INNOVATION POLICIES: INCENTIVIZING STARTUPS TO GO BEYONG ECONOMIC AND INNOVATION OBJECTIVES

Abstract

Innovation policies have a tradition of targeting entrepreneurship, but more recently, some investigated their ability to foster responsible innovation. These approaches are emerging, and are likely to spread. However, as the literature emphasizes startups' sustainability impact assessment issues, challenges might arise. I conducted a longitudinal exploratory study on the field, using the original case of i-Lab, a public grant for startups which added environmental and societal criteria in its evaluation. It provided an in-depth understanding of implementation and sustainability impact assessment challenges created by an innovation policy targeting responsible innovation for technological startups. I demonstrated the importance of the anticipation phase, which can be better prepared to extend acceptability and to guide entrepreneurs, thus overcoming their lack of knowledge on sustainability.

Keywords
Case study; Entrepreneurship; Sustainability; Innovation policies

INTRODUCTION

Startups have been acknowledged as a key driver for innovation and for the economy, which led many states to implement public policies to support entrepreneurship (Matt and Schaeffer, 2018). With the rise of global challenges, many advocated for more responsible innovation, defined as the voluntary and proactive integration of social and environmental considerations into the innovation process (Kamaludin et al, 2021). Traditionally, regulations and academics paid attention mostly to large firms' practices (Pinkse and Groot, 2015), as small and medium enterprises (SMEs) face many difficulties reducing their likelihood of implementing sustainability reporting (Johnson, 2015). Academics observed that sustainability was indeed little known and implemented by entrepreneurs (Hąbek, 2014). The literature emphasizes how sustainability impact assessment can be challenging for small firms, but it appears as "*an almost unsolvable challenge*" (Hornes, 2019, p. 1) for technological startups, characterized by uncertainty.

States are key actors in promoting sustainability practices for private companies. European countries have a longstanding tradition of adopting social and environmental policies (Steurer et al., 2012), which led European firms to be more active in terms of sustainability practices (Kolk, 2008). In particular, France has the first place worldwide when observing large firms'

extra-financial reporting, as it implemented mandatory reporting laws (Kanya, 2016). Enforced regulations are not the only way one state can promote responsible innovation. It can also use other financial instruments that favor companies with sustainable practices (Steurer et al., 2012). In this context, public grant contests have been identified as public policy tools able to encourage, support and guide innovation (Edler et al., 2016).

Recent research has investigated them in the lens of responsible research and innovation (Gay et al., 2019). Most studies observe public policies targeting directly sustainable innovations, by developing programs for climate startups for example (Bergmann and Utikal, 2021; Adler, 2011). Aside from these mechanisms dedicated to startups directly addressing sustainability issues, we know little about the paradigm shift coming, i.e. that sustainability might become an imperative for *all* startups. Moreover, guiding startups toward responsible innovation appears relevant in the light of recent debates on the "dark side" of innovation (Coad et al., 2021).

The research question is the following: What are the challenges of an innovation policy targeting responsible innovation for technological startups?

To address this question, I conducted a two-years exploratory research in a French incubator dedicated to technological startups. I use the case of i-Lab, a public grant initiated in 1999 to support technological early-stage startup, which has, for the first time in 2022, included in its application form environmental and social criteria. The methodology on the field allowed to obtain confidential data and a privileged sight on entrepreneurs' impressions. This case is the case of a public policy targeting responsible innovation and is rather unique, as it is highly unusual to condition a grant for early-stage innovative startups on sustainable requirements. However, such pioneer practices are most likely to spread. Therefore, this paper provides useful insights for decision-makers, startups, and their stakeholders, and contributes to the emerging literature on responsible innovation research (Gay et al., 2019).

The paper is organized as follows. First, I review the literature, emphasizing the tension between the increased demand for sustainability impact assessment and the difficulties faced by startups to provide them, and I highlight the role public policies can play to foster responsible innovation. Second, I present the longitudinal exploratory methodology, suited to address this new phenomenon through the case. I then evidence results, demonstrating the various challenges observed on the field. I pursue by providing a discussion on findings in the light of previous research. Finally, I conclude, identifying limitations and guidelines for future research.

LITERATURE REVIEW

An increased trend towards sustainability requirements for private companies

The Brundtland report "Our Common Future" defines in 1987 "sustainable development" as the 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Soon, the private sector took it into account, and sustainable development for companies became mainstream. The concept of Corporate Social Responsibility emerged, defined as ''*context-specific organizational actions and policies that take into account stakeholders' expectations and the triple bottom line of economic, social, and environmental performance*'' (Aguinis, 2011, p. 855). Sustainability reporting, or CSR-reporting, was identified as a tool adopted by some companies to publish their contribution to sustainability (Fernandez-Feijoo, 2014).

Bengo et al. (2015) reviewed different methodologies used by academics and practitioners to create these non-financial reporting and highlighted the challenge it represents. However, some efforts have been made to guide firms on how to create their sustainability report. In 2006, the United Nation Global Compact and the Global Reporting Initiative (GRI) united to provide a framework of processes and indicators to assess companies' sustainability. The ISO 26.000 launched in 2010 also provided guidelines for firms to define their social responsibility. Bouten et al. (2011) argue that such reports should reflect the company's aims and intentions, actions, and subsequent performance with respect to different sustainability issues.

While both incumbents and smaller companies are required to address great challenges (Hockerts and Wüstenhagen, 2010), their practices diverge. Large firms are more likely to disclose their CSR activities when compared to SMEs (Perrini et al., 2007; Simnett et al., 2009). Indeed, when studying reports published on GRI, Bos-Brouwers (2010) evidenced that SMEs reports are very scarce. As a result, SMEs deprive themselves of several benefits. Sustainability reporting improves a company's relations with stakeholders (O'Connor and Spangenberg, 2008), as it becomes a tool to communicate with them (Gray, 2006). It benefits the image of the company (Prado-Lorenzo et al., 2009) while it also minimizes reputational risk (Deegan and Unerman, 2006). It contributes to building firm legitimacy (Jahdi and Acikdilli, 2009).

Overall, different concepts emerged in the literature to describe a firm's practices and strategy with respect to social and environmental objectives. The paper will investigate more specifically responsible innovation because the concept has a broader understanding of society impacts, when compared to traditional CSR policies. The literature on sustainability reporting evidenced the tools used and opportunities it creates for companies, while stressing the divergences between large companies and SMEs. This literature is helpful to grasp the research question, but as it implies public disclosure, I will rather use the term sustainability impact assessment in this paper.

Difficulties faced when assessing sustainability impact

The fact that SMEs are less likely to implement sustainability impact assessment can be explained by several factors. They might have fewer pressure from society, regulation, market

(Brammer et al. 2012, Agudo Valiente et al., 2012) and their stakeholders (Nielsen and Thomsen, 2007). Brammer et al. (2012) also demonstrated that smaller companies obtain significantly fewer benefits from engaging in sustainability when compared with larger firms. They also have little awareness about sustainability practices (Johnson, 2015), and therefore, we cannot expect that they will adopt them (Ozaki, 2011). Authors argue that willingness is key in that context (Hsu and Cheng, 2012), but even with great willingness, SMEs lack management capability and resources to implement sustainability tools (Cassells and Lewis, 2011).

The same applies to startups (Esmaeilian et al., 2020; del Brio and Junquera, 2003), a subcategory of SMEs, defined as young, innovative and growth-oriented companies. Great hopes are placed in startups to target great challenges (European Commission, 2012), but we know little about how startups - not only the ones dedicated to social or environmental issues - deal with sustainability. The literature on SMEs' sustainability practices is constrained by available data (Johnson, 2015), which can explain the fact that "*no previous study has addressed the gap created by the dearth of sustainability impact assessment studies focusing on entrepreneurial ventures*" (Di Vaio et al., 2022, p. 2), a gap this paper ambition to address.

