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Abstract

The 2023-24 'IGP Master's Dissertation Special Issue' is a celebration of the exceptional intellectual achievement of ten distinguished students from the Master of Global Prosperity (MSc GP) and Master of Prosperity, Innovation and Entrepreneurship (MSc PIE) programs at the Institute for Global Prosperity (IGP), UCL. This special issue is a testament to their academic excellence, showcasing a diverse array of research that pushes the boundaries of our understanding of prosperity. The eleven dissertations, selected for their outstanding quality, innovative approaches, and insightful contributions, will be disseminated across three volumes, each serving as a beacon of inspiration for future students and a resource for further research in the field of global prosperity. However, this special issue represents only a fraction of the innovative and forward-thinking ideas that have been cultivated among the students at the IGP.

⇒ Jirasarunya's dissertation explores whether welfare economics should move beyond reductionist approaches centred on individual behaviour. It critiques the limits of mainstream reductionism and draws on theories of complex systems, human agency, and alternative frameworks to argue for new methodologies that better capture real-world welfare and equity concerns.

⇒ Chen's dissertation investigates the gendered dimensions of remittance-sending among Southeast Asian female migrant workers in Taiwan. Using mixed methods, it shows how

remittances function both as financial support and as fulfilment of familial and cultural obligations, simultaneously empowering women and reinforcing traditional norms.

⇒ Me's dissertation examines the feasibility of citizen science (CS) in Vietnam's politically restrictive context through analysis of the PAPI initiative. The study proposes a hybrid, adaptive approach supported by educational reforms and offers a framework for context-sensitive CS, highlighting its potential for governance reform in Vietnam.

⇒ Gamboa's dissertation investigates Regenerative Finance (ReFi) as an emerging ecological movement that integrates blockchain with regenerative principles to support nature-based solutions in Colombia. Through case studies and interviews, it finds that while ReFi holds transformative potential for participatory, community-led regeneration, it faces major challenges, including scalability barriers, scepticism toward Web3, and dominance of traditional carbon markets.

Together, these dissertations present innovative research that informs policies and practices aimed at fostering inclusive, prosperous, and empowered communities. They emphasise the importance of environmental, educational, and economic interventions in shaping a society's trajectory toward sustainability, resilience, and prosperity.

Publication collated by Almeira Parruque

PUBLICATION CONTENTS

Topic 1: Towards a Macro Theory: Rethinking Methodology in Welfare Economics

NADHAPREUK JIRASARUNYA

Global Prosperity (GP) MSc programme

Abstract

This paper is a theoretical exploration of whether economic methodology should shift from reductionism in traditional economic thinking on welfare to a "macro" approach, i.e. one that is based on aggregate outcomes which cannot be fully explained through reductionist perspectives of individual behaviours.

Welfare economics is dominated by mainstream thinking based on reductionist perspectives of individual behaviours. Such perspectives form the basis of fundamental concepts in welfare economics yet have substantial limitations and deviate from what is measured and applied in the real world. Economics has consequences for real people, and a business-as-usual approach leaves much to be desired. Other theories beyond fundamental concepts, such as those on achieving efficiency in a world where distortions exist, social contexts affecting economic outcomes, alternate ways of evaluating economic policy, and debates on equity, highlight important elements suggesting alternative methodologies are desired. A macro approach, i.e. one that is based on aggregated outcomes rather than reductionism, is advocated. Macro concepts can be informed by theories on complex systems, human agency and alternative ontological frameworks. This is an exciting area for the future of economic thinking.

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Thank you also to my family, friends and loved ones who supported me throughout my academic journey.

This paper is dedicated to my sister.

1. INTRODUCTION

Welfare economics, for good or for bad, has heavily influenced public policy discussion and decision making for the best part of recent decades. Traditional theoretical concepts based on reductionist perspectives of individual behaviours dominate mainstream thinking. However, what is measured and applied in the real-world deviates from artificial concepts with significant limitations. Mainstream economic thinking has been criticised for failing to adequately reflect a comprehensive understanding of human behaviour, social contexts, elements important to human life and normative values among other aspects. Addressing these limitations is important because economics has consequences: it influences the lives of people across broad spectrums of society.

This paper is an exploration of whether economic methodology should shift from reductionism in traditional economic thinking on welfare to a "macro" approach, i.e. one based on aggregate outcomes which cannot be fully explained through reductionist perspectives of individual behaviours. The paper is a theoretical review, research and re-evaluation of economic methodology and returns to the fundamentals of economic thinking on welfare, explores extended concepts and considers theories that can inform a macro approach.

The paper is divided into three chapters. Chapter 2 revisits the theoretical fundamentals in welfare economics. It evaluates key limitations to mainstream thinking and asks whether a business-as-usual approach should continue. Chapter 3 considers three unique angles extending discussions from Chapter 2, including: (i) additional perspectives closer to reality which challenge traditional concepts in welfare, (ii) alternative ways of evaluating economic approaches, and (iii) normative debates underscoring policy direction. Chapter 3 explores if key elements are sufficiently addressed in current economic thinking, and whether there is a case for an alternative methodological approach. Chapter 4 considers whether a macro approach is better suited to address issues raised. Methodological individualism is revisited, and other concepts that can inform a macro theory are explored, including complex systems, human agency and alternate ontological frameworks concerning the nature and outcomes of human behaviour, factors and interactions. The conclusion links all three chapters and considers the argument that methodological approaches in welfare economics should move towards a macro theory.

2. BUSINESS AS USUAL? REVISITING THE FUNDAMENTALS

Chapter 2 revisits fundamental concepts used in welfare economics. The chapter explores (i) theories on rational choice and preferences, (ii) mainstream thinking in welfare economics and (iii) positivist versus normative approaches. The discussions will highlight limitations of traditional thinking built on individualist perspectives and evaluate whether a business-as-usual approach to methodology in welfare economics should continue.

PART A. RATIONAL CHOICE AND PREFERENCES

A.1. Introducing Agency and Rational Choice Theory

A.1.1 What motivates humans?

"It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest" (Smith, 1776, bks 1, chapter 2).

This popular quote by Adam Smith is often interpreted to be the notion that people are motivated to act due to their own self-interest. This interpretation is used in the concept that the consequence of individuals pursuing their own self-interest will, through an "invisible hand" of market forces, maximise interests of society (Bishop, 1995). That the "invisible hand" (still the subject of significant debate hundreds of years later (Blaug, 2007)) of the free market would guide individual self-interest to society's general utility and welfare is often relied on as an argument to defend pursuits of individual self-interest and economic theories that follow (Bishop, 1995). However, counter to popular views, Smith did not actually claim that humans are driven by pure self-interest (Smith and Wilson, 2019). Smith's reference to individuals' "own interest" does not equate to pure self-interest or selfishly putting one's own interest over another's (Smith and Wilson, 2019). Acting in one own's interest can include commitments to the equality and dignity of all people, and there are moral rules governing the conduct of people in markets (Smith and Wilson, 2019). In fact, Smith asserted:

"How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it" (Smith, 1759, p. 1).

"*Pleasure" does not imply utility in the economic sense, nor does concern for the "fortune of others" imply altruism; rather, "pleasure" is a concept of "mutual empathy*", or being able to comprehend what it is like in another person's circumstance (Smith and Wilson, 2019). Such empathy guides humans in learning rules of conduct and morals that allow people to live harmoniously with others (Smith and Wilson, 2019). Similar ideas will be explored further in Chapter 3, but the contrast between notions of pure self-interest and more nuanced interpretations is highlighted here because much economic thinking is premised on individualist notions of maximising self-interest. However, this approach ignores

important human elements with consequences towards theories in welfare economics as will be discusse

A.1.2. Agency

"Agency" is a key theme in this paper and is a concept that is subject to much academic debate. For the purposes of Chapter 1 which discusses how traditional economic theory conceptualises human behaviour, "Agency" relates to how individuals behave. "Human Agency", a concept explored in Chapter 3, is a more nuanced construct and refers to intentionality in behaviour which has gone through a cognitive process leading to such intentionality.

Traditional economic frameworks are based on methodological individualism, which attempts to explain social phenomena by analysing individual consumers and firms as the primary unit (Blume and Easley, 2008); this concept will also be discussed in Chapter 3. Theories of individual agency and how consumers and firms behave are used to formulate ideas of how market and other systems work (Blume and Easley, 2008). Rational choice theory in economics sets out theories for human action. Under the principle of rationality, individuals act in their self-interest (Blume and Easley, 2008). This principle provides a theory for human motivations and action in orthodox economic thinking, which in turn is used as the basis for further economic concepts covered in Chapter 1 (Blume and Easley, 2008). However, even at this basic starting point, limitations already arise.

A.2. Observations in Experimental Economics

Experimental economics demonstrate that people's actual behaviours are inconsistent with rational choice theory on maximising self-interest. Two examples of experimental games are discussed.

A.2.1. The Ultimatum Game

The "Ultimatum Game" entails two players, one who is a proposer and the other who is a responder, playing one round (Guth, Schmittberger and Schwarze, 1982). The proposer is provided with a specific amount of resources and proposes to split the amount with the responder. If the responder accepts the proposal, the proposed amount is split between both players and if the responder rejects then both parties receive nothing (Guth, Schmittberger and Schwarze, 1982). Figure 1 is an example of this game.

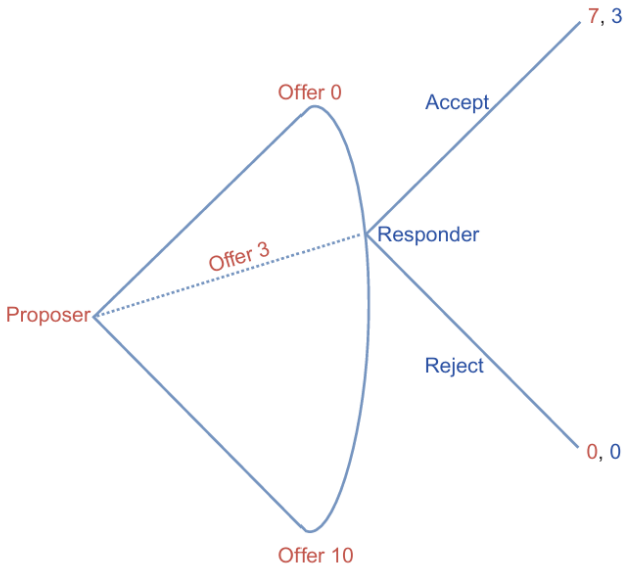


Figure 1: Example of an ultimatum game (Fehr and Krajbich, 2014, p. 194).

Repeated experiments show that if offers are too low, responders are likely to reject them, and in reality, many proposers tend to offer 40-50% of the endowed amount (Houser and McCabe, 2014). This is despite theories premised on self-interest predicting that respondents would accept all offers above zero and proposers would propose the smallest possible amount (Houser and McCabe, 2014). Such actions are often simplistically labelled as "irrational behavior" (Nowak, Page and Sigmund, 2000), but actually show that, in humans, traditional notions of self-interest do not always prevail.

A.2.2. The Stag Hunt

The **"Stag Hunt"**[1] game describes two hunters choosing to either hunt stag or hare, but without knowledge of each other's decision (Rousseau, 1984). Hunting stag yields more rewards than hunting hare. Both hunters know that hunting stag requires each other to cooperate, but one hunter can defect to hunt hare alone with more certainty but with less reward. The story illustrates a tension between risk and mutual benefit – i.e., the stag yields higher mutual benefit and requires a degree of trust that the other hunter will cooperate. However, hunting hare is less risky because if one hunter chooses to defect, the other hunter will come home empty-handed (Skyrms, 2003).

The Stag Hunt game leads to two Nash equilibria, or situations where a person cannot make a gain by changing their own strategy (see Figure 2 for an illustration of the game); i.e. if the other hunter hunts stag then it is optimal to hunt stag, and if the other

[1] Distinguished from "**Prisoner's Dilemma**" games, where the dominant strategy (and the sole Nash equilibria) for both players is defection, even though cooperation leads to a better outcome for both. While Prisoner's Dilemmas show conflicts where self-seeking behaviour produces sub-optimal outcomes, the Stag Hunt is argued to more accurately represent dynamics of social cooperation (Skyrms, 2003).

hunter hunts hare it is optimal to hunt hare (Skyrms, 2003). One Nash equilibrium is a risk-dominant equilibrium (hunting hare, which is less risky) while the other is a pay-off dominant equilibrium (hunting stag, which yields more results, but is more risky) (Skyrms, 2003).

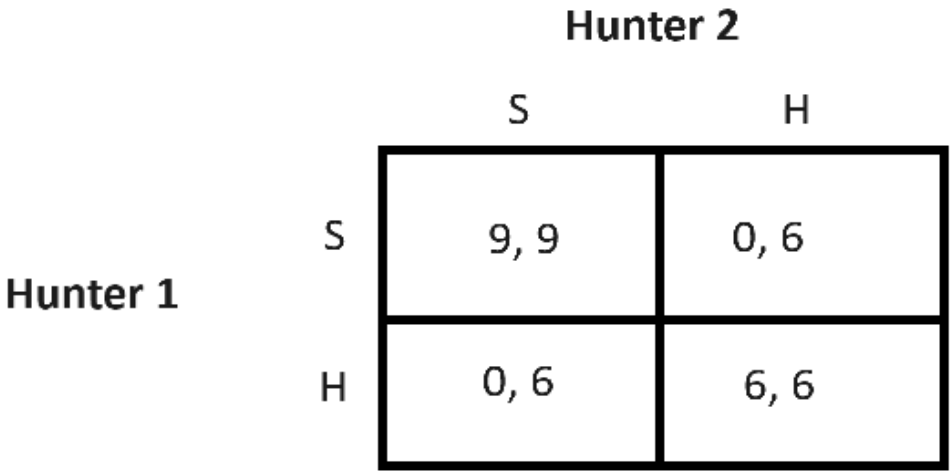


Figure 2: Example of a stag hunt game (S representing hunting stag and H representing hunting hare) (Author, 2024). (S, S) and (H, H) are Nash equilibria.

In the stag hunt and other variations of the game, experiments show that players can and do choose pay-off dominant strategies even though under standard rational choice assumptions players do not have a reason to do so (Gold and Colman, 2020). This is interesting because where there are Nash equilibria outcomes which are not pay-off dominant, game theory rationale does not have an explanation as to why a pay-off dominant strategy would be selected, i.e. it is logical for a hunter to hunt stag only if there is a reason for him to expect the other hunter to do so as well (Gold and Colman, 2020). However, because the game is perfectly symmetric there is no reason for one hunter to expect the other hunter to hunt stag (Gold and Colman, 2020).

The stag hunt game has been analysed from an evolutionary perspective on cooperation and social structures. Brian Skyrms argues that cooperation can form and noncooperative equilibriums (e.g. hunting hares) can be destabilised under certain conditions. Broadly, these include (i) locality and local interactions influencing dynamics to allow cooperative strategies to exist, (ii) communication systems arising from learning dynamics and destabilising existing equilibria, and (iii) association and dynamics of social interaction creating positive and negative reinforcement cycles where non-cooperators are increasingly rejected and cooperative behaviour reinforced (Skyrms, 2003). Such conditions can upend outcomes expected by rational choice-based game theory, and in a lot of cases cooperators prosper despite traditional risk-dominated predictions.

Experimental outcomes show that self-interest does not always prevail as traditionally conceived. Human, social and evolutionary elements, including factors such as interaction, notions of fairness and cooperation, go beyond what can be explained by standard economic decision-making theory. To be more attuned to these human realities, theoretical frameworks should address these concepts.

A.3. Preference Theory

"traditional theory has too little structure. A person is given one preference ordering, and … this is supposed to reflect his interests, represent his welfare… and describe his actual choices and behaviors. Can one preference ordering do all these things?... The purely economic man is indeed close to being a social moron." (Sen, 1977, pp. 335–336)

Orthodox views on human behaviour in economics ties behaviour to choice, which is revealed through the concept of "preferences" (Smith and Wilson, 2019). Preferences are "the values we assign to the various options available to us when making decisions" (Mallard, 2017, p. 27) and are used as a basis for constructing economic theories. Preferences are subject to parsimonious treatment in economics so that coherent models based on a theory of human behaviour can be formed. Under rational choice theory, individuals have a set of preferences according to which their choices are made. "Revealed preference" theory is a strong representation of this. Revealed preferences defines preferences by choices (not via a process of thought), and preferences defined according to this theory are determined by behaviour (Blume and Easley, 2008). For example, preferences can be revealed by the goods and services that are bought by an agent (Hirschman, 1984). However, there are important critiques to note.

First, fundamental axioms of the theory do not always hold. There are two fundamental axioms (among others axioms)[2]; (i) completeness, i.e. agents are able to rank any pair of options, and (ii) transitivity, i.e. rankings of options are transitively ordered (Mandler, 2001). Orthodox concepts of utility (which also use preferences as a basis) summarise an agent's ordinal ranking of commodity bundles, and utility maximisation means that all pairs of options are ranked and transitively ordered (Mandler, 2001). Most normative theories in economics aimed at better social-decision making make judgments about individual well-being based on individual preference rankings assumed as complete and transitive (Mandler, 2001). However, preferences may not always provide a sufficient basis to make social policy decisions because (i) completeness and transitivity can be violated in certain situations, and (ii) agents may have ill-defined preferences, so preference theory does not always allow views on normative questions to be properly formed (Mandler, 2001).

Secondly, there are strong arguments against parsimony. Amartya Sen argues that assuming humans to be uncompromising in their pursuit of self-interest is too narrow a conception of humans in economic models (Sen, 1977). Preferences presume too little because there can be relevant information which are non-choice in nature, and also presume too much because choices may represent compromises among different factors (Sen, 1977). Preferences attempt to summarise too much of a person's interests,

[2] "continuity" and "independence", which is not a focus here.

welfare, and choices and behaviours, but a simple preference ordering cannot achieve this since it fails to distinguish between different behavioural concepts (Sen, 1977).

