



Innovation Investment Alliance and CASE at Duke

IMAZON: USING DATA AND PARTNERSHIPS TO SAVE THE AMAZON

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CASE IN BRIEF

Imazon, a Brazilian nonprofit promoting sustainable development of the Amazon, exemplifies how social ventures can stay small to achieve large impact. Imazon knew that it could not tackle the enormous challenge of deforestation of the Brazilian Amazon alone. Therefore, Imazon leveraged its “special sauce” – producing trusted, neutral, high-quality data that tracks and reports on deforestation – and made that available to partners that could drive behavior change.

After a successful pilot reduced deforestation by 90 percent in two years in the city of Paragominas, Imazon attempted to scale its work across the state of Pará and beyond. Along the way, Imazon learned how to define clear objectives against which to rally stakeholders and measure progress; adapt its work to local contexts; be serial collaborators, while mitigating the inevitable risks of partnering; stay focused on core strengths; and leverage those core strengths to have broader impact. In the end, through open source data, partnerships, and utilizing incentives to drive behavior change, Imazon has contributed to reductions in deforestation and is now applying its learnings to new locations and new issues.

This case study is relevant for any social enterprise working to have outsized impact by collaborating with partners to change systems. It is also relevant for any enterprise using data to create incentives for change.

Part of the **Scaling Pathways series**.
Find the full series at www.scalingpathways.com

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Acknowledgments

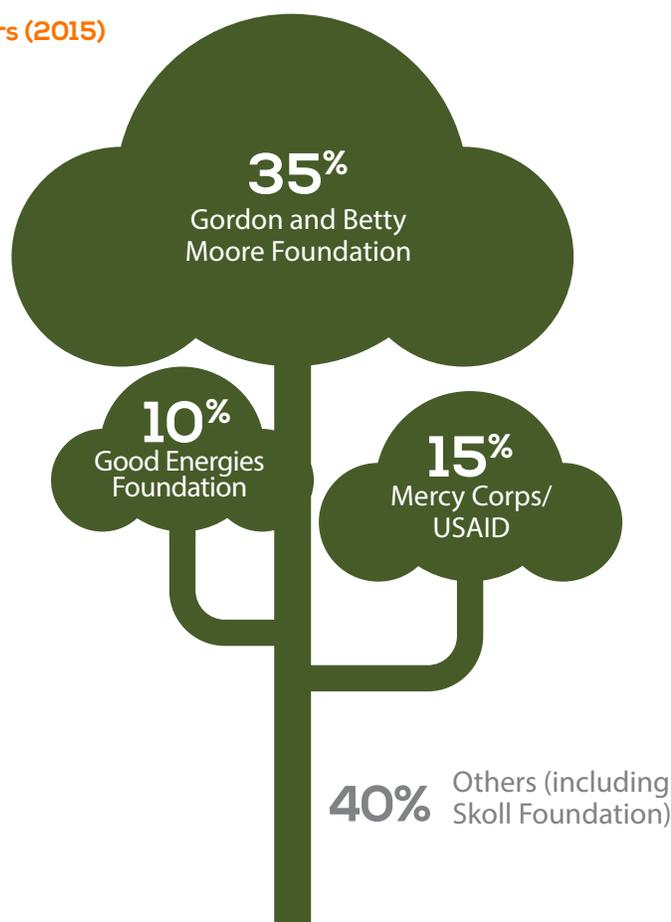
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SUMMARY TABLE ¹

Organization name	Imazon
Website	http://imazon.org.br/
Headquarters	Belém, Brazil
Year founded	1990
Leadership	Senior Researchers: Paulo Amaral, Paulo Barreto, Carlos Souza Jr., and Adalberto Veríssimo
Staff size	40 full-time staff
Scaling Pathway(s)	Open source; Partnerships; Behavior Change
Financial summary	R\$16.7 million (approximately \$5.09 M USD) in grants, contributions, and/or earned income in 2015 <i>*From this point forward, all monetary units are USD</i>

Major supporters (2015)



Mission

To promote sustainable development in the Amazon through studies, support for public policy formulation, broad dissemination of information and capacity building.

INTRODUCTION

The Amazon – the largest remaining tropical rainforest in the world and home to more than one-third of the world’s species – is in danger. As global demand for commodities, such as timber, beef, and soy continues to climb, the Amazon is being cleared at an alarming rate. Nearly one-fifth of the forest has been lost and experts worry that we are quickly reaching a tipping point from which the Amazon cannot recover.²

If we are unable to stem this rapid forest loss, the damage will be far reaching. In addition to serving as the home for important biodiversity, the Amazon produces up to 25 percent of the plants used in modern medicine³ and plays a critical role in regulating the global climate by storing carbon dioxide and, therefore, decreasing greenhouse gas emissions.

Brazil, which is home to roughly 65 percent of the Amazon, has struggled with protecting its unique forest. In 2004, deforestation in the Brazilian Amazon resulted in the loss of 27,000 square kilometers (km²) of forest, an area the size of Haiti. Government incentives led to “endless waves of migrants carving a livelihood out of the jungle”⁴ and clearing the forest from the land. More than a thousand rural activists were murdered to silence their outcry over illegal deforestation.⁵ And Brazil was labeled as one of the world’s top five greenhouse gas (GHG) emitters, with 55 percent of its overall emissions driven by rampant deforestation.



In response to pressures from domestic and international public opinion, the Brazilian government launched ambitious programs to combat deforestation in 2004. The government’s “Plan Against Deforestation in the Brazilian Amazon” (the Plan), built on earlier laws targeting illegal deforestation, included initiatives to monitor the forest using satellite imagery, and mandated punishments for violators such as fines, jail, and/or confiscation of products. The Plan also created a record amount of protected lands and mobilized companies, NGOs, and state and local governments to fight deforestation on privately owned lands.

A key player in this work is Imazon, a Brazilian nonprofit research institute and an internationally recognized social venture, whose mission is to promote sustainable development in the Amazon. Given the urgency of the problem, Imazon has worked relentlessly to magnify its impact, not necessarily by growing to become a bigger organization, but by empowering and influencing other public, private, and nonprofit sector actors in the Amazonian ecosystem to combat deforestation.

And it has worked. Imazon created tools, skills, and partnerships that have been part of the solution, leading to an astounding 78 percent reduction in deforestation in the Brazilian Amazon, from 27,000 km² (10,400 square miles) in 2004 to 5,000 km² (1,900 square miles) in 2015. This decrease in deforestation resulted in the largest reduction in GHG emissions ever achieved by humankind.⁶ It is a concrete example of a social enterprise being part of a solution to a problem at a scale that matters.

Figure 1: Annual deforestation in the Brazilian Amazon



Source: Prodes (INPE)

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- Amazon's success reveals universal lessons for other social ventures.

How did they do it? Imazon succeeded by using sophisticated data systems to drive significant reductions in deforestation. To do this, Imazon realized that one organization alone could not stop deforestation. So, rather than growing its own organization, Imazon created monitoring and evaluation systems that could share high quality, open source data with others. This data allowed government partners at the federal, state, and local levels to create regulatory carrots and sticks to drive behavior change. Imazon is a strong example of how relatively small and focused social ventures can develop and implement strategies that address huge problems on a significant scale.

Amazon's success reveals universal lessons for other social ventures about

1. sharing outcomes and measurement systems;
2. adapting work for local contexts;
3. leveraging partnerships despite risks and potential conflicts;
4. maintaining the boundaries of the organization's work, even as opportunities to evolve into other areas become appealing; and
5. using the lessons of deep engagement to achieve broader systems change.

