

AGRITECH ENTREPRENEURSHIP, INNOVATION INTERMEDIARIES, AND SUSTAINABILITY TRANSITIONS: A CRITICAL ANALYSIS

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ABSTRACT

There is active debate about the role of venture capital and entrepreneurship in advancing sustainability in agrifood systems. Our contribution to this debate is to better understand the role of agritech innovation intermediaries – organizations that foster entrepreneurship by nurturing early-stage ventures. We present the case of Social Alpha, a “mission-oriented” agritech intermediary based in India, whose mission is to support innovations that improve small farmers’ incomes and sustainable development. Our analysis investigates tensions between the institutional requirements of finance and social problem solving. Our attention to how social impact is defined, pursued, measured and disciplined allows us to focus on this tension. Our analysis highlights opportunities and limits attached to efforts to mobilize Silicon Valley-styled innovation ecosystems to advance sustainability.

INTRODUCTION

“Systems of innovation” underlying technological change in agriculture are evolving. Over roughly the past 100 years, funding and execution of agricultural R&D has been dominated by national governments, universities, multilateral organizations, commodity organizations, and large agribusiness corporations.¹ Entry of venture capitalists and entrepreneurs in recent decades, and significant rates of growth in their activities, suggests new dynamics within the sectoral innovation system (Malerba, 2002). Given the scale and scope of socioecological Grand Challenges represented by the Sustainable Development Goals (SDGs) and perceived inadequacy of the traditional innovation system for responding to complex problems such as climate change, biodiversity loss, income inequality, food waste, and public health, there is significant enthusiasm for restructuring and/or reorienting agrifood innovation systems (Barrett et al., 2020; IIASTD, 2008). Innovation processes are a “leverage point” for system restructuring (Abson et al., 2017). By studying changes in innovation dynamics - and the entry of new money, interests, objectives and relations of accountability – we seek to advance a critical and strategic analysis of prospects for advancing sustainability in agrifood systems through Silicon Valley-styled innovation ecosystems.

There is an active debate about the role that venture capital and entrepreneurship can play in terms of advancing sustainability in agrifood systems (Fairbairn et al., 2022; Klerkx & Rose, 2020). Some argue that traditional donor support for R&D and technology transfer – bilateral, multilateral and philanthropic investments - has perpetuated a cycle of dependency that has led to unsustainable solutions, particularly in developing country contexts (ICTforAg, 2022). This camp believes that applying “the Silicon Valley model of innovation” to agriculture will deliver more independent,

¹ This is not withstanding historical and contemporary contributions of farmers to knowledge creation and innovation (e.g., Marcus, 1985; Hassanein & Kloppenburg, 1995).

viable and inclusive solutions. Others, however, perceive venture capital and entrepreneurship as complements rather than substitutes to traditional models of innovation. Critical analysts view contemporary developments as an expression of financialization and speculators seeking new frontiers for advancing strategies of appropriation and accumulation (Bjorkhaug et al., 2018).

Our contribution to this evolving debate is to better understand the role of mission-oriented intermediaries in the innovation ecosystem, and specifically, how they navigate tensions between commercial relations and social impact. While intermediaries are common features of contemporary systems of innovation, their role is underexplored in both the scholarly and grey literatures. Intermediaries in agritech systems of innovation, often referred to as incubators and accelerators, seek to nurture early-stage enterprises and mitigate the risk that novel and valuable ideas fail to capture the attention of commercial investors and user communities, and get to market and “scale up” (Agthentic, 2016; Pfothenauer et al., 2022). This research advances understanding of evolving agritech systems of innovation in relation to sustainability ambitions. We focus on “mission-driven” organizations that make explicit commitments to social impact and sustainability, and we analyze how they respond to risks of “mission-drift” (Bengo et al., 2021; Conforth, 2014; Ebrahim et al., 2014; Grimes et al., 2019). Mission drift refers to the potential for financial pressures to erode commitments to social impact over time. The concept derives from recognition that the demands of competing in the market may be in tension with a public good orientation (Daly and Cobb, 1989).

Mobilizing commercial strategies to address socioecological problems invites critical analysis. The institutional logic of market competition within contemporary capitalism is distinct from the logic of public service or philanthropy (Kraft & Wolf, 2018; Thornton et al., 2012). These logics represent different types of legitimacy, what Boltanski and Thevenot (2006) identified as varied grammars of justification that structure domains (i.e., fields) such as commerce and the civic sphere. Social enterprise and social impact investing represent institutional hybrids that merit experimentation, but the existing literature on corporate social responsibility, environmental, social and governance (ESG), sustainable business, and green economy highlight contradictions and constraints. In these hybrid models, innovation is potentially financialized, a process whereby the imperatives of finance capital (e.g., returns on investment, rapid scaling) gain greater influence over activities formerly governed by other institutional logics (Bjorkhaug et al., 2018). While the capabilities associated with influx of finance capital are attractive in the context of expanding innovation, it is unclear how the interests and norms of finance map onto social problem solving.

Given debates regarding the potential for agritech innovation to deliver social impact and advance sustainability, we focus on the question of how actors in agritech innovation ecosystems respond to the risk of commercial objectives eroding commitments to social impact. To address this central question, we focus data collection on how mission-oriented intermediaries define, pursue and measure social impact and the accountability mechanisms in place to defend against mission drift.

From a theoretical perspective, this study draws on and contributes to the sustainability transitions literature in two distinct ways. First, we seek to enhance clarity on the functions, opportunities, and limitations of mission-oriented innovation intermediaries (Howells, 2006; Katzy et al., 2013; Kivimaa et al., 2019). Intermediaries in innovation systems perform bridging functions. By serving as a hub or coordinator among actors with diverse functions and orientations, these intermediaries

enhance the performance of innovation “systems”. Specifically, they contribute to increasing the volume, yield (% of innovators that attract commercial capital and “get to market”), and speed of innovation. The terms incubate and accelerate speak to these functions quite directly.

Sustainability transitions scholars identify intermediaries as enablers or catalysts that support socio-technical systems transformation. Consultants, lawyers, financiers, and other service providers are prominent examples of a network of intermediaries positioned to support and scale up the projects of others, creating potential for system restructuring. While their position in the sustainable innovation ecosystem is considered important, there is a lack of clarity on the functions, opportunities and limitations of such intermediaries and how to anticipate their contribution to sustainability transitions (van Lente et al., 2020). Our study emphasizes mission-oriented innovation intermediaries. These are organizations explicitly committed to social impact, and their programs are ostensibly designed and managed to advance socioecological problem solving.