Additionally, Albert Hirschman distinguishes between what he calls first and second order preferences: traditional economics typically deal with first order preferences, or those that are revealed by an agent's purchase of goods or services, while second order preferences, or "metapreferences", are those that may differ from their initial preferences[3] (Hirschman, 1984). Broadly speaking, metapreferences can reflect a change in a person's values (Hirschman, 1984). These autonomous and reflective changes can capture many complex human elements missing in traditional notions of preferences (Hirschman, 1984). The possibility that changes in values can lead to changes in preferences is also a key flaw in arguments put forward by those championing parsimony, such as economists Gary Becker and George Stigler who argued that all behavioural changes can be seen through price and income differences (Hirschman, 1984).

Thirdly, concepts of preferences and utility maximisation in traditional economic thinking are too narrow to capture social interactions and norms essential to understanding human behaviour (Smith and Wilson, 2019). Vernon Smith and Bart Wilson analyse Adam Smith's thinking on human behaviour, particularly the notion of "sentiments", interpreted as attitudes formed from thinking and feeling, and people's ability to "sympathize", or essentially to put themselves in another's shoes to comprehend other people's attitudes and intentions (Smith and Wilson, 2019). "Sentiments" and "sympathy" add another dimension to conceptualising behaviour since the ability to think and feel to understand another person's position challenges traditional theories of behaviour based only on maximising self-interest. Economists sometimes frame other-regarding preferences, i.e. those that expand utility functions to cover not only pay-offs to individuals themselves but pay-offs to other people as well, within a concept of "social preferences" applied to economic models (Smith and Wilson, 2019). However, this cannot capture the full variations of human action nor notions of sentiments and sympathy (Smith and Wilson, 2019). Social interactions can also be guided by moral sentiments, which emerges from human interactions in context-dependent situations (Smith and Wilson, 2019). Given these elements, it is inadequate and reductionist to apply a narrow version of preference theory to economics, however this is still the case in mainstream thinking.

One reason parsimonious simplifications are still used is due to the trade-offs between building a coherent model versus behavioural accuracy (Blume and Easley, 2008). Blume and Easley argue there are still no serious alternatives available to current constructs and hence reductionism is still relevant, and while it may be too early for sufficiently sophisticated cognitive models, they hope that cognitive science can further develop this space (Blume and Easley, 2008). However, an important paradox also arises from discussions on parsimony: it appears that only by excluding information related to human factors would one be able to gain economic knowledge (or at least coherence in economic models). Nonetheless, the process of such simplifications discards too many important complex human and social factors which economic models may need to address in the first place.

[3] such as the "*pursuit of truth, beauty, justice, liberty, community, friendship, love, salvation*" (Hirschman, 1984, p. 91).

Despite these issues, preference theory is still used as a basis to formulate utility functions and consumer indifference curves which form the building blocks for theories of demand (Perloff, 2023). These concepts thus remain very influential for key theories in welfare economics, as explored below.

PART B. MAINSTREAM ECONOMIC APPROACHES TO WELFARE

B.1. Introducing Welfare Economics

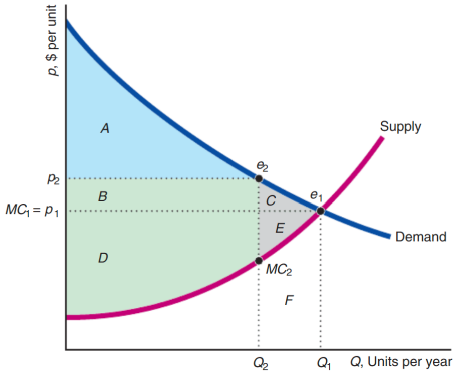
"Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses" (Robbins, 1932, p. 15).

Lionel Robbin's famous definition of economics can be interpreted as narrowing down economic theory to notions linked to rational choice – "ends" being interpretive of choice and preferences, and "scare means which have alternative uses" as relating to allocation (Backhouse and Medema, 2009). Economic thinking on welfare is concerned about distribution of resources for the welfare of society (Varian, 1975). In modern constructs a "perfectly competitive market maximises an important measure of economic well-being" (Perloff, 2023, p. 307).

Welfare in this context means the well-being of society, with welfare economics concerned with analysis of change in various groups' well-being (Perloff, 2023).

Consumer welfare (referred to as consumer surplus, "CS"), and producer welfare (referred to as producer surplus, "PS"), are measures for which society's welfare ("W") is commonly measured, i.e.: W = CS + PS (Perloff, 2023). Competitive markets lead to welfare maximisation, and if there is an output other than at the competitive level, welfare is not maximised (see Figure 3 for an example; competitive equilibrium at e1 is where allocative efficiency is achieved and consumer surplus as well as producer surplus are maximised) (Perloff, 2023).

Reducing output from the competitive level, Q_1, to Q_2, causes price to increase from p_1 to p_2. Consumers suffer. Consumer surplus is now A, a fall of $\Delta CS = -B - C$. Producers may gain or lose. Producer surplus is now $B + D$, a change of $\Delta PS = B - E$. Overall, welfare falls by $\Delta W = -C - E$, so the deadweight loss (DWL) to society is $C + E$.



	Competitive Output, Q_1 (1)	Smaller Output, Q_2 (2)	Change (2) – (1)
Consumer Surplus, CS	$A + B + C$	A	$-B - C = \Delta CS$
Producer Surplus, PS	$D + E$	$B + D$	$B - E = \Delta PS$
Welfare, $W = CS + PS$	$A + B + C + D + E$	$A + B + D$	$-C - E = \Delta W = -DWL$

Figure 3: Changes to output level (for example decreasing from Q1 to Q2) lead to deadweight loss (represented by C+E) and reductions in overall welfare (Perloff, 2023, p. 308).

This concept is applicable for partial-equilibrium analysis, or analysis relating to one market or a restricted area taken in isolation (Perloff, 2023). On a wider scale, general equilibrium theory concerns the equilibrium of multiple or all markets concurrently (Perloff, 2023), and has been instrumental in the development of fundamental theoretical concepts under welfare economics. The general equilibrium model can show competitive markets have certain properties represented by two fundamental theorems in welfare economics, discussed below (Perloff, 2023).

It is worth prefacing the discussion of the two fundamental theorems with a brief note on general equilibrium. Under the theory of general equilibrium, an economy reaches equilibrium under certain conditions (Arrow and Debreu, 1954). One theoretical construct used to show general equilibrium is the Arrow-Debreu security. An Arrow-Debreu security, or Arrow security, is a security or contract that pays off only in one state (Maskin, 2019). There is a set of all Arrow securities which can cover all possible states, and hence all possible needs are covered where markets are complete with perfect information, along with other necessary assumptions (Maskin, 2019). Under these conditions, general equilibrium exists.

However, a few broad observations are made. Firstly, these concepts are constructed on assumptions which are extreme, in particular, assumptions of perfect information and complete markets which are unrealistic. Secondly, the model requires agents to optimise according to theoretical constructs, but a pertinent question is then whether agents in this model have any real form of agency, or whether they are only following mathematical constructs – if they do not have agency, could this really be a representative of way of looking at things when in reality human agency does exist? Thirdly, the model, a mathematical construct, also assumes that everything can be traded, when in reality, a significant part of what matters in people's lives cannot be traded; there are elements which extend beyond traded commodities, for example – while job loss could be monetarily compensated, certain elements, such as social connections or the pride of having a

job cannot and would be diminished if traded. These points will be further discussed with other theories covered in Chapter 2

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B.2. Fundamental Theorems of Welfare Economics

The first fundamental theorem of welfare economics is that competitive equilibrium results in "Pareto efficiency" (Perloff, 2023). Pareto efficiency occurs where no one can be made better off without someone else being made worse off (Perloff, 2023). Another way to restate this is that competitive equilibrium is efficient and results in an optimal allocation of resources (Perloff, 2023). The second fundamental theorem of welfare economics is that all Pareto optimal allocations are achievable by competition (Perloff, 2023). In other words, if there is the right initial allocation of goods, all possible Pareto efficient allocations can achieved by competitive exchange (Perloff, 2023). Market mechanisms can be used to achieve Pareto efficient allocations via self-correcting distribution mechanisms once initial endowments are determined (Varian, 1975).

These two fundamental theorems are influential and carry significant implications for thinking on economic policy and philosophy (Blaug, 2007; Foley, 2010). For example, the first welfare theorem, said to be "one of the most important results in economics" (Ng, 2015, p. 498), allows the focus on pricing mechanisms and market coordination to achieve allocative efficiency and serves as a benchmark to identify sources of inefficiency and create corrective measures (Ng, 2015). The theory is widely drawn upon by economists who champion free markets and non-intervention by government (Blaug, 2007). As an additional example, the second welfare theorem has been used to promote laissez-faire approaches to market allocations, for example the social market argument that governments only need to be concerned about fair distributions of initial endowments (Varian, 1975).

However, some limitations should be noted. First, the first fundamental theorem of welfare economics relies on certain key assumptions which can be incomplete. For example, one assumption is that perfect competition[4] requires buyers and sellers to be price-takers rather than price-makers, i.e. with no influence on prices (Ng, 2015). Models in the first welfare theorem optimise to given prices, but relevant questions are how are prices set, and who sets them? In real world exchanges, transactions occur at disequilibrium prices – individuals find equilibrium prices by transacting at disequilibrium prices in scenarios that limit opportunities to realise economic surpluses (Foley, 2010). There are transaction costs (as demonstrated in Figure 4) in finding mutually advantageous exchanges (and prices) that prevent theoretically possible exchanges from taking place, and actual trades can lead to situations where preferences and endowments of agents do not determine resource distributions (Foley, 2010). This poses limitations to the first welfare theorem as well as the cogency of the second theorem, and also raises implications towards how government interventions are informed (Foley, 2010). The second theorem has also been widely criticised as being impractical since the notion of lump-sum

[4] Assuming there is perfect competition does away with issues around interpersonal comparisons of utility, since the first welfare theorem generalises bilateral exchanges – i.e. if everyone has the same level of prices, what is applicable for two individuals is applicable to *n* individuals (Blaug, 2007).

taxes required to adjust initial endowments are a practical impossibility (Blaug, 2007).

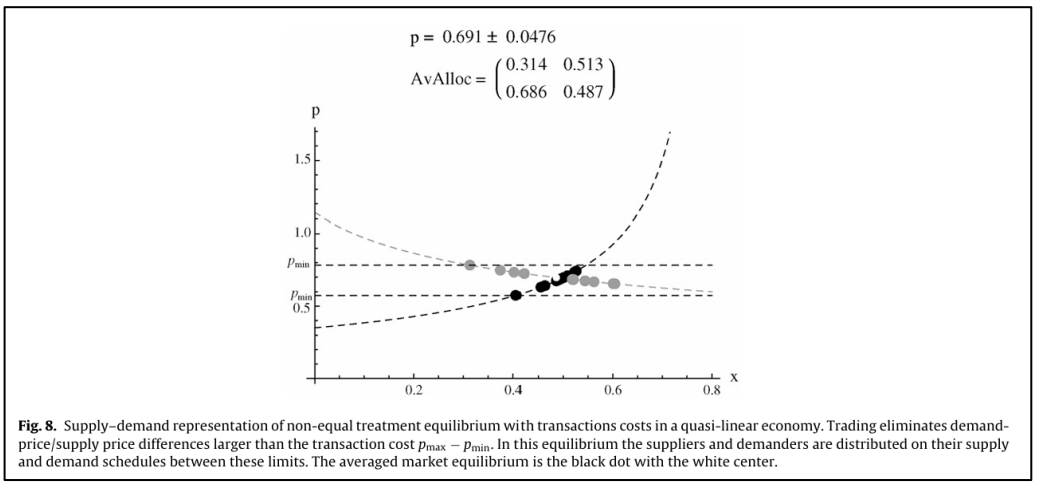

Fig. 8. Supply–demand representation of non-equal treatment equilibrium with transactions costs in a quasi-linear economy. Trading eliminates demand-price/supply price differences larger than the transaction cost $p_{max} - p_{min}$. In this equilibrium the suppliers and demanders are distributed on their supply and demand schedules between these limits. The averaged market equilibrium is the black dot with the white center.

Figure 4: representing an example impact of transaction costs; individual agents exchange at non-equilibrium prices leading to demanders and suppliers scattered throughout a region (Foley, 2010, p. 129).

Second, Pareto optimality does not equate to equity or fairness. For example, an allocation of resources where one individual receives all resources can be Pareto efficient (Varian, 1975). The Pareto principle does not allow allocations to be compared – multiple allocations can be Pareto efficient (Perloff, 2023). A question that also follows is how can fair distribution or allocation be determined? Attempts to answer this question have been made by theorists using social welfare functions, but debates in this space reveal further issues.

B.3. Social Welfare Functions and Arrow's "Impossibility Theorem"

Social welfare functions are concerned with the ordinal rankings of allocations and forms, roughly, a utility function for society (Perloff, 2023). In theory, these help determine what is optimal for society's welfare. However, Kenneth Arrow remarked that Pareto efficiency is only preliminary because achieving social maximums involve questions of redistributions, and that society must have a criteria to choose among multiple redistributions as well as principles to determine a social indifference map (Arrow, 1950). Choosing between two Pareto optimal allocations requires value judgments to assess interpersonal comparisons and social welfare functions have been used for this purpose (Perloff, 2023). Individuals could express their rankings through voting (Perloff, 2023). However, Arrow's work has demonstrated critical deficiencies in interpersonal comparison of preferences.

In analysing voting as a method to determine social choices derived from individual preferences, Arrow notes "by aggregating individual preference patterns which satisfies certain natural conditions, it is possible to find individual preference patterns which give rise to a social choice

pattern which is not a linear ordering" (Arrow, 1950, p. 330). Further, he observes: "if it turns out to be impossible to construct a social welfare function which will define a social ordering of three alternatives, it will be a fortiori be impossible to define one which will order more alternatives" (Arrow, 1950, p. 336). In other words, ranking aggregated individual preferences leads to inconclusive rankings.

Arrow's "Impossibility Theorem" proves precisely that (Arrow, 1951). A simplified explanation of Arrow's theorem is as follows:

Imagine there are three individuals and three options x, y and z:

Person 1 prefers x to y and y to z
Person 2 prefers y to z and z to x
Person 3 prefers z to x and x to y

Under a voting analysis: (i) x would have a majority over y, (ii) y would have a majority over z, and (iii) z would have a majority over x. In such situation, the majority voting rule leads to inconsistencies because where there is more than one individual it will not be possible to rank aggregated preferences (Arrow, 1951). Accordingly, decisions relying on the same voting mechanisms lead to inconsistencies unless a dictatorial approach is imposed to create a dominant ranking in preference (Sen, 1999).

Arrow's Impossibility Theorem has led to a huge volume of debate. Some economists dramatically declared Arrow's theorem as a main cause for the "death of welfare economics" since it challenged the primacy of social welfare functions traditionally used to determine social optimums (Igersheim, 2019). Some economists argued that even if there is no perfect answer achieved through voting, imperfect answers produced will still not be significantly worse than if the paradoxes raised did not exist (Tullock, 1967). Other economists attempted to make technical distinctions from Arrow's theorem and salvage what remains (Samuelson, 1977; Fleurbaey and Mongin, 2005; Igersheim, 2019). These distinctions are beyond the scope of this paper, but the point is to show that approaches to achieve social maximums are often elusive under traditional theoretical thinking.

The problems in determining what is socially maximal raises additional questions on current predominant economic approaches to welfare. What notions and principles do we use to determine what is the best way to allocate resources? Related to this question is a discussion of positive and normative approaches in economics.

PART C. POSITIVE AND NORMATIVE ECONOMICS

"There has always been a purist streak in economics that wants everything to follow neatly from greed, rationality, and equilibrium, with no ifs, ands, or buts. Most of us have felt that tug... The theory is neat, learnable, not terribly difficult, but just technical enough to feel like "science". (Solow, 2008, p. 245)

Robert Solow's observation of the "tug" of positivist approaches on orthodox economic thinking highlights the allure of a neat and sufficiently technical "science" which dominate current economic thinking. This is despite discussions above showing that traditional approaches have significant limitations, especially when considering the weaknesses of assumptions as well as real

world applicability[5]. Why is there such a draw in this approach? The attraction of treating economic theory as a "science" is related to the appeal of positive economics and the debates on methodology that have spanned many decades.

C.1. Freidman and Samuelson on Positive Methodology

One of the influential proponents of positive methodology was Milton Friedman, who built on John Neville Keynes' assertion that positive economics is about "what is" while normative economics is about "what ought to be" (Friedman, 1953). In other words, the positive is concerned with an approach that is "ethically neutral or value-free" (Weston, 1994, p. 2) while normative economics is concerned about value judgments and ethics (Weston, 1994). For Friedman, positive economics "is, or can be, an "objective" science" (Friedman, 1953, p. 4) and its "task is to provide a system of generalizations that can be used to make correct predictions about the consequences of any change in circumstances" (Friedman, 1953, p. 4) independent of ethics or value judgments (Friedman, 1953). Friedman argued that criticisms that orthodox economic theories are unrealistic or that assumptions do not hold in the real world are irrelevant; in other words, if theories can yield accurate predictions then false statements in theory are not problematic (Wong, 1973).

This argument has been critiqued. One famous criticism was by Paul Samuelson. Samuelson's critique broadly covers that: "1) It is a contradiction to maintain that all consequences can be valid and the theory and the assumptions not valid. 2) It is absurd to maintain, in the case where only some of the consequences are valid, that the theory and the assumptions are important though invalid" (Wong, 1973, p. 314); in other words, the validity of assumptions matter. Stanley Wong notes that Friedman took an instrumentalist position (focused on predictions) while Samuelson took descriptive one (focused on descriptions), and argues for a third position where theories should be explanatory and informative, going beyond pure instrumentalism and descriptivism to answer more pertinent questions of the "why" (Wong, 1973). In essence, in considering economic methodology it is important to ask what the point of the theory is and how helpful it can be in improving an understanding of questions that are trying to be answered, rather than trying to purely achieve technical instrumentalist or descriptivist coherence.

