PROTEIN CHALLENGE SOUTHEAST ASIA

What role can financial actors play in embedding agroecological principles into the protein transition in Southeast Asia?

In collaboration with

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CONTENTS

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PREFACE

THE PROTEIN TRANSITION CHALLENGE IN SOUTHEAST ASIA

In the face of critical climatic, ecological and social disruptions, the need to transform the protein system in Southeast Asia has never been more acute. Protein is a vital part of everyone's diets and its production provides livelihoods for millions of people.

However, the current protein system is a significant driver of biodiversity loss across both aquatic and terrestrial ecosystems. It perpetuates the climate crisis, whilst at the same time, is vulnerable to its effects. Current production systems are dominated by industrial-scale processes that rely on large amounts of inputs—from fossil fuels to feed, water, and antibiotics—and are financially reliant on subsidies and tax breaks. They are linked to air and water pollution, deforestation, habitat destruction and livelihoods, and can have negative impacts on people's health. Industrial livestock systems are a driver of declining animal welfare, increasing antimicrobial resistance and catalyse the spread of zoonotic diseases. Overconsumption of protein has become normalised and usually comes in the form of livestock products, ultra processed foods and ready meals with low nutritional benefit. These systems are fundamentally unsustainable from ecological, social and financial perspectives.

At the same time, there has been a rapid increase in activity in Southeast Asia around sustainable protein. Meat production companies have been pressured by investors to address Environment, Social and Governance (ESG) impacts, particularly on carbon emissions, deforestation, antimicrobial resistance and food safety. New plant-based and alternative protein innovations are making their way into the marketplace, backed by a range of financial actors and instruments. However, these new products are not holistic solutions, and need to go further to catalyse the deep and urgent transformation required for a just and regenerative protein system.

A 'just and regenerative' protein system would restore and regenerate ecosystems and create conditions for social equity, and respect for human rights. It would be adaptive, resilient and healthy for generations to come. To achieve this, we need to work with nature and reduce the pressure on ecosystems from current production focused systems. This includes looking at both technological solutions and agroecological ones, which can be mutually supportive. They will deliver diversified protein production systems that encourage the use of local traditional knowledge, and tap the potential of existing solutions in the region, alongside novel, high-tech approaches.

INTRODUCTION

The **Protein Challenge Southeast Asia** initiative by Forum for the Future ("Forum") focuses on sustainable protein and aims to drive a transition to a just and regenerative protein system in Southeast Asia, challenging us to create new visions for a decentralised, regenerative, adaptive and future-resilient system.

Over four months in 2022, Forum convened a cohort of Protein Visionaries across the protein innovation space in Singapore through an 'Action Sprint'—a creative, interactive and time-bound process exploring what ambitious leadership in a just and regenerative future for a thriving protein ecosystem could look like. Participants explored how reshaping business models and value chains can address emerging challenges in the protein innovation landscape—from declining soil health, to supply chain disruptions, to investment decisions that do not contribute to a deep transition towards a future-fit food system.

The purpose of this paper is to introduce the concept of agroecology, explore its role in Southeast Asia's protein transition, and to identify the role of the financial sector in catalysing change and barriers to action. It builds on the Action Sprint and presents the financial sector with the opportunity to enable change through its financing and investment decisions, where the capital it deploys can contribute to deep transition of the current protein system to one that is future-fit. Insights presented were generated from a combination of interviews and desk research.

The protein transition offers huge potential for the region to:

- Deliver equitable access to nutritious sources of protein for current and future generations;
- Restore and regenerate soil, oceans and all ecosystems;
- Create value-chains that deliver social justice; and,
- Nurture a system that is resilient to future environmental, economic and social disruptions.

01

AGROECOLOGY IN THE CONTEXT OF SOUTHEAST ASIA

WHAT IS AGROECOLOGY? WHY IS IT IMPORTANT IN ACHIEVING A HEALTHY, RESILIENT FUTURE FOOD SYSTEM?

THE PRINCIPLES AND ELEMENTS OF AGROECOLOGY

Agroecology is a bottom-up, context-specific approach to food production. Foundational elements of this approach include delivering nature positive outcomes and enhancing agricultural biodiversity.

The UN Food and Agriculture Organization (FAO) articulates 10 elements of an agroecological framework,[1] the purpose of which is to help design the different pathways that lead to agricultural and food systems transformation. It frames agroecology in an inclusive manner, placing all elements on equal footing and providing a structure that supports stakeholders in planning, managing and delivering agroecological transitions to enable future-proof food systems.

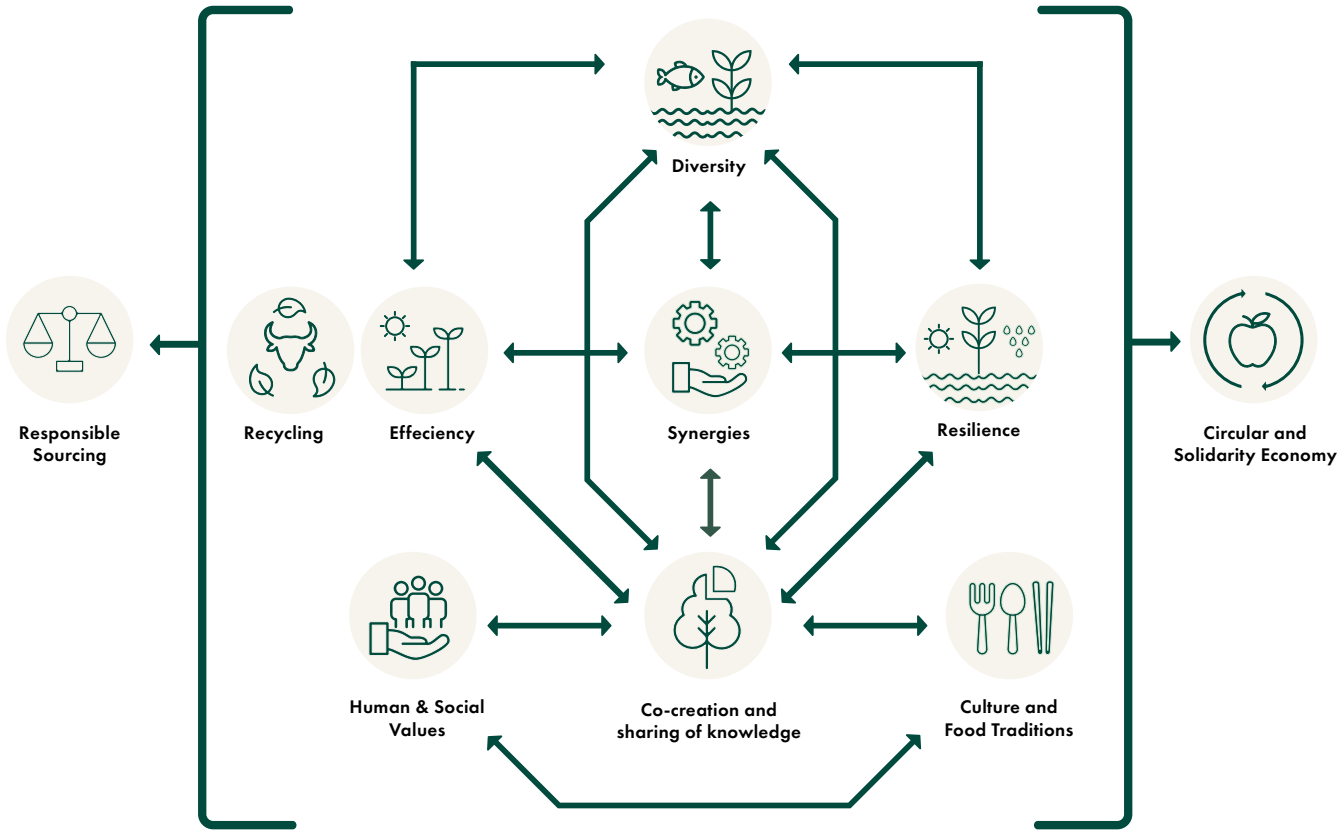


Figure 1: The 10 elements of agroecology
Source: FAO

The 10 elements—which represent both social and environmental outcomes—are interlinked and interdependent, demonstrating the integrated, holistic nature of agroecology. This means it does not seek to preserve the environment or recognise human value at the expense of economic opportunities. On the contrary, it recognises these three dimensions are interlinked and aims to improve livelihoods while creating resilient food systems.