This case study starts by tracing Imazon's origins, and the main areas of work it had developed up through 2006. Then it explores Imazon's three main scaling strategies: **using open source data, practicing serial collaboration through partnerships, and driving behavior change.** The study then delves into a specific project on which the Innovation Investment Alliance (IIA), a funding and learning partnership created in 2012 by USAID's U.S. Global Development Lab and the Skoll Foundation, with support from Mercy Corps (as USAID's implementing partner), worked with Imazon: taking a successful community pilot with a local government agency, and working with a state agency to scale it to more communities. The case ends with key pivot points and lessons learned from this work that are applicable to other social entrepreneurs and funders.

: IMAZON: The Amazon : Institute of People and : the Environment

Imazon is a nonprofit research institution whose mission is to promote sustainable development in the Amazon through scientific studies, support for public policy formulation, broad dissemination of information, and capacity building.

In addition to producing a large and compelling body of research, Imazon has served as an incubator for the training of an entire generation of Amazonian scientists.

The institute was founded in 1990, and its head office is located in the city of Belém, Brazil. In 25 years of operation Imazon has published more than 300 technical papers, about 180 of them in scientific journals. The Institute has also published 111 books, and more than 150 technical and public policy articles.



ORIGINS



Imazon's story begins in the late 1980s. At that time the Amazon region was getting international attention – unfortunately, not just for its beautiful flora and fauna, but also for the degradation marring its unique ecology.

Attempts to protect the rainforest were met with a number of challenges. Government policy actively encouraged deforestation by incentivizing clearing of forests to make way for new agricultural lands.

New road infrastructure made the region more accessible than ever before. The year 1985 saw the end of Brazil's last dictatorship and marked the beginning of the country's transition to a new democratic regime. With inflation rates at 100 percent, economic despair led to land disputes punctuated by increasing violence, forest fires, land grabbing, and more.

In the midst of this chaos, an American professor, Chris Uhl, joined forces with a group of young, passionate Brazilians who saw an opportunity to protect the forest before it was too late. They were geologists, ecologists, and agricultural engineers by training, and started working with Uhl to develop better ways to perform forest inventory. With the help of a grant from the MacArthur Foundation, they began to develop more sophisticated geomapping systems, including remote sensing and Geographic Information Systems (GIS) capable of capturing, storing, analyzing, and displaying geographically referenced information.

The team also spent significant time talking with community members to understand their needs and get feedback on ways these information systems could be used to protect the Brazilian Amazon. According to Imazon co-founder Adalberto (Beto) Veríssimo, it was through these conversations that the team noticed a gap — a lack of organizations able to provide field-based, rigorous, high-quality data to help track and understand the causes of the ongoing destruction of the Amazon region.⁷

Imazon was formed in 1990 to fill this gap. The co-founders envisioned it as a “think and do” tank that would find ways to develop rigorous, neutral, third-party data on what was actually happening on the ground in the Amazon and use that data to spark dialogue and action. They wanted to learn what kinds of change could happen when stakeholders better understood what was really going on in the Amazon forest.

Phase

While its mission has never wavered, Imazon's strategies to fulfill its mission have evolved over time. According to Imazon leadership, the evolution of Imazon's work can be divided into three phases:

1

Create a win-win situation: Sustainable Forestry

Imazon first tackled the challenge of sustainable forestry – the idea that forests don't have to be kept pure in order to be protected. It partnered with the opposition – the logger – to show that logging could be done with less waste and without sacrificing profit or planet. That work began with 200 hectares of land and has grown to over 7 million hectares today. Imazon was so successful that a new organization, IFT (Instituto Floresta Tropical)⁸, was spun off to carry on the sustainable forestry work while Imazon shifted its strategy.

2

Predict and Prevent: Conservation Areas

Imazon shifted to another sustainable development solution – creating conservation areas to protect land not yet degraded. In the mid-1990s, Imazon began proposing and mapping protected areas, but it was not until 2003 that the federal government was ready to create these reserves. By 2006, using Imazon's maps as a guide, the federal government set aside nearly half a million km² (an area equivalent to the size of Spain) as protected land.

3

Monitor: Satellite Mapping

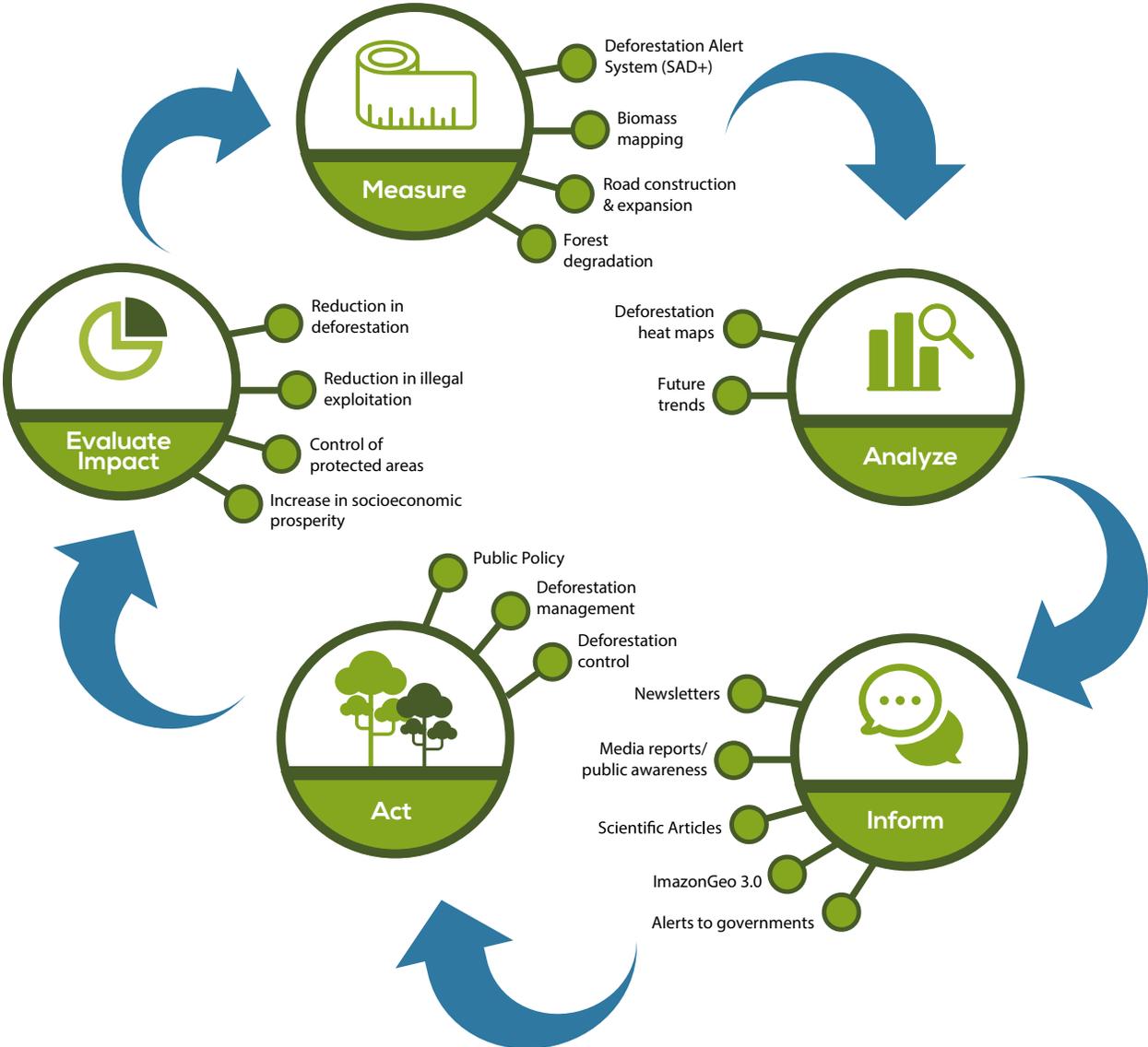
Imazon developed ways to monitor and measure the entire forest. It launched satellite mapping capabilities that allowed the group to cost-efficiently monitor large swaths of the Amazon, and developed their signature Deforestation Alert System (SAD) in 2007 to provide independent, trusted, monthly alerts of deforestation activity. This system, working alongside the federal government's PRODES monitoring system, identified deforestation and provided the data needed to stop it.