C.2. Between the Positive and the Normative

In addition to technical arguments, there are broader conceptual implications. Lewis E. Hill argues that the focus on distinctions between positive and normative economics essentially turns economics "into a completely abstract science without practical application" (Hill, 1968, p. 263). It is not possible to separate the two – that while positive economics can make value judgments on economic means, it is not possible to simply outsource the task of determining economic ends to others (Hill, 1968). As an example, the concept of equilibrium itself is said to imply normative

[5] Blaug notes the "*schizophrenic attitude of mainstream economists to the fundamental [welfare] theorems*" (Blaug, 2007, p. 198); economists are devoted to teaching welfare concepts as instrumental theories despite their inapplicability to the real world, and others like Baumol have even described concepts like the second theorem as a "fairy tale" (Blaug, 2007).

significance – with such a focus on achieving competitive equilibrium, there is an implication doing so is a good thing, and hence theories treating competitive equilibrium as standard are normative theories (Hill, 1968). Given there are implied value judgments in positive approaches, Hill argues that economists should take responsibility for normative judgments and denying the existence of that is "questionable intellectual honesty" (Hill, 1968).

Samuel Weston also asserts that economics cannot be value free. One line of argument is that, put simply: "Economics has consequences" (Weston, 1994, p. 7). Policies derived by economists will likely have costs on someone (Weston also remarks that economists are unlikely to bear the brunt of consequences if they misunderstand a situation, and aren't likely to subject to liability either, for example in the legal sense) (Weston, 1994). Values are inherent in professional norms and economic terminology (for example, the term "productivity" is value-laden), and giving policy advice is unavoidably concerned with value judgments (Weston, 1994). Weston argues positive economics should still have a role in economics, including: to clarify subjects being discussed, provide an environment to question reason without moral implications towards the questioner's character, and to support a norm of objectivity (Weston, 1994). However, Weston clarifies his position is not a defence of a "business as usual" approach, where positive economics is a "wall behind which economists can pretend to avoid ethical issues" (Weston, 1994, p. 14).

C.3. Business As Usual?

Weston's allusion to an attitude of "business as usual" in economics is a pertinent way to view how many economic questions are approached. As Solow noted, there is a real allure of economics as a neat and technical science. However, as discussed in Part B above, certain key elements end up being stripped out during parsimonious simplifications for the coherence of models and risk undermining what economics should be considering. Abba Lerner illuminates this idea with an example on the nature of some economic thinking: "the solution is essentially the transformation of the conflict from a political problem to an economic transaction. An economic transaction is a solved political problem. Economics has gained the title of queen of the social sciences by choosing solved political problems as its domain" (Lerner, 1972, p. 259) – in short, much thinking in economics may end up framing issues in ways that they end up avoiding that which really should be addressed. This is a problem because we live in a world where economics has consequences for real people. Why is it desirable to continue with mainstream thinking given the significant limitations noted?

PART D. CONCLUDING REMARKS FOR CHAPTER 1

Chapter 1 highlighted theoretical limitations in mainstream thinking in welfare economics, from fundamental building blocks of current theories to broader conceptual frameworks. Modern thinking in economics should do more to address these gaps because economics has consequences. Business as usual should not continue.

3. BEYOND THE FUNDAMENTALS; A CASE FOR ANOTHER APPROACH?

Chapter 2 extends discussions beyond fundamental concepts from Chapter 1 by exploring three unique angles: (i) theoretical examples showing further limitations to traditional thinking in welfare economics, namely the general theorem of the second best and a discussion on the impact of social factors on minimum wage (ii) the "Capabilities Approach" as an alternative way to evaluate economic policy and (iii) discussions on equity that underpin normative approaches to policy. These angles are chosen because they represent distinct types of thinking outside of orthodox frameworks. Chapter 2 seeks to answer the question of whether thinking in welfare economics should address many more important factors raised, and whether a different methodological approach is more suitable to cover these elements.

PART A. ADDITIONAL CONCEPTS ON MAINSTREAM THINKING

Part A discusses additional theoretical arguments highlighting further issues for standard concepts in welfare economics. Two examples are considered: (i) implications of the general theorem of the second best and (ii) using minimum wage as an example to show that social contexts, notions of fairness and power imbalances can affect market outcomes in ways not predicted under traditional models.

A.1. The General Theorem of The Second Best

Chapter 1 noted that models of efficiency and Pareto optimality (notions important to the fundamental theorems of welfare economics) are premised on certain conditions[6]. However, in reality, market distortions and market failures often lead to situations where such conditions cannot be fulfilled. The notion of achieving optimal situations where conditions for Pareto efficiency cannot be attained was considered by R.G. Lipsey and Kelvin Lancaster under the "general theorem of the second best", described as follows: "if there is introduced into a general equilibrium system a constraint which prevents the attainment of one of the Paretian conditions, the other Paretian conditions, although still attainable, are, in general, no longer desirable" (Lipsey and Lancaster, 1956, p. 11).

William Baumol summarises this concept as follows: "on the basis of a mathematical argument, that in a concrete situation characterized by any deviation from "perfect" optimality, partial policy measures which eliminate only some of the departures from the optimal arrangement may well

[6] For example, in a perfectly competitive market, price equals marginal cost.

result in a net decrease in social welfare" (Baumol, 1965, p. 138). In simpler terms, if there is a problem (distortions or market failures) in getting to the best position (in this case, Pareto optimality, or a "first best" situation (Leach, 2003)), and if it is not possible to fix all problems (all distortions or market failures), then fixing only some problems may not make things (e.g. welfare) better. Applying welfare "piecemeal" is insufficient and can actually reduce welfare (Lipsey and Lancaster, 1956).

This idea appears counter-intuitive to a seeming logical view that fixing some distortions should at least make things better overall, and has implications for a broad range of matters affecting welfare, including government interventions, taxation and monopolies when market failures occur (Leach, 2003). Where it is not possible to reach the "first best" allocation, the best available alternative position, or "second best", is not easily achieved. It could be reached only if all consequences of proposed policies are considered, and this might be achievable through creating more market distortions or even refraining from removing a distortion, but fundamentally "[t]here are no simple rules" (Leach, 2003, p. 287). Hence, where there are distortions that cannot all be removed "all bets are off" (Leach, 2003, p. 272).

A hypothetical example discussed by Gregory Besharov (Besharov, 2024) is as follows: suppose there is a market for a good where a monopolist produces a negative consumption externality. Output is restricted to increase profits, and inefficiency arises because some people value the good more than the costs of production but cannot consume it. Production subsidies could be introduced to address the market failure but would lead to too much market activity because people who valued the good less than its social costs are able to consume it. A tax equivalent to the externality could be introduced, offsetting the other market failure, showing that intervening to counter one market failure on its own would have an unclear effect on welfare (Besharov, 2024). Figure 5 illustrates this and shows that deadweight loss, B, would arise because of a subsidy to correct a distortion, and hence "solutions that would improve welfare in the first-best world… would reduce it in this particular second-best world with multiple market failures" (Besharov, 2024).

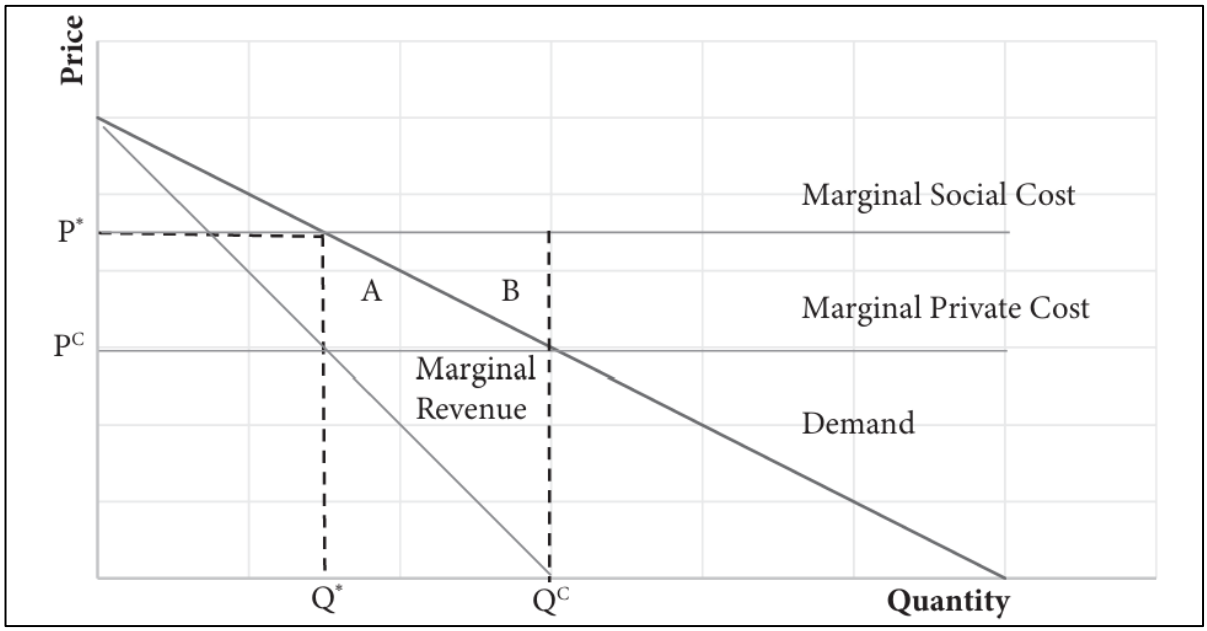

Figure 5: “example where the monopolist’s overpricing precisely offsets the negative externality to maximize surplus given the externality. That is, the price of the market P* equals the marginal social cost. If a subsidy were to offset the monopolist’s inefficient restriction of output, the market price would be Pc and the output would be Qc. This would be inefficient because people who value the good less than its cost would be consuming it. Over the region from Q* to Qc, the marginal social cost is greater than the marginal benefit as given by the demand curve, so there would be a deadweight loss of B that would occur. Separately the imposition of the Pigouvian tax would also reduce surplus because the monopolist would further restrict output” (Besharov, 2024, pp. 139–140).

In the real world, there are multiple distortions and market failures (and the example above only relates to one market, when in reality different markets could affect each other, each with their own distortions), and trying to see if achieving Pareto efficient outcome is possible requires not only models describing distortions or optimal allocations, but also a different kind of judgment on (i) what distortions cannot be changed and (ii) which policies to use that reflect market values and what is viewed as appropriate (Besharov, 2024). In other words, the theorem of the second best shows that notions of welfare premised on achieving Pareto optimality can run into serious real-world limitations, where solutions end up being a matter of value judgments or normative evaluations requiring other types of analysis. Such evaluations lie beyond traditional theoretical analysis for achieving a first-best hypothetical.

A.2 Social Contexts and Market Outcomes

Social contexts, notions of fairness and balances of power are factors that can affect market outcomes, but these are not fully addressed by traditional theories. An example of this is minimum wage discussed by Anthony Atkinson, an economist who favoured minimum wage reforms and other redistribution proposals in favour of the less advantaged.

Atkinson asks a basic question of whether minimum wage causes unemployment if it is above the market wage (Atkinson, 2015). A simple response from basic economics principles would be to draw a downward sloping demand curve – with the Y axis for wages and the X axis for the number of employed workers, and an upwards sloping supply curve, with a single intersection, which marks the point after which there would be unemployment if demand falls short of supply (Atkinson, 2015). However, more comprehensive models can show different answers, as illustrated by Figure 6. Atkinson asserts there could be supply curves that bend backwards, due to other factors like the length of a workers working life, i.e. working life may be longer at low wages as people need money and work longer, or shorter (bending back supply) if wages rise to certain levels allowing workers to shorten working lives) (Atkinson, 2015). At a point, supply bends back again if wages become so attractive leading people to work longer, leading to more supply (Atkinson, 2015). In reality, there can be more than one market outcome and this opens the door for other egalitarian proposals to be considered (Atkinson, 2015).

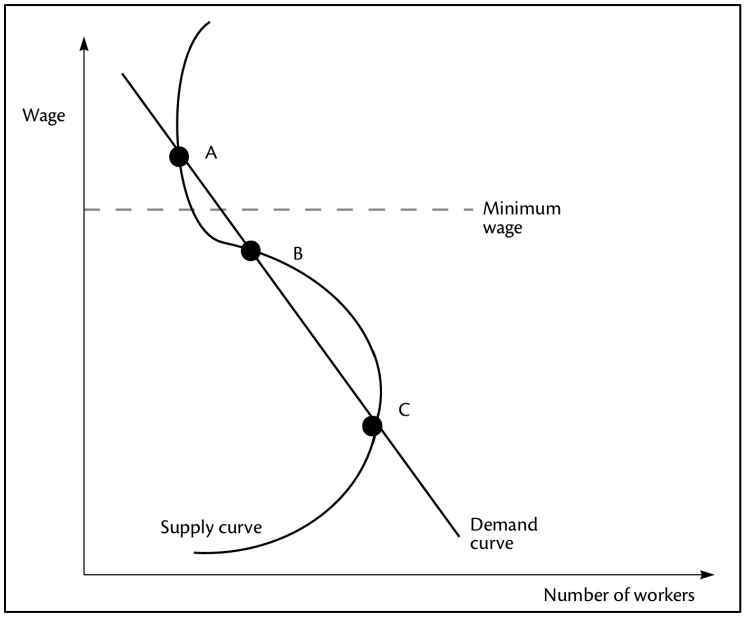

Figure 6: "An alternative view of the impact of a minimum wage" (Atkinson, 2015, p. 250).

Building on the example above where there can be multiple market outcomes, Atkinson argues there are additional elements that should also factor into economic analysis. For example, (i) social context and ideas of fairness can be determinative of wage, and (ii) there are other actions such as a rebalancing of firm power which can affect outcomes. First, markets operate within social contexts, which influence distributions of income, and therefore wages cannot be determined simply by their contributions to output alone (Atkinson, 2015). Supply and demand functions only helps sets boundaries for wage range, while social bargaining practices play determinative roles (Atkinson, 2015). Here, normative and social elements are influential: ideas of fairness and social norms (which can be subject to change) can influence wage determinations. For example, some employers integrate principles of fairness in respect of wages to attract the right employees (Atkinson, 2015).

Second, assumptions that firms and economic actors are perfectly competitive and take prices is not realistic as was discussed in Chapter 1, and ideas from this can be extended. Some firms hold significant market power and can set their own pricing strategies (Atkinson, 2015). Trade unions can limit firms' exploitation of market power in pricing products and affecting wages (Atkinson, 2015). Atkinson argues that interconnections between labour, capital and product markets affecting the general equilibrium of the economy should be explored when looking at the economy as a whole, and the power of actors and their position in the market are affective of outcomes (Atkinson, 2015). Atkinson's normative stance is that the current power balance is skewed towards firms against workers and consumers, and he argues for shifting such imbalances as well as for firms to take into account greater social responsibilities (Atkinson, 2015). He also argues that ethical codes can also lead to fairer distributional results (Atkinson, 2015).

The theorem of the second best and the minimum wage example highlights there are other issues when perspectives closer to the real world are applied to standard thinking in welfare. In addition to these limitations, standard approaches may also fail to capture other important human elements, as discussed below.

PART B. ALTERNATIVE WAYS OF EVALUATING ECONOMIC POLICY

Part B discusses how alternate ways of evaluating economic policy can identify elements important to welfare, such as human capabilities, freedoms, and dignity – factors not adequately addressed by mainstream approaches.

B.1. Evaluating Economic Approaches

Amartya Sen developed the "Capabilities Approach", an influential concept in development economics. His rationale for the capabilities approach is explored as it gives different perspectives on orthodox economic thinking.

Sen's capabilities approach is an evaluative approach focusing on the concept of people's capabilities and freedoms (Sen, 1999). Freedoms[7] are used to evaluate the success of society and also influences a person's ability to help themselves and develop "agency" (Sen, 1999). Sen's concept of agency relates to people who "acts and brings about change, and whose achievements can be judged in terms of her own values and objectives" (Sen, 1999, p. 19); this version of agency relates to treating people as active social, political and economic participants who have freedoms to do what matters to them, not as merely passive recipients of policy. This is different to the rational choice theory view of agency as well as human agency discussed in Chapter 3. Sen's concept provides another way for economics to evaluate policy by shifting perspectives on how human beings are viewed.

To assess different approaches in economics, Sen focuses on looking at what he calls "information bases", or the information required for making a judgment as well as information excluded under the approach in question (Sen, 1999). Looking at the information base shows the thrust of various approaches in economics. Sen applies this analysis to three approaches in traditional economic thinking on welfare: (i) utilitarianism (ii) a narrow focus on income and wealth and (iii) libertarian rights-based approaches. Sen argues the information bases for each approach are insufficient. These critiques are discussed below.

B.1.1. Utilitarianism

Maximising the utility of society and has been a dominant ethical theory of justice for traditional welfare economics. Modern interpretations of utility link the concept to the fulfilment of desire and people's observable choices, where every choice is judged by aggregated sum of utilities generated by those choices (Sen, 1999). However, utilitarianism's information base focuses only on the total utility of everyone (Sen, 1999). Three of Sen's critiques of utilitarianism are noted. First, under utilitarianism there are no sensitivities to distribution, and its narrow information base leads to significant ethical limitations since inequalities are ignored (Sen, 1999).

[7] Sen noted five "instrumental" freedoms (covering (i) political, (ii) economic, (iii) social, (iv) transparency and (v) protective security) that influence people's general capabilities and are interlinked with one another (Sen, 1999).