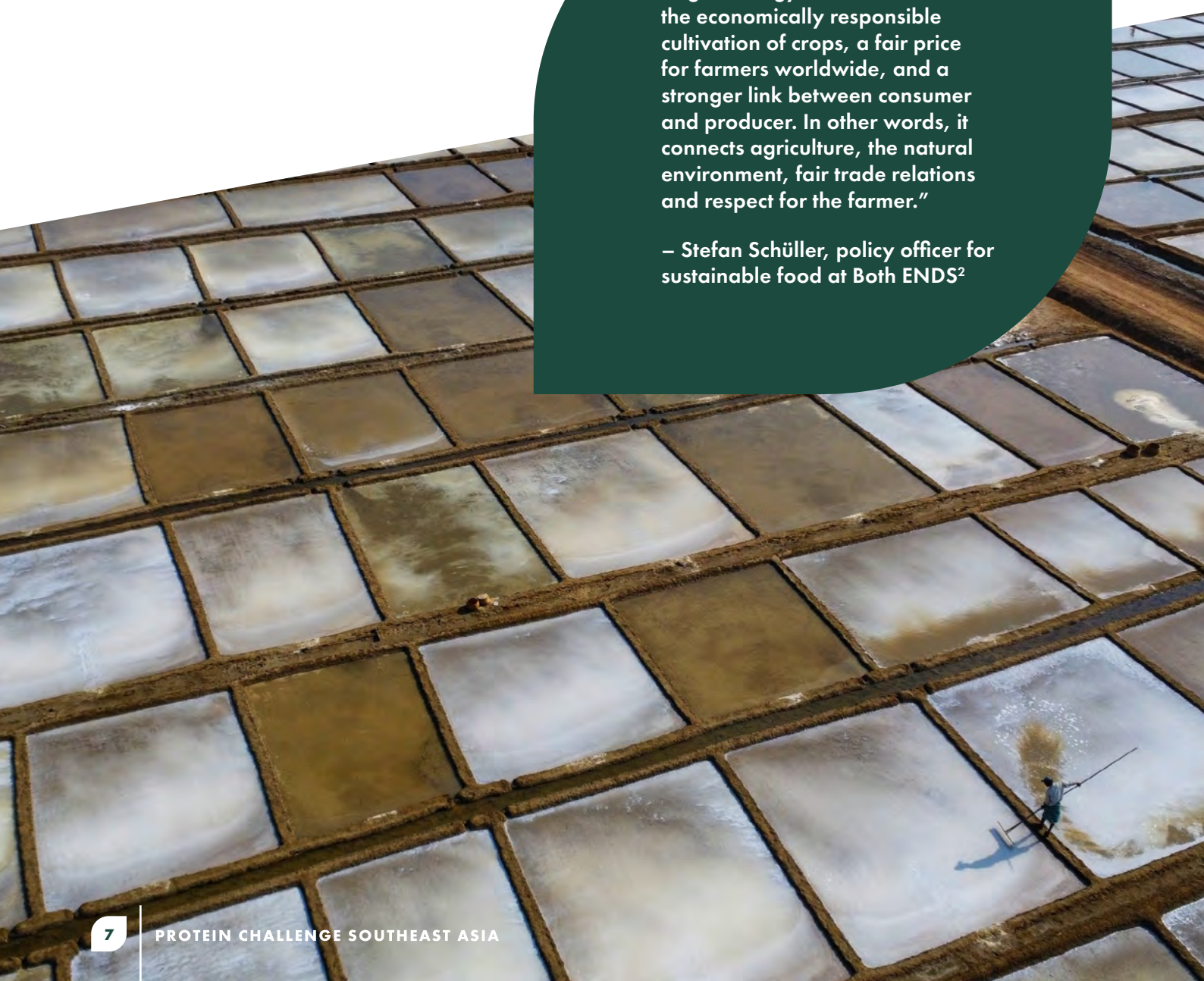
THE INTERLINKED AND INTERDEPENDENT NATURE OF THE SOCIAL AND ENVIRONMENTAL ELEMENTS OF THE FAO AGROECOLOGICAL FRAMEWORK

Biodiversity builds resilience in a system. Different species respond in various ways to changing climates, and as a subset of agroecology, agrobiodiversity,[3] which promotes the use of a variety of crops or animals, provides insurance against change and contributes to more stable ecosystems.

Instead of a dominant species in an agricultural system performing various functions, which can all be impacted by an emerging threat, having a diversity of species leverages their unique response and range of traits, thereby enabling the system to better adapt. Diversity contributes to resiliency and agrobiodiversity can therefore have a positive impact on yields, contributing to local resilient livelihoods and food security.

"Agroecology is aimed at the economically responsible cultivation of crops, a fair price for farmers worldwide, and a stronger link between consumer and producer. In other words, it connects agriculture, the natural environment, fair trade relations and respect for the farmer."

– Stefan Schüller, policy officer for sustainable food at Both ENDS[2]



DEFINING AGROECOLOGY, REGENERATIVE AGRICULTURE AND NATURE-BASED SOLUTIONS

Due to its established history, holistic approach to agriculture that includes both environmental and social aspects, and clear, well-defined principles, we believe agroecology provides the most robust approach for a deep and urgent transformation of our protein and food systems.

RELATED APPROACHES: REGENERATIVE AGRICULTURE AND NATURE-BASED SOLUTIONS

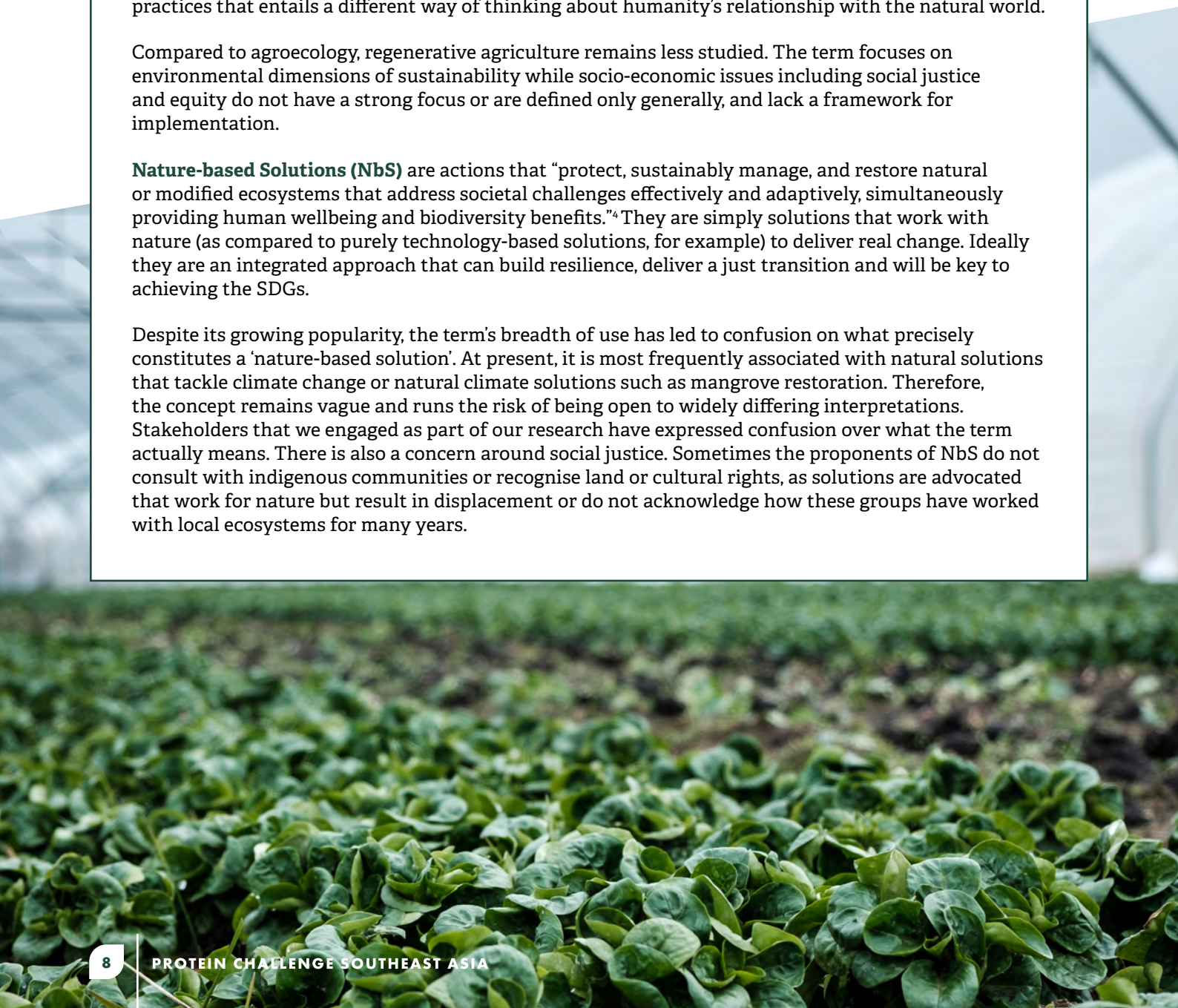
Regenerative agriculture and nature-based solutions are concepts that have similar goals to agroecology. Neither are the same as agroecology, but they share many values and overlapping practices.

Regenerative agriculture is an approach to farming that returns more into the environment and society than it extracts. Like agroecology, regenerative agriculture practices have the potential to create more resilient supply chains, restore soil health and enable farmers and businesses to thrive. However, the concept of regenerative agriculture is still new and understanding of the term differ. For some, it is primarily an approach to farming that places emphasis on the importance of fostering 'soil health', and optimising the carbon sink potential of agricultural soils. For others it is a set of farming practices that entails a different way of thinking about humanity's relationship with the natural world.

Compared to agroecology, regenerative agriculture remains less studied. The term focuses on environmental dimensions of sustainability while socio-economic issues including social justice and equity do not have a strong focus or are defined only generally, and lack a framework for implementation.

Nature-based Solutions (NbS) are actions that "protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits."[4] They are simply solutions that work with nature (as compared to purely technology-based solutions, for example) to deliver real change. Ideally they are an integrated approach that can build resilience, deliver a just transition and will be key to achieving the SDGs.

Despite its growing popularity, the term's breadth of use has led to confusion on what precisely constitutes a 'nature-based solution'. At present, it is most frequently associated with natural solutions that tackle climate change or natural climate solutions such as mangrove restoration. Therefore, the concept remains vague and runs the risk of being open to widely differing interpretations. Stakeholders that we engaged as part of our research have expressed confusion over what the term actually means. There is also a concern around social justice. Sometimes the proponents of NbS do not consult with indigenous communities or recognise land or cultural rights, as solutions are advocated that work for nature but result in displacement or do not acknowledge how these groups have worked with local ecosystems for many years.



WHY IS AGROECOLOGY IMPORTANT IN SOUTHEAST ASIA?

SOUTHEAST ASIA'S VULNERABILITY TO CLIMATE IMPACTS

Southeast Asia is one of the most vulnerable regions to climate change and faces rising sea levels, heat waves, floods, droughts and more. This will affect millions of people in densely populated areas and coastal zones. Extreme weather events will increasingly affect the region's protein and food production systems for both consumption and exports, putting its economic growth, food security, food and agricultural investments at risk, and negatively affecting the livelihoods of the region's population. According to the Asian Development Bank, Southeast Asia is likely to sustain larger economic losses from climate change than most other areas in the world, with collective losses from agriculture, tourism, energy demand, labour productivity, catastrophic risks, health, and ecosystems expected to reduce GDP by 11% by 2100 from a business-as-usual scenario from 2016.[5]

The region's fast growing population, which the IMF projects will reach 707 million in 2028 (a 9% increase from 2018)[6] will have increasing impact on the climate from human activity and consumption. This means that the regional food system will need to be bolstering to meet rising demand. In meeting this demand, Southeast Asia has become a deforestation hotspot, with one of the highest rates of deforestation in the world, losing ~1.2% of this natural carbon sink while adding around ~10% of human-made greenhouse gas (GHG) emissions annually.[7, 8] While its "long coastlines, high concentration of population and economic activity in coastal areas, reliance on agriculture in providing livelihoods for a large segment of the population, especially those living in poverty, and dependence on natural resources and forestry to drive development"[9] further exacerbate its vulnerabilities.