Second, we study how accountability for social impact is structured within agritech innovation processes. Sareen and Wolf (2021) theorize sustainability transitions as institutional dynamics that hinge on changes in accountability relations and practices. Sociomaterial changes (e.g., reduced GHG emissions) stem from shifts in access to resources and the distribution of rewards and sanctions at local and global levels, and these shifts reflect changing values, knowledge, and social relations. This empirical study allows us to evaluate this thesis and develop strategies for evaluating how accountability is practiced. In line with our ambition to evaluate the incentives, rules and organizational routines that constrain and enable alignment between investments, innovations, and sustainability, this study advances a *critical institutional analysis* of agritech innovation systems. Such an analysis is concerned with “identifying the various institutional mechanisms by which economic activity is coordinated, with understanding the circumstances under which these various mechanisms are chosen, and with comprehending the logic inherent in different coordinating mechanisms.” (Hollingsworth and Boyer, 1997:8). Our empirical assessment will inform understanding of how sustainability is pursued in agritech innovation ecosystems and what kinds of institutional changes could enhance their capacity to deliver social impact.

THE RISE OF PRIVATE CAPITAL IN INNOVATION PROCESSES

Venture-capitalists have shown growing interest in agrifood startup businesses in recent years. In 2021, they invested \$51.7bn in agritech, an 85% increase over 2020 (AgFunder, 2022). While most investors are focused on post-harvest elements of agrifood systems, some of this venture capital is directed toward products and services for farmers. There are several overlapping reasons for this surge of private capital into the sector.

The surge in private investments in food and agriculture is related to basic market fundamentals. Because food is a biological necessity and a central element of culture there is a strong floor under aggregate demand. Growing populations, greater demand for high-protein diets, a finite supply of agricultural land, and rising food prices contribute to investors’ growing interest. Moreover, financial actors are continuously seeking new arenas for capital accumulation, and agritech is considered a relatively untapped market. Perception that agriculture is a traditional (i.e., old-

fashioned) industry that is ripe for digital transformation is linked to speculative investment. The intersection of agrifood and information and communication technologies gives rise to excitement around digitization of agriculture – expanded reliance on data to support production and management at all nodes of value chains (Wolf & Wood, 1997; Wolfert, 2017). Agritech, like fintech, healthtech, and cleantech before it, is now a well-established reference in the domains of finance and public policy.

The rise of the “Silicon Valley model” of innovation is contributing to expanded private investment in agrifood R&D (Fairbairn et al., 2022; Polzin et al., n.d.). This model is characterized by an ecosystem - a network of differentiated actors, infrastructure, and a cultural ethos - that generates an abundance of novel, high-tech ideas. These ideas are sparked through research and development within garages, firms, or universities, and only a select few “unicorns” develop to the point of producing fabulous profits and disruption of established orders. Venture capital and social impact investors occupy central roles in this model of innovation, as they take an ownership stake in promising ventures in return for financing these early-stage (i.e, pre-commercial) enterprises. Many of these ideas and nascent firms do not succeed, and “failing fast” is an ideal linked to cultural and strategic commitments to pursue unconventional ideas. The Silicon Valley model has become the dominant way of viewing entrepreneurship and has inspired many to adapt it to other industries and regions in the hopes of igniting economic growth and prosperity (Irani, 2019). The agritech sector is no exception and now hackathons, incubators and accelerators proliferate with the aim of spurring innovation in the food system.

MISSION-ORIENTED INTERMEDIARIES IN SUSTAINABILITY TRANSITIONS

The Silicon Valley model often involves technology incubators and accelerators as intermediaries provide entrepreneurs with resources to develop and grow. These actors serve as bridges that allow early-stage enterprises (i.e., talented people with promising ideas) to attract commercial investment, which is a key step in the process of “getting to market” and “scaling up”. Beyond seed capital, they often provide fledgling ventures with mentoring, legal and management consulting, testbeds, office space, and introductions to established actors in the public and private sectors. Intermediaries take various organizational forms – non-profit, for profit, and collaborations between philanthropic foundations, public agencies, established corporations, and private equity investors (Audretsch, 2021). Some, but not all, intermediaries take an equity stake in the ventures they support. Support from these intermediaries can be critical, particularly for sustainability-oriented enterprises that have an acute need for support at early stages.

The sustainability transitions literature goes beyond mainstream innovation studies by focusing explicitly on systemic change for sustainable futures (Kivimaa et al, 2020). Howells (2006, p. 720) defines an innovation intermediary as “an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties.” Scholars have added more nuance to this understanding, for instance, Kivimaa et al. 2020 propose a definition and typology of transition intermediaries that responds to the explicit goals of intermediary actors in transition processes. Klerkx and Begemann (2020), argue for a mission-oriented agricultural innovation system (MAIS) approach to understand how agriculture innovation systems can facilitate food system transformation. We add to this scholarship through an empirical analysis of a mission-

oriented agritech intermediary, an organization that seeks to leverage agrifood innovation to address socioecological problems.

Mission-oriented innovation intermediaries come in many shapes and sizes. Some, but not all, take an ownership stake in the early-stage ventures that they nurture. This capital is an essential resource for entrepreneurs, most of whom do not have an historical record of business success and do not yet have prototypes, business plans, or well-developed management teams. Willingness to put money into these high-risk ventures is a key element of what intermediaries contribute to innovation systems. At the same time, these commercial investments introduce potentially problematic incentives for individuals and organizations that are ostensibly on a mission to advance socioecological problem solving. To the extent that actors' job security and professional status rests on demonstrating commercial success, and an organization's ability to remain viable rests on demonstrating capacity to create financial value, the incentives in place raise questions.

These mission-oriented innovation intermediaries operate in complex environments and deal with multiple tensions, uncertainties and interdependencies. Their actions are constrained by the structures within which they operate and, paradoxically, seek to mediate (Kivimaa et al., 2020; Van lente et al., 2020; Manders et al., 2020). Organizations that support the intermediary can also constrain an intermediary's autonomy. We observe that some incubators and accelerators sit inside commercial organizations – i.e., private equity firm or major corporation - often in the form of a not-for profit trust. Other incubators rely on funds from philanthropies or Corporate Social Responsibility programs, and these external relations can orient the goals, programming and procedures of intermediaries. Conflicts can arise when objectives compete. For example, attention to long-term investment potential is quite different from a focus on securing quick increases in the value of equity stakes. Similarly, a commitment to expanding opportunities for female farmers could be in tension with an emphasis on reducing GHG emissions. As has been examined in social impact ventures themselves (Cornforth, 2014), the way these decisions are structured can reveal the values, priorities, and strategy of innovation intermediaries.