The satellite mapping and monitoring outlined in Phase 3 is the core of Imazon's current work and the means by which Imazon hopes to reach impact at scale. Therefore, the remainder of this case study will examine how Imazon leveraged their satellite mapping capabilities and their signature SAD system as the backbone of sophisticated partnerships at the local, state, and federal levels to scale their impact and drive faster reductions in deforestation.

IMAZON'S PATH TO SCALE

Imazon's work is based on a five step process or value chain (see figure 2). In this value chain, Imazon uses their expertise to **measure and analyze** data sources; leverages that data to pilot new solutions (such as reports, tools, etc.) to **inform** others; builds the capacity of partners to **act on** those solutions to scale their own impact; and, then attempts to spin off the experiments that work so that they continue without Imazon, or with Imazon in a smaller, technical assistance role to achieve the intended **impact**: reducing deforestation, reducing illegal logging, and creating effective protected areas.

Figure 2: Imazon's impact value chain



Within this value chain, Imazon has uncovered the building blocks that ground their scaling strategy:



Providing open source data that is carefully measured and analyzed.



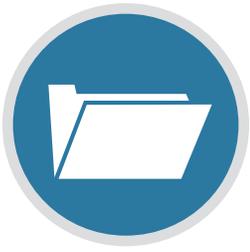
Establishing partnerships that collaborate at each step of the process to drive impact.



Driving behavior change through innovative use of communications and incentives.

The following sections will describe in more detail these three building blocks and show how Imazon used these building blocks at the community level to bring local partners into the work of reducing deforestation, including those community members actively cutting down the rainforest.





Building Block #1: **PROVIDE OPEN SOURCE DATA**

In conversations with the Imazon team and its many partners, it is striking how consistently Imazon's "special sauce" is described: They are a trusted, neutral source of high-quality data and analysis.

While much of the geospatial data on deforestation that Imazon generates is also provided annually by the Brazilian government through PRODES (Brazil's equivalent to the United States' NASA), Imazon's data nevertheless provides critical value.

According to Carlos Souza, Senior Researcher at Imazon, "Funders always ask us, why do you need a second system in addition to the data the government publishes? And the answer is we had a strong commitment to research" and want "to provide neutral information as basis for dialog."

Added Amintas Brandao, Jr., Adjunct Researcher at Imazon, "We have had the benefit of being neutral politically and, as a third party, many see us as more credible. Imazon's reports cannot be held back by a political issue of the moment, for example.

"As an independent nonprofit, we have also been able to innovate and partner more easily than government and so have been able to bring new technological advances and innovations into our satellite mapping services more rapidly."

These innovations have allowed Imazon to produce reports more frequently than the government, enabling real-time data that can be used to stop logging before irreversible damage is done. And as Sally Osberg and Roger Martin point out in their book, "Getting Beyond Better: How Social Entrepreneurship Works," Imazon has also innovated to reduce the cost of surveillance.

More timely and cost-effective surveillance capabilities have created a value proposition for governments, making it possible to enforce previously unenforceable laws.⁹ In sum, Imazon's data is neutral, more frequently updated, cheaper, and often of higher quality than existing alternatives.

- Imazon's "special sauce":
- a trusted, neutral
- source of high quality
- data and analysis.

Importantly, Imazon chose to make that data and analysis – its own “special sauce” – open source. Imazon shares its data and analysis freely with others through alerts, maps, and media. It provides technical assistance and trains others to use and adapt its systems and algorithms for new

uses. And Imazon has published more than 100 books and 300 technical papers to share research findings. Imazon realized that the best way to promote sustainable development of the Amazon and decrease deforestation is by finding partners that can use the data to implement their own solutions to reach scale. In the words of co-founder Veríssimo, “We are not the heroes of the Amazon. We have a big vision, but know that we are part of a village.”

- “We are not the heroes of
- the Amazon. We have a big
- vision, but know that we are
- part of a village.”



Building Block #2: **ESTABLISHING PARTNERSHIPS**

The scaling strategy that has emerged for Imazon has been less about growing the team and organization, and more about being a “serial collaborator” and convener. Imazon has established partnerships with media outlets, government at the municipal, state, and federal levels, other NGOs working in deforestation, and many others.

When discussing Imazon’s approach to partnerships, Senior Researcher Paulo Amaral stated that “outreach is outdated.” According to Amaral, most similar institutions start with research papers, create their findings, and then do outreach to partners. In contrast, Imazon “realized that we needed to do outreach to develop the ideas, needed partners to be involved in the design from the beginning, not afterwards. ... We had to include both social and economic sides of our arguments, and we needed to talk to a lot of stakeholders to be sure we are highlighting what they need highlighted to make their case.” Throughout its work, Imazon uses this forward-looking approach to partnerships.



Building Block #3: **DRIVING BEHAVIOR CHANGE**

Imazon had a solid foundation of research showing the trends and consequences of deforestation, but convincing others to change their behaviors regarding deforestation was challenging. So, Imazon learned to take its rigorous analysis and boil it down to messages that would resonate with non-research partners. Reports and complicated geospatial and scientific data became simple metrics, maps, and visuals. As the messages about deforestation began to spread, national and international attention rose and soon the government began to pay more attention to the issues at hand.

In addition, Imazon and partners leveraged powerful incentives to drive behavior change. Positive incentives, or carrots, including access to funding, peer networks and training programs, and local, national and international recognition for communities reducing deforestation were all effective drivers of behavior change.

The negative incentives, or sticks, that Imazon leveraged were perhaps even more powerful. For example, in 2008, the Brazilian Ministry of the Environment's Ibama agency developed a federal blacklist of 36 municipalities that were the greatest areas of deforestation in Brazil. A municipality on the blacklist found itself with a credit embargo for rural producers, which meant that all producers were denied access to state bank credit, basically halting their ability to grow and sell their products. In addition to the embargo, federal regulators took a very punitive style of enforcement where they seized assets and materials of deforesters such as ranchers and miners. These sticks created the motivation for Imazon's community pilot in Paragominas, one of the municipalities on the federal blacklist.

- Positive incentives, or
- carrots, were all effective
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IMAZON IN ACTION



The Community Pilot: **PARAGOMINAS**

The Paragominas pilot was a pivotal experience for Imazon. It taught them how to leverage open source data to create behavior change through broad multi-stakeholder partnership at the community level. This community-based partnership created the unit of scale that the IIA later invested in spreading across the state of Pará. After the release of the federal blacklist, authorities forcefully closed 300 sawmills and seized assets in Paragominas. In a municipality that had in some ways built its economy on deforestation, the impact was immediate. Producers and farmers revolted, robbing apprehended vehicles, setting fire to the Ibama office and vehicles from the Municipal Environmental Secretariat, and even threatening to lynch agency employees.¹⁰

Adnan Demachki, mayor of Paragominas in 2008, explained, “the list was hurting the city, as we were having difficulty selling our products.”¹¹ He started speaking publicly about the link between protecting the environment and generating economic development, and he committed his government to take action. He set up some industry commissions and soon his environmental commissioner, Justiniano de Queiroz Netto, was talking to Imazon about helping to craft a plan to curb deforestation and get Paragominas removed from the blacklist.

Imazon and the Paragominas government started with a pilot program in which 51 community stakeholders – including rural producers and agricultural federations, industry federations, municipal government leaders, NGOs, and others – came together to sign a local pact to achieve zero net deforestation in their municipality and transition to legal, sustainable products. That pact, according to Commissioner Netto, created a set of critical social pressures that were often more compelling than the legal sanctions the government enacted. The community aimed to make sustainable development the norm, with all stakeholders holding collective responsibility for that goal.