Given the interconnected nature of these issues, it is clear that a holistic approach to the region's challenges is needed one that restores soil health, regenerates landscapes, enables diversification of food and energy sources, and enables producers and communities to thrive.

THE REGIONAL PROTEIN SYSTEM AS BOTH DRIVER AND CASUALTY OF AGRICULTURAL COLLAPSE

Rapid population growth and economic development has increased demand for livestock products and cereals for both human consumption and feedstock. This has in turn put increased strain on agricultural systems and in particular the protein system, which is both a driver of, and will be negatively affected by, climate change. As a major driver of GHG emissions and natural resource degradation, the protein system contributes to its own production challenges by negatively impacting the natural ecosystems that it depends on.[10]

These challenges do not just affect economic growth. Given it is a major net exporter of rice, vegetable oil, fish and fresh fruit,[11] they also risk regional food sovereignty and threaten food access and population health.[12] The production (and consumption) of staple foods is expected to fall in the coming decades due to climate change. Of note is the impact on rice and fish stocks. In 2019, Southeast Asia was responsible for 72% of the world's aquatic food products and 90% of global rice production. Fish provided over 50% per capita average animal protein, with ~72% of total aquatic foods available for human consumption on the planet being eaten in Southeast Asia, while rice provided 50% of calorie intake for its population. While per capita food and protein availability in Southeast Asia increased by 85.1% from 1961 to 2018,[13] production of staple foods essential to most of the region's population is also at risk.

Regional food insecurity has increased significantly in recent years, with policymakers focused on establishing food sovereignty. In 2015, when the Sustainable Development Goals (SDGs) were launched, food insecurity affected just over 100 million people. By 2020, this figure increased to over 125 million.[14] In the same year, 347 million people could not afford a healthy diet.[15] As Figure 2 shows, between 2016 to 2021, despite increased focus from policymakers, regional prevalence of food insecurity has instead increased, while the prevalence of undernourishment saw only a moderate decrease. If production intensification and related natural resource depletion can result in one fifth of the population remaining food insecure, then this puts the sustainability and effectiveness of Southeast Asia's food and protein systems in question.

	2016	2018	2019	2020*	2021*
Prevalence of Severe Food Insecurity (%)	2.5	2.6	2.6	3.4	4.1
Number of Severely Food Insecure people (millions)	16.1	17.1	16.9	22.4	28.0
Prevalence of Moderate or Severe Food Insecurity (%)	17.0	17.3	16.8	18.9	20.7
Number of Moderately or Severely Food Insecure People (millions)	109.1	113.6	111.0	126.4	139.7
Prevalence of Undernourishment (%)	6.7	5.9	5.6	5.8	6.3
Number of Undernourished people (millions)	43.3	38.8	36.9	38.6	42.8

Figure 2: Food Security and Undernourishment in Southeast Asia
**Projected values based on the middle of the projected range, calculated by the FAO*
Source: FAO[16]

THE NEED FOR SOUTHEAST ASIA'S PROTEIN SYSTEM TO TRANSITION TO AGROECOLOGICAL APPROACHES

The adoption of industrialised approaches to help ensure food security and maintain yield growth has resulted in a shift away from traditional agroecology. These approaches have contributed to overfishing, deforestation and less healthy diets. Under business-as-usual it is possible to see further industrialisation of protein production in the region, with connected environmental and social costs. Some of these costs may not be visible or obvious, such as the loss of ecosystem services, and may not be evident until the future. For instance, the reliance on agricultural inputs to sustain yield puts financial pressure on farming communities as the price of inputs fluctuates. If agrochemicals are used, it also decreases soil quality over time, which reduces yield, in turn creating an ever-increasing dependency on inputs over time.

Instead of creating a vicious cycle of dependency, applying agroecological practices can support biodiversity and soil health by reducing the reliance on external inputs, thereby reducing costs and protecting yields in the long-run. Such costs can be a significant portion of the farming incomes of many smallholder farmers within the region. The benefits of agroecology for local economies are manifold beyond the direct economic advantages to farmers and local businesses. In areas where agroecology has been embedded, communities have seen increased crop yields, higher incomes for farmers and improved local economies, lower input costs, improved social networks, improved health and reduced healthcare costs.[17] Through longer-term thinking and adoption of traditional practices, an agroecological approach creates healthier communities and conserves local ecosystems, which then become more resilient to climate change. Protecting and enhancing biodiversity creates opportunities to explore new food sources and increase diet diversity, which is important in a region with a fast growing population and concerns of nutrition and food security.

THE UNIQUE CONTEXT OF SMALLHOLDER FARMS IN SOUTHEAST ASIA

Unlike other regions in the world, the food system in Southeast Asia is made up of mostly smallholder farms, with an estimated 100 million smallholder farmers in the region.[18] The FAO defines smallholders as "small-scale farmers, pastoralists, forest keepers, fishers who manage areas varying from less than one hectare to 10 hectares. Smallholders are characterised by family-focused motives such as favouring the stability of the farm household system, using mainly family labour for production and using part of the produce for family consumption."[19]

The dominance of smallholder farms makes it difficult to ensure widespread policy adoption, to oversee and ensure actual implementation of policies, and support farmers where lack of implementation is due to capacity constraints or lack of education and expertise. The resource constraint of smallholders and their lack of access to enabling technologies presents an additional cost to a regional transition to agroecological practices. Shifting towards (or back to) more regenerative practices may be seen as a risk that many cannot afford, especially if the benefits cannot

be seen until much later. As one interviewee shared "Once they start to see the yields from inorganic practices, (shifting towards more regenerative practices) will see a huge drop in yield that will take years to build back up."

Due to this unique context it is essential to have human and social values such as solidarity, co-creation, knowledge sharing—principles that place the farmers at the core—incorporated into any approach or policy in the region. Many governments in the region have provided limited policy support and have let the market lead the way in determining prices. In order to shift towards a more regenerative approach and to embed agroecology into the system, regulatory changes must be more supportive of smallholders.

> **"Talking to them (smallholders) about climate change 10 years down the road often does not sync with them. We have to create a product that incentivises them to carry out sustainable practices, and this incentive must be commercially viable (now)."**
>
> **– Interviewee**

WHAT ARE THE BARRIERS TO EMBEDDING AGROECOLOGICAL PRINCIPLES INTO SOUTHEAST ASIA'S PROTEIN SYSTEM?

THE FOCUS ON FOOD SECURITY EMPHASISES 'MORE' OVER 'BETTER'

Policy approaches to addressing the food security challenge predominantly focus on increasing yield and less on building a healthy, resilient and regenerative protein system. With Southeast Asia's expected population growth,[20] coupled with climate volatility, the demand for food is expected to increase 40% by 2050. Our discussions with stakeholders suggest that actors within the protein system—companies, investors, civil society and policymakers—are designing their sustainable protein solutions with a primary, and often only goal of meeting the food security challenge.

Some governments, such as in Singapore, have published clear targets to produce 30% of its nutritional needs by 2030 in order to achieve food resilience in the future.[21] As food security is etched firmly in the minds of policymakers, it is challenging to shift and diversify their thinking towards policies that focus more on the longer-term resiliency of the food system and less on increasing production yield. The latter tends to incentivise monoculture crops, increase the risk of prophylactic use of antibiotics in livestock farming (thereby contributing to antimicrobial resistance in humans), and create the negative ecological and social consequences already discussed in earlier sections.

Such approaches carry real risks of being short-term solutions that do not solve the systemic challenges for the region in the long-term.[22] To date, they have also yet to solve the issue of malnutrition in the region. Producing and consuming 'more' versus 'better' or healthier food, has also created the phenomenon of a nutrition paradox—where more low nutrition-value food is produced and consumed—calorie intake is increased, but health is decreased. This means that rising levels of obesity can coexist within a region that still suffers from undernutrition in some countries. As Figure 3 shows, obesity is rising in Southeast Asia while the prevalence of stunting (which the World Health Organisation (WHO) attributes most directly to inadequate nutrition) in children remains relatively high.

	AGE RANGE	2012	2020*
Prevalence of Stunting in Children	>5	30.5	27.4
Prevalence of Overweight Children	>5	5.8	7.5
Prevalence of Obesity in Adults	≥18	5.4	6.7
Prevalence of Anaemia in Women	15 - 49	25.0	27.2

Figure 3: Malnutrition in Southeast Asia

**The collection of household survey data on child height and weight were limited in 2020 due to the physical distancing measures required to prevent the spread of COVID-19. Only four national surveys included in the database were carried out (at least partially) in 2020. These estimates are therefore based almost entirely on data collected before 2020 and do not take into account the impact of the COVID-19 pandemic.*

Source: FAO[23]

DECARBONISATION AND CARBON MYOPIA

Other than solving for food security, current protein innovations largely orientate towards decarbonisation and limiting the need for agricultural land.[24] While tackling the climate and ecological crises are critical challenges, this approach does not address other urgent environmental and social impacts of protein production, hence misses the potential for agriculture to support a socially just and equitable transition (i.e. the restoration and replenishment of planetary and human health). In a region that still requires buy-in from a large number of system actors including smallholders, there needs to be clear social benefits to incentivise producers them to take part in the protein transition. As the FAO states, agroecology has evolved to represent "a transdisciplinary field that includes the ecological, socio-cultural, technological, economic and political dimensions of food systems, from production to consumption."[25] Embedding agroecological principles into the transition ensures social elements have equal weight with ecological considerations.