Utilitarian approaches also do not allow for important interpersonal comparisons (Sen, 1999), and this will also be discussed in respect of income below. Secondly, utilitarian approaches also ignore key freedoms (Sen, 1999). Aspects of quality of life or normative evaluations have no influence on determinations under utilitarian theory (Sen, 1999). Thirdly, utility can be significantly inequitable to those constantly deprived because mental conditioning and adaptive attitudes force people to adapt to poor conditions, conditioning and limiting their desires and expectations which skew utility assessments (Sen, 1999). People need to have the right conditions to be able to judge the lives they want to live, and this requires a wider information base than utilities (Sen, 1999). The above thus reiterates that maximising utility in traditional welfare economics does not always lead to the best outcomes.

B.1.2. Income and Wealth

There is also a substantial focus on income and wealth in welfare economics. Sen asserts traditional economic thinking is often too narrowly focused on these aspects (Sen, 1999). Approaching income from a utility perspective is also particularly problematic since "[h]uman diversity is among the difficulties that limit the usefulness of real-income comparisons for judging different persons' respective advantages" (Sen, 1999, p. 69). Utilitarianism presumes everyone has the same choice behaviour and theoretical demand functions have severe limitations because in reality people have different demand functions (Sen, 1999). The utilitarian treatment of income fails to allow for interpersonal comparisons of utilities, and two different people may have different opportunities or well-being even with identical commodity bundles (Sen, 1999). Separately, Sen notes there is a gap between concentration of economic wealth and concern for the kind of lives people can live (Sen, 1999). For Sen, while wealth is important and is useful, it is only one factor affecting substantive freedoms; it is not enough to just maximise income or wealth and economic growth cannot be an ends itself – policy should focus on its impact on the lives of people and their freedoms (Sen, 1999). The above is hence a reminder that welfare thinking focused purely on wealth and income leads to a narrow view of human life – economics is not just about income and wealth and the capabilities approach discussed below addresses this.

B.1.3. Rights and the Priority of Liberty

Libertarianism has been used to champion free market theories, and the idea of rights is also a core tenant in libertarian views of justice in welfare economics. Sen discusses theoretical notions of libertarianism, where some types of rights have nearly complete priority over social goals (Sen, 1999). Under this concept, the information base consists entirely of liberties and rights (Sen, 1999). Procedures are designed to ensure such rights are to be accepted regardless of outcomes, and there is an absolute priority of rights as opposed to a view of comparative importance (Sen, 1999). Sen is critical of this approach because it is possible to have situations were rights are not violated, yet there can be serious deprivations of freedoms (Sen, 1999). For example, serious famines can occur in situations where rights are not being violated; people may starve because their entitlements do not lead to circumstances where they have enough food or resources (Sen, 1999). The in-consequentialist approach of libertarianism

thus also needs to broaden its information base to cover key freedoms (Sen, 1999). Part C will expand on libertarian theories which have influenced thinking in welfare, but it is noted that a heavy focus on rights is not always the best approach either.

B.2. The Capabilities Approach

In the context of the critiques above, Sen offers an alternative way to evaluate economic policy. Broadly, Sen's Capabilities Approach is about improving the "capabilities" and "functionings" of people. In short, capabilities are what a person can do, and functionings are essentially what a person does (Sen, 1999). A person's capabilities set are the mixture of functionings feasible for that person to realise, while combinations of functionings are reflective of a person's actual achievements (Sen, 1999). The approach looks at what people are able to do, be and achieve in the context of their lives.

Sen's capability approach is an evaluative approach, is pluralistic rather than prescriptive (i.e. it does not have a specific or clear scale), and can be used in many ways (Sen, 1999). How functionings are ranked is ultimately a social exercise for citizens to determine (and Sen champions determination through democracy) (Sen, 1999). The evaluative nature of the approach allows for comparisons of capabilities to be made, which can then be applied to help sensitise economic or social policies in various contexts (Sen, 1999). As discussed below, it is possible to also extend certain discussions from Chapter 1 with Sen's rationales for the capabilities approach.

B.2.1. Extending discussions in Chapter 1 with Sen's rationales

Sen's also analysed Arrow's Impossibility Theorem, discussed in Chapter 1, from the lens of his capabilities approach. Sen asserts that the theorem "does not in fact show what the popular interpretation frequently takes it to show. It establishes, in effect, not the impossibility of rational social choice, but the impossibility that arises when we try to base social choice on a limited class of information" (Sen, 1999, p. 250). Arrow's Impossibility Theorem has an information base which consists only of preference rankings of persons (individual orders of relevant alternatives) and this is inadequate for making judgments about economic welfare problems (Sen, 1999). Sen argues having a logical framework for a reasoned social assessment is not possible because there is a heterogeneity of preferences and values, and ideas need to go beyond narrow conceptions of self-interest because of the wide range of human behaviours and values (Sen, 1999). Sen notes that rules for economic decision making do not consider a variety of other information, and he argues that his capabilities approach allows for a better way of social and economic assessment (Sen, 1999).

Chapter 1 also discussed Sen's views on preference theory alongside Hirschman's. In addition, Sen refutes notions that humans are uncompromisingly self-interested. While self-interest is an important motive, people's actions can also reflect values with clear social components beyond purely selfish behaviour, and social norms can emerge from reasoning and evolutionary selection of behaviours (Sen, 1999). These values play important roles in different types of social organisations, including market mechanics, politics, and the provision of basic public

goods (Sen, 1999). Sen notes "rational choice" is typically used with simplicity, based on personal advantage, but he disagrees that rationality should be narrowly defined (Sen, 1999). It is possible to have different interpretations consisting of sympathy and commitment, concepts going beyond self-interest: sympathy, broadly, in the sense that there is a concern for others, commitment in the sense people may make sacrifices for other ideals like welfare (Sen, 1999). In addressing issues like distribution and equity, broader motivations of humans, such as humanity, generosity and public spirit emphasised by Smith should be considered (Sen, 1999). For Sen, people exist socially and have a responsibility to the problems around them and in society (Sen, 1999).

A key point Sen has made in his capabilities approach and the rationale for it is that for human beings, there's much more that economics should focus on beyond the traditional ways of thinking. It's not just about maximising utility, nor income and wealth, nor rights, and ways of deciding what is best for society using traditional concepts of rational choice is not enough. An approach which encompasses how humans behave as well as what matters to them is needed. Sen's comments about needed to account for a wide range of human behaviours (beyond self-interest), the emergence of socially determined norms and the importance of values are important themes in Chapter 3.

B.2.2. Nussbaum's Prescriptive Approach

Sen's version of the capabilities approach is intentionally not prescriptive. This is viewed as limitation by some. Martha Nussbaum developed the approach with Sen, but asserts the approach should set specific criteria (Nussbaum, 2011). While Sen views capabilities as zones of freedoms, Nussbaum argues for the idea of capabilities as fundamental political entitlements (Nussbaum, 2011). She sets out ten necessary capabilities[8] as a minimum threshold applicable universally to every person (Nussbaum, 2011). Nussbaum does not directly suggest redistributive or balancing approaches to address welfare issues like inequalities (although some may be indirectly involved to achieve the minimum level of capabilities), rather she says that provided people are above the threshold certain degrees of elements like inequalities could be accepted (Nussbaum, 2011). However, Nussbaum's approach, while more prescriptive is still just "a partial theory of social justice: it does not purport to solve all distributional problems; it just specifies a rather ample social minimum" (Nussbaum, 2011, p. 40). Thus, while the capabilities approach raises relevant perspectives on what economics should consider, it still (intentionally) does not provide a specific approach to policy, and importantly the question of how economic thinking should encapsulate concerns raised by the evaluative approach still remain.

Nussbaum also argues for a key element connected to the capabilities approach: dignity. She acknowledges that the concept of dignity is vague and is more of an intuitive notion related to ideas of respect (Nussbaum, 2011). In the context of the capabilities approach, it is used to emphasize that policy and thinking needs to treat people as an end, one that is focused on protecting their agency (the term "agency" is used broadly by Nussbaum but is related to Sen's version), rather than treating people as passive receivers of policy decisions (Nussbaum, 2011). This "approach to social justice asks, What does a life worth of dignity

[8] (i) Life, (ii) bodily health, (iii) bodily integrity, (iv) senses, imagination, and thought, (v) emotions, (vi), practical reason, (vii) affiliation, (viii) other species, (iv) play, (x) control over environment (political and material) (Nussbaum, 2011).

require?" (Nussbaum, 2011, p. 34). Hence, social and economic policies must consider the impact on human dignity, and this is what her minimum threshold seeks to achieve (Nussbaum, 1999). This discussion also raises an interesting perspective – do current economic models and thinking lead to people having lives worthy of dignity?

Discussion on the capabilities approach express a wider concern for other aspects of human life. Rationales for the approach extends discussions of limitations highlighted in Chapter 1. Other ideas, such as the role that society plays in determining functionings as well as the view of human beings as ends, with each human worthy of dignity, are also concepts beyond orthodox thinking. However, the question of what should be done with standard approaches in economics still remains since the capabilities approach does not provide an answer to this. Chapter 3 will consider whether a macro approach can move thinking on methodology towards a direction that also covers these concerns.

PART C. NORMATIVE DEBATES ON EQUITY

C.1. Theories of Equity

Part C shifts discussions to broader philosophical perspectives: debates on equity. These debates are relevant because normative views are fundamental to policy, and how it is framed in economics can be re-evaluated in the context of this paper's discussions. Normative values influence human behaviour, affecting economic outcomes. Real-world economic policies reflect normative stances even though the space for normative debates is wide. Importantly, traditional thinking in economics may not cover these concepts adequately. Discussions on equity can also highlight limitations of existing approaches in economics that should be considered for a macro theory.

Part C will cover main debates on justice and theories of equity to contextualise the complexity of these issues and more clearly articulate why the treatment of normative and moral values have vital roles to play in economic thinking. In "Justice: What's the Right Thing to Do?", American political philosopher Michael Sandel analyses the main traditional philosophical arguments on justice and equity which can be split broadly into three streams: (i) maximising utility/welfare, (ii) respecting freedoms, and (iii) promoting virtue (Sandel, 2010).

C.1.1. Maximising Utility

Justice can be seen as an approach of maximising utility or welfare for society; as mentioned, this idea has had significant influence on thinking in welfare economics. For example, Chapter 1 noted one of the limitations of the first fundamental theorem of welfare economics was that Pareto efficient distributions are not necessarily equitable, since distribution is not considered under this approach (e.g. it can still be Pareto efficient where one person has all resources and others have none). Sen's critiques of utilitarianism were explored in Part B.1.1, so only a brief mention of Sandel's arguments will be noted for completeness. First, justice under utilitarianism is not a matter of principle but of blunt calculation (Sandel, 2010). It fails to respect individual rights and has potential to lead to cruel outcomes for individual people in ways that violate decency and respect (Sandel, 2010). Second, it does not allow for qualitative

differences or interpersonal comparisons, and all values are set on a single scale (Sandel, 2010).

C.1.2. Respecting Freedom

The second main approach is to see justice as respecting freedom of choices. While Sen criticised libertarianism for its absolute focus on priority of rights, Sandel critiques this approach normatively. He asserts that while the approach addresses the first criticism of utilitarianism (that utilitarianism could lead to individual rights being grossly violated), it still fails to address the second critique, i.e. that the approach fails to account for qualitative differences between certain types of freedoms (Sandel, 2010). While there can be agreement that certain rights are fundamental, beyond identifying these, Sandel argues that this approach still treats people's preferences as they were without questioning them, its comprehensiveness and other key elements (Sandel, 2010). Sandel's rationale is worth exploring because these views are reflected in many normative discussions in welfare economics. Broadly speaking, there are two schools of thought under this notion of equity (i) the laissez-faire school and (ii) the fairness camp (Sandel, 2010).

Laissez-faire and Free Market Libertarians

To some free market libertarians like Milton Friedman, life is unfair and this is something that people should learn to live with and even benefit from (Sandel, 2010). Free market libertarians under the laissez-faire camp, argue for unfettered markets, minimal government regulation, and for people to be able to conduct free market exchanges in ways that respects their freedom (Sandel, 2010). Individual liberties are violated by laws restricting free market (Sandel, 2010). People have fundamental rights to do what they choose provided other people's rights are respected (Sandel, 2010). Economic inequality is not unfair if it does not manifest through force or fraud, and individual freedoms are fundamental (Sandel, 2010). Philosopher Robert Nozick also took a similar stance, advocating for people's ability to make choices in the free market (Sandel, 2010). On taxation, Nozick argued that the state is not entitled to take (e.g. for redistribution) what people have or earned without their consent and provided their initial holdings were obtained in a just manner and properly transferred (Sandel, 2010). Friedman also disagreed with a minimum wage, arguing that governments should not stop employers paying wages people were willing to agree to (Sandel, 2010).

Sandel critiques free market libertarians because the "free" market is actually not that free. For people with few options, circumstances may mean that people act out of necessity, not freedom (Sandel, 2010). Additionally, Sandel argues that if certain goods and social practices were sold for money, such goods and practices would be degraded (Sandel, 2010). There are three observations out of the above discussion, related to discussions on general equilibrium theory from Chapter 1. First, what are the implications to human agency if the free market as theorised is not really that free? As Sandel notes, people may act out of necessity, not freedom – in this case, do we see a theoretical ignorance of agency? Do free market models simply expect people to optimise to equilibrium states when in reality people cannot act consistently with

theory out of practical necessity? If this is the case, are such models desirable and what kind of agency is being exercised? Second, some things cannot be traded, and this is related to Sandel's argument that trading certain goods and services degrade them. For example, what matters in people's lives cannot be traded on the market – the dignity of not having work or a job loss cannot simply be compensated through economic terms – there are certainly other aspects that matter. As Nussbaum asks, what does a life worthy of dignity require? Third, and related to the theorem of the second best, how effective are free market models based on Pareto efficiency in a real world where there exists multiple distortions and market failures? If there is more than one distortion (which is likely in reality), how helpful is it to champion these models when, in such case, "all bets are off"? Should these notions and models be used in setting policy goals, or are they oversimplified views of the real world with unobtainable efficiency goals? These questions show that while free-market theories are interesting constructs, this approach, representing some laissez-faire views of equity, would run into significant real-world problems.

Fairness and Egalitarians

Those in the fairness camp are concerned about egalitarian principles, requiring policies to address social and economic disadvantages (Sandel, 2010). Among prominent contemporary thinkers is John Rawls, who was a significant influence on many modern economists (Sen, 1999; Sandel, 2010; Atkinson, 2015). Rawls based his theory of justice on the notion of hypothetical consent, where laws are just if the public as a whole would agree to them (Sandel, 2010). He applies a "veil of ignorance", or a theoretical situation that assumes individuals do not have any knowledge about who they are, in order to determine what is equitable. The agreement or position reached in this situation would be an original position of equality, because people, as self-interested and rational individuals[9] would choose such position in such context (Sandel, 2010). Utilitarianism would not be chosen, because, under the veil of ignorance, people would think they could end up as part of an oppressed minority (Sandel, 2010).

Hypothetical positions allow for the two following principles: (i) equal fundamental rights for everyone, with priority over general welfare and social utility, and (ii) socio-economic equality, where equal distribution of wealth is not required, and social and economic inequalities are allowed as long as they operate in favour of the least well-off in society, this latter concept being called Rawls "difference principle" (Sandel, 2010). Hence, huge inequalities, such as significant wealth by few individuals, may be justified if such wealth, taken on balance, works in favour of the least advantaged. Inequalities could be acceptable under the difference principle, if it is subject to appropriate progressive tax systems which taxes the rich for society's welfare and where the poor benefit more than they would under other constructs of equality (Sandel, 2010). The Rawlsian difference principle provides a theoretical solution which corrects for unequal distributions, with a focus on the least advantaged (Sandel, 2010). In contrast to free market libertarians who say that life is unfair and this is something that people should learn to live with and even benefit

[9] Rawls' assumption of people as self-interested individuals appears strikingly similar to the principles in rational choice theory on self-interest. It's therefore possible that his perspective could be expanded to address more nuanced views of behaviour.

from, “Rawls states a familiar truth that we often forget: The way things are does not determine the way they ought to be" (Sandel, 2010, p. 165) – to Rawls, natural distributions are simply natural facts and is neither fair nor unfair, but it is a matter of fairness how institutions deal with these facts (Sandel, 2010).

The above highlights another important view of equity. However, critical questions can be raised. How well does this rationale justify huge concentrations of wealth with the few today, and how properly applied or fair are current progressive tax systems? Under what kind of economic theories are these concepts applied? How do egalitarians define their policy goals within current economic thinking? Is there a better way to implement these ideas in the real world if they end up using traditional economic frameworks to apply their solutions (perhaps due to a lack of better alternative models)? If so, how much are they actually better in achieving their objectives than free market libertarians, or are they still afflicted with the same limitations this paper has raised?

C.1.3. Virtue and Sandel’s version of justice

Sandel notes that Rawls has put forward one of the strongest philosophical arguments for a more equal society, but he also criticises it because the freedom to choose, even under fair contexts, is not sufficient for a truly fair society from a moral perspective (Sandel, 2010). “Liberal justice requires we respect people's rights ... not that we advance their good” (Sandel, 2010, p. 224). Rawls veil of ignorance essentially is a morally neutral stance on what constitutes a good life (Sandel, 2010). For Sandel, determining rights and duties requires articulating moral positions, and this determination requires social and human input (Sandel, 2010). Such determination is signalled by a promotion of virtues, but this too has problems.

The third main approach is where promoting virtue and conceptualisations of the common good leads to justice. Traditionally, this approach is linked with concepts of what is virtuous, what is a good life, and what are appropriate morals and ideals (Sandel, 2010). The perspective is often identified with cultural conservatives and religious movements, and Sandel criticises this approach for essentially suggesting that morality be legislated against rights of citizens in a liberal society, and could be a potential form of coercion and intolerance (Sandel, 2010). Hence, from the above discussions, there are already three different views of equity, each which could be criticised. Thus, the question of what “ought to be” does not always have a clear answer.