Given issues of incentives and organizational constraints, we identify a risk of mission-drift. Mission-drift occurs when an organization loses focus on their original values and goals and develops a new orientation that has important consequences for outputs and outcomes. The concept of mission-drift is well-established in the subfield of microfinance but less so in the social innovation and sustainability transitions literatures. Microfinance institutions emerged to provide financial services to poor, underserved clients to support poverty alleviation based on a self-sustaining business model. Scholars have documented that in the last two decades, micro-finance institutions have shifted attention from social performance to financial performance, and they have reoriented their services toward wealthier population segments (Bhuiyan et al., 2020; Mersland & Strom, 2010). Given this example and our general argument that the rigors of finance and the challenges of sustainability are not easily aligned, we are interested in how mission-drift may emerge in entrepreneurial ecosystems that express commitments to sustainability.

We identify potential for economic objectives, assessment criteria and accountability controls to crowd out social considerations within mission-oriented intermediaries. We surmise that metrics and accountability mechanisms may help to buffer against mission-drift by ensuring that social enterprises, and the intermediaries supporting them, maintain their commitments to sustainability

objectives. However, managing and measuring for social impact must be approached in a critical, reflexive manner to avoid entrenching practices that project a perception of impact rather than tangible results for communities and ecosystems (Ferguson, 1990; Konefal et al., 2022).

Specifying and measuring social and environmental returns is often problematic, particularly compared to the standardized process of calculating financial returns (Stephens, 2021). Measurement can support capacity to assess the social impacts of new products and services and the extent to which incubators are succeeding in supporting innovations that advance agrifood sustainability. However, measurement does not ensure impact. While it is often said, “you cannot manage what you do not measure”, we hold critical views regarding the relationship between quantification and performance. We identify a tendency to measure instead of manage when it comes to social policy and sustainability. Acts of quantification and the formalized performance of oversight are an increasingly central form of symbolic politics that produce legitimacy and “sustain the unsustainable” (Blühdorn, 2007). In this context, there is a need to identify how social impact is defined, assessed, and managed in agritech innovation ecosystems.

CASE STUDY DESIGN AND METHODS

This qualitative study adopts a single, descriptive case study method, which allows for detailed, focused exploration. By focusing on a single case, we can engage with rich accounts and triangulate on relevant phenomena and relationships. These data allow us to identify patterns and relationships – key ingredients for theory testing and building (Hans-Gerd 2017). This is the initial phase in a collective case study that involves several key axes of variation derived from theory and our specific research questions. The larger study’s geographic focus is South Asia and the United States, territories with very different industrial organization, social problems, and systems of innovation (Morgan, 2004). Our selection of cases in these territories allows us to look across, and through, both commercial and non-profit mission-oriented agritech incubators. The initial descriptive case study and the larger collective case study are elements of an engaged research program that aims to support reflexive debates and innovative practices among mission-oriented agritech intermediaries, thereby strengthening responsible research and innovation (RRI) (Fielke et al., 2022; Stilgoe et al., 2013). The intermediaries we approached as partners in this study consistently expressed interest in critical analysis of social impact measurement and management within their organizations and in their professional field. This appetite for research is linked to interest in critical self-reflection, understanding others’ practices, and strengthening capacity to document and communicate the social impacts.

Social Alpha is a relevant case to investigate given its mission-orientation and high-visibility role as a systemic intermediary in the agritech innovation ecosystem in India, a country identified as heavily invested in leveraging private capital and entrepreneurship to advance development (Irani, 2019). Social Alpha was established in 2016 as a not-for-profit organization. It is funded primarily by Tata Trust, the Government of India and partnerships with industry and foundations. Tata Trust funds were earmarked only for initial incubation operations, and the expectation is that Social Alpha will eventually be self-sustaining based on “exits” (i.e., sales of shares of start-ups they help launch). They describe their aims as “game changing, disruptive innovations.” Social Alpha operates a network of technology and business incubation labs across the country. It maintains healthcare, clean energy, and education investment portfolios, as well as their agritech portfolio. Our study focuses on Social Alpha’s agritech investment portfolio – i.e., early-stage ventures that

receive pre-commercial seed funding and bespoke support - as well as their India Agritech Incubation Network (IAIN), a cohort-based agritech innovation program funded by the Gates Foundation.

Between April 2021 and January 2022, we interviewed staff, external partners, venture capital investors, and entrepreneurs. The range of participants allowed us to triangulate our findings. Within Social Alpha, we interviewed staff members including program leads, portfolio managers and the Managing Director. We also interviewed entrepreneurs and investors for a total of 19 participants.

Table 1 – Interview breakdown

Actor	Number	Details
Agritech entrepreneurs (i.e., start-up founders)	8	Entrepreneurs at various stages in their start-up journeys and relationships with Social Alpha
Social Alpha staff members and leaders	5	Program leads, portfolio managers and the managing director/founder
Investors	6	Philanthropic, venture capitalist and impact investors

Interviews took place over Zoom and lasted between 60 and 90 minutes. We interviewed study participants twice. The first-round of interviews served to introduce our research and objectives and to stimulate interest among respondents. The second round of interviews occurred approximately one month after the initial discussion. Our effort to organize follow up discussions allowed us to go deeper into discussions, as participants had time to reflect on the questions we introduced in the first interview and on their own relevant experiences. This two-stage process was intended to produce more focused and richer reflections critical to making sense of complex and potentially sensitive social interactions. In line with research ethics commitments, we asked permission to record all interviews and we provided assurance that no identifying details would be revealed during publication to ensure that interviewees felt safe to speak candidly.

The eight entrepreneurs that we interviewed had engineering backgrounds. Some were raised in rural communities, growing up in farming families and had direct experiences with the challenges faced by smallholder farmers. Others hailed from more urban environments. Most all of them expressed their motivation in relation to a desire to improve livelihoods in rural areas of India. Most had previous engagement with other incubators, tech competitions and/or university start-up programming. They engaged with Social Alpha at different stages of development; some were at the early concept stage, and others had a product/service ready for market. The types of innovations that these entrepreneurs were involved with include a nitrogen fixation technology which aims to reduce GHG emissions and improve yields; sonic animal repulsion technology for managing wildlife and pests in agricultural landscapes; a remote sensing platform to support farm management and administration of crop insurance; an absorbent polymer to reduce the amount of

water required to irrigate fields; a vegetable sorting technology that uses machine-learning to reduce food waste. The six investors had varying degrees of experience in rural development and investment. Some had worked in rural credit, for large national development banks as well as in venture capital, research institutes and with other incubators.