ALTERNATIVE PROTEINS CONSIDERED AS THE PANACEA FOR THE PROTEIN SYSTEM

There has been a strong push—and arguably, an overemphasis—for alternative proteins in recent years as a response to the urgent need to decarbonise our food systems, including considerations by some to remove animal farming altogether. Alternative proteins are substitutes for conventional meat, seafood, dairy and eggs and in most cases, attempt to replicate the taste, texture, and appearance of animal products. In 2023, the alternative protein market was valued at an estimated USD 76.3 billion and is projected to reach USD 423 billion by 2033.[26] Despite global private investment dropping in 2022 from the peak of 2021 as capital markets waned, global governments tripled their year-on-year (YoY) funding and global plant-based meat sales continued to rise. Countries such as Singapore have invested heavily in alternative proteins in a bid to become a global leader in the sector, bucking the global trend and increasing its private investment into the sector by 100% YoY to reach USD 170 million in 2022.[27, 28]

Aside from producing fewer emissions, alternative proteins claim to offer a variety of other environmental benefits including using less land, energy and water, and no live animals or antibiotics in their products. While they provide a new and alternative pathway for a climate friendly protein system to emerge, alternative proteins as a protein transition are not a 'silver bullet' solution, but a product innovation in response to deeply entrenched systemic challenges. They still run the risk of reinforcing current food system dynamics that rely on mass production, monoculture ingredients and energy intensive processes that have little positive impacts on livelihoods; nor do they shift unequal power dynamics that keep the current systems in place.[29] Alternative proteins may also fit in with the existing manufacturing and retail system that align with consumer behaviour and preferences,[30] and may therefore not be capable of bringing the transformative shift within the protein system that agroecology can.

CONSUMER AWARENESS AND PERCEPTIONS

Consumer mindsets also need to shift as their demands have the power to drive change in the food system. The prevailing belief is that if a product is sustainable, then it is more expensive by default and consumers may not be willing to pay the premium. If a transition to sustainable protein production (at least at the beginning) results in a higher cost of production, consumers will need to pay a premium for the product in the absence of subsidies. However, ceteris paribus, demand growth should drive production growth, which in turn should bring down prices as a result of economies of scale. Until that occurs, consumers may have expectations of quality to compensate them for the higher prices paid. These expectations may be on appearance and texture rather than the sustainability credentials of the product. As one interviewee remarked,"Unfortunately when you have an organic product you don't have the huge size or beautiful look vs an inorganic product. So from a consumer standpoint, it is tough to break that mindset."

Consumers may also have limited understanding and awareness of production practices and their social and ecological implications, therefore relying on producer and manufacturer messaging and transparency. Policy therefore plays a part in educating and spreading awareness.

OPPORTUNITIES TO EMBED AGROECOLOGICAL PRINCIPLES INTO THE PROTEIN TRANSITION

At present, there is no evidence of any systematic and systemic application of agroecological principles across the region. However, our research has unmasked emergent regenerative solutions and models coming out of Southeast Asia. These are described in the 'signals of change' section on page 18. Other opportunities to embed the principles into the transition are outlined here.

AGROECOLOGICAL APPROACHES ALIGN WITH REGIONAL TRADITIONAL FARMING PRACTICES

According to the French development non-government organisation (NGO) GRET, farmers in the Mekong have historically practised subsistence-based integrated farming that combined crops, livestock, and trees. Rotational agriculture has also long been used in rice production, as has the integration of fallow periods in farming cycles to restore soil nutrients, and the use of nitrogen-fixing trees in agroforestry. Many of these practices have shifted due to a combination of government policy and agricultural modernisation across the region.[31] Opportunities exist for the return and expansion of such practices, and as evidenced by the Ibis Rice case study on page 16, their application can have multiple positive outcomes.

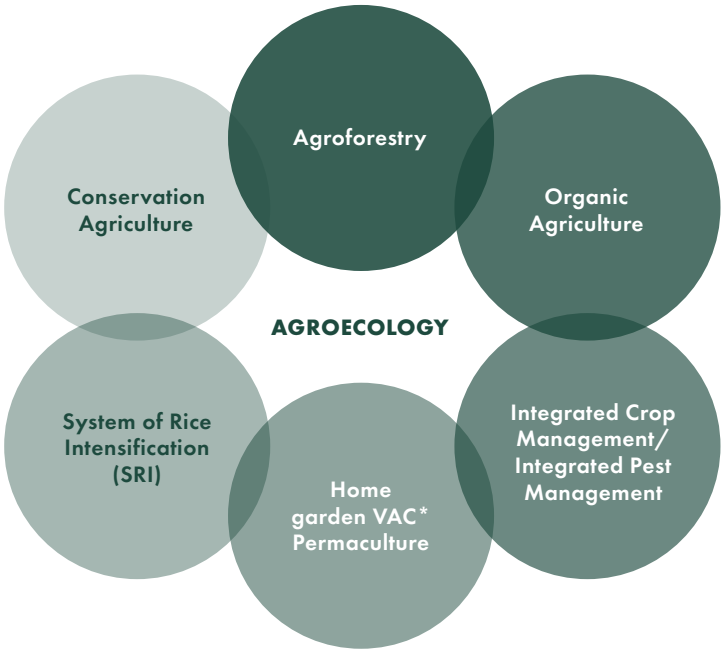


Figure 4: Main agro-ecological practices in the Mekong countries

**VAC is a Vietnamese acronym that stands for Vuon (garden or orchard) Ao (fish pond) and Chuong (animal sheds). It is an integrated, traditional approach to farming.*

Source: GRET[32]

Given that many of the countries within Southeast Asia are still industrialising, this presents an opportunity to shape the trajectory of farming practice in the region. While regenerative agriculture practices are gaining interest here, stakeholders we spoke to did not believe that it is being done at scale, but rather at a small-scale farming level. Decades of growth in industrialised farming across the region have made it challenging for farmers to become profitable when operating outside of industrialised practices.

Reverting to more traditional farming practices that work with the land instead of against it aligns with with agroecological practice. Referencing these and overlaying them with appropriate technologies that can support their scaling-up, halt the negative impacts of current farming practices, and work towards restoring and rejuvenating the region's landscapes.

Agroecological approaches typically result in shorter food supply chains compared to large-scale industrial food production, which can be complementary to the fragmented nature of smallholder production in Southeast Asia (see page 10 for a discussion on the unique context of smallholder farms in the region).

> "People are being taught to use techniques... where you need pesticides, fungicides... based on the soil ability to generate this amount of rice, fruits etc, you need an external nutrition source. So farmers are addicted to inorganic fertilisers. It's a vicious cycle. If you get out of that cycle you destroy your soil."
>
> – Interviewee

CHANGES IN CONSUMER PREFERENCES

A shift in consumer preferences for sustainably-sourced food is also an opportunity to embed agroecology into the protein value chain. The desire for healthier and sustainable food will drive 55% of food spending in Asia by 2030, equivalent to USD 2.4 trillion.[33] As income levels rise in low- and middle-income communities, there has been a transition away from plant-based proteins derived predominantly from cereals, starches and other staple crops[34] towards animal protein.[35] The consumption of meat alternatives such as tofu and tempeh is common in many Southeast Asian countries and has been for some time. However, protein demand is expected to increase significantly by 2050, with demand for animal-derived proteins expected to double.[36] The increase is expected to intensify pressure on land and resources due to the need to produce more animal feed, with continued agricultural expansion posing serious risks to natural habitats and raising GHG emissions.[37] There are social consequences too, such as the loss of access to traditional hunting grounds and loss of land rights.

Leveraging off conscientious consumer behaviour and desire for healthier food, further awareness can be raised on the externalities created by current protein production. Educating consumers on alternative production pathways such as those applying agroecological principles can help shape demand for sustainable foods domestically, and in countries importing food from Southeast Asia.

IBIS RICE – WILDLIFE CONSERVATION SOCIETY

Inspired by a mission to save Cambodia's critically endangered national bird, the Giant Ibis, the Wildlife Conservation Society launched the Ibis Rice initiative in 2009 to promote and market wildlife-friendly rice grown in the communities located in areas in the northern plains of Cambodia protected for their biodiversity value. Ibis Rice links wildlife conservation to improving livelihoods of villagers whose opportunities are limited by their remote location, with little opportunity to expand their farms and limited market access. Hundreds of affiliated farmers are now the guardians of 500,000 hectares of remote national park land and more than 60 threatened and endangered species in an area traditionally plied by loggers and poachers.

Farmers are paid a significant premium (70% above market price) for the pure, long grain jasmine rice coming from a protected area, and a range of products at the top of the Cambodian market has been established. The Ibis Rice team in Cambodia is responsible for purchasing directly from farmers through guaranteed contracts through the processing of the rice all the way to the final pack, keeping the value in Cambodia to sustainable farmer premiums. Since the project began, the critically endangered Giant Ibis, Cambodia's national bird, has made a comeback.

A partnership of NGOs and government agencies, the project provides local communities with an incentive to engage in conservation, by offering farmers a premium price for their rice if they agree to abide by conservation agreements that are designed to protect the rare water birds and other species that use the protected areas. This has incentivised farmers not to engage in harmful practices such as deforestation and hunting of wildlife.

DIVERSIFICATION OF PROTEIN SOURCES

Agrobiodiversity is important for building a healthy, resilient food system (see page 6). Changing the narrative around how we address food insecurity challenges away from increasing yield to building resilient food systems could create more focus on diversification as a tangible solution, increasing awareness in value chain actors and creating the channels to amplify agroecological practices.

Currently, the majority of proteins globally still come from plant sources by a significant margin, with meat, dairy, fish, shellfish and insects making up the rest, in that order.[38] In Southeast Asia, historically, the majority of protein comes from rice and fish. Depending on the location, other lesser sources of protein are eaten including beans, pulses, tofu, seitan, tempeh, meat and poultry. However, poultry is on course to become a predominant source of protein with very high rates of increase forecast to occur in Asia.[39] This is due to multiple factors including changing consumer preferences, production capacity, the impact of zoonotic diseases such as swine flu, and population growth.[40] Intensive factory farming to meet growing demand will have environmental and health risks, including the growth of antibiotic resistance and the threat of zoonotic diseases—seen by the WHO as two of the most significant risks to humanity.[41, 42]

The principles of agroecology can be applied in the protein system to facilitate the integration of alternative proteins to address multiple issues. An agroecological framework can be applied to provide nutrient-rich, sustainable diets for Southeast Asia's rising population, because it embraces both plant and animal farming to create balanced diets and "promotes multiple streams of revenue for small producers".[43] Agroecology can also limit costs from externalities as it "optimises ecological processes, environmental and public health, and well-being while minimising socio-ecological costs from agriculture and food systems."[44]

THE SHIFTING PROTEIN AGENDA IN SOUTHEAST ASIA

The sustainable protein agenda has become highly dynamic. Animal protein producers are taking the need to improve the sustainability of production more seriously, and many are investing in or purchasing plant-based protein and/or cellular protein companies. Policymakers are exploring new economic opportunities for protein production and innovation and even starting to look at the existing tax and subsidy regimes. Innovators continue to develop new novel options, some of which are hybrids of plant and animal proteins, offering the flavour and texture consumers want combined with enhanced nutritional benefits and stronger sustainability credentials.[45] These developments provide opportunities to engage with value chain actors to embed holistic, systemic approaches to solutioning and ensure the region's protein transition results in a system that responds to the needs of both planet and people.