The lack of knowledge in the literature is the result of the difficulties startups face when assessing their sustainability impact. Hornes described it as "*an almost unsolvable challenge*" (2019, p. 1) for startups. Trautwein (2021) linked five startups characteristics to five of their difficulties while assessing their contribution to sustainability. (1) Their informal and evolving internal structure reduces the likelihood of providing a continuous and replicable model of the assessment. (2) Their limited resources do not favor a completion of the assessment, nor its communication. (3) Their volatility makes them deal with uncertainties with respect to their business model and value chain, which make the assessment even more difficult. (4) Their newness prevents them from having the data needed. (5) Their lack of sustainability knowledge provokes hesitations with respect to the right assessment tool.

From the literature review, I showed that sustainability and responsible innovation is no longer the concern of only a few motivated companies. As the global challenges became greater, so did the expectations towards private firms. It is highly likely that the number of companies concerned with sustainability objectives and responsible innovation will increase in the coming years. Nonetheless, smaller companies, and in particular startups, seem unprepared for these new requirements (Hąbek, 2014, Esmaeilian et al., 2020).

Interventionism for responsible innovation

The literature investigated the drivers for responsible innovation for small firms (Burch et al., 2016; Campbell, 2007; Haigh and Jones, 2006; del Brío and Junquera, 2003). They mentioned that regulation and public policies - existing and the threat of future ones - can pressure small firms to behave in a responsible way. Similarly, the CSR literature also identified the key role played by the government (Kanya, 2016, Graafland and Smid, 2004). Streurer et al. (2012) evidenced that governments have the legitimacy and power to foster responsible innovation,

and they can use various tools to pressure private firms. Aside from mandatory regulation, public policies can also use 'soft' policies, like financial instruments - described as 'carrots' by the authors.

Bradford and Fraser (2008) demonstrated that financial incentives, such as grants, are particularly effective for small firms (less than 50 employees). Burch et al. (2016) evidenced that such companies are usually more reactive than voluntary in terms of responsibility - aside from some exceptions of highly dedicated firms. Such results seem to indicate that public policies could be proactive and effectively foster responsible innovation in their innovation policies. These public policies have other benefits. They can contribute to provide an external perspective and expertise that founders usually do not have (Johnson, 2015) and reduce the heterogeneity in the engagement in responsible innovation (Brammer et al., 2012). According to Streurer et al. (2012), financial instruments have the potential to raise awareness, to improve disclosure and transparency, to favor socially responsible investment (SRI), and governments can also lead by example.

However, state interventionism has a long tradition of being decried. In the case of our topic, previous research demonstrated that such public policies could add regulatory complexity (del Brío and Junquera, 2003), which already represents a challenge for startups. Pinkse and Groot (2015) emphasized that sustainable startups are highly dependent on government support, but their application might lack transparency. In addition, I highlighted the challenge faced by entrepreneurs when voluntarily trying to assess their sustainability impact, it is possible that decision makers will face the same difficulties. Indeed, startups navigate through uncertainty, as technologies are by definition ambivalent and unpredictable (Ellul, 1988). Therefore, public policies cannot fully control their outcomes (Burch et al., 2016).

Responsible research and innovation (RRI) and financial incentives

The field of responsible research and innovation integrated such criticisms and adopted a critical view on innovation by acknowledging its negative externalities. The ambition to assess innovations' risks is poorly efficient with new technologies (Owen, 2012), and integrating various stakeholders in the assessment is not enough to guarantee its responsibility (Blok and Lemmens, 2015). To overcome these challenges, Stilgoe et al. (2013) developed a four components framework for responsible innovation. First, "Anticipation" requires defining desirable futures and the resources allocation to reach them. Second, "Reflexivity" aims at understanding the goals, drivers and possible consequences of the innovation, as well as integrating the uncertainties. Third, "Inclusion" favors the integration of diverse stakeholders through large-scale consultation. Last, "Responsiveness" emphasizes the need for a dynamic, iterative and inclusive learning process.

Schot and Steinmueller (2018) identified three frames of innovation policies. The first one initiated Post-World War II institutionalized government support for science and R&D in the quest for growth. The second one started in the 1980s and advocated for competition and foster entrepreneurship. Many academics provided evidence with respect to these policies for

entrepreneurship guided by the search for high-growth (Mason and Brown, 2013; Acs and Szerb, 2007). Schot and Steinmueller (2018) observed the rise of a third frame, inspired by the sustainable development goals (SDGs), that could be driven by RRI. Recent studies investigated to what extent financial incentives could represent a relevant policy instrument for responsible innovation, and invited for further research with empirical evidence (Gay et al., 2019).

The literature review identified a tension between, on the one hand, a greater monitoring of private companies with respect to sustainability issues, and on the other hand, difficulties existing while assessing one's firm contribution on sustainability, in particular in the case of startup. Governments are key actors in this context, but they rarely engage *all* startups toward responsible innovation. The literature on responsible research and innovation investigated public policies' ability to implement this new paradigm, but advocate for more empirical evidence, a gap I address with the following research question: What are the challenges of an innovation policy targeting responsible innovation for technological startups?

METHODOLOGY

Because this research is one of the first to address this issue, I used an exploratory methodology (Dumez, 2011). The aim was to provide an in-depth understanding of the many facets of one phenomenon, rather than converging toward general findings. To address the research question, I use the case of i-Lab, a public grant created in 1999 by the French Ministry in charge of Research with two main objectives: (1) to detect and develop business creation projects based on innovative technologies; (2) to promote the transfer of research results to the socio-economic world (Palmarès i-Lab, 2022). Since 1999, it has supported more than 3.700 laureates, with a budget of 526B€ and an overall success rate of 15%. Every year, about 70 laureates benefit from a grant, up to 600.000€. Laureates develop innovative solutions in different sectors, such as pharmaceutical and bio-technologies, digital, software technologies, communication, materials, mechanics and industrial processes, medical technologies, electronics, signal processing and instrumentation, chemistry and environment.

i-Lab answers the definition of an innovation policy provided by Edler et al.: a "public intervention to support the generation and diffusion of innovation, whereby an innovation is a new product, service, process or business model that is to be put to use, commercially or non-commercially" (2016: 3). It can be described as a "inducement prize" (Gay et al., 2019), with *ex ante* prices deliberated at the end of the process. The main characteristics of the i-Lab contest are presented in Appendix A. The application form remained almost the same since its creation: (1) presentation of the project, (2) team, (3) market and commercial goals, (4) innovation program, (5) legal aspects, (6) financial needs and provisional financing. In 2022, it added one section after legal aspects: "Environmental and societal impacts". The integration of sustainability criteria into early-stage startups contests is very rare, and appears as a relevant

case to analyze the challenges of an innovation policy targeting responsible innovation for technological startups.

To investigate the research question, I conducted a longitudinal exploratory research in a Parisian incubator. This sample design allowed to have privileged access to data and startups. I selected a public incubator specialized in innovative startups, created in 2000 by universities and laboratories and supported by local, national and European funds. Its longevity and experience with the i-Lab contest motivated my choice. It accepts about 30 startups per year, for a two-years incubation. The incubator supports startups in their application for i-Lab. 17% of the i-Lab laureates were incubated by this incubator in 2021, 16,5% in 2020. I was integrated to the incubator's staff in 2020, and was on site four days per week, along with the sixty startups incubated. This field immersion allowed to understand the mechanisms at work and facilitated the collection of various data.