The types of questions that we asked participants included: “Do you perceive tensions between financial and social impact goals, and if so, how do you address such tensions?”, “What kinds of assessments and measurement practices do you rely on to support delivery of social impact?” and “How is accountability applied to social impact organized in your work?”

Interviews were transcribed and later analyzed by searching the audio transcripts for keywords and quotes focused on relevant themes and our specific research questions. Memos taken during and immediately after interviews allowed us to record and refine key themes.

RESULTS

According to their website, Social Alpha shares a philosophy that, “science and technology innovations and entrepreneurship has the potential to bring about a positive change in the life of masses. We search for entrepreneurs and innovators who are on a mission to create social, economic and environmental impact and support them through their lab to market journey, as they create compelling solutions to fight poverty and address India’s intractable developmental challenges.” To date, they have evaluated over 1000 ideas, incubated 111 startups, and invested in 37 across sectors.

Social Alpha has an agritech portfolio that focuses on innovations that support rural livelihoods as well a complementary IAIN program, which is a cohort-based agritech innovation program supported by a Bill and Melinda Gates Foundation grant in partnership with the Indian Institute of Technology. The IAIN has a cohort of 30 organizations, 8 of which are in the very early stages of development and 22 that instituting pilots. Start-ups that are a part of IAIN’s three-year program, are largely located in the Northern state of Utar Pradesh. Utar Pradesh is India’s most populous state where 47% of the population is directly dependent on agriculture for their livelihood (Gulati et al., 2021). Both the agritech portfolio and IAIN aim to create an enabling ecosystem that develops solutions for smallholder farmers.

Social Alpha’s livelihoods portfolio scouts early-stage ventures and helps take them from lab to market through a hands-on approach. Support provided to entrepreneurs can include business planning, intellectual property consulting, financial modelling, networking and market access opportunities, and “patient capital”, equity investments characterized by low discount rates (i.e., no expectation of rapid returns) and risk tolerance. Social Alpha also partners with other incubators, investors, and academic organizations to expand their network and enhance their capacity to identify promising early-stage enterprises and entrepreneurs. Social Alpha runs scouting challenges in the form of nationwide “pitch competitions”. These forums allow innovators to make a case for investment and engagement. At the same time intermediaries use these forums to identify promising teams and projects. This process exposes Social Alpha to a large number of early-stage ventures. Their assessments of these ventures inform decisions

regarding whether they take an ownership stake, choose to provide non-financial support to advance the enterprise's prospects, or choose not to invest at all.

We now turn to results from the specific empirical questions that we asked to advance our understanding of our overarching research question regarding mission-drift within mission-oriented agritech incubators.

(1) How is social impact defined and pursued?

Social Alpha has an explicit theory of change, which is to reach the “*bottom of the pyramid*” – i.e., the very large customer base that has weak purchasing power - by deploying patient capital to entrepreneurs that show promise for improving the livelihoods of smallholder farmers. By emphasizing poor farmers' needs and their willingness to pay, they aim to help entrepreneurs succeed where others have failed. In addition to willingness to accept slower growth rates and payback times associated with businesses selling to poor farmers, Social Alpha identifies their role as “*derisking*.” They are willing to back companies with profiles that are too risky to attract mainstream investors as part of an explicit effort to help nurture these businesses to a point where they can compete for commercial capital. By nurturing successful businesses in territories with a weak commercial sector, they aim to have a transformative effect.

The following quote by a portfolio manager illustrates the rationale and the discipline associated with Social Alpha's work.

“India has about 80% of small or marginal farmers, it's naturally assumed that just because you're working in agriculture, you're working in the impact space. That's not true. Because a large portion of the startups out there are probably only working with larger farmers. They're probably only working with agribusiness. They're probably only working with corporates...How many of these startups are actually working with smallholders or are able to reach smallholders?...It's actually a very small percentage of these startups. And we are willing to work with those startups. We have actually rejected a whole host of startups...If a startup is not able to cater to smallholder farmers, we will not look at them.”

On the topic of theory of change, an investor expressed, “*I'm very impressed with Social Alpha and their likelihood of achieving social impact, because it is thesis driven. Social alpha has a very good understanding of what the problem is and then tries to find solutions to it, rather than having a technology that you retrofit (to various problem contexts).*” The emphasis attached to the problem statement is significant, as this is a critical element of Social Alpha's strategy and how they maintain focus and discipline. When they encounter opportunities to invest in firms and when they evaluate applications to their incubator programs, they use their problem statement to assess fit and to make decisions about resource allocation.

Social Alpha's approach is distinct from, though complementary to, public assistance programs and the traditional philanthropic project-based model of development. Social Alpha sees itself as an “*ecosystem enabler*.” This position can be understood in a few ways. First, the organization focuses its work in areas that have exhibited market failure and that are undercapitalized. In other words, the organization focuses on creating markets that will ultimately support social change in underserved communities. Developing and scaling solutions that improve livelihoods for smallholder farmers in India is seen as an area that requires both innovation and seed funding and

thus motivates the organization's efforts. Social Alpha works closely with farmer producer organizations (FPOs) to ensure that innovations reach marginalized communities. These farmer cooperatives allow groups of smallholders to make collective purchases (e.g., an optical scanner that sorts onions), which allows entrepreneurs to focus on scales beyond the level of individual smallholder farms.

Social Alpha also works to enable the innovation ecosystem in these rural areas by increasing incomes at farm level in order to generate an additional willingness to pay. This, in turn, makes it possible to spark a new round of innovation. In this sense, Social Alpha seeks to nurture a virtuous cycle of innovation in underserved areas. Social Alpha's role as an intermediary allows it to act as an ecosystem enabler in a third way. The organization leverages its relationship with partners including Tata Trusts to connect entrepreneurs they work with to other actors in the innovation ecosystem. In effect, Social Alpha acts as a broker, bringing disparate elements of the sector into contact with one another in order to realize capacity for innovation. The organization fills a gap in the innovation ecosystem by focusing on products rather than services. We were told on more than one occasion that agritech investors are drawn to services and can overlook products (i.e., hardware) that cater to smallholder farmers. A portfolio manager explained why focusing on products is central to achieving their mission:

"If you look at all of the agritech investments that have happened in India over the last maybe two or three years, it's a very active space. There's so many agritech investments happening. Most of them of have been in either software analytic platforms, essentially asset-light models. How many of them have actually happened in products? How many investments have really happened in say, small scale processing units which can be decentralized so that it can be used across the country? A lot less has happened in...product innovation. Those models take a lot longer to scale, and our focus at Social Alpha has been to focus on those areas where the gap exists and continues to exist because other players are not investing in that space or not operating in that space...Product is a huge area of interest for us, because we feel that that's underfunded or under-penetrated."