Imazon took on three key roles in the Paragominas pilot: measuring and monitoring, convening, and registry development.

1

Measuring and Monitoring

Imazon's role monitoring and interpreting data was critical. Enforcing efforts to curb deforestation would be impossible without reliable information about where deforestation (whether legal or illegal) was happening, and who owned the land on which it was occurring. According to Mayor Demachki, "Imazon was essential because we needed to monitor deforestation to see if people were complying and how do you monitor 12,000 square miles, a county that is the size of Belgium?"¹²

2

Convening

Imazon was invited to serve as a convener of the initiative by local leaders, including the mayor, cattle ranchers, soybean producers, and loggers. In addition to helping the group define and agree on a measurement system for monitoring deforestation in near-real time and using it to enforce the pact, Imazon also held public meetings on a quarterly basis to share updated data and celebrate progress. Imazon's trustworthy satellite mapping data and analysis were, according to Commissioner Netto, an essential element when convening the group: "Until we saw the data that Imazon provided, many members of the community actually disbelieved that deforestation was continuing to happen."

3

Developing a Registry to Enable Local Licensing

Imazon helped develop and improve systems to guide efforts to reduce deforestation. One example was the Rural Landowner Registry, or CAR (Cadastro Ambiental Rural). CAR is a registry of the people or organizations that own or control rural properties, and of the specific boundaries and vegetation map of each property. Once land was registered through the CAR, Commissioner Netto's office was able to create environmental licensing procedures which stipulated the allowable activities on the land, including clearing of forest for sanctioned projects. Then, on an ongoing basis, Imazon produced map and satellite data to identify deforestation happening on the ground. If questionable activity was detected, Imazon sent alerts to the municipality which could then ascertain whether that activity was licensed or illegal and enforce any legal action against the registered landowners.

"Until we saw the data that Imazon provided, many members of the community

actually disbelieved that deforestation was continuing to happen."

PARAGOMINAS

Pilot Results

In less than two years, by 2010, the pilot demonstrated results in three key areas:

1

Decentralized Environmental Management

By 2010 CAR had mapped and registered 1,200 rural properties — more than 80 percent of the territory. Because of the CAR registry and licensing process, the Paragominas municipal government had a master database of landowners and approved land activities – tools to quickly assess deforestation alerts received from Imazon – and a set of accepted policies for addressing infractions.

2

Community Acceptance

Importantly, the municipality's environmental agency, which had made unpopular decisions about developers' and farmers' livelihoods, was considered equitable and fair by the local stakeholder community. Tellingly, the same type of confiscations that resulted in violence a few years ago when performed by federal regulators, have been accepted by the local community without political backlash when performed by the local municipality.

Indeed, as Commissioner Netto stated a few years later, "A common error in official policies has been, when emphasizing command or control, to exclude or alienate local stakeholders in areas where the problem is occurring. Mayors, municipal council members, producers, and local organizations have been routinely ignored, when not considered accomplices in the deforestation taking place in their municipalities."¹³ Imazon's efforts to engage local communities paid off.



Illegally forested timber confiscated by the Paragominas Environmental Secretariat, 2016.

3

Substantial Reduction in Deforestation

Within two years of this pilot program in Paragominas, deforestation rates dropped by more than 90 percent.¹⁴ As work shifted away from environmentally degrading activities, cattle ranchers were trained in more sustainable practices and jobs were created in a new sustainable MDF (medium-density fiberboard, an engineered wood product) production facility. Paragominas was the first municipality to be taken off of the federal embargo list in 2010. The mayor was re-elected with 80 percent approval after the program was launched and Paragominas came to be known as the "Green Municipality."¹⁵

CAN YOU SCALE COMMUNITY BUY-IN?

Launch of the Green Municipalities Program

The efforts in Paragominas, thanks in part to Imazon’s local and global media relationships, became headline news in the Brazilian media. The Economist hailed the reduction of deforestation as a landmark event in the history of saving the tropical rainforests.¹⁶ In 2010, Imazon won the prestigious Skoll Award for Social Entrepreneurship, a major international honor.

In March 2011, the Pará state government launched the Green Municipalities Program (GMP) (locally called Programa Municípios Verdes or PMV) to build on the successful pilot in Paragominas. The State of Pará represents a microcosm of deforestation dynamics in the Brazilian Amazon. Its vast territory of 1.25 million km² is three times the size of California and its eight million people need to have sustainable livelihoods as an alternative to deforestation.

The question was two-fold: could the Paragominas pilot be replicated in other municipalities in the state of Pará and, if so, would participation drive down deforestation rates as rapidly as it did in Paragominas?

The Green Municipalities Program

The Green Municipalities Program (GMP) (Programa Municípios Verdes – PMV) is a Pará State Government program developed in partnership with municipalities, civil society, private initiative, Ibama, and the Federal Public Prosecution Service.

The Program strives to fight deforestation and strengthen sustainable rural production through strategic actions for environmental planning and environmental management. It focuses on local pacts, deforestation monitoring, implementation of the Rural Environmental Registry (CAR) and the structure of municipal management.



Establishing New Goals and Governance

To get underway, the GMP engaged Imazon to help define goals and governance, the terms of engagement for Pará municipalities, and to determine the financial sustainability of this new effort. Netto moved to the Pará state government to become Special State Secretary of the GMP and began laying the groundwork for a collaborative multi-sector partnership. The ambitious goal of the partnership was an 80 percent reduction in the rate of deforestation in the state by 2020, with zero net deforestation beginning that year. The program also aimed for at least 50 percent growth in CAR registrations by 2012.

Secretary Netto had the full support of the state government. According to Simão Jatene, Governor of the State of Pará, “The program is operated based on pacts involving rural producers, and social and environmental organizations in partnership with the local and state governments. And it is innovative in considering that producers who do not deforest and are in the process of environmental regularization will enjoy incentives such as access to credit, consumer markets, and the possibility of removing their properties from embargo. Additionally, actions for land title regularization are now considered a priority.”¹⁷

Defining Municipal Engagement

Building on what was done in the Paragominas pilot, the municipalities first were asked to sign a pact for controlling deforestation with their own local associations of producers and civil society. Then they were asked to sign a term of commitment with the Federal Public Prosecution Service in order to create legal and political stability for the program.

The commitment included a set of seven goals that would be monitored by the GMP:

1. Sign a local pact against deforestation with the local society and government;
2. Create a municipal working group for fighting illegal deforestation;
3. Carry out verifications in the field of illegal deforestation points and report to the program;
4. Maintain the annual deforestation rate below 40 km² (based on Prodes/Inpe) criteria;
5. Register more than 80 percent of the municipal area through CAR;
6. Be removed from or stay off of the list of municipalities deforesting the most in the Amazon;
7. Introduce concepts of environmental education in municipal schools.

Imazon agreed to collaborate with the GMP specifically on goals 3, 4, and 5 and continued to engage as they had in the Paragominas pilot: measuring and monitoring, convening, and developing the registry.

Obtaining A New Scaling Grant

To carry out this effort across the state of Pará, Imazon applied for and received a scaling grant from the IIA. The IIA's grants aim to influence systems-level change by supporting proven, transformative, and innovative organizations to reach scale.¹⁸

The IIA's support of Imazon's scaling project totaled \$5.2 million. The Skoll Foundation contributed \$2.6 million and USAID contributed \$2.6 million, over two phases of work, from May 2013 to April 2016.

The scaling grant's goals were to fund Imazon to assist the state of Pará in setting up its own governance structures for the Green Municipality Program at the state and municipal levels, and to extend Imazon's deforestation monitoring system to include individual land registration and rural settlements in Pará. The plan was to start with 10 municipalities in Pará and then to expand to another 40 after that. In addition, Imazon pledged to help raise outside funds to leverage the state government's commitment to the GMP.