As case studies should "rely on a variety of sources" (Yin, 2009: 110), the data collection includes four main materials, presented in Table 1. In total, the study relies on the analysis of more than 1.448 pages of archival records and documentations, 16 hours of participant-observations, and 14 hours of interviews.

Data collection	Source	Total
Archival records (see Appendix A)	- i-Lab rules since 2005 - i-Lab application form since 2005 - Incubator's i-Lab notes since 2005	- 90 pages - 90 pages - 54 pages = 234 pages of archival records
Documentations (see Appendix B)	- 26 i-Lab 2022 candidates' application form - 11 evaluations from i-Lab operators	- 1170 pages of documentation - 44 pages = 1214 of documentation
Participant-observations (see Appendix C)	- 2 private sessions organized by i-Lab coordinators with selected incubators, in 2021 and 2022 - 6 incubator' support sessions for its i-Lab candidates	- 4 hours - 12 hours = 16 hours
Interviews (see Appendix D)	9 semi-structured interviews with startup founders applying to i-Lab 2022	= 14 hours

Table 1 - Data collection (inspired from Yin, 2009)

The archival records were analyzed to create a chronology of the public grant i-Lab and its effective modifications. Combined with the incubator's notes of every edition, it allowed to

understand the incremental changes over the years, with a particular attention to every topic related to responsible innovation. From the private sessions organized by i-Lab coordinators with selected incubators, I identify the drivers for such modifications and the challenge they faced. Combined with the evaluations, I was able to understand how operators constructed their understanding of "environmental and societal impacts" and what they valued. Documentations on the i-Lab 2022 candidates' application form highlighted what entrepreneurs valorize in terms of environmental and societal impacts. Added with the incubator's yearly notes, sessions for entrepreneurs and interviews, I was able to identify the main challenges faced by entrepreneurs and their insights on such policies. I regrouped the materials together and coded them using an inductive approach. The data structure is presented in the Appendix D). Triangulation was possible thanks to the use of multiple sources of evidence (Yin, 2009).

To conclude, a longitudinal exploratory methodology was suited to address the research question, as we know little about public policies targeting responsible innovation for startups. These public policies are scarce, so I investigated the case of France, a pioneer country in terms of public policies targeting responsibility for private companies (Kanya, 2016; Habek and Wolniak, 2016). I selected the case of i-Lab, an "inducement prize" (Gay et al., 2019) which recently added social and environmental impacts in its criteria. The objective was to provide an in-depth understanding of the challenges that arose with these evolutions, as I believe they will become more and more common. I collected multiple sources (Yin, 2009) and encoded them together to have a deep understanding of the phenomenon and its stakes.

RESULTS

Implementation challenges: i-Lab in the lens of responsible research and innovation

First, I present the sresult in the lens of responsible research and innovation. It is worth mentioning that this term was not used in the materials, but I chose to use the Stilgoe et al. (2013) framework to build on previous research (Gay et al., 2019).

Anticipation

The phase "Anticipation" concerns the design of the contest. The data revealed that the objective of the contest did not change with the addition of environmental and social criteria. Incremental evolutions can be observed through time, and reflects the influence of other public policies. When the rules added in 2012 sustainable development, it followed European Union guidelines, with for example the use of the principle "Do Not Significant Harm". Again, when it added the "Environmental and societal impacts" section, it used the European taxonomy developed the same year to orientate investments on activities designated as "Green". Overall,

the operators did not define desirable futures itself, but rather diffused the ones expressed by the European Union. The "Societal impacts" section also reflected recent government-led public initiatives to foster diversity in the French startup ecosystem, such as the French Tech Impact Board or the French Tech Tremplin, whose missions are to respectively close the gender gap and strengthen diversity. Anticipation also reflects the resource allocation. The money invested did evolve in the past year, to have more candidates benefiting from greater amounts of grants. In addition, the operators of the contest benefited in 2022 from gender bias training. Indeed, the percentage of women laureates was increasing in the past years, reaching 20% in 2020, but the number for the 2021 lowered to 13%, meeting the average of 11% of women since the contest creation. Operators said they did not want to implement a positive discriminatory policy to increase the number, but rather allocated resources to reduce gender bias evaluators might have.

Reflexivity

Reflexivity consists in identifying the goals and drivers. The operators of the contest stipulated that they "*could not just do nothing"* with respect to sustainability. After the pandemic crisis, French public policies targeting startups shifted from a focus on digital startups to a focus on "deeptech" startups, i.e. startups with a radical innovation. As a result, a contest such as i-Lab gained in visibility, and some informants considered that the integration of sustainability criteria contributed to legitimate the need for deeptech startups. To others, it seems that France has a tradition of challenging private firms with respect to CSR, and therefore this evolution is in continuity with the French ambition to be a pioneer. Overall, i-Lab is perceived to have the legitimacy and influence to guide startups toward responsible innovation. Reflexivity also concerns the possible consequences of the innovation, and integrates the uncertainties. i-Lab operators stated during private sessions that the applicants of 2022 will serve as testers to improve their methodology. They acknowledged that sustainability impact assessment for startups is challenging, and they shared these difficulties. In the 2022 private session for incubators, they mentioned that the goal of the Environmental and societal section was to evaluate the level of reflections of the project and its ability to take into account sustainability, as the low maturity of the technologies makes sustainability assessment ambiguous. The oral exams will test the veracity of the statements provided in the application form.

Inclusion

Inclusion favors the integration of diverse stakeholders through large-scale consultation. Here, no large-scale consultation was implemented, but some stakeholders were taken into consideration in the process. At least, operators initiated a dialogue with incubators to answer their questions. It is more likely that different stakeholders were involved in the construction of the new section, as the contest gathers many actors: representatives of the region dedicated to technology, representatives of Bpifrance (the French public investment bank), recognized experts and representatives of the Minister of the Economy and Research. However, informants were reluctant to disclose who was involved in the creation of the new section. In addition, some entrepreneurs received the evaluation of their application. The operator

explained that a grade was created based on their results on the "Environmental and societal impacts", but did not accept to share the methodology after the 2022 edition, as it would change again in 2023.

Responsiveness

Responsiveness takes into consideration the dynamic, iterative and inclusive learning process. First, even though the change in the rule was implemented for the 2022 edition, some 2021 candidates were questioned during oral exams about their contribution to environmental and societal issues. Second, the section evolved for the 2023 edition, integrating more specific questions, which demonstrates the operators' ability to learn from the previous edition. Third, i-Lab operators were aware of their initial lack of knowledge on environmental and societal impact assessment, so they chose to progressively take it into account in the evaluation. In 2022, this section was evaluated "*at the discretion of the evaluator*", and for the 2023 edition, the grade is integrated in the global assessment scale.

The challenge of heterogeneity: sustainability impact assessment by technological startups

The 2022 candidates had to establish their environmental and societal impacts in the application file (see Appendix B.1.). For the purpose of the analysis, I regroup the "societal impact" mentioned in the first subsection "Project's impacts with respect to sustainable development", and the "social impacts of the project". I first present the societal and social impacts, and then the environmental impacts.