Sandel’s idea of justice, in brief, is a version championing virtues, but is a different political philosophy which is not entirely prescriptive and is still under development (Sandel, 2010). At a high level, his version of “communitarianism” favours a form of politics of the common good, a form of political discourse aimed at reconstruction of the civic life, discourse on civic consequences of inequality, distributive justice and a common good which can help find new angles and arguments which traditional politics and arguments may not (Sandel, 2010). Essentially, what is good needs to be properly determined by society based on new forms of political discourse.

Sandel’s position that moral and normative positions should be determined by social and human input is consistent with the discussions in Chapter 1 and 2, such as references from Adam Smith and Vernon Smith’s interpretations on human moral values and the formation of moral codes of conduct, Atkinson’s arguments on social and normative elements influencing economic outcomes and Sen’s norms and functionings

being a matter to be socially determined. But how well are notions of normative values being socially determined reflected in economic thinking? Mainstream frameworks, built on traditional theoretical constructs such as rational choice and preference theory, does not support this – the scope is simply too narrowly focused on reductionist theories of behaviour to be capable of capturing these elements. Also, as noted in Chapter 1's discussion, positivist economic approaches detach from the normative, but this is not sufficient because views of equity and how they are applied are in reality consequential to people's lives.

C.2. Part C Discussion

The discussion in Part C show how varied and contested notions of equity can be. Versions of justice are a contested space even among economists, for example between free market libertarians and those focused on egalitarian distributions based on Rawlsian principles. There are going to be various debates on what story of equity is best, and this is one more important reason why limitations to traditional economic thinking need to be addressed.

If one relies only on mainstream economic approaches (limited by parsimonious over-simplifications, problematic assumptions, and fundamental inadequacies in capturing human and social elements), the harder it would be to achieve goals for equity in a world with many distortions, where complex human elements play big a part, and where notions of equity are contested yet insufficiently addressed by mainstream models. In other words, trying to apply normative stances on equity, which at times are contested notions, to economic thinking while using approaches with significant deficiencies would likely lead to unsatisfactory normative results.

Another approach is desired. Normative and moral values, which can include the different debates on equity above, will also be discussed in the context of human agency and a macro approach in Chapter 3.

PART D. CONCLUDING REMARKS FOR CHAPTER 2

Chapter 2 extended discussions of ideas beyond the fundamentals noted in Chapter 1. Part A's discussion on the theorem of the second best and minimum wage show limitations to orthodox approaches to welfare from perspectives closer to the real world. Part B highlights that alternative approaches to evaluate economic policies suggest much wider and human elements, such as capabilities, freedoms and dignity should be addressed. Part C's coverage of the main debates on equity and fairness argue that traditional economic frameworks can lead to unsatisfactory normative outcomes. All three parts highlight existing gaps that require another approach that can encompass these points. Chapter 3 considers if notions discussed are better served under a macro approach to economic thinking.

4. TOWARDS A MACRO THEORY

Chapters 1 and 2 form an argument that a different approach in economic thinking is desired. Chapter 3 explores whether a macro perspective is a suitable approach to address the points raised. A macro approach refers to one that is based on aggregate outcomes which cannot be fully explained through reductionist views of individual behaviours.

This Chapter considers how a macro approach can cover concerns raised and lays the groundwork for future thinking by exploring the following: (i) critiques of methodological individualism, (ii) theories on complex systems, and (iii) conceptualisations of and ontological frameworks for understanding human agency in a broader aggregated perspective

PART A. REVISITING METHODOLOGY

Chapter 1 discussed that traditional economic frameworks are based on methodological individualism, which attempts to explain social phenomena by analysing individual consumers and firms as the primary unit (Blume and Easley, 2008). Reinhard Neck noted that in economics, social phenomena has typically been understood through two competing notions: individualism and holism (Neck, 2021). Under individualism, the individual is the key component, and groups and society are characterised by the behaviours and characteristics of individuals (Neck, 2021). This contrasts with holism or collectivism, which looks at the group or the collective, and considers individuals as determined by the group (Neck, 2021). Methodological holism was criticised by J.W.N. Watkins on the basis that a social system as an organic whole is unable to derive the behaviour of its components, and Watkins' ideas that social phenomena are not able to explain the motivations and actions of the individuals contributed to the prominence of microeconomic foundations in macroeconomic theory (Neck, 2021).

Neck argues there are two strands of individualism: a "strong" or strict definition, where explanations are framed from the perspective of individuals in isolation, and a "weak" or mild definition, which considers the individual primarily but also includes influential social interactions (Neck, 2021). Neck notes that methodological individualism has been critiqued by multiple economists because individuals' decisions are made in contexts influenced by social ideas and hence reducing explanations to individualist concepts do not work (Neck, 2021).

Neck argues that ultimately, while strict or "strong" individualism has typically been rejected, there is still a case to use a model of "weak" individualism, since this notion can still capture how behaviours and interactions of individuals and their associations in various groupings can be analysed through defined categorisations (Neck, 2021). Such approach allows for individual interests of agents to be analysed in relation to specified types of group choices within certain defined groupings (Neck, 2021). However, while Neck may be attempting to explain broader behaviours using a type of individualism with specified interpretations of groupings and group choices, Neck's model is too narrow in categorising individuals to limited types of interactions and by identifying limited types of groupings. In reality, society is much more complex. Neck's notion also discounts the

possible complexity of interactions between agents, as well as emergent outcomes and properties that can arise through various forms of interaction and influences between various structural levels, factors which cannot be fully understood from individualist perspectives. Arguably, even modified versions of weak individualism are still insufficient.

Discussions in Chapter 1 and 2 have argued that mainstream economic notions based on reductionist individual perspectives and a narrow view of agency have failed to address important elements, such as (i) qualities of fairness and cooperation seen in experimental economics, (ii) the range of elements related to human behaviours as discussed by Sen and Hirschman on preferences and changing values, as well as Vernon Smith's exploration of sympathy, a concept that extends awareness and cognition to others' perspectives, (iii) social contexts that can affect market outcomes as argued by Atkinson (iv) the capabilities, freedom and notions of dignity raised by Sen and Nussbaum forming an evaluative and socially focused approach, and (v) the broader debates on equity which Sandel argues are to ultimately involve social determination. These are complex human elements and methodological individualism is too simplistic a perspective to address these factors. Economic thinking in welfare based on these notions are also limited. For example, the fundamental theorems of welfare economics, while appearing holistic in the sense that it tries to put forward a model for the welfare of society broadly, is based on individualistic and traditional notions of preferences. Limitations discussed indicate that economic methodology should have a more comprehensive view which can capture important elements from a truly aggregated perspective, and theories of complex systems and human agency can inform this macro view.

PART B. COMPLEX SYSTEMS

The macro approach this paper conceptualises is based on aggregate outcomes and involve an understanding that social systems as a whole are complex systems shaped by interactions and emergent properties of its elements at various levels (and also that the whole is not just a sum of its parts). Understanding outcomes from an aggregated perspective allows the whole to be better understood, and this is a view that can guide economic thinking in welfare to be more attuned to reality.

In the context of complex systems, methodological individualism has a critical flaw: it is not possible to extrapolate the macro from the micro. Philip W. Anderson show that, from the scientific world (such as in physics and chemistry), reductionist views are inadequate to explain dynamics and systems of the whole: "The behavior of large and complex aggregates of elementary particles, it turns out, is not to be understood in terms of a simple extrapolation of the properties of a few particles. Instead, at each level of complexity entirely new properties appear" (Anderson, 1972, p. 393). Using the example of molecular physics, Anderson explains: "the whole becomes not only more than but very different from the sum of its parts" (Anderson, 1972, p. 395). New dynamics emerge when systems have different levels of complexity, and such dynamics cannot be fully understood by looking at laws and dynamics and lower levels (Stumpf, 2022). In Figure 7 below, Michael Stumpf illustrates an example of Anderson's increasing complexity in science among various system levels, from quantum electrodynamics all the way up to society and human culture.

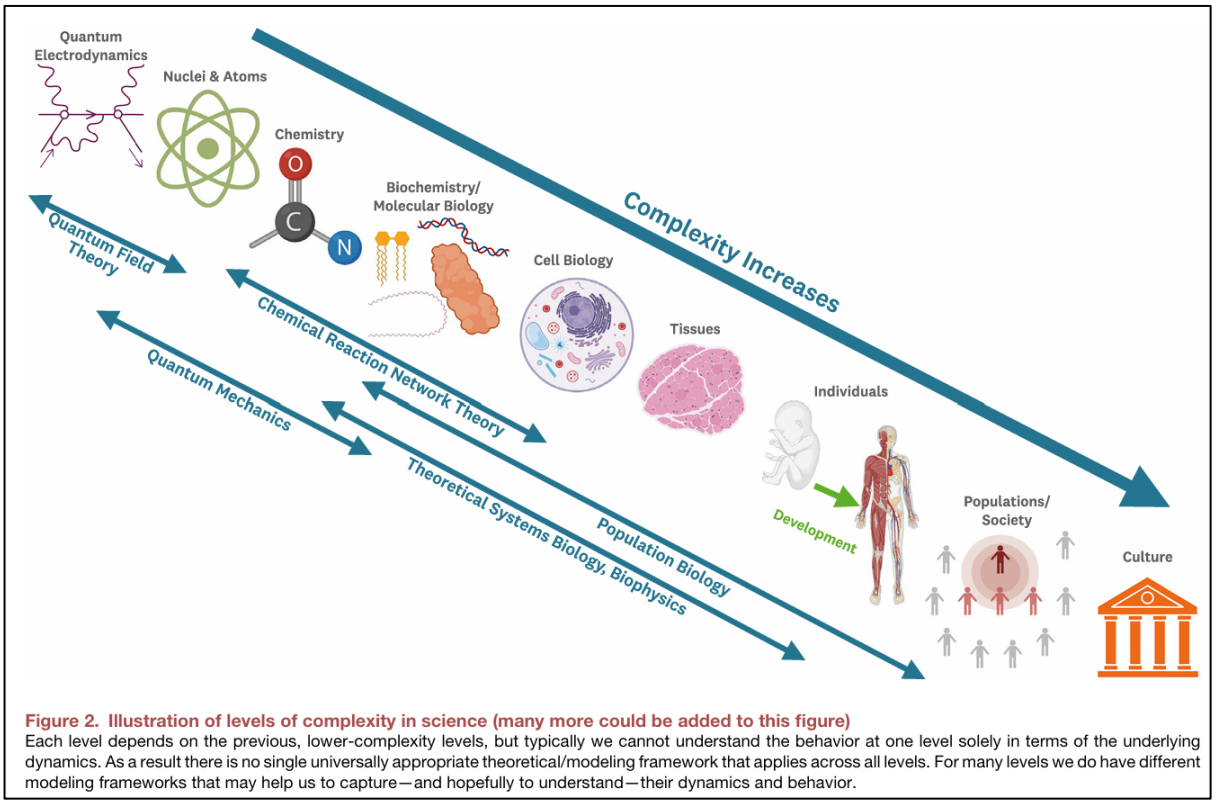

Figure 7: Increasing levels of complexity cannot be understood by previous levels alone (Stumpf, 2022, p. 596).

Is it possible to understand society and human culture by only understanding the properties and rules applicable at the level of quantum electrodynamics only? The answer is clearly no, yet this is the type of thinking consistent with reductionism. Theories based on individualism in economics are subject to similar limitations. Economics involves complex human systems interacting at multiple levels, and so properties at micro levels cannot be used to explain the whole which are aggregate outcomes. Theories also need to reflect the complexity of humans and human interaction at multiple structural levels rather than only applying abstract individualist concepts with scoped assumptions extrapolated to models purporting to represent the broader world.

A macro view is desired. Such view sees human beings, human elements, interactions and social systems as part of a broader complex system. Understanding the aggregated outcomes arising not just from the sum of all parts but through various interactions of its elements and emergent properties can better inform welfare theories in economics. One vital element to building this approach are theories of human agency and ontological frameworks.

PART C. HUMAN AGENCY, ONTOLOGICAL FRAMEWORKS AND THE AGGREGATE PERSPECTIVE

This Part argues that more comprehensive concepts of human agency and alternative

ontological frameworks can provide a better basis to understand aggregate outcomes for a macro theory.

Understanding human agency helps contextualise discussions in Part B so that the aggregate perspective can see human agency as having a key role in a view where human social systems are complex systems influenced by interactions. In this Part, "Human Agency" refers to intentionality in behaviour which has gone through a cognitive process leading to such intentionality. It is helpful to understand how this definition is derived by looking at the evolution of agency in humans. Part C will also discuss how human agency is conceptualised within the broader notion of a collective form of agency, as well has how this sits within wider ontological frameworks.

C.1. The Evolution of Agency

Humans are unique to other organisms because our cognitive abilities, social interaction and social structures evolved to create distinct factors affecting agency. Michael Tomasello explored the notion of agency from an evolutionary perspective and analysed how living entities direct and control their actions (Tomasello, 2022). Tomasello considered various types of animals, from lizards, employing only forms of reactive control, to different mammals (Tomasello, 2022). Mammals engage in proactive "first order executive tier control", which means engaging in value based choices and planning, and executing actions while reacting to obstacles, reflecting intentional action (Tomasello, 2022). Mammals also live in social groupings and compete with others, leading to more complex cognitive skills (Tomasello, 2022). Great apes have a "second order executive tier" of functioning, whereby individuals monitor and evaluate their own first order executive control, and are subject to social structures (Tomasello, 2022). They also plan future goals, make logical inferences based on a comprehension of causal and intentional relations, are critical of their decision making processes, analyse issues and act to solve them (Tomasello, 2022).

Humans are more advanced than great apes because they are able to forgo pursuing individual goals to align, communicate cooperatively and coordinate toward common goals with a partner, or cultural groupings with more advanced social coordination and social motivation; this involves coordinating joint agencies and joint goals for common benefit (Tomasello, 2022). This leads to "cooperative rationality", or acting in a "context of their collaboratively structured agency" (Tomasello, 2022, p. 103). Social cooperation required new socio-moral attitudes and emotions, involving notions of respect, fair treatment and legitimate rebukes for uncooperative behaviour, hence there are normative standards in human social relationships (Tomasello, 2022). Modern human cultural groups also lead to collective agencies, where goals and decisions were made as a single unit, through discussion and reaching consensus (Tomasello, 2022). Individuals thus developed group-minded concern for the culture's goals and welfare, with mechanisms for group level social selection that excluded non-cooperative members in a form of collective self-regulation (Tomasello, 2022).

Modern humans thus became "fully normative agents operating with a normative rationality of obligation" (Tomasello, 2022, p. 113), with three modes of agency (i) "I" – pursuing self-interest, (ii) "we" – operating via group's collective practices and norms, and (iii) "me" – in the role of an agent doing

duties the cultural group requires (Tomasello, 2022). "Normative rationality thus means adapting one's individual agency to "objective" facts and values as they inhere in collective cultural experiences" (Tomasello, 2022, p. 115). Such objective normative standards for individuals means they operate under a "new form of socially perspectivised consciousness" (Tomasello, 2022, p. 117).

The above discussion leads to two key points when considering economic thinking on human behaviour. First, a crucial point is that traditional notions of agency should be reconsidered. Tomasello's analysis shows a much more nuanced version of human cognition beyond purely maximising self-interest, and importantly his version of human agency covers a type of "collaborative rationality" forming a type of "collaboratively structured agency". Tomasello argued there is not one but three modes of agency covering not only self-interest but also types of agency facilitating group practices involving awareness of others, group objectives and of one's role in society. This construct provides room to explain elements that this paper argued was missing in methodological individualism and a restrictive view of agency discussed in Chapter 1. For example, theories of fairness and cooperation, the ability to sympathise or understand another's perspective, the determination of and adherence to social values and normative standards, i.e. such factors that lead to a broader and more collective "socially perspectivised consciousness" encompassing key human, social and moral elements discussed. This kind of thinking allows future economic concepts to be based on a more comprehensive and collective version of agency which macro theories can build upon in the context of aggregated outcomes arising from human behaviours, society and interactions.

A second ancillary point is that moral values, normative elements and debates on equity discussed in Chapter 2 should not be seen as necessarily separate from conceptualisations of human behaviour and humans in economic thinking. It is part our evolutionary history to consider the normative and apply equitable values and rules of conduct. Societal rules and culture can affect what drives humans to consider another's perspective or to act with awareness of others' perspectives, something which individualist views fail to explain. Normative evaluations form part of human culture which ultimately influences "collaborative rationality" and aggregated outcomes of a broader social system. Sometimes this develops implicitly through cultural rules and normative behaviours, and sometimes this is done explicitly by deliberate and express policy decisions derived and agreed through political consensus as Sen or Sandel suggest. In this context, one can argue that the distinction between positive and normative economics discussed in Chapter 1 can be reframed. Discussions in economics about "what is" versus "what ought to be" can suggest the normative is an external element separate from economic models based a narrow conceptualisation of humans, when in fact, it may by virtue of us being moral-setting humans with collective forms of human agency, be part of our broader "socially perspectivised consciousness". Notions of equity thus may be much closer to us than we and many economists may have traditionally thought, and macro methodologies may better incorporate these aspects than orthodox approaches.

There are also other key factors to incorporate in a macro theory, because human behaviour and economic activity exist in social contexts with complex interactions and properties. Part C.2. explores how viewing human interaction and emergent outcomes under alternative ontological frameworks can be part of the thinking in a macro approach.

C.2. Ontological Frameworks

Theories on interaction and emergent outcomes should also factor into a macro approach. Elder-Vass proposed an ontological framework for social structures and human agency that can contextualise the concept of emergence and add to an understanding of how aggregate outcomes are derived. As a starting point, Elder-Vass noted that the concept of agency in sociology is "a problematic concept" (Elder-Vass, 2010, p. 2) and that typically there is a debate between voluntarist views, where agency is about human reflexivity and conscious decision making, versus determinist views, where human behaviour is a product of dispositions acquired from social contexts (Elder-Vass, 2010). Elder-Vass argues for both structural and agential causal power, which includes human agency, influence social events (Elder-Vass, 2010). Elder-Vass thus takes a broader view of agency, which is also suggested for a macro approach.