RESULTS

Scaling Systems is Easier than Scaling Community Engagement

Looking back over the program, there were some key successes:

- 1 Establishing a Legal Framework for Decentralized Environmental Licensing In Pará.**
Imazon worked with the GMP to suggest, assess, and develop a new legal framework allowing for decentralization of environmental management from the state level to the municipality level. This represented an important step as it gave municipalities greater control over their environmental licensing processes and authority over other important decisions around deforestation.

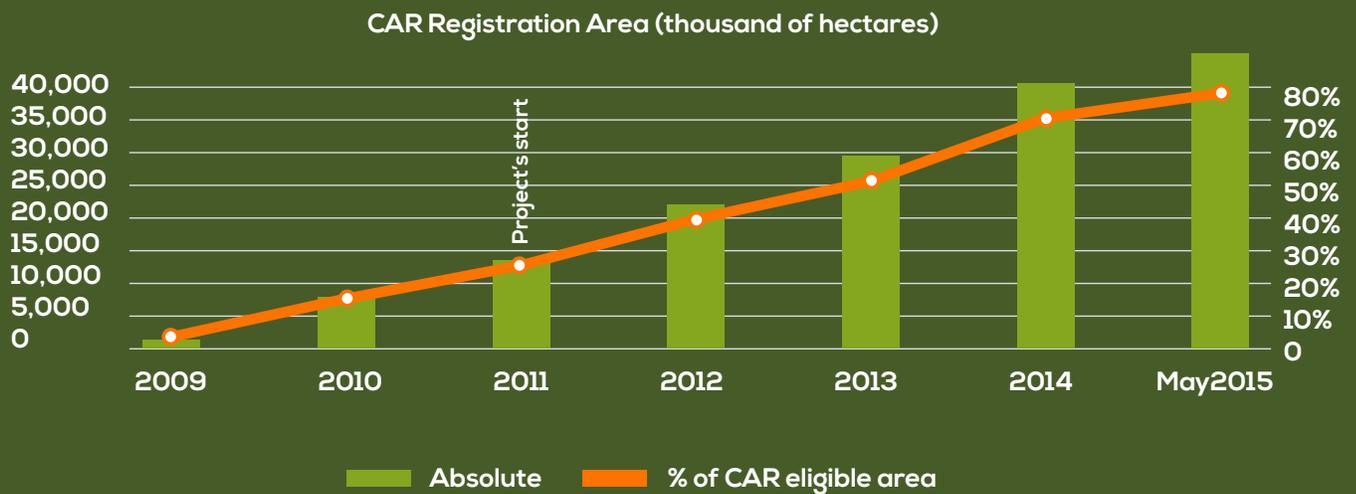
Imazon far outreached its goal of having the initial 10 municipalities sign decentralization agreements between the State and Municipal Environmental Agencies, ending up with 96 municipalities with signed agreements by 2016.

2

Establishing Rural Land Registrations through CAR

The most successful part of Imazon’s scaling effort was the development and implementation of the CAR registration program. There were only about 23,000 CAR registrations before GMP began; by 2015 more than 150,000 registrations had been achieved, a growth rate of over 600 percent, representing more than 70 percent of the state territory with potential for CAR .¹⁹ Figure 3 shows the annual CAR registration growth.

Figure 3: Annual CAR registration growth. Sourced from Imazon.



Imazon also faced some challenges which they worked to address:

3

Municipal Adoption Required More Support than Anticipated

Of the 144 municipalities in Pará, 96 met environmental management and control criteria and all of these joined the GMP by November 2016. By joining the GMP, these municipalities were granted access to Deforestation Alert System (SAD) reports and data. However, some of the municipalities were slow to fully adopt or adapt the tools and data available to them to attack deforestation. By June of 2016, only 40 percent had signed a local pact, and only 25 percent were carrying out field validation. Of those that verified deforestation, only 22 percent had created a municipal office to actively address the infringements.

As these issues emerged, Imazon addressed them by refining their scaling support model; this included identifying needs and providing infrastructure, building more automated systems, creating financial incentives, and supporting local leadership:

Identifying and Supporting Operational Needs

Imazon realized that some of the hesitation from municipalities stemmed from simple lack of education and infrastructure. Imazon developed a program to train technicians in CAR licensing processes and control of deforestation. The curriculum and course materials were developed and shared with GMP for broader dissemination. Regarding infrastructure, according to Imazon researcher Brandao Jr., "It is not too expensive for the municipalities to participate – they only need a small team to carry out the work – but there are still challenges of lack of infrastructure, like computers and internet access, for which the municipalities had not budgeted." Imazon worked to unlock financial support to provide this much-needed infrastructure.

Building More Automated Systems

Based on feedback from the federal prosecutors and municipalities, Imazon developed an Integrated State Environmental Management System (SIGAM). SIGAM is a software program that has three modules: CAR evaluation, Rural Environmental Licensing, and Environmental Regularization. In March 2016, SIGAM was donated to the state environmental agency, another example of Imazon's strategy of open source sharing. The Environmental Regularization module was officially adopted on May 19, 2016 as the tool used by the private sector to seek regularization. The CAR evaluation and licensing modules were installed and piloted in four municipalities, and by 2016 were set to become the official system used by the municipalities to issue environmental licenses and would be installed in all 96 municipalities. Imazon ensured the systems could be used online or offline depending on internet access.

Creating Financial Support and Incentives

As part of its goal of helping to institutionalize funding for the GMP, Imazon helped secure \$45 million from the Amazon Fund in 2016 and developed concept proposals for other potential funders. To create financial incentives for adoption, GMP implemented a new Green Tax (ICMS Verde) to give benefits to municipalities with high engagement in controlling deforestation and implementing environmental management. As municipalities decrease deforestation and increase the number of CAR registrations, they receive higher tax revenues from the Green Tax fund. According to Secretary Netto, \$30 million was expected to be allocated from the state of Pará to participating municipalities in 2016. Imazon and the GMP leadership also emphasized that, as municipalities have better data and tracking systems from the improved environmental licensing process, they could generate additional funds through fee collection. As an example, in 2014 only 14 fees were collected because tracking systems were lacking. Just two years later in 2016, the number of fees collected rose to 800.

Supporting Local Leadership

Imazon learned that in order to scale community level engagement, they needed to create effective support systems and support individual leadership through training, funding, legal assistance, infrastructure, and technology development. It was also critical to allow for the time needed to build buy-in at the community level. The importance of committed local leadership as a lever for change was cited by many of the GMP partners.

In the end, Imazon realized that asking over 90 municipalities to move from no activity to streamlined environmental licensing in three years was quite a leap. Much time was spent working to understand the municipalities' needs, to segment them, and to solve their unique challenges.



RESULTS:

Ultimate Outcomes

Reduction in Deforestation Rates

Reduced deforestation, the most important overall outcome, was achieved. Of the ten municipalities with which Imazon and the GMP first began working, eight achieved the targeted deforestation rate of less than 40 km² per year per municipality, compared to an average baseline rate of 150 km² per year at the beginning of the project. Remarkably, of these ten initial municipalities, six had been on the federal blacklist and three were removed by 2016.

At the Pará state level, the GMP goal for deforestation rate was 90 percent achieved by 2016. This is especially relevant in the context of the federal government weakening its policies against deforestation and seemingly becoming complacent with the current band of deforestation outcomes (around 5,000 km² per year).

GMP Equipped to Continue Independently as State Program

One of the most impressive outcomes is that the project equipped the GMP to continue to work on deforestation without intensive help from Imazon and its funders. From this perspective, much progress was made, as Imazon helped to develop procedures, training, infrastructure, and governance to identify and engage stakeholders and build community buy-in and ownership. Secretary Netto reiterated the usefulness of the community buy-in approach for long-term success: "If policies and structure depend on individual government officials, this GMP effort will be a failure. Regulations with local pacts and meetings with the steering committee should continue no matter who are the state government's leaders."