Societal and social impacts

First, most candidates presented their internal functioning, commitments and governance to argue their societal and social impacts (76% of files). 50% of application files emphasized their contribution to gender equality, a high rate that can be explained as it was directly demanded in the application file to complete. However, one female-led startup did not stress that point in their response. Some candidates have no women in their founding team, but pointed out the women in their board and/or their team, and argued parity was more important in their startup than the usual rates in their sector. 42% mentioned their diversity policy and their promotion of chances equality. 23% also presented their actions for society, with ONGs, schools or feminist programs. 11,5% of application files mentioned the startup mission. The term *raison d'être* was included in the French legal system with the PACTE law, and some respondents developed their ambition to become *société à mission* (mission-driven companies). However, one *société à mission* did not mention it. 11,5% declared their commitments for their employees, with for example employee ownership, flexibility and well-being policies, as well as training. 11,5% of them indicated they follow governance indicators. 8% mentioned internal environmental policies, like promoting public transportation for employees. Only one project expressed itself on ethics commitments.

Second, most candidates argued the benefits of their solution for society (73%). 27% advocated their continuity with other public policies launched, like France Relance 2030, European or local programs. 19% stressed the inclusion of stakeholders, mostly with public research centers. Their contribution to a critical issue diverged according to sectors. Health candidates wrote they address a public health stake, like lack of care, access to care, reducing mortality or fighting against biases. Industry/Greentech candidates emphasized how they contribute to the remuneration of isolated populations, to avoid catastrophes or to democratize access to environmental solutions. Digital candidates identified other issues, such as deepfake, cyber-attacks, access to creation, steering public policies or reducing digital divide.

Third, about half of the candidates emphasized their contribution to the economy (58%). 42% mentioned the jobs they will create, high-value jobs, researchers or young academics, local and industrial jobs. 31% advocated their contribution to sovereignty stakes, to contribute to France's international influence or for security's sake. 19% insisted on the benefits of their startup for the French economy as they improve its resilience and efficiency. 19% of candidates, mostly from the Industry/Greentech sector, included their project in a local or reindustrialization process.

Environmental impacts

First, most candidates found indirect positive environmental impacts in their projects (86%). Their indirect impacts were very diverse according to their solution: improving energy efficiency, using less consumables, avoiding wastes, and limiting the need for transportations. Digital responsibility was the most cited indirect impact (27%), with a predominance of digital startups using this argument. 11,5% of candidates, again mostly digital startups, argued their solution will contribute to the emergence and development of environmental innovations. 19% of them emphasized that their technology will prevent or avoid disasters.

Second, many candidates, mostly from the Industry/Greentech sector, argued that their startup will have direct positive impacts on the environment (42%). These positive impacts are obtained by reducing the use of rare materials, providing an alternative to polluting wastes, favorizing biodiversity or enabling better water treatment. The most cited direct impact concerns the significant improvement of energy efficiency (19%). 27% also suggested that the development of their startup will have a direct effect on their industry, favoring a circular economy, developing regenerative agriculture or decarbonizing the whole industry.

Third, many candidates provided evidence to support their positive contribution to the environment (42%). 11,5% presented the tools they used or planned to use, with a particular focus on life cycle analysis. 11,5% identified the providers they will work with to improve their environmental strategy. 8% mentioned labels and certifications they received or targeted. 23% of candidates also supported their statements by connecting them with recommendations made from public policies or from the scientific community.

Fourth, some candidates went further and provided a more complete approach of their contribution to environment stakes (27%). 23% of them imagined solutions to go deeper in their environmental assessment, by measuring the actual environmental gains of their technology or by realizing their carbon report. Only 8% of them acknowledged their negative impacts and thought of potential alternatives to later develop.

The challenges and confusions surrounding the integration of environmental and social criteria

Framing challenges

The interviews revealed a great confusion with respect to the meaning of the integration of environmental and societal criteria in such a contest. Both entrepreneurs and the incubator staff consider it is not clear whether the contest will later accept a project with no impact on the environment and on society. One entrepreneur stated: "*I provide a digital solution, using consuming data servers, that will increase efficiency in a particular sector, and therefore reduce the need of humans to do these tasks. That is the truth. If I wrote that, or simply 'n.a', in the environmental and societal section, would I be rejected?*". In addition, i-Lab operators mentioned during the 2022 private sessions for incubators that it will not do positive discrimination. In the 2023 edition, the application file clearly asks the number of women in the founders' team. One entrepreneur asked during one of the incubator support sessions for candidates: "*Should I put myself as a candidate even if I am not the CEOs? If they demand the number of women, it means that female-led teams will obtain more points?*". The formulation of questions led to confusion. Moreover, because the "Environmental and societal impacts" section was "at the discretion of the evaluator" for the 2022 edition, entrepreneurs admitted they spent less time on these questions. The support sessions organized by the incubator for the 2023 edition demonstrated that entrepreneurs are globally more demanding for advice when the section is actually evaluated.

Transparency challenges

For the 2022 edition, the "Environmental and societal impacts" section was not much detailed, which led to important difficulties for the candidates. For most of the interviewees (88%), it was the first time they were asked about their contribution to such goals. Every interviewee said they would have preferred to have a common tool to use, rather than open questions. The results evidence the heterogeneity of candidates' responses, but at the same time, the quantity of answers envisaged by the candidates. During the incubator's support sessions for entrepreneurs, one of them asked whether "governance" criteria was considered by evaluators, as private investors rather use Environmental, Social and Governance (ESG) criteria to evaluate startups' contribution to sustainability. The answer is not evident. When analyzing the quantitative environmental evaluations, I observed that Industry/Greentech startups obtained the most points. All the five evaluations that I obtained from these startups attributed environmental points to the candidates, whereas only two startups in the Health sector managed to gain points in this section and none in the Digital sector. In addition, the evolutions

revealed some discrepancies. Some evaluators valued job creation, whereas others did not. The application file invited candidates to stress the inclusion of gender equality and diversity, but the most mentioned social impact in evaluations concerned public health issues. To conclude, the operator's lack of transparency in the expectations and in the evaluation created a confusion for candidates.

Acceptability challenges

More surprisingly, interviews revealed a great frustration with respect to the simple fact of asking an early-stage startup for its contribution to society or the environment. This resentment was shared by all interviewees, even by environmental startups, with the term "greenwashing" largely used by respondents: "*We are currently nothing, less than five people, with great ambition but currently we just have two slides. Our environmental impact is not significant, but for i-Lab we have to do greenwashing, just like large companies*". Another explains: "*They force you to lie. Even if we had the resources to assess our contribution to the environment, it is not possible to know for sure, as it will depend on so many factors we cannot determine. It is very frustrating to be forced to lie and pretend it is possible to assess"*. Another frustration came from the social impact. Interviewees perceived their social actions as nature, rather than rational. One entrepreneur argued: "*It turns out that I have parity in my team, but I never did positive discrimination. I am forced to mention it in the file, it is degrading for the women in my team"*. Another entrepreneur argued that "*We will not get points in this section because we do not have women in the team. But let's be clear, the team today is me and my cofounder, so yes 0% but what does it really mean?*". The addition of environmental and social criteria faced an acceptability challenge due to the difficulties of sustainability impact assessment for early-stage startups.

DISCUSSION

The results evidenced entrepreneurs' little awareness of sustainability practices (Johnson, 2015). One main positive outcome of the integration of environmental and societal criteria in the public policy was to raise awareness (Streuer et al., 2012), as almost all of them never had to answer to such criteria before. They indeed have little pressure from their stakeholders on these matters (Brammer et al., 2012). Johnson (2015) advocated that public policies can contribute to diffuse expertise that founders do not usually have. However, with open questions, it failed to reach this benefit for entrepreneurs. By simply building up on previous public policies, they also offered a narrow view of responsible innovation, missing key points such as ethics or governance.