The focus on reaching the bottom of the pyramid by working with product innovations, economically marginal territories, and ventures committed to selling to smallholder farmers rather than large commercial farms, reflects Social Alpha's mission, theory of change, and their strategy of positioning itself in ways that add to existing innovation capabilities. This intermediate bridging function is where we identify relevance in relation to sustainable transitions.

We have emphasized Social Alpha's commitment to poverty alleviation. Our empirical study identifies novel, dynamic, coherent and professionally administered strategies for making positive, and perhaps far reaching, contributions to this goal. It is worth noting that environment, health, and gender equity are social problems that are recognized by Social Alpha, but these concerns do not figure centrally in their programming. We view this as an important limitation in terms of the depth and scale of impact Social Alpha can make.

(2) Do actors recognize "mission drift" as a risk as ventures move from ideation to commercialization?

Mission-drift was considered a risk by all Social Alpha staff, investors and entrepreneurs. There is widespread awareness of tension between commercial pressures and commitments to addressing social problems, and there is awareness of the potential to fail to deliver social impact. Participants

shared the view that as the enterprise grows and begins to attract mainstream capital, the likelihood for drift increases. A leader within Social Alpha provided the following synopsis:

“At a certain point, we will have created space for mainstream investors if these companies are growing. And the benchmark that these mainstream investors will create for them will have changed...Like when the nature of capital changes from philanthropy to capital markets, then the capital markets require the company to deliver. It all depends on what the shareholders want...As the nature and character of who owns a business changes, there is always an opportunity for mission-drift.”

An enterprise is particularly vulnerable to mission-drift – at two specific moments; the introduction of new investors, and relatedly, with efforts to scale up. One program manager provided us with examples of these scenarios and the pressures that startups face in their social entrepreneurship “journey”:

“Now that this startup is trying to raise its next round of funding, a lot of the investors are pushing it to look at a certain per month revenue, which is impossible to achieve if they continue working with FPOs or with community organizations, because it would take them much longer to scale. Instead, investors are expecting them to show 10x, 15x, or in most cases 20x returns in a really short period of time by developing products which are more suitable to customers who are willing to pay for it must faster and more.”

The risk here is that entrepreneurs will turn their attention away from small farms and marginal territories to larger farms and less disadvantaged territories in order to achieve revenue and growth targets. This program manager went on to explain how Social Alpha wants this startup to take their time in developing their business in order to demonstrate that focusing on smallholder farmers is a viable business strategy.

A related conundrum is when an organization begins to scale. For instance, Social Alpha works with a consumer product, “lifestyle” company that employs women to collect flowers and process them into incense and other household items. This enterprise has been under pressure to automate as they scale:

“In raising follow-on funding, there have been many investors who push them to fully automate the process. But then what happens to the basic impact model that you have working with these women on the ground? These are the questions, dilemmas we face constantly.”

This particular example demonstrates how enterprises can reject investor pressures and pursue their impact journeys. Rather than succumbing to pressures to automate incense production, this company chose to focus on R&D and product development. They moved up the value chain by becoming a bio-materials company, eventually raising mainstream capital. In other words, it operated on its own terms and defied the typical challenges of mission-drift.

The potential for drift is evaluated throughout the lifecycle of an enterprise. When selecting which organizations to incubate at the outset, Social Alpha considers their ability to deliver on its social mission of improving smallholder livelihoods over time. Within IAIN, if Gates Foundation funding yields significant intellectual property, the entrepreneurs are required to enter into a global open access agreement so that their technologies are not “fenced behind the whole IPR (intellectual property rights)” infrastructure. This strategy aims to focus early-stage ventures efforts on

developing technology to solve problems of small farmers rather than develop intellectual property to attract investment and drive up their valuation.

Staff also maintained that their focus on creating new markets is a core strategy for responding to drift. They believe that by “*creating markets where they’ll generate enough entrepreneurial interest in that space, this will create a large number of people to continuously create impact and [realize] their mission.*” By avoiding highly competitive domains, they reduce pressures that cause social impact to leak out of enterprises. Further, by creating a pipeline for entry of new entrepreneurs they aim to refresh the population of early-stage ventures. We interpret this strategy as an acknowledgement of drift as a significant structural problem.

The potential for mission drift is not specific to entrepreneurs. Mission-driven innovation intermediaries also face risks of losing focus and becoming opportunistic rather than thesis driven. In relation to their stated goal of supporting small farmers, Social Alpha did not emphasize dialogue with farmers as a strategy to reinforce mission-focus and support critical self-reflection in relation to advancing the interests of small farmers. Social Alpha’s direct engagement with farmers seems to be weak. Yet, Social Alpha invests in developing intelligence about farmers and FPOs and they consistently emphasized the importance of entrepreneurs’ engagement with farmers.

All of the entrepreneurs we spoke with except one were farmer/FPO facing,² and Social Alpha’s thesis driven approach to reach small farmers was consistently practiced. Social Alpha used Tata Trust’s relationships and commissioned studies of farmers and FPOs in communities to make sense of local production system and economics. This market intelligence is shared with the ventures supported by Social Alpha. The emphasis on pilots – practical deployments – is another important interface supporting points of contact with local people and conditions.

(3) What role do social impact metrics play in defending against mission drift and how are assessments of social impact implicated in relations of accountability among entrepreneurs, equity investors and mission-oriented innovation intermediaries?

While Social Alpha has a strong vision of the impact it wants to make for smallholder farmers and rural development, it does not have a systematic approach to measuring those impacts. Social Alpha sees value in establishing a baseline (i.e., counterfactual control), quantifying outputs, and developing estimates of social impact under various scenarios, however, they do not see this idealized approach to social impact measurement and management as particularly practical for the enterprises in which they invest. They identify data collection as expensive and time-consuming and especially onerous for early-stage startups.

There is a strong contrast between how Social Alpha approaches impact measurement between its agritech portfolio and the IAIN program. There is also variability in how impacts are assessed within these two initiatives.

² One start-up founder told us that his business had recently shifted away from providing remote sensing services to farmers and had moved to focus on selling to crop insurance firms.