Imazon's success in Paragominas and subsequent work scaling to the state level through the GMP has shown the potential of data, partnerships, and community engagement to incentivize significant behavior change and decrease deforestation. Imazon believes it has learned important lessons along the way that will help the organization to continue to accelerate the pace of change.



KEY PIVOTS AND LESSONS LEARNED

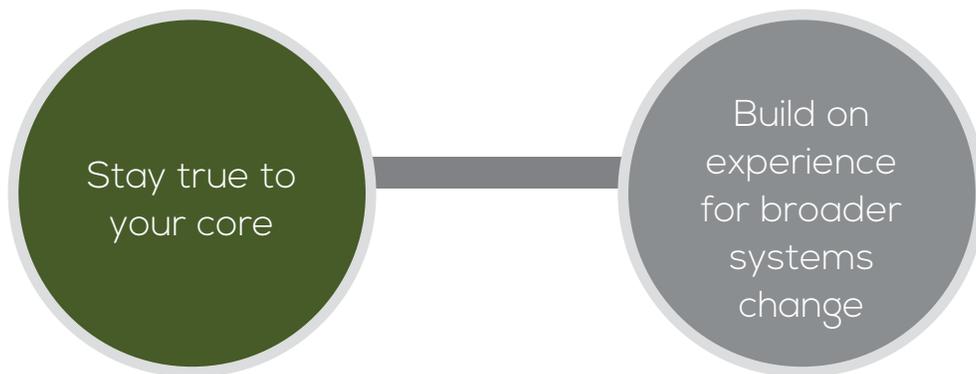
Of the many lessons that Imazon has learned along its scaling journey, five key areas with applicability to other social ventures include:



Together with stakeholders, define clear, tangible objectives against which to measure progress.

While scaling, adapt work to fit local needs and motivations.

Leverage partners while mitigating potential risks and conflicts.



Maintain the boundaries and size of the organization's work, even as opportunities to evolve into other areas become appealing.

Use the lessons of initial, deep engagement to build credibility in cross-sector partnerships in order to achieve broader systems change across national and global levels.

Share outcomes and measurement systems

Imazon's success has centered around defining a clear set of goals that could then be objectively measured. For example, the goals of the GMP partnership included an 80 percent reduction in the rate of deforestation by 2020, zero net deforestation beginning that year, and at least 50 percent growth in CAR registrations. These clear targets aligned partners around shared goals.

A subset of systems theory, trustworthy feedback loops, recognizes the necessity of monitoring systems to measure and report on the flow inside a system. These feedback loops – with the right information given at the right intervals to the right decision makers – are essential to change flow (such as slowing down deforestation rates). Imazon's work is a microcosm of this theory.

By creating monthly alerts at the hectare level (which took over 20 years to do technologically and cost effectively), and being willing to serve as a convener to share and interpret that data, Imazon has created a powerful tool to allow many actors to control the flow of deforestation.

Imazon's serial collaboration strategy enables identification of stakeholders' problems, around which they can agree deforestation data is a key feedback loop. In the GMP they've gone even further by developing process control systems, such as CAR and SIGAM, which allow others to evaluate and act on the data in faster and more effective ways. These developments have led to significant learning just by watching the data change and have helped stakeholders, from government agencies to international NGOs to loggers, change the way they work to reduce deforestation. As Imazon researcher Souza notes, "We have to keep monitoring implementation with a set of indicators that can be understood and that are neutral and transparent."

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Adapt to local contexts

Determining the right amount of local adaptation is often challenging for social ventures. In some cases, a social venture's model can be replicated across an entire country or region without much adaptation, given similar stakeholder groups, environmental and cultural contexts, and effective partners. In other cases, adaptation is needed from one community to the next. Reaching the right balance is important in order to keep quality consistent while recognizing that the more adaptation required, the more time and cost involved.

Even with shared objectives, Imazon and the GMP faced challenges adapting the successful Paragominas pilot to other local municipalities. They realized that each municipality had varying causes of deforestation, leading to differing motivations and incentives. In some areas, deforestation was driven by speculation (clearing the land to claim ownership and increase the value for resale); in others, by charcoal production, cattle ranching, and other drivers. It became clear that the different drivers meant different stakeholders were key to the local engagement.

According to Netto, "The crucial element is the local leadership. Even though the causes of deforestation change from area to area, if you can engage the right local leadership, then you can solve the deforestation problem because they will be able to find a way to make it work." Imazon and the GMP learned to take the time in each municipality to identify the critical drivers of deforestation and the associated industry or government groups, and then to talk with community members to identify the key decision makers or influencers within those groups. It was critical to engage these influencers and turn them into advocates for the program.

Even when the appropriate local leaders were identified and engaged, high levels of turnover at the municipal government level and changing political will throughout the state caused challenges in some locations.

So, in addition to engaging local leaders, Imazon worked to institutionalize local engagement structures – creating regulatory policies, guidelines for establishing steering groups, best practices for stakeholder communications, training materials, and incentives (both carrots and sticks) – that could remain in place amidst government turnover.

In the end, local context clearly matters and, in the words of Imazon co-founder Veríssimo, "to make a difference, you have to be close to the problem. When you lose touch with the field, you lose the capacity to understand." Imazon recognizes local engagement as an area for improvement in their model. Imazon researcher Souza noted that it was not necessarily something Imazon had to do alone; he realized that local engagement could be better accomplished through the selection of skilled partners.

Leverage partnerships

Imazon's pathway to scale relied heavily on partnerships to help carry out its mission. Through their "serial collaborations," they have had to figure out who to collaborate with, which roles to take on, and how to manage the risks of partnerships.