None of the entrepreneurs used frameworks traditionally mentioned in the literature or adopted by practitioners (Bengo et al., 2005). To overcome their lack of preparedness for such requirements (Hąbek, 2014, Esmaeilian et al., 2020), entrepreneurs used a bricolage approach

(Lévi-Strauss, 1967; Baker and Nelson, 2005). The results demonstrated that smaller companies are indeed more reactive than voluntary in terms of responsibility (Burch et al., 2016), as none of the startups in the sample had prepared responses to such criteria before the contest. I emphasized the ability of a 'soft policy' (Streurer et al., 2012) to overcome the sole willingness for sustainability impact assessment (Hsu and Cheng, 2012), as startups are highly motivated by the prize. Without such incentives, startups are not likely to measure their contribution to environmental and social issues.

The papers also contribute to the emerging literature on responsible research and innovation (Gay et al., 2019) and make recommendations for practitioners. Policy makers can learn from this case not to neglect the "Anticipation" phase, and rigorously answer several questions candidates might have with respect to the goals and the methodology for this new requirement to avoid many challenges. In particular, little anticipation creates confusions and frustrations, expressed by the impression of conducting greenwashing. To my knowledge, no previous study had expressed this risk for responsible innovation policies. Even if the contest has legitimacy, it is not enough to reach acceptability (Banister, 2008). The case revealed little transparency and inclusion in the process, yet, these two elements are key for responsible innovation. Stakeholders were rarely involved in the process, but its responsiveness was effective as evolutions were integrated every year, learning from past editions.

While the open questions on environmental and societal impacts failed to guide entrepreneurs, it provided an insightful overview on what entrepreneurs consider to be their environmental or social contribution. Such knowledge enriches the emerging literature on sustainability impact assessment for startups (Trautwein, 2021) and can be useful for startups and actors coaching them. I demonstrated that entrepreneurs are more likely to identify their indirect positive environmental impact, to argue that their internal structure is coherent with sustainability goals or to evidence the benefits of their solution for society. On the other hand, they more rarely consider economic contributions, advocate for direct environmental impacts or identify ways to mitigate their negative environmental impact.

Finally, the case also reflects the need to control outcomes, even when it is clear that technologies are by nature ambivalent and unpredictable (Ellul, 1988). By questioning the environmental and societal impacts, the public policy seems to acknowledge that some innovations are not desirable (see Soete, 2013). The literature stresses the importance of drawing desirable futures (Stilgoe et al., 2013), but I rather argue that drawing undesirable futures could be effective. The integration of social and environmental criteria in the contest does not meet Schot and Steinmueller (2018) expectations for a third framing of innovation policies. Indeed, it did not question the current system itself, but rather offered an incremental evolution. However, policy makers in the sample were pioneers in the integration of sustainability criteria and demonstrated their responsiveness. Therefore, one can be optimistic about further public policies to come.

CONCLUSIONS

The number of companies constrained by sustainability requirements is likely to evolve over time. While we know a lot about large companies' practices, a scar of knowledge is available on smaller firms, and in particular startups, which are nonetheless identified as promising actors to address great challenges. Through a longitudinal exploratory research on the field, using the original case of i-Lab, a public grant targeting early-stage technological startups, I was able to demonstrate the challenges that arise when targeting responsible innovation for startups. I analyzed in-depth the implementation and the sustainability impact assessment challenges that arose.

Doing so, I pursue recent research on the ability of public actors to foster responsible research and innovation for startups (Gay et al., 2019), and connected it with the emerging literature on the problematic of sustainability impact assessment for entrepreneurial ventures (Hornes, 2019; Trautwein, 2021; Di Vaio et al., 2022). The results have implications for practitioners, policy makers, startups and their stakeholders. I acknowledge that such initiatives play a major role with respect to sustainability awareness. However, I demonstrated that legitimacy alone is not enough to obtain acceptability when implementing sustainability criteria. A great work has to be done during the anticipation phase to efficiently reach acceptability and to educate on the meaning of such new requirements.

This case is original, as it is highly unusual for startups to be challenged in their early stages on sustainability criteria. This phenomenon was observed in France, a country known to be a pioneer in terms of environmental and social requirements for companies. However, as such practices are likely to spread, policy makers and private companies from different countries can use this research to anticipate future evolutions. The discussion emphasized that such changes in innovation policies are rather incremental. One may wonder whether responsible innovation should require a more extensive questioning of the actual system and its current tools.

While enriching the literature, the paper also identifies avenues for further research. Exploratory studies are difficult to extend to a broader population. The research setting influenced the results, as the incubator had access to the operators of the contest, non-incubated candidates might face even more challenges. Further research could improve our knowledge with a quantitative approach, questioning startups about their challenges when complying with new responsible innovation requirements. Moreover, the study investigated the first years of implementation of environmental and social criteria, and demonstrated a high responsiveness capability from operators. No doubt the evolutions to come will be insightful, and will require further investigation.

REFERENCES

Acs, Zoltan J., and Laszlo Szerb. 'Entrepreneurship, Economic Growth and Public Policy'. *Small Business Economics* 28, no. 2 (1 March 2007): 109–22. https://doi.org/10.1007/s11187-006-9012-3.

Adler, Jonathan H. 'Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization'. *SSRN Electronic Journal*, 2011. https://doi.org/10.2139/ssrn.1576699.

Agudo-Valiente, José M., Conchita Garcés Ayerbe, and Manuel Salvador. 'Social responsibility practices and evaluation of corporate social performance'. *Journal of Cleaner Production,* Vol 35, (2012): 25–38. https://doi.org/10.1016/j.jclepro.2012.05.002.

Aguinuis, Herman. 'Organizational responsibility: Doing good and doing well'. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology*, Vol. 3. (2011): 855–879. https://doi.org/10.1037/12171-024

Baker, Ted, and Reed E. Nelson. 'Creating Something from Nothing: Resource Construction through Entrepreneurial Bricolage". *Administrative Science Quarterly*, Vol 50, No 3 (2016). https://doi.org/10.2189/asqu.2005.50.3.

Banister, David. 'The sustainable mobility paradigm'. *Transport Policy*, Vol 15, No 2. (2008): 73-80. https://doi.org/10.1016/j.tranpol.2007.10.005.

Bergmann, Thorsten, and Hannes Utikal. 'How to Support Start-Ups in Developing a Sustainable Business Model: The Case of an European Social Impact Accelerator'. *Sustainability* 13, no. 6 (January 2021): 3337. https://doi.org/10.3390/su13063337.

Bengo, I., Arena, M., Azzone, G., and Calderini, M. 'Indicators and metrics for social business: A review of current approaches'. *Journal of Social Entrepreneurship*, 7 (1), (2015): 1-24. https://doi.org/10.1080/19420676.2015.1049286.

Blok, Vincent, and Pieter Lemmens. 'The Emerging Concept of Responsible Innovation. Three Reasons Why It Is Questionable and Calls for a Radical Transformation of the Concept of Innovation'. *Responsible innovation 2: Concepts, Approaches and Applications, Chapter: 2,* (2015). https://doi.org/10.1007/978-3-319-17308-5_2.

Bouten, Lies, Patricia Everaert, Luc Van Liedekerke, Lieven De Moor, and Johan Christiaens. 'Corporate social responsibility reporting: A comprehensive picture?'. *Accounting Forum,* 35 (2011): 187-204. https://doi.org/10.1016/j.accfor.2011.06.007.

Bos-Brouwers, Hilke Elke Jacke. 'Corporate Sustainability and Innovation in SMEs: Evidence of Themes and Activities in Practice'. *Business Strategy and the Environment* 19, no. 7 (2010): 417–35. https://doi.org/10.1002/bse.652.