Social Alpha portfolio managers have developed a list of 10-12 indicators (financial and social) that they want the portfolio as a whole to achieve, but individual start-ups may only monitor 2-3 of these indicators. One way that Social Alpha seeks to understand the social impact potential of the concepts, technology and team is through pilots – i.e., practical deployments. The pilots allow startups to refine their designs/strategies so as to create value and be accessible to poor farmers, the target market. The pilots allow Social Alpha to evaluate the startups to see which merit continued support. Finally, these pilots present opportunities to establish a baseline and pursue change detection (social impact assessment). Some, but not all, of the start-ups in their investment portfolio have established pilots, and only a few of these are actively working to establish a baseline to track impacts across time. Social Alpha emphasizes that impact can only be measured adequately once a business has scaled-up substantially. Therefore, the focus must be on impact “potential” when evaluating individual pilots and broader portfolios.

Social Alpha staff meet weekly with the companies in their portfolio and present monthly reviews to their peers in Social Alpha regarding progress and problems. The portfolio managers meet as a group monthly to present updates on the enterprises they are supporting, and they reported that these sessions function to ensure that all managers adhere to the problem definition and theory of change that derives from their mission. When we asked about oversight of portfolio managers applied to social impact, these ‘peer review’ sessions were identified as a useful mechanism for introducing focus and discipline.

There are several reasons why Social Alpha does not impose rigid measurement requirements on the start-ups in its portfolio. Several staff members mentioned that the start-ups are in too early of a stage to generate data that would demonstrate impact. Because they are focused on products rather than services, and products take considerable time to develop, test and iterate it can take several years to refine their design and develop working prototypes. As one entrepreneur who is developing an onion sorting technology explained, *“it takes time for the product to mature and actually solve the problem completely...since this is a hardware product, it takes a lot of time for us to develop, the iteration cycles are quite long.”*

An added complication is the lack of systemic data and infrastructure. With a lack of more broadly available baseline data on the different points along the agrifood value chain, it becomes difficult to ascertain a product’s contribution or impact. One entrepreneur told us that when it comes to social impact,

“...the way we see it, all these data points are literally absent...For example, if the farmer is bringing the produce to a market, how much percentage (of what they are paid) is grade, how much is damaged, how much is rotten? We have tons and tons of data about the production stages, but we don’t have much data about post harvest. There is literally no data that has been measured or captured at scale...There’s a void when we see the data that has been captured over the years.”

This startup has begun to do the legwork of capturing this important downstream data to document their contributions to improving farmers’ incomes. They also noted the possibility that this data could have value to commercial advisory firms or government agencies.

Instead of quantitative metrics and reporting schemes, some start-ups have opted to develop videos and testimonials which help to capture the “softer” sides of impact. Start-ups did recognize that

once they need to raise another round of funding they may be required to track and report impacts. For instance, when we asked about how assessments of social impact are used by Social Alpha and potential investors, one entrepreneur stated,

“I think metrics give guidance, they also give guidance to ourselves. They would certainly be required once we get into investment rounds with impact investors. But at earlier stages they would be maybe too overburdening. So, the stage we are currently at we would find it too overburdening.”

Indeed, a Social Alpha staff member explained that they have devoted resources to more rigorous measurement of social impact for a small number of portfolio companies when they are at the stage to raise funds and the investors are asking for “solid” numbers.

Commitments to social impact measurement in IAIN – Social Alpha’s Gates Foundation-funded agritech incubator program – are substantial. IAIN features establishment of a baseline and change detection supported by third party research. These commitments reflect the interest of Gates Foundation, and Gates foundations’ willingness to pay for this work. Because IAIN is a geographically focused, cohort-based program, Social Alpha was able to justify significant investment in conducting detailed assessments of local farming systems, agricultural services, agricultural markets, and FPOs. This assessment serves as market research to support program participants’ understanding of value propositions (i.e., willingness to pay) for their target market, as well as Social Alpha’s *a priori* assessment of the potential contributions of the products and services envisioned by entrepreneurs. At the same time, this data serves as a baseline to support *ex-post* assessments of impacts attributable to interventions by entrepreneurs and the IAIN portfolio as a whole.

The way that Social Alpha approaches data collection for social impact measurement and accountability varies across programs and specific contexts. However, respondents consistently emphasized a practical and pragmatic approach to managing and measuring social impact. Partners such as the Gates Foundation may emphasize measurement practices and, in those cases where funding is provided, resources are put towards quantification. In other cases, intuition, narratives and other qualitative approaches support evaluation and communication of potential or imagined impact.

Social Alpha staff explained how their efforts to “frontload” critical assessment of founders, technologies, and ventures gave them more flexibility in terms of monitoring and accountability. Before Social Alpha makes an investment, they carefully assess the startups. They spend time with the entrepreneurs. These upfront screening routines and their efforts to use their problem statement to guide their work not only help them avoid mission-drift but also reduce their need to adopt stringent social impact measurements practices. Similarly, IAIN is characterized by substantial investment in screening and selection. While Social Alpha’s pragmatic approach to social impact assessment has appeal, it is possible to suggest that unevenness in data collection and assessment routines is a weakness.

Our research aims to assess linkages between social impact assessments and intermediaries’ and investors’ decisions about resource allocation. Our interviews indicate that there is no clear, direct connection between social impact assessment and continuing access to resources provided by Social Alpha. Our data indicate that Social Alpha views their upfront screening and selection

process, accompanied by their monthly reviews, as an adequate basis for determining the potential for social impact attached to an early-stage venture. There were no instances reported where participants were invited to exit Social Alpha programs based on not realizing social impact expectations. This finding should be understood in the context of Social Alpha's patient approach, which stems from the demands of supporting very early stage ventures pursuing product development.

DISCUSSION

The urgency, scope and scale of the sustainability crisis facing agrifood systems invites critical reflection on agricultural innovation systems (Barrett et al., 2020; IASTD, 2008). We focus on mission-oriented agritech innovation intermediaries because they represent a potential leverage point to advance sustainability objectives (Abson et al., 2017). This intuition is premised on recognition that venture capital funded entrepreneurship has potential to complement public sector-led innovation if the actors and organizations involved emphasize social problem solving and commercial objectives do not crowd out social objectives over time (i.e., mission drift).

Based on framing summarized above, our central research question addresses mission drift and the way that it is perceived and managed as innovations move from ideation to commercialization. To get traction on this overarching research question, we pursued three empirical questions about the ways in which social impact is defined and actioned; actors' perceptions of mission-drift as ventures move from ideation to commercialization; and the role that social impact metrics play in defending against mission drift and serving as accountability mechanisms between entrepreneurs, equity investors and innovation intermediaries.

It is clear that mission-oriented intermediaries have to negotiate conflicting needs in order to reach their goals. Navigating this terrain involves implementing guiding principles that allow for innovations to achieve their social missions while remaining reflexive to the broader context which is influenced by commercial and political interests. Given the fluid nature of this environment and relatively early stages of the enterprises that Social Alpha is supporting, it is not entirely clear how effective the accountability mechanisms in place are for warding against mission-drift. Moreover, it remains to be seen if markets that deliver social value can be created and sustained.