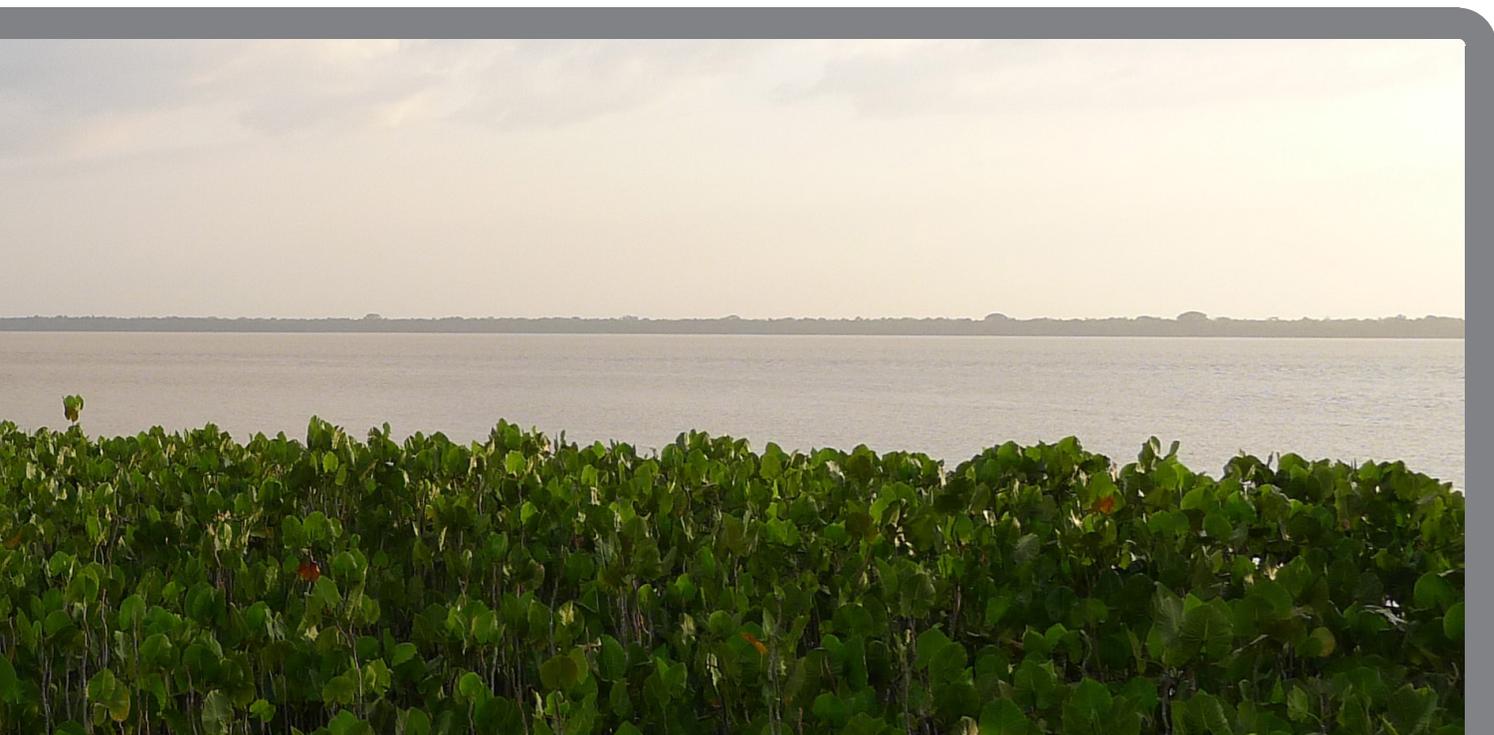
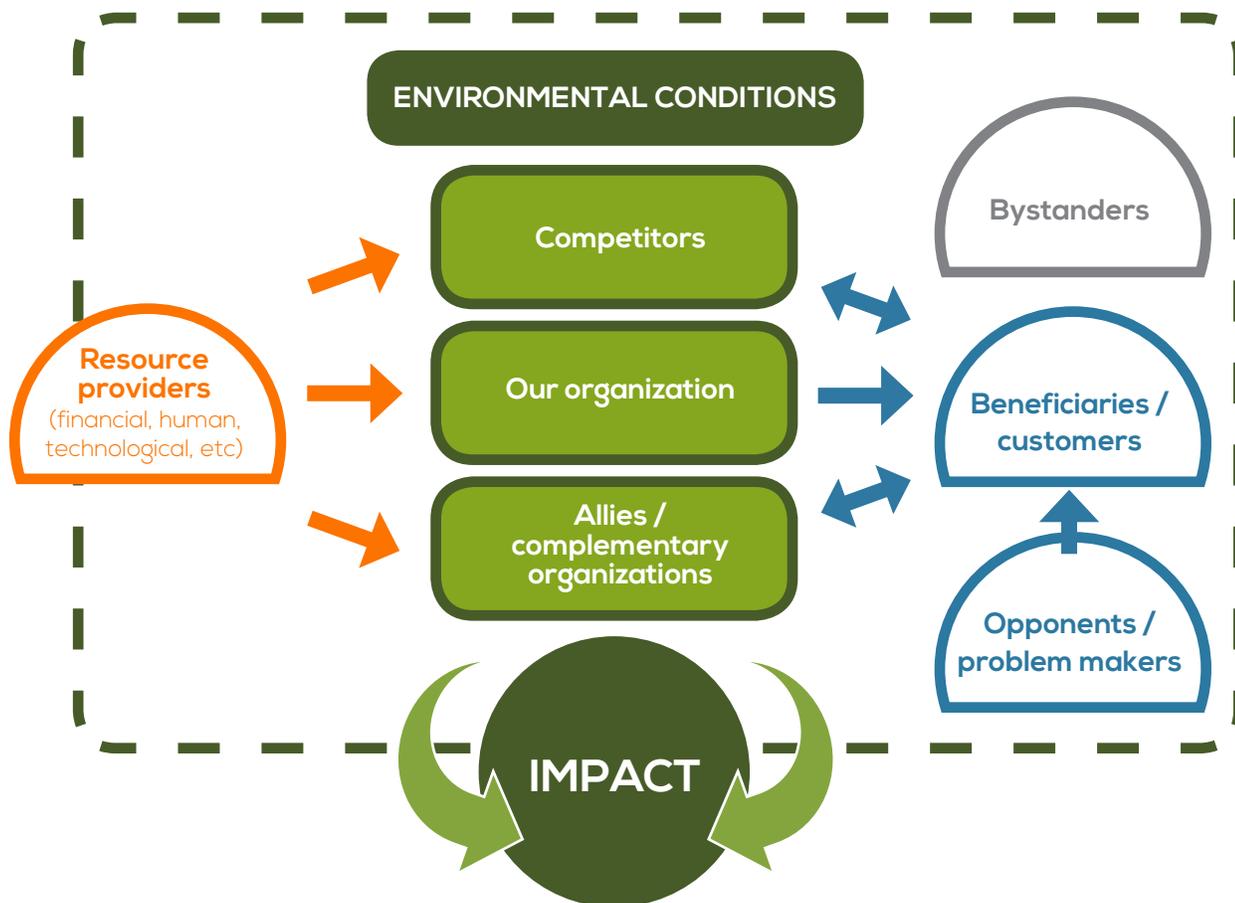
Determining who to partner with

Veríssimo underscored the importance of mapping the ecosystem in which Imazon would be working in order to identify the key stakeholders and align incentives with critical partners. This forced Imazon to look across the aisle and patiently engage with a complicated mix of partners, for example the loggers who had been a main cause of deforestation and were skeptical of Imazon's efforts. It also allowed them to better understand and align incentives.

For example, when approaching government, it became clear that the environmental arguments were important but that economic arguments – telling the government that they were losing money by not enforcing licenses and that Imazon could help provide the data to collect fees – motivated faster change. Felipe Zagalo, former Environmental Secretary of Paragominas and now Director General of the GMP, reiterated that "key success factors were the early adopters and advocates in each municipality." Mapping each ecosystem to understand potential partners, competitors, and other stakeholders can be accomplished using an ecosystem mapping tool like the one outlined in "Cultivate Your Ecosystem" by CASE Founder, J. Gregory Dees and Paul Bloom (see figure 4).



Figure 4: Ecosystem Map template.²⁰
Dees & Bloom, 2008



Creating complementary, not competitive, partnerships

It was important for Imazon to understand its own core skills so that they could find partners that were complementary, not competitive. Early on, they partnered with a respected international NGO and found that they were doing duplicative work creating maps. Both partners were creating high quality maps but time was spent comparing the maps to see which was better or where they differed – time better spent elsewhere! However, a complementary partnership with Greenpeace was effective because Imazon was able to bring its unique data and analysis skills, while Greenpeace was better prepared to grab the attention of media and bring the issues to the forefront of public dialogue.

Managing brand risk in government partnerships

All partnerships bring risks as they entail ceding control, sharing responsibility for quality, and tying your brand to another's. Imazon had to depend heavily on the government to create the systems and policies necessary for program success. However, core to its success was its reputation of being neutral and having high-quality, transparent data. In a dramatically politicized environment, there was a very fine line between leveraging the government partnership and remaining independent and free from government influence, a delicate balance that could make or break Imazon's success.

In order to strike this balance and remain neutral and independent, and in order to remove any perception of dependency and to have the freedom to be transparent with their data, Imazon was very clear to never accept funding from the government. They were able to release reports and maps in a timely manner and make the data open source so that others could use it freely. They also developed relationships with government partners at all levels – federal, state, and municipal – to insulate themselves as much as possible from the pressures of individual government offices and representatives.

Stay true to your core

Over 25 years, Imazon has assessed many opportunities to determine whether these would accelerate its impact and/or improve the sustainability of the organization. Assessing new opportunities is challenging for any social venture and Imazon did not always get it right.