Bradford, Jaryn, and Evan D. G. Fraser. 'Local Authorities, Climate Change and Small and Medium Enterprises: Identifying Effective Policy Instruments to Reduce Energy Use and Carbon Emissions'. *Corporate Social Responsibility and Environmental Management* 15, no. 3 (2008): 156–72. https://doi.org/10.1002/csr.151.

Brammer, Stephen, Stefan Hoejmose, and Kerry Marchant. 'Environmental Management in SMEs in the UK: Practices, Pressures and Perceived Benefits'. *Business Strategy and the Environment* 21, no. 7 (2012): 423–34. https://doi.org/10.1002/bse.717.

Brammer, Stephen, Gregory Jackson, and Dirk Matten. 'Corporate Social Responsibility and Institutional Theory: New Perspectives on Private Governance'. *Freie Universitaet Berlin on December* 10 (1 January 2012): 3–28. https://doi.org/10.1093/ser/mwr030.

Brío, Jesús Ángel del, and Beatriz Junquera. 'A Review of the Literature on Environmental Innovation Management in SMEs: Implications for Public Policies'. *Technovation* 23, no. 12 (1 December 2003): 939–48. https://doi.org/10.1016/S0166-4972(02)00036-6.

Burch, Sarah, Mark Andrachuk, Dustin Carey, Niki Frantzeskaki, Heike Schroeder, Niklas Mischkowski, and Derk Loorbach. 'Governing and Accelerating Transformative Entrepreneurship: Exploring the Potential for Small Business Innovation on Urban Sustainability Transitions'. *Current Opinion in Environmental Sustainability*, System dynamics and sustainability, 22 (1 October 2016): 26–32. https://doi.org/10.1016/j.cosust.2017.04.002.

Campbell, John L. 'Why Would Corporations Behave in Socially Responsible Ways? An Institutional Theory of Corporate Social Responsibility'. *The Academy of Management Review* 32, no. 3 (2007): 946–67. https://www.jstor.org/stable/20159343.

Cassells, Sue, and Kate Lewis. 'SMEs and Environmental Responsibility: Do Actions Reflect Attitudes?' *Corporate Social Responsibility and Environmental Management* 18, no. 3 (2011): 186–99. https://doi.org/10.1002/csr.269.

Coad, A., Nightingale, P., Stilgoe, J., & Vezzani, A. 'The dark side of innovation'. *Industry and Innovation*, Vol 28, No 1, (2021): 102-112. https://doi.org/10.1080/13662716.2020.1818555.

Di Vaio, A., Hassan, R., Chhabra, M., and Arrigo, E. 'Sustainable entrepreneurship impact and entrepreneurial venture life cycle: A systematic literature review'. *Journal of Cleaner Production*, Vol 378, (2022): 134-469. https://doi.org/10.1016/j.jclepro.2022.134469.

Deegan, Craig, and Jeffrey Unerman. *Financial accounting theory: European edition*. McGraw-Hill, (2006).

Dumez, Hervé. 'Qu'est-ce que la recherche qualitative?'. *Le Libellio d'AEGIS*, Vol 7, (2011): 47-58. https://hal.science/hal-00657925.

Edler, Jakob, Paul Cunningham, Abdullah Gök and Philip Shapira. 'Handbook of Innovation Policy Impact'. *Edward Elgar Publishing.* (2016). ISBN:9781784711849.

Ellul, Jacques. *Le Bluff technologique*. (1988).

Esmaeilian, Behzad, Joe Sarkis, Kemper Lewis, and Sara Behdad. 'Blockchain for the Future of Sustainable Supply Chain Management in Industry 4.0'. *Resources, Conservation and Recycling* 163 (1 December 2020): 105064. https://doi.org/10.1016/j.resconrec.2020.105064.

Fernandez-Feijoo, Belen, Silvia Romero, and Silvia Ruiz. 'Commitment to Corporate Social Responsibility Measured through Global Reporting Initiative Reporting: Factors Affecting the Behavior of Companies'. *Journal of Cleaner Production* 81 (15 October 2014): 244–54. https://doi.org/10.1016/j.jclepro.2014.06.034.

Gay, Claudine, Isabelle Liotard, and Valérie Revest. 'Les concours d'innovation en ligne : un instrument pertinent pour la recherche et l'innovation responsable'. *Innovations*. (2019) https://doi.org/10.3917/inno.059.0129.

Gioia, Dennis A., Kevin G. Corley, and Aimee L. Hamilton. 'Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology'. *Organizational Research Methods*, Vol 15, No 1, (2012). https://doi.org/10.1177/10944281124521

Graafland, J., and H. Smid. 'Reputation, Corporate Social Responsibility and Market Regulation'. *Review of Business and Economic Literature*, 2004. https://www.semanticscholar.org/paper/Reputation%2C-Corporate-Social-Responsibility-and-Graafland-Smid/b19356c47fb355a6cea0c4ae1e0d564e10f9c811.

Gray, Rob. 'Does sustainability reporting improve corporate behaviour?: Wrong question? Right time?'. *Accounting and Business Research*, Vol 36, (2006): 65-88. https://doi.org/10.1080/00014788.2006.9730048.

Hąbek, Patrycja. 'Evaluation of sustainability reporting practices in Poland'. *Quality & Quantity* (2014): 48:3 https://doi.org/10.1007/s11135-013-9871-z.

Hąbek, Patrycja, and Radosław Wolniak. 'Assessing the Quality of Corporate Social Responsibility Reports: The Case of Reporting Practices in Selected European Union Member States'. *Quality & Quantity* 50, no. 1 (1 January 2016): 399–420. https://doi.org/10.1007/s11135-014-0155-z.

Haigh, Matthew, and Jones, . 'The Drivers of Corporate Social Responsibility: A Critical Review'. *The Business Rev* 5 (1 January 2006).

Hockerts, Kai, and Rolf Wüstenhagen. 'Greening Goliaths Versus Emerging Davids—Theorizing about the Role of Incumbents and New Entrants in Sustainable Entrepreneurship'. *Journal of Business Venturing* 25 (1 September 2010): 481–92. https://doi.org/10.1016/j.jbusvent.2009.07.005.

Horne, Jonas. 'The sustainability impact of new ventures. Measuring and managing entrepreneurial contributions to sustainable development'. Ph.D. Thesis, der Technischen Universität Berlin (2019). https://depositonce.tu-berlin.de/horne_jannic

Hsu, Jui-Ling, and Meng-Cheng Cheng. 'What Prompts Small and Medium Enterprises to Engage in Corporate Social Responsibility? A Study from Taiwan'. *Corporate Social Responsibility and Environmental Management* 19, no. 5 (2012): 288–305. https://doi.org/10.1002/csr.276.

Jahdi, Khosro S., and Gaye Acikdilli. 'Marketing Communications and Corporate Social Responsibility (CSR): Marriage of Convenience or Shotgun Wedding?'. *Journal of Business Ethics*, Vol 88, (2009): 103-113. https://doi.org/10.1007/s10551-009-0113-1.

Johnson, Matthew P. 'Sustainability Management and Small and Medium-Sized Enterprises: Managers' Awareness and Implementation of Innovative Tools: Sustainability Management Tools and SMEs'. *Corporate Social Responsibility and Environmental Management* 22, no. 5 (September 2015): 271–85. https://doi.org/10.1002/csr.1343.

Kamaludin, Mohammed Faiz, Jesrina Xavier, and Muslim Amin. 'Social Entrepreneurship and Sustainability: A Conceptual Framework', *Journal of Social Entrepreneurship*, (April 2021). https://doi.org/10.1080/19420676.2021.1900339.

Kanya, Idil. 'The Mandatory Social and Environmental Reporting: Evidence from France'. *Procedia - Social and Behavioral Sciences* 229 (August 2016): 206–13. https://doi.org/10.1016/j.sbspro.2016.07.130.