SHIFTS TO SUSTAINABLE FINANCING APPROACHES

In the same way that consumers are shifting their preferences towards sustainable and more nutritious food, investors are demanding better ESG credentials from food and agriculture companies in which they invest. This shift has garnered policy support in some countries within the region, such as Singapore, which has taken pre-emptive steps to position itself as a sustainable finance hub. Both investor demand and policy development has been influenced in-part by emerging expectations from regions such as Europe and the pressure on investors from within and outside of the region to invest responsibly will ultimately shape capital allocation decisions. This presents an opportunity for the investment community to shape the food and agriculture value chain and steward food system transition towards sustainable outcomes. Further discussion on the role of financial actors can be found in section 2.

ARE WE SEEING ANY SIGNALS OF CHANGE?

It is also important to consider signals of change[46] or 'niche' innovations, which point to a potential development that indicate how the Southeast Asia's protein system is changing and provide clues into where the system is moving towards.

Following a combination of desk research and interviews, we unearthed interesting case studies and insights that help to explain where agroecological approaches are being used in the protein transition, and give a glimpse of our future:

1. **RegenX**[47] is a Singapore-based climate technology financing platform for small agri-businesses in Southeast Asia transitioning to regenerative agriculture. Through their technology, they have become one of Southeast Asia's only climate technology companies that is making "regenerative agriculture more profitable than conventional agriculture".[48]

   Applying what they call the 'RegenX Flywheel', access to their financing facility is given to small-scale producers who pledge to implement their Regen Ag protocol and track progress. Technical assistance and post-harvest guidance is given to farmers, as well as regenerative agriculture monitoring. As a result, global buyers can source directly from regenerative farms within the region, and farmers receive higher farm-gate prices. Progress towards agroforestry is measured and scored for each agri-business and farm against a Regenerative Agriculture Scale and farmers are incentivized with better financing terms for more progress made.

   This demonstrates how a data-driven approach can de-risk agri financing for investors while creating real economic benefits for farmers. Consequently, a virtuous cycle where better farming economics incentivizes better practices is created, which in turn raises the security of supply and attracts buyers and more investment.

2. **The Agroecology Learning Alliance in Southeast Asia (ALiSEA)**[49] aims to enable local and regional agroecology stakeholders to leverage each other's expertise, produce and disseminate evidence-based case studies, and to support a regional transition towards agroecology.

   While there is a long way to go with embedding agroecological practices, platforms such as ALiSEA aim to catalyse this shift. ALiSEA brings together 150 members who have different backgrounds and approaches to agroecology, and provides a much needed space for knowledge exchange. They recognise the importance of sharing experiences and understanding to support incorporating regenerative practices within farmers, companies and in public policy.

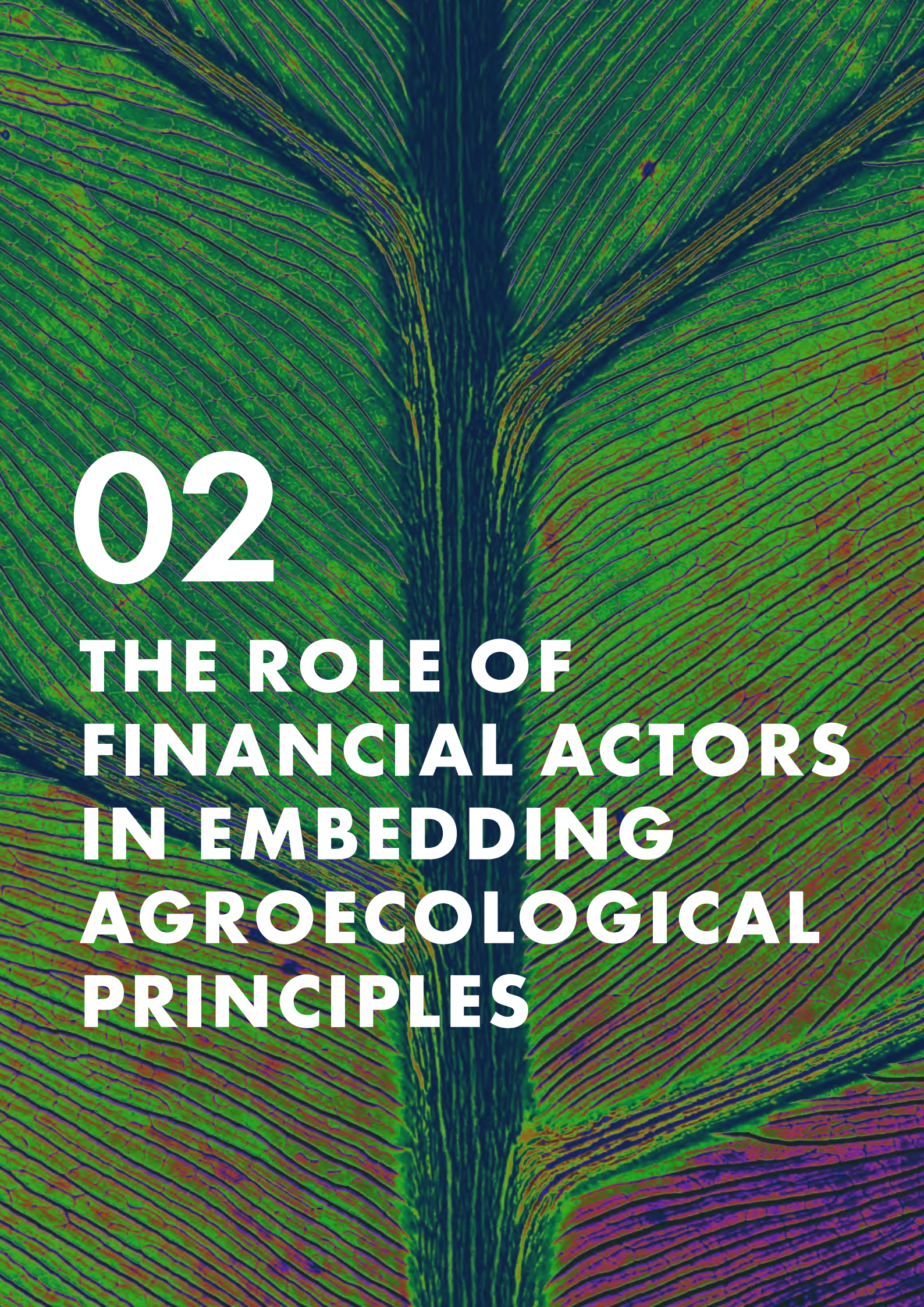
3. **SEADLING**[50] is a leading seaweed biotech company that promotes regenerative agriculture. Based in Borneo, Indonesia, the company uses modern technology alongside traditional, community-based farming practices to create unique, traceable seaweed products. SEADLING trains and partners with local Bajau farming communities who use their organic seedlings to grow a steady supply of sustainably farmed seaweed in its natural marine environment. Innovative bio-manufacturing technology is then applied to transform it into nutrient-rich farm feed and food products.

   Working closely with partners along the entire value chain, the company can certify, trace, and verify quality and sustainability at every stage. They are an example of how leveraging local community knowledge and practice and cultivating a crop within its natural environment while combining this with advanced technology can lead to an innovative, healthy product.

FINANCING AN AGROECOLOGICAL TRANSITION

We believe that it is possible to feed a growing population a healthy diet through agroecological production. In the long-term, doing so can make both economic and ecological sense. A food system transition will result in a diverse protein system made up of traditional foods, as well as new forms of alternative proteins. It will involve moving back from the current trajectory and changing consumption habits and redesigning how food production systems utilise natural resources. Dietary change is a key part of this, moving away from a "Western way" of overconsuming animal-based protein, towards sustainable diets built around a range of foods produced through agroecological practices.

In the next section of this paper we look at the critical role financial actors can play in enabling a protein transition that aligns with agroecological principles. Financial actors are critical players that provide the funding support necessary for any system to transition. They are therefore essential to catalysing change and accelerating and sustaining systemic transformation.



02

THE ROLE OF FINANCIAL ACTORS IN EMBEDDING AGROECOLOGICAL PRINCIPLES

WHAT ROLE CAN FINANCIAL ACTORS PLAY IN CATALYSING AGROECOLOGICAL APPROACHES IN THE PROTEIN TRANSITION IN SOUTHEAST ASIA?

CLOSING THE PROTEIN TRANSITION FUNDING GAP

Although food systems transformation is key to achieving many of the SDGs and global climate targets, there are clear funding gaps to enable the necessary transitions. The International Food Policy Research Institute estimates this gap will reach USD 350 billion per year by 2030.[51] Nowhere is this more evident than in developing regions such as Southeast Asia, where there is inadequate funding to support smallholder farmers, many of whom are already economically challenged, to transition. According to the Climateshot Investor Coalition and Climate Policy Initiative, there is a gap of approximately USD 29 billion in climate finance for small-scale agrifood systems, against estimated unmet general financing needs of smallholder farmers of USD 170 billion annually.[52]

Agroecological principles provide all system actors—including policymakers and financiers—a benchmark for best practice. But agroecology requires deep transformation that results in long-term, systemic sustainability, and funding that allows agroecology to take root in national agriculture strategies has fallen short. Even in developed countries, funding has been inadequate. There has been research that shows how from 2016 to 2018, none of the funds from Europe channelled through the FAO, International Fund for Agricultural Development (IFAD) and World Food Programme (WFP) went into any projects supporting transformative agroecology.[53]

PRIVATE SECTOR FINANCING IS KEY

The role of private sector financing in filling this gap is important, especially in a region such as Southeast Asia where public financing may be constrained by development challenges and public debt. Private financing is especially beneficial where domestic governance or infrastructure is less established as it can support the development of national regulation and policy across food system sectors. At full scale, including both domestic and foreign investment, private sector financial flows are significant and may also exceed public sector financial flows. It is also known to be more agile and can respond to business funding needs much faster than development or public sector financing.