Leadership team members talk of a time a few years back when Imazon took on too many new opportunities and, with a culture of “if you promise, you deliver,” they quickly felt overcommitted. They grew their team, and, as a consequence, started to feel that they were losing key aspects of their culture and that their work was stretched too thin to maintain the quality standards that were critical to their brand. According to Souza, in 2012-2013, the leadership team “looked at each other and said, ‘We need to halve our organization within two years.’”

What ensued was a period of staff downsizing – from a peak of 75 staff members, down to 40. For example, they closed down an Imazon-run training center and decided to partner with another organization to deliver the content. They reached this decision after realizing that they had stopped evolving the curriculum and were spending significant amounts of time and money on infrastructure for something that was not true to their core skill sets and that could be executed by other partners.

With each new opportunity, they now ask themselves questions such as these:

Does this opportunity leverage our unique skills? Will we have to increase our team size? Are there other ways we can accomplish the same goals (such as software solutions or partners that could save time)? And, importantly, how does this align with the outcomes we are trying to achieve?

They make those outcomes as measurable as possible and tied with key products – maps, papers, managed pieces of land, for example – that they are focused on creating. As Veríssimo stated, “Temptation comes every day, so we must focus on products and have clear outcomes about what we are trying to achieve.”

Build on experience for broader systems change

Having a laser focus on core skills does not mean that a venture should be closed off to new opportunities. To the contrary, once a venture is clear on its core skills, it can better leverage that core to undertake new initiatives or evolve its programs to achieve greater impact.

Imazon learned a lot from their local experience in Pará and made remarkable progress in efforts to curb deforestation. But, even after 25 years, their work is certainly not finished.

- “The current rate of
- deforestation in Brazil roughly
- equates to a soccer field being
- cleared every minute.”

The Imazon leadership team believes they cannot rest until zero net deforestation is achieved in the Brazilian Amazon and so, for greater impact, have committed to building on what they have learned in Pará. Their work in Pará has served as inspiration for new deforestation initiatives in other parts of Brazil. For example, the neighboring state of Mato Grosso is working with partner NGOs to create deforestation initiatives inspired and assisted by Imazon. Having identified its core skills – mapping, analysis, open source technology – and tested its activities on a local scale, the Imazon team feels ready to effect change at a broader systems level through more national and global activities. They are now adapting their processes and skills to tackle larger social challenges, in broader contexts, with new partners: for example, climate change, in other biomes and global GHG initiatives, with global multinational corporations.

LOOKING AHEAD



With twenty years of experience, the Imazon team continues to experiment with new scaling pathways to achieve its desired impact thoughtfully, effectively, and efficiently.

Building on the Work of the GMP

Building on the scaling work funded by the IIA, Imazon continues to partner with the GMP to transfer SIGAM – by providing documentation, installation, and preliminary technical assistance – to municipalities selected by the Pará State Government. The team is also providing technical support for the zero net deforestation strategy in Pará.

In addition, Imazon is bringing its work to other states to strengthen environmental management as they have done in Pará. With support of the Amazon Fund, they are targeting 38 municipalities on the blacklist located in the states of Amazonas, Rondônia, Mato Grosso, and Pará. At this point in time, many municipalities in states outside of Pará do not have full authority over environmental management. Therefore, Imazon is focused on providing open source information (e.g. diagnostics of municipal environmental management, land cover and use maps, monthly data deforestation, etc.) and training local environmental agents to help drive deforestation efforts in these states.

Working to Reduce Greenhouse Gas Emissions in Brazil and Globally

Imazon has begun to work on the broader theme of climate change through various initiatives, including the SEEG (The System for Estimation of Greenhouse Gas Emissions) initiative of the Climate Observatory, a Brazilian network of NGOs dedicated to the climate agenda. The SEEG compiles annual GHG emissions data related to five sectors – Agriculture, Energy, Land Use Change, Industrial Processes, and Waste. Building off its work on deforestation, Imazon created the algorithms and provides the land use data that SEEG utilizes annually. This data is presented through an online platform with infographics and free access to researchers, journalists, decision-makers, and the public. Imazon's themes of open source, high quality data, partnerships, and clear communications are clear in this new work.



Mapping All Biomes

MapBiomas,²¹ an initiative started in 2015, builds on what Imazon has learned mapping the Amazon and produces land use maps and reports for all nine of the Brazilian biomes, not just the rainforest. The centerpiece of MapBiomas is a public-private partnership with Google wherein Imazon uses Google Earth Engine, a platform for analyzing geospatial datasets,²² to analyze satellite imagery faster and at lower cost, even while increasing the detail that can be obtained in the process. Imazon's algorithms and Google's satellite imagery and computing power have been a powerful combination, allowing MapBiomas to reconstruct the data from 1985 to the present in order to identify historical trends and continue to release updated reports on Brazilian land use for government, policy makers, and partners to use.

Notably, the Imazon partnership was the first data-mapping project for Google Earth Engine and inspired the Google Earth Engine team to expand their services, including working with partners to map malaria risks, species conservation, and changes in global surface water.²³ As the MapBiomas project continues to grow, Imazon is considering creating an NGO to oversee the work and ensure that it continues to be maintained and scaled over time.

Supporting Sustainable Agribusiness

Imazon is engaging with the private sector to capitalize on the power of markets to drive behavior change related to sustainable development of the Amazon. Toward this aim, some of Imazon's team is currently launching a for-profit company, called Terras. Terras builds off of Imazon's algorithms and data collection methodology to create technology solutions and applications for sustainable agriculture companies related to land management, risk monitoring, geotraceability of rural properties, and more. The goal is to create big data for the agribusiness sector in Brazil to help improve efficiencies, environmental compliance, and sustainability. If successful, major agricultural companies would be helping Imazon achieve its mission and profits from the for-profit Terras would help to fund the work of the nonprofit Imazon. Terras, still in the early stages, represents an innovative approach of using data to directly engage the private sector in order to influence sustainable development.

Imazon co-founder Veríssimo notes that all of these initiatives will take time to develop fully: "New solutions need the time to mature, and you need to do the work to identify investments that have long term potential. We also need donors to be patient and not jump to new efforts every two years. Honestly, we believe the question has been the same for 25 years, and we're committed to providing new solutions and products over time as the problem, and stakeholders engaged in solving it, evolve."

CONCLUSION

Imazon and its partners have made enormous progress mobilizing ecosystems of actors, changing the relationships and operations of different levels of government, and using technology to cost-effectively drive substantial decreases in deforestation.

It is important to note that this work is not finished. Weakening federal government policies regarding deforestation (for example, a new forest code that weakened punishments for deforesters) and increased investment in infrastructure development (such as roads and dams that paved the way for deforestation) have caused set-backs.

Many challenges lie ahead as Imazon drives toward its goal of zero deforestation. Scaling impact is rarely a straight path; it involves experimentation and reevaluation. Imazon's work has stretched over 25 years and will continue evolving into the future. Patient and flexible funders and passionate and committed leadership and staff have been the foundation for Imazon's success, as has sticking to its core "special sauce": becoming experts at sharing quality, open source data, and partnering to drive behavior change and increased impact. As Imazon continues to innovate through improved technology, broad international partnerships, and for-profit business models, the future looks bright.

In the words of co-founder Veríssimo, "In 10 years we believe we will be working on the same questions but with a different perspective. Deforestation will be marginal in the region, forests will have more value, including some kind of payment for environmental service that the forest provides for the planet, and the economic conditions will be in place, including land tenure being solved and better governance in place that allows for better investment."

Imazon's success inspires those looking for new approaches to save the rainforest and offers valuable lessons for all social ventures looking to scale their impact.





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The IIA's partners include:

- **The Skoll Foundation** drives large scale change by investing in, connecting, and celebrating social entrepreneurs and the innovators who help them solve the world's most pressing problems. Skoll brings an expertise in identifying and cultivating social entrepreneurs. Learn more at www.skoll.org.
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