We approached this study with the goal of linking research with practice, a core thrust in sustainability-oriented research (Schneider et al., 2021). That is, through our conversations with interviewees we engaged in an iterative process that brought together diverse experiences and helped to produce context-specific knowledge about ways to enhance sustainability transitions. As a result of these exchanges, Social Alpha modified the way it describes itself and its role in the innovation ecosystem by adopting the terms "mission drift" and "mission-driven innovations". Now, founder Manoj Kumar is quoted on the website stating,

*"We are building an "ecosystem" that would make it easier for entrepreneurs to access risk capital, attract talented professionals and create successful and self-sustaining business models. Social Alpha stack is focused on addressing the challenges of market failure, **mission drift**, suboptimal scale and financial sustainability encountered by **mission-driven innovations** throughout their entrepreneurial journey" (2023, emphasis added).*

This new framing reflects a potential deepening of Social Alpha's perception of its role as a mission-oriented intermediary in India's agritech innovation ecosystem. Research on institutional logics explains how organizational identities are turned into practice at the organizational level (Olsen & March, 1989). In other words, the way an organization thinks about and represents itself is key to guiding behaviour. Therefore, the adoption of this critical frame potentially signals a greater future focus on how Social Alpha thinks about and responds to risk of mission drift.

Accountability and mission-drift

Our findings indicate that social impact metrics are not central to the work of Social Alpha and the entrepreneurs and investors with whom they work. Actors expressed significant interest in developing robust accounts of social impact and there is some investment directed toward measurement, but currently social impact metrics are largely aspirational. We did not find that quantitative or qualitative representations of social impact figure prominently in Social Alpha's decisions about providing continued support to early-stage ventures, and in this sense accountability relations are not focused narrowly around social impact targets and expectations.

Sustainability transitions scholars Van Lente et al., (2020) maintain that because of the inherent challenges of communicating social impact, innovation intermediaries must leverage a combination of performative statements to project credibility and a storyline to provide meaning. Social Alpha largely mirrors this strategy by adopting both qualitative and, where possible, quantitative approaches in measuring and accounting for social impacts.

Measuring social impact is much discussed, as a variety of actors are reportedly demanding greater transparency and accountability regarding sustainability criteria. In this context, Social Alpha has developed a practical (insisting on not overburdening resource-strapped start-ups) and pragmatic (practicing highly variable assessment and measurement techniques, depending on circumstances) approach for advancing assessment and accountability. Given the ambiguity of the term "social impact", some are deploying it as a marketing strategy rather than a genuine strategy of sustainable transformation. "Impact washing" now parallels greenwashing (Bengo et al., 2021). In this context, organizations need to be open about the challenges involved in defining and measuring social impact. Throughout our conversations, Social Alpha staff, investors and entrepreneurs provided candid reflections that can help to inform how mission-oriented intermediaries communicate and make their mark.

Silicon Valley-Styled Innovation

Our research teases out the frictions involved in applying the Silicon Valley model of innovation to agrifood, considering the sustainable transitions required to address Grand Societal Challenges. As venture capital investments in agriculture have proliferated in recent years, understanding the implications of Silicon Valley-styled innovation for delivering social impact is becoming increasingly relevant.

As Fairbairn et al. (2022) point out, "the financial logic of Silicon Valley...favours innovations that are easy to sell to other companies, rather than those that provide the greatest value to farmers" (2022). Their analysis of investments in agri-food tech reveal a tendency toward "non-disruptive

disruption.” In other words, they argue that the futures that Silicon Valley styled innovation are able to deliver are ultimately very limited and lacking in the types of social and ecological transformations required of our food systems. The case of Social Alpha adds to this conversation as it offers insights into how mission-oriented intermediaries work to maintain their goals while leveraging the tech sector’s relatively newfound enthusiasm for agriculture.

With the ultimate goal of supporting small holder farmers in India, the Social Alpha case serves as a microcosm for understanding how the entrenched political and economic realities of food and agriculture interface with Silicon Valley styled innovation. The organization clearly borrows certain aspects from a typical Silicon Valley incubator playbook – by hosting pitch competitions and providing strategic and financial resources aimed at leading the start-ups from ideation to commercialization. However, as a hybrid organization, it also departs from the traditional model – deploying patient capital and seeking to build markets for the sake of delivering social impact. As our results demonstrate, operating in this hybrid space presents a unique set of challenges that do not always have an obvious solution. It is also clear that investors demanding high rates of return common amongst venture capitalist are not suitable for supporting Social Alpha’s vision, and the organization remains steadfast in not succumbing to such extractive relationships.

The potential mismatch between traditional venture capital investors and mission-oriented intermediaries like Social Alpha highlights the role of hybridized investors, such as VC impact investors. Acting as hybrid organizations, these impact investors are themselves subject to mission-drift (Centindamar & Ozkazanc-Pan, 2017). Centindamar and Ozkazanc-Pan acknowledge that VC impact investors are an important source of innovative funding beyond government and philanthropy for mission driven organizations. However, they also heed critiques that, “involvement of VC impact investors with mission-driven companies struggling with social problems might transform them in such a way that could leave no room for social mission” (Centindamar and Ozkazan-Pan, 2017). This relates to Harji and Jackson’s argument that without appropriate accountability mechanisms in place, financial organizations could turn to impact investment as an “impact washing” activity rather than one that achieves genuine social impact (2012). Our analysis brings the question of impact washing into focus as an area that requires more investigation.

Implications of Financialization on Mission-Oriented Intermediaries

The involvement of VC impact investors with mission-driven organizations highlights the ways that social innovation can become financialized. Financialization refers to the increasing dominance of market-based practices, logics and actors in domains that have more traditionally been the purview of the non-profit or public sectors. Financialization is also tied to the strengthening of shareholder value, which can significantly influence the ways that companies invest in R&D. Generally, greater financialization is seen to have an overall negative impact on innovation as a focus on delivering shareholder value can lead to “managerial myopia” and a decline in investments in long-term assets in the ‘real’ economy (Dosi et al., 2016; Mazzucato, 2013; Seo et al., 2012).

Lee and Joo (2020) find that increased financialization is associated with less radical technological innovations, and more incremental innovation reflective of growing short-termism in innovation

strategies. This is in line with Fairbairn et al.'s observation of venture capital investments in agritech advance non-disruptive disruption rather than deep transformation. The risks of financialization are evident in the case of Social Alpha, particularly as enterprises seek to scale up and require new investment. This critical inflection point has the potential to tilt enterprises towards financial goals rather than impact-first approaches. Indeed, we see financialization as one of the key factors contributing to mission-drift.