C.2.1. Emergence

One key concept in Elder-Vass' framework is "emergence", where something can have "emergent properties" or "properties or capabilities that are not possessed by its part" (Elder-Vass, 2010, p. 4). Emergent properties have a "causal impact that is not just the sum of the impacts its parts would have if they were not organised into this kind of whole" (Elder-Vass, 2010, p. 5). Using the example of water to conceptualise this, Elder-Vass notes water has properties that can extinguish a fire, but its components, oxygen and hydrogen, react differently to fire (Elder-Vass, 2010). The relationship between emergent properties and social structures and its parts are crucial elements in Elder-Vass' concept of human agency, since he argues that humans have "causal powers of their own and implement causal powers that belong properly to higher social entities" (Elder-Vass, 2010, p. 28).

Elder-Vass explores the links between cause and emergence. In the natural sciences, certain regularities can be produced in experiments, but only in closed systems which exclude causal influences (Elder-Vass, 2010). These observations fall away in open systems, which is the case in the real world. Causal powers may be linked to multiple interactions, and may emerge at different levels (Elder-Vass, 2010). Social structures are important, influencing inter-related structural elements, emergent properties and how various processes for those properties and its causal powers operate (Elder-Vass, 2010).

Elder-Vass argues humans have individual causal powers, which are emergent properties, and his theory of human agency is "based on the emergent properties of human individuals, as part of a hierarchy of entities with emergent powers, including both the biological parts of human beings and the social entities composed (at least in part) of human beings" (Elder-Vass, 2010, p. 88). Emergent properties of humans include their mental states which have causal effects, particularly on behaviour, and also include human reasons, dispositions and beliefs (Elder-Vass, 2010).

C.2.2. Elder-Vass' Framework

A high-level summary of Elder-Vass' ontological framework is described for further discussion. Social structures are causal powers of social arrangements and lead to normative practices, or "social institutions", which are patterns of behaviours (Elder-Vass, 2010). Normative social institutions arise from normative circles (groups enacting normative practices by members holding normative dispositions) and are emergent properties (Elder-Vass, 2010). Normative circles have causal influences on behaviours of individuals, which are also affected by each person's interpretation of their normative contexts, where there are intersections with various social influences (Elder-Vass, 2010). Organisations, viewed as "structured social groups with emergent casual powers" (Elder-Vass, 2010, p. 144) influence social events and can set social roles and norms as well as have complex inter-relationships with normative institutions and norm circles (Elder-Vass, 2010). It should be noted that Elder-Vass' concept of emergence appears to suggest that emergence occurs upwards, i.e. from lower levels to higher structural constructs, rather than from top levels down. This is possibly due to how he tries to logically set out a clear and understandable framework from the bottom up. However, and for completeness, it is noted that emergence can occur both ways, i.e. it can also happen from top-down types of interaction as well.

C.3. Part C Discussion

Elder-Vass' ontological framework shows that to fully understand aggregated outcomes, complex systems need to include an understanding of interactions and emergence. Humans and many human elements, from the biological to the social, form parts, but the whole is not just the sum of its parts and needs to be understood from an aggregated perspective accounting for all interactions, emergent properties, mechanisms, elements and qualities. Elder-Vass' framework contextualises how inter-linked social structures, human agency and the hierarchies of multiple levels of inter-relationships and interactions have roles to play and thus can inform the aggregated perspective of a macro approach.

Given this context, it is simply not possible for just an individualist perspective in traditional economic thinking to explain the complexities of elements discussed. The discussions in this paper made it is abundantly clear that traditional notions of human behaviour in orthodox economic thinking are significantly lacking, and consequentially theories in welfare economics premised on such thinking suffer the same tribulations. A macro approach using alternative frameworks like Elder-Vass' is thus more helpful to understanding economic phenomena in the real world and can help better calibrate policies in welfare.

The exact design of macro approaches in economics is an area for further thinking, research and debate. The argument in this paper is that methodology needs to shift from one based on reductionist views of individual behaviours (which, despite extensive debates on its limitations is still very dominant in contemporary economic thinking) to one that is based on aggregate outcomes incorporating these perspectives. Understanding and defining the scope of what constitutes aggregate outcomes and how this is derived under a macro perspective would help economists discuss issues of welfare in a more realistic and constructive light. This would require new types of theory that challenge mainstream approaches.

5. CONCLUSION

Chapter 1 revisited the fundamentals of economic theory forming the bases for welfare economics. The chapter covered important limitations of such theories, starting from basic building blocks to broader frameworks in welfare economics, and the discussions serves as a cautionary reminder of key limits to a business-as-usual approach.

Chapter 2 looked beyond the fundamentals, extending discussions from three unique perspectives: (i) arguments on traditional concepts through the theorem of the second best and ideas of social contexts affecting economic outcomes in a minimum wage example, (ii) alternative ways of evaluating economic policy which focuses on what also matters for human life, such as capabilities, functionings and human dignity, and (iii) the broad range of debates on equity, which while a contested space with no clear answers, is consequential as it underpins the directions of economic policy. Chapter 2 also highlights that many crucial elements are not adequately addressed in traditional frameworks. Combined, Chapters 1 and 2 build a case that an alternate methodological approach to economic thinking on welfare is desired.

Chapter 3 argues that a macro approach, one focused on aggregate outcomes, rather than one based on reductionist views of individualist behaviours, can better address key elements identified in discussions. Methodological individualism is lacking, and broader perspectives of the macro is needed. The whole is more than just the sum of its parts, and the macro cannot be extrapolated from the micro. Macro theories should incorporate thinking from ideas on complex systems, a comprehensive notion of human agency and alternate ontological frameworks showing that complex systems involve interactions and emergent outcomes which inform an aggregated view. The theory should build upon distinctly human elements discussed in this paper. This kind of understanding for a macro approach will allow economic thinking on welfare to be more attuned to reality and help improve policy design.

All chapters combined lay further ideas for future theories built on a macro approach. This is an incredibly exciting area for the future of economic theory. Already, there are different streams of thinking and research exploring concepts that can be used in macro approaches. For example, innovative thinking on agent-based modelling (Epstein, 2014), ideas in neuroeconomics challenging existing economic methodology (Gul and Pesendorfer, 2008), and network theory applied to aggregate behaviours of the economy (Chakrabarti, Pichl and Kaizoji, 2019). There is plenty more to research and conceptualise.

While all this is promising, it is also helpful to remind oneself that approaches in welfare economics are still dominated by traditional thinking based on reductionism, so the path forward to change this will be a challenging one. This paper thus hopes to contribute to this effort by serving as a humble waypoint in any reader's journey towards a macro theory, ultimately for the betterment of the welfare of society.

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Topic 2: Exploring Opportunities for Social Position and Subjectivity Through Migrant Remittances in Feminised Migration: Narratives from Southeast Asian Female Migrant Workers in Taiwan

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Abstract

The increasing feminisation of migrant labour in Taiwan has significantly shaped the sociocultural landscape of Southeast Asian Female Migrant Workers (FMWs). This study investigates the gendered dimensions of remittance-sending amongst FMWs in Taiwan, with a focus on how these practices shape social positions, identities, and subjectivities within the contexts of feminised migration and gendered division of labour. While existing research often emphasises the economic functions of remittances, there remains a gap in understanding the intertwined sociocultural and gendered factors that affect these practices. Grounded in a mixed-method approach combining quantitative surveys and in-depth qualitative interviews with Southeast Asian FMWs workers, mostly Filipino caregivers, this research highlights how economic motivations intersect with sociocultural factors, revealing remittances as both financial support and a means of fulfilling familial obligations. The findings emphasise the dual role of remittances: they empower FMWs by enabling them to exercise agency within traditional gender roles, while simultaneously perpetuating certain sociocultural norms. The study also identifies challenges such as financial insecurity, limited resources, and systemic barriers, underscoring the complexity of autonomy in managing remittances, which is shaped by gender relations and transnational support networks. Despite these challenges, the study shows how remittance practices contribute to both social mobility and the reinforcement of existing power dynamics. The research's limited sample size constrains broader generalisations but offers crucial insights into the intersection of migration, gender, and financial flows in Taiwan's labour context. These findings suggest the need for policy interventions that better support migrant women, ensuring their contributions are fully recognised and fostering equitable conditions for their socio-economic advancement.

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1. INTRODUCTION

Migrant workers/Migrants, defined as individuals who leave their countries of origin for short-to mid-term employment abroad (Asis and Piper 2008; International Organisation for Migration 2019), have become integral to Taiwan's workforce, marking significant contributions to the country's economic and social development (Wang 2011; Tsay 2016; Lopega 2017; Deng, Wahyuni and Yulianto 2020). During my previous job, I worked closely with migrant workers (MWs) from the Philippines and Viet Nam. I frequently observed them making video calls during breaks, often discussing money transfers and gifts with their families back home. Many of these workers are mothers who have left their children behind in their home countries. These observations sparked my interest in exploring how FMWs in Taiwan utilise remittances to maintain their perceived social roles—such as daughters, mothers, or wives—and how they reconfigure their social position through the process of sending remittances throughout their migration journey.

The feminisation of migrant labour is a global trend, driven by various push-pull factors in both sending and receiving countries (Parreñas 2001; Piper 2008; Siddiqui 2008; Yeoh 2016, 2021). While some research suggests that feminised migration dos not necessarily empower women, it often reinforces gendered division of labour and express FMWs to greater vulnerabilities (Siddiqui 2008; Pan and Yang 2012; Russell 2014; Yeoh 2016; Lattof, Coast and Leone, 2018; Tan and Kuschminder 2022). In Southeast Asia, most FMWs are employed in caregiving, textile, and entertainment sectors—industries typically labelled as 'unskilled' and often stigmatised (Silvey 2004; Piper 2008; Yeoh and Huang 2010; Chien 2018; Lan 2022; Liang 2023). Despite this, sending women abroad is frequently framed as a family strategy or a national development tactic (Stark 1991; Castles, Miller and Ammendola 2005; Cohen 2005; Schiller and Faist 2009), as seen in the Philippines, where female Overseas Filipino Workers (OFWs) are honoured as 'Bagong-Bayani [New Heroes]' (Hennebry et al. 2019; Yeoh 2021; Eugenio 2023). Such societal recognition foregrounds the sociocultural dimensions of migrant remittances, which extend beyond their economic value.

In the meantime, Taiwan has become increasingly reliant on migrant labour since the 1980s due to economic restructuring, globalisation, and a declining fertility rate (Wang 2011; Lin 2012; Tsay 2016; Lopega 2017; Chien 2018; Deng, Wahyuni and Yulianto 2020). Today, its MWs are from Viet Nam, Indonesia, the Philippines, and Thailand, filling roles in both productive (e.g., agriculture, manufacturing, and construction) and social welfare industries (e.g., caregiving, domestic work). It is noteworthy that, over the past three decades, FMWs have consistently outnumbered male migrants, reflecting a feminised migration trend. Amongst this, over 99% of women are employed in social welfare roles—predominantly Indonesians—highlighting the distinct gendered dynamics of migration in Taiwan.

While research indicates FMWs tend to remit a higher proportion of their earnings and experience social and financial empowerment through migration (Jolly et al. 2005; Siddiqui 2008; IOM and Remittances Factsheet 2015), they also face intersectional challenges including gender-based violence (GBV), wage disparities, exploitation, and limited access to social services (Pan and Yang 2012; Russell 2014; Cheng 2016; Lattof, Coast and Leone 2018; Hennebry, Hari and Piper 2019; Rich et al. 2022; Tan and Kuschminder 2022).

Significant gaps persist in understanding the full scope of FMWs' experiences, particularly in Taiwan's context of feminised migration and gendered labour divisions. By far, much research focuses on both economic and financial aspects of remittances (Nguyen Thi Thanh Yen 2022; Chen 2023), less attention as a whole is given to their gendered dimensions (Battistella and Conaco 1998; Jolly et al. 2005; Hennebry and Petrozziello 2019; Hennebry, Hari and Piper 2019). Moreover, societal norms and public discourse often lead to the undervaluation or dismissal of these women's personal experiences and contributions (Pearson and Sweetman 2019).

This research seeks to address the gap in understanding how remittance practices shape the social positions, identities, and subjectivities of FMWs within Taiwan's context of feminised migration. It anticipates expanding the current understanding of migrant remittances by exploring their non-economic values through a gendered lens.

Anchoring on Meyer and Ströhle (2023) argument that migrant remittances encompass more than mere financial transactions, including social capital, objects, values, and norms, this study introduces the concept of 'Hierarchical Social Terrain'. This framework is used to analyse the asymmetries in FMWs' migration and remittance-sending processes, as well as the opportunities and barriers they encounter through remittances.

The research is structured as follow: first, an overview of the migration context in Taiwan, followed by an exploration of the feminised migration trends in Southeast Asia and their implications for FMWs' social mobility and cultural identity. It then examines potentials of migrant remittances through a gendered lens. Employing a mixed-methods approach, the research combines quantitative surveys with qualitative interviews to capture individual experiences from an emic perspective. Online interviews are conducted with Filipino FMWs currently employed in Taiwan who regularly remit. Findings from the mix-methods approach confirm that remittances carry beyond economic value, encompassing sociocultural, transnational, and psychological significance. These remittances not only reflect FMWs' contributions but also play a critical role in shaping their social position, identities and subjectivities, particularly through social roles such as daughterhood, wifehood, or motherhood, even when they are far from home. The research emphasises the interplay between social positioning and its potential shifts, relying on a relative understanding that highlights the importance of emic narratives from FMWs. Although the study's limited sample size constrains broader generalisations, it challenges traditional economic push-pull theories by foregrounding how migration is not solely an economic necessity but is deeply intertwined with cultural and gendered expectations. This approach broadens the scope of migration discussion in Taiwan context.

Research Objectives and Questions

Remittances are often the key motivation for many MWs and have the potential to elevate their lives economically and socially. Observing the trend of feminised migration in Taiwan, this research aims to contextualise the sociocultural factors through a transnational lens and highlights the role of remittance-sending practices in shaping FMWs' social positions, identities, and subjectivities.

The research contends migrant remittances present an opportunity for addressing the vulnerabilities faced by FMWs, enabling them to renegotiate their social roles, identities, and subjectivities amidst the challenges associated with feminised migration and labour. feminised migration and labour emerge as a double-edged phenomenon: while it holds the promise of empowerment, it also poses risks of further marginalisation for migrant source countries. By delving into these intricate dynamics, the study seeks to highlight on the broader implications of remittance-sending for both the MWs themselves and the communities they engage with, ultimately contributing to a more nuanced understanding of the sociocultural dimensions of migration.

This study sets out to achieve four key objectives:

1. To present a more comprehensive understanding of gendered dynamics amongst MWs in Taiwan.
2. To identify the social and cultural meanings embedded in the remittance-sending practices for Southeast Asian FMWs in Taiwan.
3. To examine the connection between remittance-sending and the social position, identity, and subjectivity of Southeast Asian FMWs in Taiwan from an emic perspective.
4. To explore the transformative opportunities of remittance-sending, whether from social, cultural or economic, for FMWs within a transnational framework.

In line with these four objectives, this study sets out three research questions:

1. What significance does remittance-sending hold for Southeast Asian FMWs from a transnational perspective?
2. What sociocultural elements and gender dynamics are embedded in the remittance-sending practices for Southeast Asian FMWs in Taiwan, and how might these practices influence their social position, identity, or subjectivity?
3. What opportunities does remittance-sending present for Southeast Asian FMWs?

Using a mixed-methods approach that combines quantitative survey analysis and semi-structured qualitative interviews, this research aims to offer culturally grounded perspectives from migrant communities in Taiwan. It seeks to elucidate the identity-building processes of FMWs through remittance-sending practices while giving rise to broader discussions on the gendered effects of migration remittances in area and development studies. Ultimately, this research aspires to provide insights that may encourage greater attention and investment in facilitating relevant services for MWs in Taiwan.

Migration Context in Taiwan

Migrant workers/Migrants refer to individuals who relocate from their countries of origin to destination countries for legal employment, typically on a short- to mid-term basis; migration, more broadly, refers to this movement of people across borders (Asis and Piper 2008; International Organisation for Migration 2019). In the context of Taiwan, MWs specifically refer to the 'Type B Foreign Worker(s)', colloquially known as blue-collar or low-skilled labourers (Regulations on the Permission and Administration of the Employment of Foreign Workers 2024). These workers, regulated by the Employment Service Act in Taiwan, are allowed to work in three

industries, including productive (e.g., agriculture, manufacturing, construction), social welfare (live-in caregivers, institutional caregivers, domestic helpers), and ocean fishing sectors.

For decades, migration has been widely acknowledged as a pivotal mechanism for development in both destination and source countries, contributing to economic growth, societal diversification, and social transformation (Castles, Miller and Ammendola 2005; Schiller and Faist 2009). Yet this positive framing often contrasts sharply with the lived experiences of MWs in many destination countries. Such as Taiwan, despite hosting significant migrant populations for decades, it still faces substantial challenges in effectively safeguarding the basic rights of MWs. These challenges are particularly pronounced for FMWs, who face additional vulnerabilities stemming from the gendered nature of their work and the intersection of migration and gender-based risks (Lan 2003a, 2003b; Pan and Yang 2012; Chien 2018). This chapter then examines Taiwan's migrant landscape, focusing on the feminisation of migrant labour and the gendered vulnerabilities that shape women's migration experiences

Migration Composition in Taiwan

Taiwan's migrant population has grown dramatically over the past three decades, officially surpassing the indigenous population by the end of 2019, reaching 3% compared to 2.5% as of May 2024. This expansion, spanning three decades since legal authorisation in 1992 (with ad hoc permissions beginning in 1989), has been driven by pressures familiar to other developed countries: economic restructuring, globalisation, political liberalisation, declining fertility rates, and rising domestic wages (Wang 2011; Lin 2012; Tsay 2016; Lopega 2017; Chien 2018; Deng, Wahyuni and Yulianto 2020).