Despite their promising traits, the private sector has yet to close this gap and capitalise on the many opportunities that a regional protein and food system present. For example, Grow Asia estimates the untapped green investment opportunities in the region across the food, agriculture, and forestry sectors to be USD 205 billion per year.[54] Instead, resisting barriers such as risk perceptions of investing in these sectors remain. The region have therefore largely remained reliant on donors, concessional funding and development financing from multilateral banks to support transformation of its food production systems. Both concessional and non-concessional funding through these channels have supported food system transition in the region—either by providing lenient terms to borrowers who may otherwise be considered 'unbankable' by commercial lenders, or through technical assistance and capacity building.

POLICY SUPPORT FOR THE FINANCIAL SECTOR IS NEEDED

Given the fragmented nature of the food, agricultural sectors, and landscape across Southeast Asia, an integrated response is required across the protein value chain and broader food system. The actions of policymakers are thus essential to create an enabling environment that supports financial actors and other stakeholder groups to shift.

The absence of significant private sector financing and investment is a barrier to the fast transformation of the protein and food system that is requisite for a just transition. System actors must therefore collectively address the challenges—both perceived and real—posed by the financial sector in order to unlock its capital. Financial actors in return must engage with other stakeholders and play a stewardship role in ensuring the capital it provides is applied in a way that actually results in a transition—where the outcome is a future-fit protein and food system for the region.

In the face of such challenges and current emphasis on efficiency and dependency on market mechanisms, what is the role of financial actors in enabling agroecological principles, which have the potential to systemically transform the protein and food system, to be embedded?

TO WHAT DEGREE IS AGROECOLOGY ON THE RADAR OF FINANCIAL ACTORS WHO ARE FINANCING OR INVESTING IN PROTEIN TRANSITION ACTIVITIES?

GENERAL LACK OF AWARENESS OF AGROECOLOGY AS A COMPLETE FRAMEWORK

As standalones, each of the 10 elements of the Agroecology Framework defined by the FAO is not new to most practitioners. Most are aware of the elements on an individual basis, applying some or several of the principles, but we have found no evidence to suggest investors are applying them in their entirety as a complete framework into their work.

In speaking with financial actors, the term 'agroecology' itself is not used and in its place 'regenerative agriculture' was used more often and understood to be a general proxy (see page 8 for a discussion on their differences). Other terms such as 'organic farming' were well understood. These practices incorporate some of the agroecology principles, but do not specifically require an alignment with social and community welfare, or an holistic approach that is integral to agroecology. Agroecology encompasses a broad range of practices, and it is difficult to judge the degree to which financiers and investors have it on their radar or integrate it into their investment and financing decisions, if at all.

There is private sector funding and blended finance solutions that are supportive of climate-smart solutions, regenerative practices, and other elements and subsets of an agroecological approach, but there is very little funding to support a broader systemic transition towards agroecology. Furthermore, despite agroecology having the potential to be increasingly recognised by public policymakers, it currently remains untapped by public funding globally.[55] Some funding support has come from the Green Climate Fund (GCF), which has allocated 10.6% of the money invested in agricultural projects into supporting transformative agroecology. Even so, 79.3% of agricultural money flows from the GCF are still allocated to conventional agriculture and/or projects related to efficiency approaches.[56]

PRIVATE FINANCE REMAINS FOCUSED ON RETURNS

For the most part, private sector financing has largely focused on principles that have clear pathways to returns, such as that of efficiency and responsible governance, and look at these mainly in the context of the investee company itself, not as an evaluation of its impact on the wider community or the ecosystem within which it operates. Nevertheless, there is evidence that regenerative agriculture and agroecology are gaining momentum, given the rising number of scientific papers dealing with these topics.[57] As the general excitement over alternative proteins has waned from its peak and investors are seeking the 'next best thing', regenerative agriculture is getting more attention and may be poised to attract the next wave of funding.

One area of private funding that remains committed to positive impact is impact investing. For example, many reputable firms incorporate community engagement into their investment design and management of impact performance. However, compared to mainstream investing, impact investing within Southeast Asia remains relatively niche. Investment is still small-scale and at individual project level.

But, the emergence of impact investing itself is evidence that traditional financing models that focus solely on profit have already been challenged. Taking this one step further, though new and nascent, the concept of 'regenerative finance'—which prioritises sustainability, transparency, and community impact, and operates on principles of circular economy with the aim of creating positive impact and regenerating natural and social systems[58]—is gaining traction.

PUBLIC FINANCING REMAINS FOCUSED ON FOOD SOVEREIGNTY

In the interim, public sector finance and policy support remains focused on ensuring food security and continued economic development, with development finance supporting the latter and the flow-on effects of it on social welfare. In the name of food sovereignty, practices such as growing crops in greenfield forests are still pervasive in many countries across the region. Meanwhile, private investment in food security is largely opportunistic, with the sector viewing it as an investment theme, giving birth to new innovations with immense growth potential and therefore inflated returns. This may not align with the principles underpinning agroecology, which prioritises the working relationship between people and the environment to obtain sustainable outcomes and long-term resilience over yield and returns.

> "At the moment, food security is fighting with nature."
>
> – Interviewee

WHERE ARE THERE LIKELY BARRIERS OR LIMITATIONS TO FINANCIAL ACTORS CATALYSING AGROECOLOGICAL APPROACHES?

LACK OF INVESTMENT AND RESEARCH TO PROVE CREDIBILITY

Hindering investment into regenerative practices is a general lack of awareness by system actors. Embedding agroecology into commercial farming requires more research and investment to create the awareness and conditions to scale, to prove such practices are viable and have long-term benefits to the planet and people. As more investment is deployed, this creates a feedback loop that would provide the confidence and credibility to farmers and investors alike, in turn driving greater uptake and accelerating the shift towards more regenerative practices.

Without demonstrable success and proof that these practices are economically sustainable on a large scale, the investment community will be reluctant to allocate capital into this area; that is, it lacks credibility in the eyes of investors and the benefits of transitioning to them, in light of the costs, are not yet clear.

MISMATCH IN TIME HORIZONS

One barrier faced by financial actors is the mismatch between relatively short-term investment time horizons and investment return goals of investors, and the long-term impact of applying agroecological practices, where both monetary and non-monetary returns may be evident much later than an investor's time horizon. The drive for short-term gains has instead steered investment towards the benefits of chemical fertilisers, mechanised farming and genetically modified seeds. This makes it difficult for producers to transition away from the use of inputs and practices that enable scale, towards those that are ecologically sound, but where payback may be delayed. This is a significant barrier in a region such as Southeast Asia, where producers are mainly smallholders whose livelihoods are dependent on current harvest yields.

ISSUES OF SCALABILITY GIVEN THE CONTEXTUAL NATURE OF AGROECOLOGY

Agroecology has no single definition or set of practices; therefore replication of results and scaling solutions can be challenging, and this is seen as a disincentive to investors who may view it as an additional cost factor. By necessity, agroecological approaches are designed for specific landscapes. It is therefore difficult to scale and replicate them across different geographies. This issue is especially relevant in a region where the physical landscape is diverse and existing policies in relation to the protein system are fragmented. The lack of consistency of practice increases the perceived risk of investing into agroecological approaches, given the potential wide variance of returns due to the broad suite of solutions —with the whole process yielding results that may be difficult to systematically measure because of the complexity of measuring social and ecological impact.

PERCEIVED CONFLICT BETWEEN AGROECOLOGY AND RETURNS

Agroecology is also often seen to conflict with yield and returns. Because it favours a synergistic, collective, cross-sectoral approach, it is perceived to require more resources, resulting in higher costs. Financial actors fail to recognise that practices that give rise to short-term investment returns and production yields often result in negative social and ecological externalities, and therefore negatively impact returns in the long-run.

In measuring impact, financiers face the following challenges:

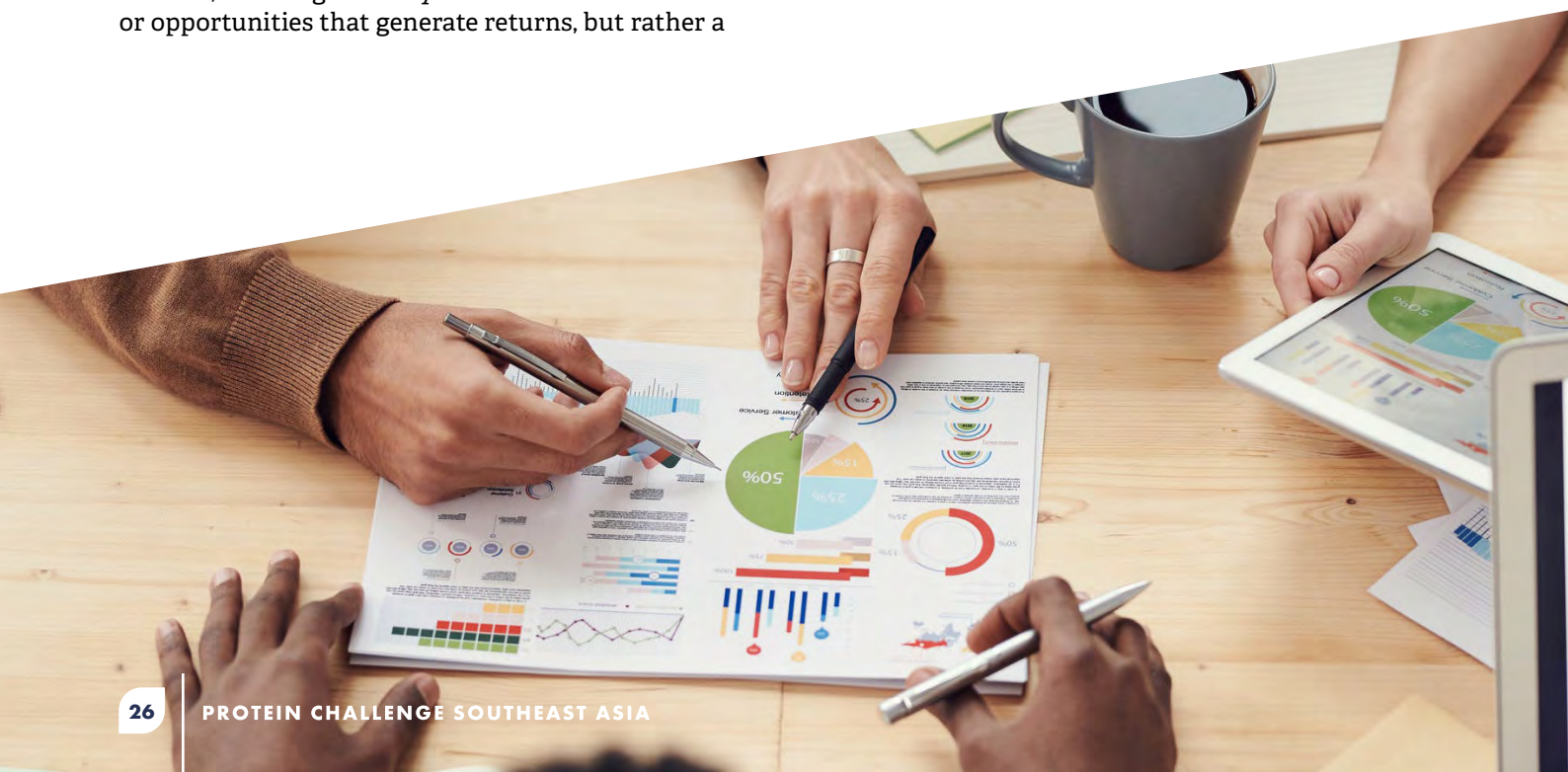
1. A lack of access to farmers in order to assess their 'bankability' and the need for aggregation in a fragmented market (which is especially relevant in Southeast Asia);
2. Difficulty in appraising and assessing farmers given lack of tools for assessment; and
3. The nature of agriculture itself being a biological process that can be unpredictable and difficult to control.

