and trade fairs.

By implementing these recommendations, Guatemala can continue to build a vibrant and inclusive entrepreneurial ecosystem. Such efforts will not only drive economic growth and job creation but also foster a culture of innovation and sustainable business practices, contributing to the country's long-term prosperity and development.

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We thank you for your continued support to develop the Guatemalan entrepreneurial ecosystem.

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