The initial impetus for opening Taiwan's borders to MWs came primarily from labour-intensive industries facing acute worker shortages, particularly construction and manufacturing sectors in the late 1980s (Tsay 2016; Chien 2018). These demographic and economic pressures have only intensified, with MWs now comprising approximately 6.4% of Taiwan's total workforce as of May 2024—significantly higher than its neighbouring countries such as Japan (0.72%) and South Korea (1.13%) (Executive Yuan, 2024).

Taiwan's migrant workforce composition has also evolved significantly. Initially limited to Thailand, Malaysia, the Philippines, and Indonesia, the approval of Viet Nam as a source country in 1999 reshaped the landscape, with Viet Nam eventually replacing Malaysia as a major source. Currently, all MWs originate from Southeast Asian countries, with Indonesia providing the largest share at 32.91%, followed by Viet Nam at 27.31%, the Philippines at 19.04%, and Thailand at 8.70% as of May 2024 (see Table 1). This represents remarkable growth from just 2,999 individuals (0.18% of the workforce) in 1992 to 793,5444 individuals today (Executive Yuan, 2024).

Table 1. Migrant Population in Taiwan by Nationality from 2014 to July 2024

Year	Grand Total (pers.)	Indonesia (ID) (pers.)	ID in Total (%)	The Philippines (PH) (pers.)	PH in Total (%)	Thailand (TH) (pers.)	TH in Total (%)	Viet Nam (VN) (pers.)	VN in Total (%)
2014	551,596	229,491	41.60%	111,533	20.22%	59,933	10.87%	150,632	27.31%
2015	587,940	206,712	35.16%	118,041	20.08%	56,696	9.64%	141,059	23.99%
2016	624,768	213,214	34.13%	130,126	20.83%	56,721	9.08%	152,728	24.45%
2017	676,142	227,885	33.70%	143,887	21.28%	59,586	8.81%	178,340	26.38%
2018	706,850	238,069	33.68%	149,782	21.19%	59,228	8.38%	195,331	27.63%
2019	718,058	246,933	34.39%	153,481	21.37%	57,899	8.06%	199,494	27.78%
2020	709,123	234,330	33.05%	146,939	20.72%	56,113	7.91%	201,500	28.42%
2021	669,992	210,074	31.35%	138,592	20.69%	55,542	8.29%	193,867	28.94%
2022	728,081	220,183	30.24%	150,687	20.70%	64,481	8.86%	205,075	28.17%
2023	753,430	243,889	32.37%	145,795	19.35%	65,463	8.69%	207,089	27.49%
2024	793,544	261,123	32.91%	151,061	19.04%	69,048	8.70%	216,727	27.31%

Source: MOL (2024), available at: https://statdb.mol.gov.tw/html/mon/c12060.htm (accessed on 23 August 2024). Note: Data for 2024 reflects figures through July 2024. Population figures include employed, unemployed, and missing MWs.

Feminised Migration & Feminisation of Migrant Labour

Amongst these migrant demographic trends in Taiwan, two notable phenomena have drawn considerable societal attention: feminised migration and the feminisation of migrant labour.[10] labour. As illustrated in Figure 1, FMWs in Taiwan have historically outnumbered their male counterparts, with this pattern only reversing in recent years (2022-2024). The feminised trend was most pronounced during the early 2000s and 2010s, when FMWs constituted well over 60% of the migrant population. However, prior to 2000, during the 1990s—the first decade of legal MWs inclusion in Taiwan—male migrants significantly outnumbered FMWs. This initial male dominance can be attributed to early migration policies that primarily targeted productive sectors, which were predominantly male-dominated industries.

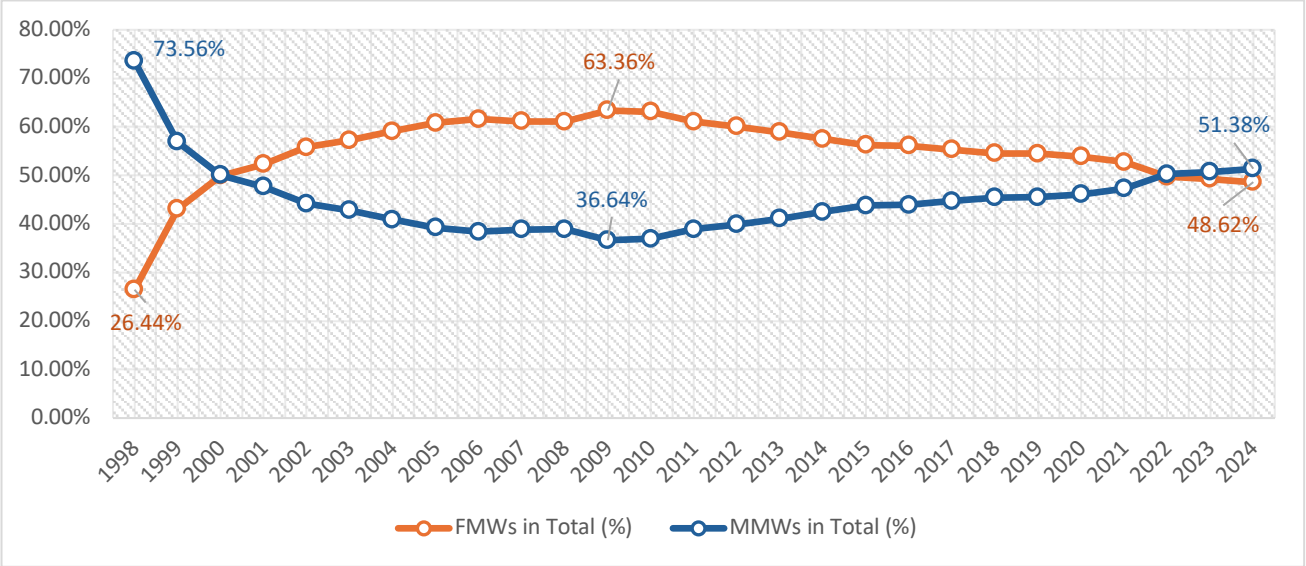
A closer intersectional examination of migrant labour distribution reveals a clear feminisation of migrant labour across dimensions of sector, sex, and nationality. Stark gender differences emerge in sectoral concentration: over 70% of MMWs in productive industries, while nearly 100% of FMWs are employed in social welfare sectors. When examining sectoral distribution by nationality, Vietnamese workers comprise the largest share in productive industries at 40.44% (197,567 individuals), whereas Indonesian workers dominate overwhelmingly in social welfare sectors at 79.15% (165,803 individuals) (see Figure 2). These patterns suggest distinct pathways that align specific groups of workers with particular sectors based on both their gender and country of origin.

Taiwan's demographic realities, marked by growing women's participation in the formal workforce (rising from 46% in 2000 to 51.8% in 2024), rapid population ageing (projected to become a 'Super Aged Society' by 2025), and persistently low fertility rates (below replacement level since the 1990s),

[10] Feminised migration refers to the demographic trend where women constitute a significant or increasing proportion of migrant flows, while the feminisation of migrant labour describes the concentration of FMWs in specific sectors, particularly care work, domestic services, and other traditionally gendered occupations.

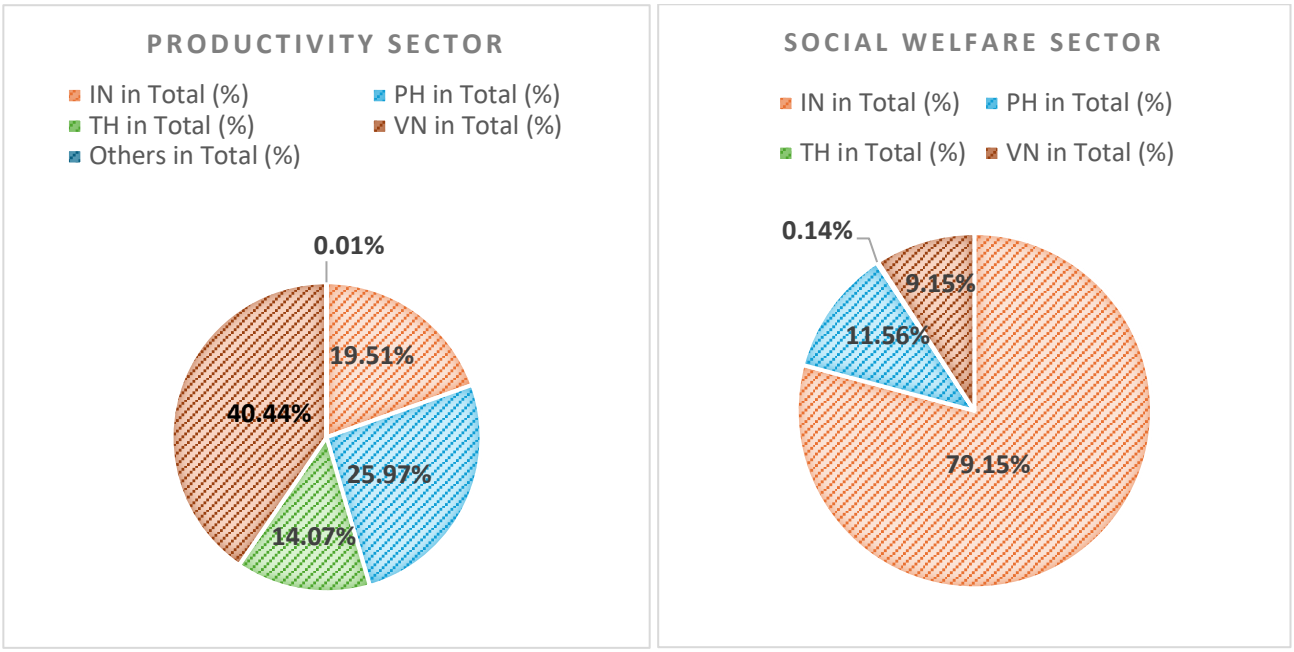
combined with traditional societal norms that assign care responsibilities primarily to women, directly contribute to the formation of these gendered migration patterns (National Development Council 2024). In this context, migration has become a solution not only for general labour shortages but also for addressing care gaps in dual-income households and providing live-in support for the elderly and chronically ill, particularly given the decline in multi-generational living arrangements and insufficient long-term care services (Lan 2003a, 2003b, 2022; Chien 2018). This evolving demographic landscape intensifies reliance on MWs, particularly women, to fill care-related roles, further entrenching the feminisation of Taiwan's migration framework.

Figure 1. Migrant Population in Taiwan by Sex (%) from 1998 to July 2024



Source: Data for 1998-2009 from Labor Statistics Information Services (MOL), available at: https://statdb.mol.gov.tw/statiscla/webMain.aspx?sys=100&kind=10&type=1&funid=wqrymenu2&cparm1=wq64 (accessed 23 August 2024); data for 2010-2024 from MOL (2024), available at: https://statdb.mol.gov.tw/html/mon/c12060.htm (accessed on 23 August 2024). Note: Data for 2024 reflects figures through July 2024. Population figures include employed, unemployed, and missing MWs.

Figure 2. Migrant Population in Taiwan by Sector and Nationality (%) in July 2024



Source: MOL (2024), available at: https://statdb.mol.gov.tw/html/mon/c12030.htm (accessed on 23 August 2024). Note: Data for 2024 reflects figures through July 2024. Population figures include only employed MWs.

The Challenges Faced by Migrants in Taiwan

Although migration has become integral to Taiwan's labour market and cultural diversity, challenges related to assimilation, integration and basic protection of MWs continue to plague the system (Wang 2011; Tsay 2016; Lopega 2017; Deng, Wahyuni and Yulianto 2020). These challenges are characterised by inadequate legal safeguards, insufficient social support, and underdeveloped public discourse surrounding migrant rights and welfare (Lopega 2017; Chien 2018; Deng, Wahyuni and Yulianto 2020; Lin 2023), reflecting broader structural inequalities that position MWs as temporary economic inputs rather than individuals deserving of fundamental rights and protections.

From a policy perspective, Taiwan's 'guest worker regime[11] primarily channels low-skilled MWs into 3D sectors—jobs characterised as dirty, dangerous, and difficult or demeaning—under a temporary and supplementary framework (Cheng 2016; Rich et al. 2022; Hioe 2023). While originally designed to protect its domestic workers' employment opportunities and address public concerns about overcrowding, crime, and cultural preservation, this approach has been criticised for effectively excluding MWs from basic labour rights and even pathways to permanent residency or citizenship (Wang 2011; Cheng 2016; Tsay 2016; Lopega 2017;

[11] A guest worker regime is a temporary labour migration system that permits foreign workers to enter a country for specific jobs and limited periods, typically without providing pathways to permanent residency or citizenship. In Taiwan's case, this system allows foreign workers to fill specific labour shortages for predetermined periods (typically 3 years, with renewal options) without offering pathways to permanent residency, citizenship, or family reunification.

Deng, Wahyuni and Yulianto 2020). This exclusionary framework creates significant legal disparities. For instance, MWs in social welfare industries remain outside the protection of the Labor Standards Act, which covers all domestic workers and even MWs in productive sectors. Such differentiated protections generate numerous work disputes concerning working hours, minimum wages, and workplace abuse, leaving MWs increasingly vulnerable in an already precarious situation (Tsay 2016; Chien 2018; Deng, Wahyuni and Yulianto 2020).

Beyond policy exclusion, MWs often face exorbitant fees charged by labour brokers for recruitment and placement services, which subsequently plunge them into debt before their employment even begins (Wang 2011; Lopega 2017; Chien 2018, 2019; Lin 2023). This is particularly severe in Taiwan, where most MWs and employers heavily rely on labour brokers for administrative issues throughout the migration process. According to Transparentem (2024), Vietnamese workers face steep charges which can reach more than USD 5,000 before migration[12]. This financial burden creates a vicious cycle of debt and exploitation, trapping many MWs in debt bondage and precarious financial conditions (Alffram et al. 2023).

In addition to economic exploitation, MWs frequently face stigmatised representations in mass media, steeped in prejudice and stereotypes that marginalise migrant communities and perpetuate harmful biases (Cheng 2016; Rich et al. 2022). Furthermore, Taiwan's migration corridors primarily connect to Southeast Asian countries whose languages, lifestyles, religions, and cultures differ significantly from Taiwan's. These cultural differences, particularly evident amongst live-in caregiving workers, can lead to conflicts between MWs and employers, with some cases resulting in physical and sexual abuse against FMWs in this sector (Pan and Yang 2012).

Amongst these challenges, the most marginalised segments of the migrant population—particularly FMWs in domestic and care sectors—face compounded discrimination due to the intersection of gender and migrant status. These workers, predominantly Indonesian women in live-in caregiving roles, experience heightened risks of sexual harassment and violence due to the isolated nature of their work (Pan and Yang 2012). In addition, the commodification and sexualisation of FMWs, partly influenced by cross-border marriage patterns, create additional vulnerabilities. Unfortunately, while some women migrate to escape gender-based violence in their home countries, they often encounter further exploitation abroad. Their migration decisions, though appearing to exercise agency, are frequently driven by dire economic conditions—limited job prospects and low wages—that leave them vulnerable to human rights violations and systemic exclusion from full societal integration in Taiwan (Lan 2003a, 2003b; Pan and Yang 2012; Lian, Rahman and Alas 2016; Lin 2023).

Unravelling the Gendered Dynamics in Migration Through Migrant Remittances

[12] MWs in productive sectors earn an average of USD 1,080 monthly (TWD 33,000, based on MOL annual report on migration management). This gross figure, before deducting broker fees, health and labour insurance, and taxes, demonstrates the significant burden of USD 5,500-6,000 pre-migration charges faced by Vietnamese workers.

Beyond these systemic challenges, understanding Taiwan's migration landscape requires examining the deeper gendered dynamics that shape both migration decisions and ongoing transnational connections. While the previous discussion highlighted how Taiwan's guest worker regime creates structural vulnerabilities—particularly for FMWs—the patterns of who migrates and why reveal more complex underlying forces that extend beyond Taiwan's borders.

Although globalisation theories emphasise economic factors through push-and-pull frameworks that typically drive migration flows from South to North, developing to developed countries, and unskilled to skilled sectors (Asis and Piper 2008; Lian, Rahman and Alas 2016; Deng, Wahyuni and Yulianto 2020), migration patterns in Southeast Asia both align with and deviate from these conventional models. For instance, in countries like Sri Lanka and the Philippines, migration policies and systems actively encourage female migration, particularly in domestic work sectors (Lian, Rahman and Alas 2016; Hennebry et al. 2019; Yeoh 2021; Eugenio 2023). This trend not just demonstrates institutional intervene rather than patterns naturally shaped by market forces but also underscores the importance of adopting a transnational perspective that examines both micro- and macro-level dynamics, focusing on how MWs' origin communities shape decision-making and how MWs maintain or reshape identities through continuous transnational interactions (Meyer and Ströhle 2023).

In Taiwan's context, the gender composition of migrant labour appears more heavily influenced by the cultural and social contexts of source countries than previously recognised, as evidenced by the persistent patterns in migrant labour distribution by nationality (see Figure 2). However, existing literature still lacks a comprehensive understanding of these dynamics, particularly regarding how gender intersects with transnational practices and economic behaviours amongst Taiwan's migrant population.

One crucial yet underexplored avenue for understanding these gendered transnational dynamics is through migrant remittances, here specifically referring to monetary and material transfers made across borders to MWs' origin communities. Remittances serve as vital mechanisms sustaining transnational connections and identities while reflecting broader patterns of gender, economic agency, and social responsibility (Rahman and Fee 2012; International Organisation for Migration 2019; Meyer and Ströhle 2023). In Taiwan, the introduction of 'Small-Amount Remittance Servies for Foreign Migrant Workers (SARSs)' in 2021 provides unprecedented opportunities to examine these patterns systematically.