As previously stated, this makes risk quantification difficult and deters investors from allocating capital to the sector. As a result, those that do step in demand outsized returns to compensate them for the risk of investing.

LACK OF A CLEAR TAXONOMY AND FRAMEWORK TO AID APPLICATION OF THE PRINCIPLES

Financiers must be able to measure risk and calculate expected returns from investment. This remains difficult without a clear and generally accepted taxonomy and framework for applying agroecological principles to financing. Without the ability to incorporate this into its financial decision-making and disclosures, the sector will continue to be slow-moving in shifting capital in support of agroecology. The taxonomy must clearly differentiate between climate smart agricultural practices, regenerative agriculture, nature-based and nature-focused solutions, and agroecology. A discussion on the related approaches of regenerative agriculture
and nature-based solutions can be found on page 8.

The agroecological principles are a practice guidance. As such, we recognise they are not investable assets or opportunities that generate returns, but rather a guidance to operating models. However, this does not diminish their relevance or importance to the financial sector as they help identify risks which may lead to financial vulnerabilities. Their application strengthens investees' operations by mitigating possible social and ecological risks, and supports a more resilient food system overall, which impacts returns for both investee and investor in the long-run. In the short-term, the questions to ask may be: which financial actor is best placed to finance and catalyse a shift towards agroecological approaches? Which financial mechanism or vehicle is best placed to support this transition?



CASE STUDY: NATURE-RELATED FINANCIAL RISK– HOW SOIL DEGRADATION CAN IMPACT ASSET VALUE

Robeco, together with the The University of Cambridge Institute for Sustainable Leadership (CISL) published the first nature-related financial risk use-case and call to action report in 2022.[59] They analysed the impact on listed companies in the food supply chain from exposure to degraded land and quantified the valuation impact. A stress test focusing on Brazil was conducted to examine how soil degradation impacts the financial vulnerability of listed companies. Brazil was chosen because of its key role in expanding the agricultural crop markets globally and given global dependency on its agricultural output.

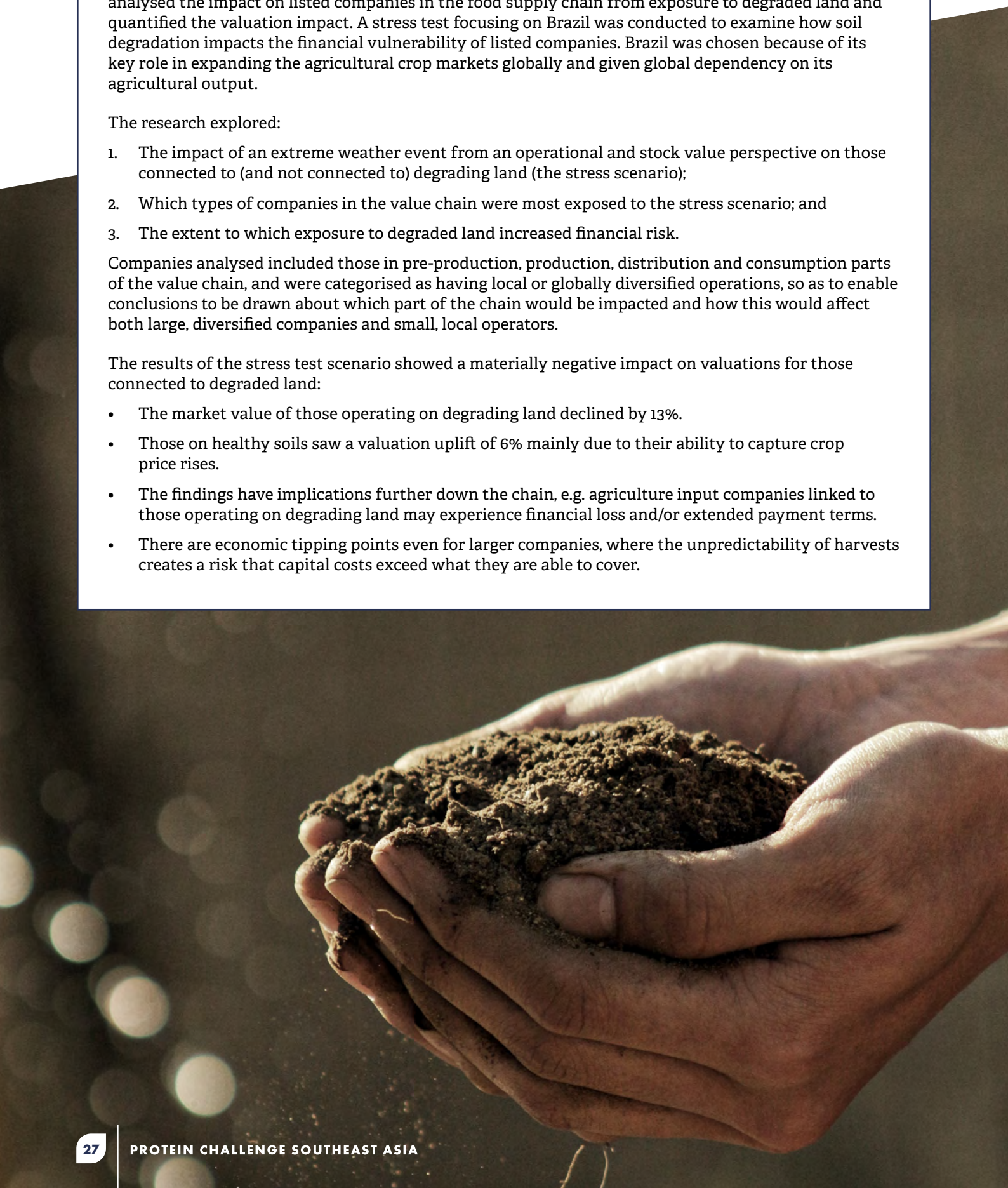
The research explored:

1. The impact of an extreme weather event from an operational and stock value perspective on those connected to (and not connected to) degrading land (the stress scenario);
2. Which types of companies in the value chain were most exposed to the stress scenario; and
3. The extent to which exposure to degraded land increased financial risk.

Companies analysed included those in pre-production, production, distribution and consumption parts of the value chain, and were categorised as having local or globally diversified operations, so as to enable conclusions to be drawn about which part of the chain would be impacted and how this would affect both large, diversified companies and small, local operators.

The results of the stress test scenario showed a materially negative impact on valuations for those connected to degraded land:

- The market value of those operating on degrading land declined by 13%.
- Those on healthy soils saw a valuation uplift of 6% mainly due to their ability to capture crop price rises.
- The findings have implications further down the chain, e.g. agriculture input companies linked to those operating on degrading land may experience financial loss and/or extended payment terms.
- There are economic tipping points even for larger companies, where the unpredictability of harvests creates a risk that capital costs exceed what they are able to cover.



WHERE ARE THERE OPPORTUNITIES FOR FINANCIAL ACTORS TO CREATE THE CONDITIONS FOR PROTEIN AND FOOD SYSTEM ACTORS TO EMBED AGROECOLOGICAL APPROACHES?

ALIGNMENT BETWEEN AGROECOLOGY AND ESG

Agroecology aligns with finance sector ESG considerations because it considers wider ecosystem impacts and social issues in addition to environmental impact. As an approach, it addresses the 'E', 'S' and 'G' of ESG at a systemic level. Agroecological principles offer benefits for both ecological and social well-being that may not be addressed if looking at food systems through a purely economic lens.

Agroecology is rooted in ecological processes and seeks to both balance and enhance ecosystem services,[60] which aligns well with investor interest in nature-based solutions and emerging recognition of the benefits of working with nature instead of in opposition to it. In searching for 'bankable' or 'investable' projects and assets, if a systemic, holistic approach such as agroecology is not taken by financial actors, then the sector stands to increase the very ESG risks it seeks to mitigate and which threaten investment returns.

A distinction therefore needs to be made between NbS and agroecology, as conflation of the two may risk exacerbating negative externalities. For example, if NbS with low biodiversity value is encouraged in the pursuit of climate mitigation and afforestation with non-native monocultures is pursued as an NbS, it could result in maladaptation and reduced biodiversity-based resilience of the landscape.[61] Conversely, applying the agroecological principles of diversity (where natural resources are enhanced and protected), and resilience (where biodiversity-based resilience is protected because it is essential to a well-functioning natural ecosystem) would highlight such risks at the outset.