It is clear that Social Alpha has several strategies in place to avoid their social innovations from becoming financialized including ensuring that the beneficiaries of the innovations under development remain smallholder farmers rather than those with more resources. They also focus on deploying patient capital to avoid the incremental, shallow innovations that can result from financing that demands high returns over the short-term. The emphasis on products, or the 'real economy' rather than services, may also prove to be a useful tactic in avoiding the abstraction that is characteristic of financialization. What remains less clear, however, is how the new markets that they seek to create will avoid becoming financialized (Krippner, 2005).

While Social Alpha recognizes the limitations of capitalist relations, they seek to employ the logic and tools of finance capital to generate social innovation. This pragmatic approach to sustainable development has a contradictory and paradoxical dimension. It is not clear to what extent and in what contexts they will succeed in building markets to advance social welfare and counteract incentives that draw talented people, ideas and capital to sites most likely to produce high returns on investment and rapid growth. Similarly, the "mission" itself is somewhat paradoxically a product of the system it is meant to change (Klerx and Begemann, 2020). Despite these limitations, there are clear indications that Social Alpha is alleviating structural barriers that constrain innovation. In principle, they expand the scope for innovation by investing in problem domains, geographic territories, and people that would otherwise not receive support from public or private sector organizations. Therefore, the specific problem statements, programming, and capabilities of these innovation facilitators play a central role in determining what they contribute to entrepreneurs, investors and society.

CONCLUSION

Though there is evidence that Social Alpha is broadening opportunities for entrepreneurs to reach the "bottom of the pyramid", we argue that mission-oriented intermediaries are ultimately limited in their transformative potential. Most importantly, market relations are only relevant where there is ability and willingness to pay. It is relatively easy to imagine business-led solutions to a class of problems of direct concern to small farmers; for example, higher yields, reduced variation in yields, pest management, quality improvements that attract price premiums, real-time market intelligence, and protection of safe drinking water for their families. And, there are many examples of public subsidies and "blended capital" that allow commercial firms to bring their prices into line with poor farmers' willingness/ability to pay. But grand societal challenges such as biodiversity conservation and GHG mitigation and other public goods - do not lend themselves to commercial logic unless regulations give rise to compliance markets (e.g., legal obligations to create public benefits linked to a social right to operate) or the scope and scale of voluntary standards rise dramatically. Research and debates must address interplay between state and market dynamics because processes of social regulation shape market opportunities. (Mis)alignment

between private and public interests defines what business and finance have to offer for social problem solving. This conclusion speaks directly to our ambition to apply critical institutional analysis to agritech in order to identify its limitations and to sketch out alternative and complementary socioeconomic coordination mechanisms.

What can the Social Alpha case study tell us about the role of mission-oriented agritech intermediaries, entrepreneurship and innovation in the broader context? Entrepreneurship and innovation shifted in India due to ideology, political economy and disappointment in past decades with the outputs of India's developmental state coupled with reliance on donors. The emphasis on market-based development strategies is reflected in the Companies Act. In 2015, the Indian government passed the Companies Act, which required large companies to dedicate a minimum of 2% of their profits to corporate social responsibility (CSR) projects. A reformed version of the Act explicitly recognized technology incubators as CSR investments. Irani points to the Tata Group to illustrate the ways in which development-rendered-entrepreneurial “generated complex tangles of partners across NGOs, corporations, and government” (2019, p. 18). Tata has an extensive network of NGOs that have now become “logistical organizations that help funded innovators intervene in the lives of the poor” (2019, p. 18). Social Alpha benefits from Tata Trusts' contacts in public, commercial and civil society organizations. Growing enthusiasm for enlisting finance in social problem solving merits expanded debate and research.

Mission-oriented intermediaries like Social Alpha offer valuable insights about how tensions between commercial relations and social problem solving are navigated throughout the lifecycle of the startups that they support. Namely, a strong commitment to a socially-oriented theory of change, identifying appropriate startups that will deliver on the mission and working with more patient capital and longer-time horizons are attributes that help to ease the tensions between commercial and social goals. However, given that there is substantial heterogeneity among intermediaries (Agthentic, 2016), there are not simple answers to these questions. More research into specific dynamics is needed.

This article advances analysis of the entry of venture capital into agrifood innovation through an in-depth case study of a mission-driven agritech innovation intermediary operating in a country where venture capital occupies a very central place in pursuit of sustainable development. We focus on intermediaries in innovation systems because the literature suggests that they hold potential for producing social impact at scale and catalyzing system-wide sustainable transitions. In terms of future research needs and opportunities, we identify a need for more empirical studies of mission-oriented intermediaries to better understand their possible contributions to sustainable innovations and transitions. Research focused on different national contexts and different kinds of innovation intermediaries will deepen our understanding of constraints and opportunities.

The entrance of venture capital, both impact investors and speculators, into agricultural innovation systems invites reflection on the principles and practices of responsible research and innovation (RRI). Proponents of RRI view innovation in the broader societal context – the legitimacy of innovation processes and outputs rests on engagement with economic, social, and ecological considerations (Burget et al., 2017). Stilgoe et al. (2013) identified inclusion of stakeholders as a key element of constructing this legitimacy. While recognizing that Social Alpha brings information about farmers into their work in meaningful ways, we identify opportunities for Social

Alpha to engage farmers more directly and build working relationship as a potential response to pressures that give rise to mission drift. More broadly, opportunities exist to bring other stakeholders – rural communities, agricultural consultants, environmental advocates - into their work. Research focused on which voices are included and heard in innovation ecosystems is needed.

Beyond assessing if and how assessment and accountability are practiced within agritech innovation ecosystems and working to support critical reflection and learning by practitioners through engaged scholarship, we see a need to situate research on contemporary developments in agricultural innovation system dynamics in a broader critical framework. Despite considerable focus on the unsustainability of the conventional agrifood system and need to transform towards sustainable solutions, policy debates, the bulk of scientific research, and most innovation activity are oriented toward incremental efficiency gains. As McGreevy et al. (2022) argue, sustainable agrifood transitions demand “redesign” according to principles of “sufficiency, regeneration, distribution, commons, and care”. In order to move in this ambitious direction, we argue that careful consideration of innovation processes – the way they are funded, incentivized, structured, practiced, regulated and evaluated – is vitally important. Shifts in how agrifood innovation is structured and governed - *innovations in innovation systems* – will have important social and ecological implications, and this makes entry of venture capital an important focus of critical analysis.

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