Kolk, Ans. 'Sustainability, accountability and corporate governance: Exploring multinationals' reporting practices. *Business Strategy and the Environment*, 17(1), (2008): 1-15. https://doi.org/10.1002/bse.511

Lévi Strauss, C., (1962). From The Savage Mind. Chapter One, The Science of the Concrete. University of Chicago Press. ISBN 10:0226474844.

Mason, Colin, and Ross Brown. 'Creating Good Public Policy to Support High-Growth Firms'. *Small Business Economics* 40, no. 2, (1 February 2013): 211–25. https://doi.org/10.1007/s11187-011-9369-9.

Matt, Mireille, and Véronique Schaeffer. 'Building Entrepreneurial Ecosystems Conducive to Student Entrepreneurship: New Challenges for Universities', *Journal of Innovation Economics and Management*, Vol 1, No 25, (2018): 9-32. https://doi.org/10.3917/jie.025.0009.

Nielsen, Anne Ellerup, and Christa Thomsen. 'Reporting CSR - What and how to say it?'. *Corporate Communications An International Journal*, Vol 12, No 1, (2007). https://doi.org/10.1108/13563280710723732.

O'Connor, Martin Paul, and Joachim H Spangenberg. 'A methodology for CSR reporting: assuring a representative diversity of indicators across stakeholders, scales, sites and performance issues'. *Journal of Cleaner Production*, Vol 16, No 13, (2008): 1399-1415. https://doi.org/10.1016/j.jclepro.2007.08.005.

Owen, Richard, Phil. Macnaghten, and Jack Stilgoe. 'Responsible Research and Innovation: From Science in Society to Science for Society, with Society'. Science and Public Policy, Vol 39, No 6. (2012): 751–760. https://doi.org/10.1093/scipol/scs093.

Ozaki, Ritsuko. 'Adopting sustainable innovation: what makes consumers sign up to green electricity?'. *Business Strategy and the Environment*, Vol 20, No 1, (2010): 1-17. https://doi.org/10.1002/bse.650.

Perrini, Francesco, Angeloantonio Russo, Antonio Tencati. 'CSR Strategies of SMEs and large firms. Evidence from Italy'. *Journal of Business Ethics*, Vol 7, No 3, (2007):285-300. https://doi.org/10.1007/s10551-006-9235-x.

Pinkse, Jonatan, and Koen Groot. 'Sustainable Entrepreneurship and Corporate Political Activity: Overcoming Market Barriers in the Clean Energy Sector'. *Entrepreneurship Theory and Practice*, 2015, Vol 39, No 3, (2015): 633-654. https://doi.org/10.1111/etap.12055.

Prado-Lorenzo, José-Manuel, Isabel Gallego-Álvarez, and Isabel María García Sánchez. 'Stakeholder Engagement and Corporate Social Responsibility Reporting: The ownership Structure Effect'. *Corporate Social Responsibility and Environmental Management*, Vol 16, No 2, (2009): 94-107. https://doi.org/10.1002/csr.189.

Schot, Johan, and W. Edward Steinmueller. 'Three Frames for Innovation Policy: R&D, Systems of Innovation and Transformative Change'. *Research Policy* 47, no. 9 (1 November 2018): 1554–67. https://doi.org/10.1016/j.respol.2018.08.011.

Steurer, Reinhard, Andre Martinuzzi, and Sharon Margula. 'Public Policies on CSR in Europe: Themes, Instruments, and Regional Differences'. *Corporate Social Responsibility and Environmental Management* 19 (1 July 2012). https://doi.org/10.1002/csr.264.

Simnett, Roger, Ann Vanstrelen, Wai Fond Chua. 'Assurance on Sustainability Reports: An International Comparison'. *The Accounting Review*, Vol 84, No 3, (2009). https://doi.org/10.2308/accr.2009.84.3.937.

Stilgoe, Jack, Richard Owen, and Phil Macnaghten. 'Developing a Framework for Responsible Innovation'. *Research Policy* 42, no. 9 (1 November 2013): 1568–80. https://doi.org/10.1016/j.respol.2013.05.008.

Soete, Luc. 'Is Innovation Always Good?'. *Innovation Studies*. (2013). https://doi.org/10.1093/acprof:oso/9780199686346.003.0006.

Trautwein, Constanze. (2021). 'Sustainability impact assessment of start-ups – Key insights on relevant assessment challenges and approaches based on an inclusive, systematic literature review'. *Journal of Cleaner Production*, Vol 281, (2021): 125-330. https://doi.org/10.1016/j.jclepro.2020.125330.

Yin, Robert K. Case Study Research: Design and Methods (4th ed.). *Thousand Oaks, CA: Sage Publications*. (2009).

APPENDIX

- Appendix A. i-Lab characteristics, from archival records
- Appendix B. Documentations: i-Lab 2022 candidates' application form and evaluations
- Appendix C. Participant-observations: private sessions organized by i-Lab coordinators and incubator's support sessions for candidates
- Appendix D. Interviews: interviewees profile and interview guide
- Appendix E. Data structure (inspired by Gioia et al., 2012)

Appendix A. - i-Lab characteristics, from archival records

i-Lab design	Rules and procedures
Eligibility criteria	- Legal person who has created his/her company in France for less than two years, or who has the project the creation of a French company. - A rejected candidate can apply the further year(s) if it still matches the eligibility criteria (in 2021, 35% of laureates have applied to i-Lab in 2020).
Setting and process	Three institutional and professional bodies are represented: The regional technical secretariat (STR), composed by a representative of the region dedicated to technology, a representative of Bpifrance (the French public investment bank), and a recognized expert; The national technical secretariat (STN), composed by representatives the Minister of the Economy or Research; The national jury ("jury"), composed by a President designated by the STN, professional experts (entrepreneurs, industrials…). The process is the following: - February: deadline for candidates to submit complete files. Bpifrance examines the applications, and the STR pre-selects candidates. - March-May: selected candidates endure an in-depth audit - carried out by Bpifrance with the support of a service provider selected by tender - with an oral exam to assess candidates' entrepreneurial skills. A list of best candidates is then established by the STN, taking into account the STR recommendations. - June: selected candidates present themselves in front of a jury for an oral interview with the national jury. - July: awards ceremony with laureates (about 70, depending on the years).
Rewards	A grant up to 600.000 euros, intended to finance up to a maximum of 60% of the eligible expenses of the company innovation program. The total budget increased in the past years (26B€ in 2021). Eligible expenses, up to a maximum of €1 million, are personnel, operating or equipment expenses directly related to the research and development program of the company created, which should last from 24 to 36 months. Payments are made in two or three installments. August: laureates are informed of the amount of aid granted December: payment of the 1st installment
Selection criteria	General criteria: Until 2012, six criteria were considered: (1) innovation and established proof of concept; (2) economic viability of the project; (3) significant potential for development and value creation, including internationally; (4) motivation,

	availability et ability of the candidate to create and develop a company and to build partnerships; (5) quality and complementarity of the team; (6) intellectual property. Since 2012, the rules mentioned the impacts of the project in terms of sustainable development in the selection criteria section. Since 2019, a criterion was added with respect to the ability of the candidate to be involved in the project. Since 2022, the rules consider 9 criteria as it added "environmental impacts" and "societal impacts".
Application form	- A video of the founder - An Excel providing the financial planning - A Word document presenting the project: 1. General presentation 2. Team 3. Market and commercial objectives 4. Innovation program 5. Legal aspects 6. Financial needs and provisional financing In 2022, a new section was added after "Legal aspects", and targeted "Environmental and societal impacts". In 2023, this new section was divided into two distinct sections, and several questions were added.