SHEPHERDING THE DEVELOPMENT OF AN ENABLING ENVIRONMENT IN SOUTHEAST ASIA

Emerging markets such as those of Southeast Asia present untapped investment opportunities that can make a positive impact in sectors such as food and agriculture. The region is characterised by improving infrastructure, increasing sector-targeted policies, and developing regulatory frameworks. With what can be considered relatively small amounts of investment, financiers and investors can promote embedding systemic approaches and steward the adoption of sustainable practices across the protein and food value chain. In doing so, not only do they contribute to the region's economic, environmental, and social development; they help to ensure a food system that is more climate resilient, equitable, inclusive and works in partnership with nature instead of against it. Such a system does not undermine food security and food sovereignty but ensures it for all.

To embed agroecological principles into current practices, an enabling environment for both the financial sector and real economy actors needs to be created. There is little incentive for producers, especially smallholders who may be financially constrained, to bear the cost of transitioning to alternative practices. Given that financiers and investors hold the purse strings, they must actively engage with investees and provide them with the necessary incentives and disincentives to transform their practices. Government policy can certainly support investment, but within a market mechanism, the financial sector has a strong role to play in determining which solutions and practices survive and

which die, thereby shaping the food system.

In the same way, there must be adequate incentives for financial actors. The commercial benefits of embedding these principles into their lending and investment practices, even if not immediate, need to be clearly articulated. If this is assumed to be fair, then what counts as adequate compensation? What would be considered a 'reasonable' hurdle rate for an investor? How can policymakers, producers and other actors in the value chain support this rate being reached in order to crowd-in private sector funding?

SUPPORTING OTHER VALUE CHAIN ACTORS TO EMBED AGROECOLOGICAL PRINCIPLES INTO THEIR PRACTICES

Larger private sector companies such as agriculture input firms have piloted programmes that support smallholder farmers in crop management, provision of inputs, technical assistance and environmental impact education to enable them to transition their production methods. In return, these firms agree to buy directly from farmers, thereby providing assurance to the producer, while simultaneously helping to improve farming practices. The role that development agencies and government programmes once played is now being taken up by the private sector which can be more agile, have large resources at their disposal, and the ability to scale. These corporations recognise the structural issues in the way that farming is currently being done and the need for an inclusive business model that engages with actors in the value chain to ensure production is sustainable and thereby safeguard supply. At scale, these initiatives have the potential to change the landscape, but unless business models fundamentally change and/or other stakeholders in the value chain, such as financiers, take up their stewardship role, there remains a risk that the underlying motive of profit results in a shallow food system transition instead of deep systemic transformation. Here too lies an opportunity for financial actors to play a leading role in shepherding the behaviours of other value chain actors.

WHAT ACTIONS CAN BE TAKEN TO CREATE THE CONDITIONS FOR CHANGE?

REFRAME HOW INNOVATION IS ASSESSED, VALUED AND DEVELOPED

In the pursuit of profit and maximum returns, entrepreneurs, investors, and policymakers have largely focused on technological solutions to address everything from climate change to food security —looking to AI, digitalisation, seed technology, plant genetics, modern irrigation systems and new industrial inputs to solve these challenges. Despite these new innovations and technological advancement, our protein and food systems remain entrenched in the industrial agriculture model birthed by the green revolution in the last century. The revolution was successful in achieving many of its goals, but there have been both social and environmental costs as a result. As we look to solve the multiple challenges in the current protein system, it pays to examine the way in which we innovate.

- **A new mindset to assess opportunities to invest in food, agriculture and aquaculture.** Investment returns from specific technological trends drive—and can oftentimes bias—investment decisions. This can work against less-obviously investible innovation that if received necessary funding, can help achieve a just and regenerative protein system in Southeast Asia. It is therefore beneficial to acquire a new reference to assess opportunities. This ensures the ability to unlock technology that can achieve the biggest positive impact in the protein system across Southeast Asia and facilitate greater adoption of agroecology across the region. Involvement of specialists or specialist investors can help navigate this, as does cross-sectoral collaboration with other system actors.

- **Challenge and evolve the philosophy that informs the development of new innovation.** The development of new solutions is underpinned by certain mental models and world views. For example, the linear mindset of "take-make-waste" has developed innovation that has benefitted us but also harmed our planet. We are seeing a burgeoning of innovators who now embrace a circular mindset when innovating. By embracing agroecological principles, entrepreneurs and investors can start to take a broader long-term view and innovate to achieve whole system benefits, instead of a narrow perspective that answers only to individual needs.

- **Moving from pure innovation to embracing entrepreneurship.** This will bridge the gap between innovators and investors. Incentivising and developing entrepreneurial capability will lead to more "investible" innovation, and lead to wider adoption by customers or users and in the long-run, generate sustainable returns.

In its 2019 report titled 'Agroecological and other innovative approaches', the High Level of Panel of Experts on Food Security and Nutrition (HLPE) discusses the distinction between innovation and invention. It highlights that innovation is essential to bringing about deep food system transformation, and that it "encapsulates how people will do things differently in the future than they have in the past."[62] Innovation is distinct from, not necessarily induced by, and possible without invention.[63] It is "the dissemination of something new in a given context, not something new in absolute terms."[64] This distinction raises three important points that should be considered by financial and other system actors when evaluating investment opportunities:

1. Because true innovation comes from behavioural change, an invention that seeks to be absorbed into existing value chains and applies existing processes and practices risks having minimal real impact.

2. Dissemination is essential, but innovations that fail to scale in an ecologically safe and socially just way risk becoming irrelevant in an increasing climate of social and ecological awareness.

3. Innovation is contextual and can only have real value if it is responsive to the needs of the system within which it is applied. The criteria of newness is unnecessary, but consideration of externalities created now and from future application is essential.

We find ourselves nearly a century after the green revolution at a different juncture and with a new understanding of the inter-relationship between the social and environmental dimensions of our food systems. We have a new set of challenges, the address of which requires a different set of actions and a different approach to innovation.

"Investors are usually led by trends... they're always chasing the next big thing, but not implementing the last best thing."

– Interviewee

SHIFT RISK PERCEPTIONS TO ALLOW STRUCTURAL CHANGE TO OCCUR

There exists a prevailing belief that returns are a necessary sacrifice when investing for impact. We cannot deny that there is a cost to every dislocation in the short-term, but measurement of the net return of investing needs to take account of transition costs relative to the overall reduced costs from negative externalities, costs borne by competitors as the whole system transitions, and long-run investment returns (versus short-term return targets).

Not only do our business models need to change, but so do our financing models. At the root of this is the way in which investors and financiers perceive risk, measure it, and incorporate it into their financing and investment decisions. **Investors need to look beyond current transition risks and costs of acting and start incorporating the risks and costs of inaction.**

COLLABORATE TO ENABLE SYSTEM TRANSFORMATION

Investors have been signalling concerns of the externalities caused by the current protein system for some time. Many have been focused on the reputational risks to food companies and their stakeholders if they fail to make measurable commitments to reducing negative supply chain impacts. Agroecological principles offer an opportunity to build a framework for protein system transition within the region that can answer some of these concerns, addressing all dimensions of risk at a systemic level.

Based on the findings of this enquiry there are some clear questions that need to be discussed when seeking to identify the role financial actors play in embedding agroecological principles into the protein transition in Southeast Asia.

These questions would benefit from **deeper collective inquiry** amongst diverse stakeholders in the protein system.

- Where might stakeholders and the finance community intervene to shift the trajectory of the protein transition in the region towards agroecology?
- What are the implications for the health and resilience of Southeast Asia's future food systems if the principles continue to be absent? What will it mean for investors?
- What would it take for the food system in Southeast Asia to shift?
- How can the narrative shift from the productionist food security framing to one that delivers true food security?
- How can the financial community drive change? What are the short-term and long-term opportunities for them to do so?
- What is the role of the public sector and how can it be catalysed?

NEXT STEPS TOWARDS CHANGE

To apply the agroecological principles, investors need to think differently. Understanding that it is not just a set of agricultural practices, they will need to take a longer-term approach to returns and rethink their perceptions of risk. Agroecology addresses the entire food system (production to consumption) by taking the best of all innovations compatible with the principles of agroecology and combining them with traditional and farmer knowledge. It is a holistic, integrated approach to reach economic, environmental, climate, health, social and cultural objectives.

As stakeholders in a common society, we need to define a just and regenerative protein and food system in Southeast Asia, built on agroecological principles. Financial actors play a critical role as their actions and behaviours are crucial to enabling the change we need. Through this whitepaper, we hope to start new conversations and build on existing ones with stakeholders who share this vision.

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ABOUT FORUM FOR THE FUTURE

Forum for the Future is a leading international sustainability non-profit. For more than 25 years we've been working in partnership with business, governments and civil society to accelerate the shift towards a just and regenerative future in which both people and the planet thrive.

As our environmental, social and economic crises intensify, the world is rapidly changing, with multiple transitions already reshaping how we all live and work. But will we go far enough, and fast enough? Forum is focused on enabling deep transformation in three game-changing areas: how we think about, produce, consume and value both food and energy, and the purpose of business in society and the economy. We're working with ambitious and diverse change-makers to shift how they feel, think, act and collaborate to drive systemic change for sustainability.

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ABOUT GROW

GROW is an ecosystem catalyst advancing innovation, sustainability, and resilience in the food system. We're on a mission to inspire and accelerate extraordinary founders who are developing technology solutions that deliver positive impact for people, place, and planet. Through our fund and accelerator programmes we work with startups to supercharge their growth on the global stage.

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ABOUT PROTEIN CHALLENGE SOUTHEAST ASIA

Our food system needs reimagining. Protein can be a lens through which we look at food, because the protein system is a keystone element of the wider food system. The way we produce and consume protein has significant implications for our climate, biodiversity and human health. In response to the global challenges we face to ensure our food systems are sustainable, and to the specific challenges we face within the region, Forum for the Future launched the Protein Challenge Southeast Asia initiative in 2021.

The initiative seeks to challenge existing models by challenging the assumptions upon which they are built and applying systems thinking to help redesign a new protein system. It does this by bringing together a broad cross-section of actors in the protein value chain in a series of Action Sprints to collectively address current and future food system challenges. Each sprint focuses on a different aspect of the protein system. Within each sprint, participants are equipped with systems tools and frameworks to be able to diagnose the current protein system and vision a new one for the future. Importantly, through this process participants realise their own role and agency, enabling them to think and act systemically as stewards of the protein system. This work has been generously supported by Singapore's Economic Development Board.