Appendix B. - Documentations: i-Lab 2022 candidates' application form and evaluations

Appendix B.1. - 26 i-Lab 2022 candidates' application form

The application form cannot extend 40 pages, not including Appendix. I obtained 26 files, with a certain representability across sectors and between laureates and rejected candidates.

	i-Lab candidate in the Industry/Greentech group at the incubator	i-Lab candidate in the Digital group at the incubator	i-Lab candidate in the Health group at the incubator	Total
Rejected applications	4	7	4	15
Laureates	5	2	4	11
Total	9	9	8	26

The section "Environmental and societal impacts" in the 2022 form is presented as followed in the application form:

6. Environmental and societal impacts

- *Project's impacts with respect to sustainable development*

Explain its contribution to sustainable development, by presenting the effects, quantified as far as possible, direct or indirect, positive or negative, established on the following points:

- *climate change mitigation;*
- *adaptation to climate change;*
- *sustainable use and protection of aquatic and marine resources;*
- *transition to circular economy;*
- *pollution prevention and reduction;*
- *protection and restoration of biodiversity and ecosystems,*
- *societal impacts.*

- *Social impact of the project*

Explain the social impact of the project, in particular in terms of promotion of gender equality and inclusion.

Candidates used one to two pages, not including appendix, to answer these criteria.

Appendix B.2. - 11 evaluations by i-Lab operators

Laureates and candidates rejected at the last step could ask for their evaluation to i-Lab operators. For the sample of 26 application forms, 16 should have obtained this document. I collected 11 of them, 5 of them did not manage to have access to this file. The evaluation file is a 4 pages paper divided into two sections.

First, "General Overview". The evaluator provides a general score of the project on 20 points on five criteria: human dimension, legal aspects, technology, market and financial dimension. Another score is given to the project on its Environmental impact, presented as a radar, providing a score from +2 to -2 the eight first items presented in the application file with respect to environmental contribution (climate change mitigation…).

Second, "General comments on the project". The evaluator wrote its opinions on several aspects of the projects: strengths of the project, weaknesses, recommendations from the national jury, opinions on the disruptive nature of the technology, on the societal and environmental impacts of the project, on the video pitch, and integration of design in the project.

In particular, I paid attention to the grade provided in the first section on environmental impact and on comments provided on the societal and environmental impacts.

Appendix C. - Participant-observations: private sessions organized by i-Lab coordinators and incubator's support sessions for candidates

Appendix C.1. - 2 private sessions organized by i-Lab coordinators and incubator's support sessions for candidates

The French Ministry of Research organizing i-Lab gathers some incubators about three months before the deadline for submission. The incubators are invited as they are known by the French Ministry for

having a lot of candidates each year. The aim is to answer their questions. The researcher participated in the 2021 session, preparing for the i-Lab 2022, and for the 2022 session, preparing for the i-Lab 2023. Each session is held online, gathers about 40 participants and lasts about 2 hours. The first hour is a presentation of the result of the past years, learnings and evolutions, and the second hour is dedicated to questions.

Appendix C.2. - 6 incubator's support sessions for candidates

The incubator organizes three sessions every year to guide i-Lab candidates, with an average of 30 participants per session.

The first one is organized by the incubator Startups Managers. The incubator has three Startups Managers, one in Health, one in Digital and one in Industry/Greentech. During this session, they present the contest and its specificities. They provide tips from their experience with past candidates and explain how to work with them in the coming months as they help the candidates on the proofreading of the files. The second hour is dedicated to entrepreneurs' questions. The second session is organized with two laureates of the previous edition and also lasts 2 hours. This session is more a discussion between laureates and candidates, but Startups Managers are also there to complete answers. The third session is dedicated to the video pitch, with an external professional challenging the candidates' scripts and providing shooting tips.

Appendix D. - Interviews

Appendix D.1. - Interviewees profile

Interviews were conducted in 2022 with candidates to i-Lab 2022, with an average of 1 hours and 33 minutes. I followed Hancock and Algozzine's five steps to gather information from interviews (2005: 39-41). First, the key participants were selected to have a certain representability of sectors and laureates according to the application forms collected (see Appendix B.1.). Previous research also emphasized the importance of entrepreneurs' vision while considering startups' challenges (Bridge, 2021), so I chose to interview startups founders. I interviewed CEOs because, according to the Startups Managers, they are leading the completion of the application forms, even if they sometimes delegate the technical part to CTOs. Second, I developed the interview guide, presented in Appendix D.2.). During the semi-structured interviews, participants were encouraged to speak freely (Yin, 2003), and the interview guide served as a checklist for the interviewer. Third, I considered the setting: the interview took place face to face, in a private meeting room at the incubator. Fourth, to avoid the loss of valuable information, I recorded the interviews with the participants' agreement. Last, I defined an ethical protocol: it was agreed that the audio would only be available to authors.

	i-Lab candidate in the Industry/Greentech group at the incubator	i-Lab candidate in the Digital group at the incubator	i-Lab candidate in the Health group at the incubator	Total

Rejected applications	1	2	1	4
Laureates	2	1	2	5
Total	3	3	3	9

Appendix 2.B. - Interview guide

1. What motivates you to apply to i-Lab?
2. Is it the first time you apply? Do you think you will reapply next year if you are not selected?
3. Did you ask for help to complete the application file?
4. What difficulties do you face while completing your application file? + Review of each section
5. In particular, what did you think of the environmental and societal impact session?
6. Did you have anything prepared to answer it? Is it common for you to be challenged on these aspects?
7. What methodologies did you use? How did you find them? Were they easy to implement?
8. (If relevant) Did they ask you about environmental and societal impacts during the oral exams?
9. Do you consider it to be a strength or a weakness in your appliance?
10. What could help you to answer such criteria?

Appendix E. - Data structure (inspired by Gioia et al., 2012)

1st Order Concepts	**2nd Order Themes**	**Aggregate Dimensions**
- Use of UE framework - Formation of the operators on gender bias	Anticipation	Contest in the lens of responsible innovation
- External pressure from society - Continuity with France's pioneer position - Communication needs - Legitimacy and influence - We cannot do nothing - Awareness of lack of experience - Acknowledgment of assessment difficulties	Reflexivity	
- No large-scale consultation - Inclusion of some stakeholders - Progressive inclusion - Black box on evaluations	Inclusion	
- Narrowed vision of impacts - From open questions to guided questions	Responsiveness	
- Governance: how the startup works (parity, diversity, *raison d'être*, militantism, employee well being,	Societal impacts	Sustainability Impact Assessment

employee ownership, internal culture and ethics) - Societal: how the solution benefits the society (continuity with other public policies, stakeholders' integration and addressing a critical need) - Economics: how the startup benefits to the economy (job creation, sovereignty stakes, local approach, reindustrialization, efficiency and resilience)		
- Direct impacts (reduction of pollution, improvement of energy efficiency and virtuous circle on the industry) - Indirect impacts (non-significant improvements, internal environmental policy, responsible digital, precautionary principle in the face of potential danger) - Legitimation of the environmental approach (tools, providers, labels, certifications, publications and public policies) - Projections (future developments to insure environmental responsibility and paths to reduce negative impacts)	Environmental impacts	
- Is the objective to finance only responsible innovation in the future? - What innovations will be banned in the future?	Framing	Challenges
- What methodologies entrepreneurs should use to assess their sustainability? - How is this section evaluated?	Transparency	
- Are the statements made binding? If not, what prevents impact washing? - Natural commitments turned into rational choices	Acceptability	