The scale of remittance activity in Taiwan is substantial and growing rapidly. According to the Financial Supervisory Commission of Taiwan, migrant remittances through SARSs reached TWD 63 billion (approximately USD 1.96 billion) in 2023 across 6.09 million transactions, demonstrating a substantial increase from TWD 23.7 billion (approximately USD 0.74 billion) in 2022 with 2.64 million transactions[13]. While these figures only represent one transaction option (SARSs) in Taiwan, with other two legal channels—banks and labour brokers (on behalf of MWs to conduct transactions through banks)—remaining unexplored, not to mention the informal channels that likely prevail amongst MWs.

Despite these data limitations, the sheer volume of documented transactions

[13] Based on Financial Supervisory Commission of Taiwan, foreign workers can remit up to TWD 400,000 (approximately USD 12,416) annually and TWD 30,000 (approximately USD 931) monthly through SARSs.

suggests that remittances represent a significant economic practice that warrants gendered analysis. The patterns of who sends money, how much, how frequently, and through which channels may reveal important differences in how MMWs and FMWs navigate financial responsibilities, maintain family connections, and exercise economic agency within Taiwan's restrictive migration framework. Understanding these gendered remittance behaviours could illuminate how FMWs, despite facing heightened vulnerabilities as domestic and care workers, potentially demonstrate forms of transnational economic empowerment that challenge assumptions about their agency and decision-making power.

However, the absence of sex-disaggregated data in SARSs historical records represents more than a simple data gap. It reflects a fundamental oversight in how Taiwan conceptualises and monitors migrant economic behaviours. Given that FMWs constitute nearly 100% of social welfare sector workers and face distinct vulnerabilities related to isolated work conditions and limited legal protections, their remittance patterns likely differ substantially from those of MMWs in productive sectors. The current data collection framework, which aggregates all migrant remittances regardless of gender, obscures these potentially critical differences and renders invisible the economic strategies that FMWs employ to navigate structural constraints.

This institutional invisibility is particularly significant given the chapter's documented patterns: the stark feminisation of Taiwan's migration flows, the near-complete concentration of FMWs in isolated care work, and their heightened exposure to structural vulnerabilities ranging from policy exclusion to debt bondage. If remittances indeed represent forms of transnational economic agency—as the scale of activity suggests—then understanding how FMWs navigate financial responsibilities and family obligations through these transfers becomes crucial for comprehending how gender shapes not only migration decisions but also ongoing transnational connections. The absence of sex-disaggregated remittance data thus represents a critical methodological barrier to understanding whether and how FMWs exercise economic agency within Taiwan's restrictive migration framework, and whether their remittance practices reveal alternative forms of empowerment that challenge dominant narratives of victimisation and vulnerability.

Conceptual Foundations and Theoretical Framework

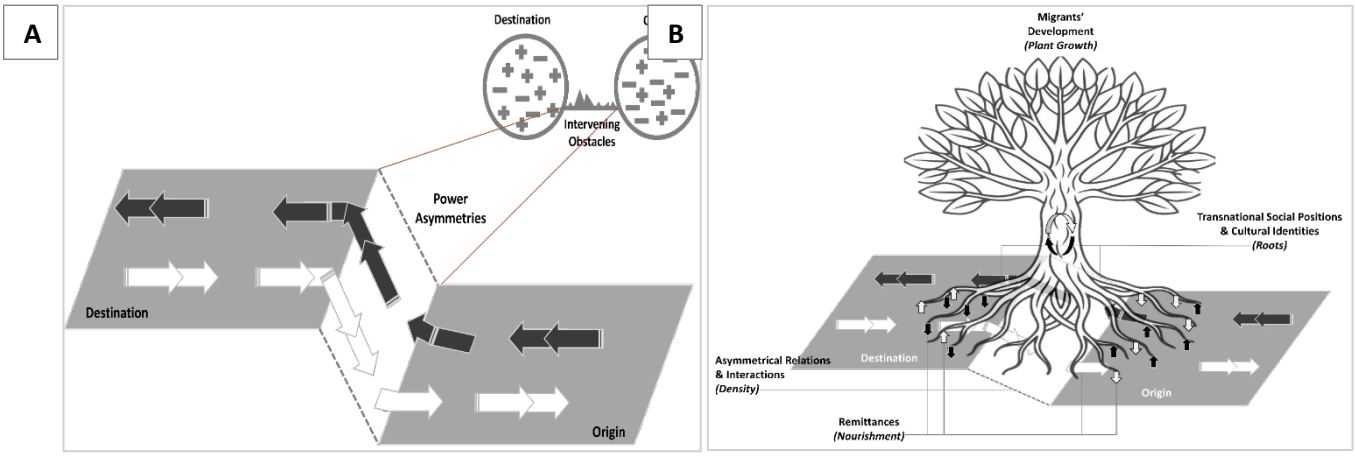
This research examines how FMWs' remittance practices both respond to and reshape gendered transnational power dynamics. Understanding these dynamics requires moving beyond traditional economic analyses of remittances to examine how monetary transfers function as social practices embedded within complex power relations that span national boundaries. The study employs a novel 'Hierarchical Social Terrain' framework that conceptualises remittances as 'nourishment' flowing through asymmetrical social hierarchies, creating circular patterns that potentially reinforce the feminisation of migrant labour over time.

Hierarchical Social Terrain is built on Lee's (1966) Push-Pull Theory and Meyer and Ströhle's (2023) conceptualisation of remittances as agents of social change. This study proposes the Hierarchical Social Terrain (see Figure 3). The framework employs an agricultural metaphor to

visualise transnational migration as a dynamic ecosystem where remittances function as 'nourishment' circulating through social hierarchies, simultaneously sustaining individual MWs and broader social structures. In this framework, Lee's original Push-Pull Theory provides the foundational understanding of migration flows as responses to positive and negative factors in origin and destination contexts, with intervening obstacles creating varying degrees of difficulty for different populations. However, this framework requires adaptation to capture the multidirectional and recursive nature of remittance flows. While migration typically flows from origin to destination, remittances create counter-flows of resources, ideas, and social influences that reshape the very conditions that initially motivated migration.

Figure 3. The Adaptation of Lee's (1966) Push-Pull Theory to Transnational Remittance Flows Across Varied Transnational Terrain (A) and The Hierarchical Social Terrain Framework (B)

Figure 1. The Adaptation of Lee's (1966) Push-Pull Theory to Transnational Remittance Flows Across Varied Transnational Terrain (A) and The Hierarchical Social Terrain Framework (B)



Beyond the Push-Pull framework, the Hierarchical Social Terrain framework also integrates three key concepts—integrated by Meyer and Ströhle's (2023)—from contemporary migration literature to provide analytical depth. The first and most fundamental one is Carling's (2014) 'Remittance Scripts', which provides the framework's understanding of how social expectations structure remittance practices. These scripts encompass the cultural narratives, family obligations, and community norms that influence how, when, why, and to whom remittances are sent. For FMWs, these scripts often involve complex negotiations between traditional expectations about women's roles as caregivers and emerging identities as primary economic providers. The scripts are not deterministic but represent negotiated frameworks that MWs both conform to and potentially reshape through their practices.

Followed by the Remittance Scripts is Levitt's (1998) 'Social Remittances', which expands the framework's scope beyond monetary transfers to include the circulation of ideas, behaviours, identities, and social capital that MWs acquire abroad. These non-monetary flows can be equally significant in reshaping social hierarchies and gender relations. FMWs may transmit new concepts

about women's autonomy, family planning, or economic decision-making that gradually influence social norms in origin communities. Social remittances flow through the same pathways as monetary transfers but may have different temporal patterns and social impacts.

The final one is Meyer and Ströhle's (2023) analysis of 'being' and 'becoming', drawing on the arguments of Levitt and Schiller (2004), provides insight into how MWs negotiate between normative expectations and individual agency within transnational contexts. This concept captures the dynamic process through which MWs develop new subjectivities while maintaining connections to origin communities. For FMWs, 'becoming' often involves complex negotiations between empowerment through economic success and persistence of gendered expectations about care and family responsibilities. The process of becoming is neither linear nor uniform, reflecting the varied ways in which individual agency intersects with structural constraints.

Drawing these theoretical insights together, the agricultural metaphor serves as more than illustrative device, which provides analytical structure for understanding how remittances operate within social systems. Like nutrients in soil, remittances circulate through social networks, facilitating growth in some areas while potentially depleting others. This circulation follows patterns of density and accessibility, moving from areas of high concentration to those with lower levels, but also creating feedback loops that can alter the underlying social terrain over time.

Circular Dynamics and Feedback Loops

This framework operates on three interconnected levels that mirror natural ecological processes. The first level, termed Migrants' Development, represents individual migrant experiences, identity formation, and empowerment through remittance practices. Like plants growing towards optimal conditions, MWs develop new forms of agency and social positioning through their transnational experiences. This 'growth' encompasses not only economic advancement but also shifts in social capital, cultural identity, and personal autonomy. FMWs, in particular, may experience complex forms of growth that simultaneously challenge and reinforce traditional gender roles.

The second level, Transnational Social Positions, depicts how MWs navigate asymmetrical power relations across origin and destination contexts. These social positions function like root systems that represent the social scripts, family obligations, and gendered expectations channelling remittance flows into particular directions. These root systems are not static but adapt and extend based on changing conditions, creating new pathways for resource circulation. For FMWs, these root systems often reflect gendered care responsibilities that persist across transnational spaces.

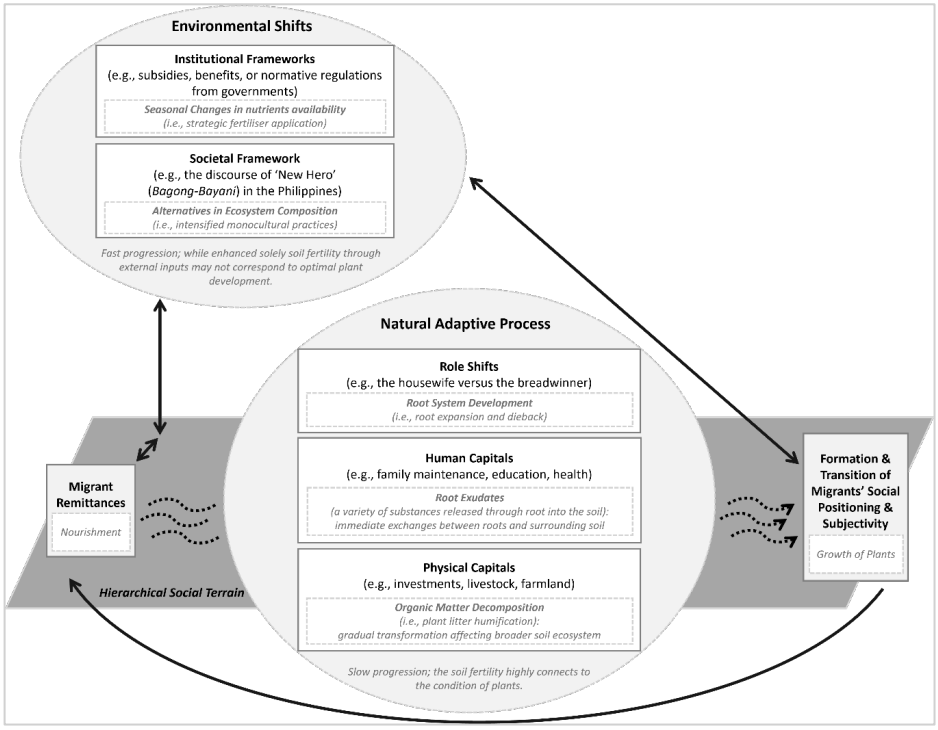
The foundational level, Asymmetrical Relations, shows how structural inequalities create gradients that facilitate or constrain remittance flows. This terrain density reflects how areas of higher concentration represent positions of greater social capital, economic opportunity, or cultural privilege, while lower density areas indicate structural constraints or disadvantages. These asymmetries shape both the direction and intensity of remittance flows, creating predictable patterns while simultaneously generating pressures for change within the transnational social terrain.

The interaction between these three levels generates the framework's central insight: remittances create circular patterns rather than simple linear transfers. As MWs send resources through their transnational social positions in response to existing asymmetrical relations, they simultaneously begin to reshape those very asymmetries, creating new possibilities for individual development. This circularity unfolds through two complementary processes that operate across different temporal scales.

Across these interconnected levels, these processes manifest through two distinct but interconnected mechanisms: Environmental Shifts and Natural Adaptive Processes (see Figure 4). Environment Shifts, on the one hand, represent institutional and structural changes that affect migration patterns and remittance flows. These encompass policy modifications, bilateral agreements, technological innovations in financial services and/or infrastructures, and changes in labour market demands. In Taiwan's context, the introduction of SARSs in 2021 exemplifies how institutional shifts can alter remittance landscapes by reducing transaction costs and improving accessibility. Environment Shifts tend to create rapid changes that affect the external conditions of migration but may not necessarily transform underlying social relations or power structures. Natural Adaptive Processes, on the other hand, encompass grassroots changes in social norms, family structures, gender expectations, and community practices driven by successful remittance practices over time. These processes unfold more gradually but may have deeper transformative effects on social hierarchies. When FMWs consistently demonstrate economic success through remittances, they may gradually alter expectations about women's roles and capabilities within their origin communities, creating new templates for subsequent generations. The interaction between Environment Shifts and Natural Adaptive Processes creates 'remittance feedback loops', in which successful remittance practices encourage similar migration decisions amongst other women, gradually reinforcing the feminisation of specific migration pathways while also creating conditions for social change within both origin and destination contexts.

The framework provides particular analytical leverage for understanding the experiences of FMWs within Taiwan's care economy. The concentration of FMWs in domestic and care sectors creates what can be conceptualised as 'monocultural practices' within the migration system, which are specialised pathways that maximise economic efficiency but create vulnerabilities through reduced diversity and increased dependency on specific labour markets. This gendered channelling operates through multiple levels of the social terrain simultaneously. At the structural level, bilateral agreements and recruitment practices create institutional pathways that Favor women for care work while directing men toward productive industries. At the social level, cultural expectations about women's 'natural' caregiving abilities reinforce these channelling processes through the operation of remittance scripts that valorise women's care-related migration. At the individual level, women's remittance successes create positive feedback loops that encourage similar migration decisions among other women in their social networks, perpetuating the concentration of female labour in specific sectors.

Figure 4. The circular impact chain of migrant remittances across the migration landscape



The framework illuminates how remittance practices can simultaneously empower and constrain FMWs within these circular dynamics. Women may gain unprecedented economic agency through their ability to send substantial remittances, challenging traditional gender hierarchies within their families and communities while demonstrating forms of 'becoming' that transcend conventional role expectations. However, their success may also reinforce essentialised notions of women's caregiving responsibilities and create pressure for continued migration in care sectors rather than diversification into other economic opportunities, illustrating how empowerment and constraint can operate simultaneously within the same social terrain.

These complex dynamics, characterised by simultaneous empowerment and constraint, necessitate sophisticated analytical approaches that attend to multiple temporal-spatial scales. Short-term individual experiences of empowerment or constraint must be understood within longer-term patterns of social change and structural reproduction. Similarly, local experiences within specific households or communities must be connected to broader patterns of labour market segmentation, policy frameworks, and cultural transformation. The framework suggests that effective analysis must attend to both visible and invisible flows within transnational social networks. While monetary remittances are easily quantified, the circulation of social remittances and the gradual transformation of gender expectations may be equally significant for understanding long-term impacts on the feminisation of migration, requiring methodological approaches that can capture both immediate experiences and emergent social patterns across the interconnected levels of the social terrain.

2. LITERATURE REVIEW

The Feminisation of Migrant Labour in Southeast Asia

Historically, Asia has long been a central hub of migration, with colonial rule introducing new dimensions to population movements (Hugo 2005; Lian, Rahman and Alas 2016). Post-colonial Asia saw the rise of temporary labour migration, enabling people to move from the region to various global destinations (Hugo 2005; Asis and Piper 2008; Lian, Rahman and Alas 2016). A notable consequence of this shift has been the rising participation of women in the global labour market, a trend that became particularly evident after the 1980s (Siddiqui 2008; Lian, Rahman and Alas 2016; Yeoh 2016, 2021). The feminisation of migrant labour has been driven by multiple pull factors in destination countries, including growth in manufacturing, the indigenisation of certain employment sectors, greater participation of women in formal labour market, demographic changes, and increased demand for women-specific jobs; concurrently, push factors from origin countries – such as limited personal development opportunities, increasing male unemployment, and socio-political conditions such as the imposition of martial law in the Philippines in the 1970s—have further fuelled this trend (Parreñas 2001; Piper 2008; Siddiqui 2008; Yeoh 2016, 2021). While these push-pull dynamics primarily reflect intra-Asian migration patterns, similar power dynamics can also be observed globally.

However, even within similar contexts, not all countries in broader Asia exhibit identical trends in feminised migration. For instance, South Asian countries such as Nepal, India, and Bangladesh have relatively low numbers of FMWs, constrained by social norms and limited data collection on migration (Siddiqui 2008). Conversely, countries like Sri Lanka, Indonesia, and the Philippines have a higher proportion of FMWs due to earlier participation in the migration labour market, supportive government policies, and strategic development programmes (Parreñas 2001; Siddiqui 2008; Yeoh 2016, 2021). In particular, the Philippines stands out for its pioneering legal frameworks, such as the Labour Code of 1974 and the establishment of the Commission on Filipinos Overseas in 1980, which have been instrumental in safeguarding its migration workers. The Philippines was also the first Asian country to implement legal protections specifically designed for its migrant population (Asis 2008).

Given the political, economic, and societal factors at play, Southeast Asian countries have become key contributors to the phenomenon of feminised migration (Lian, Rahman and Alas 2016; Yeoh 2016, 2021). The latest United Nations migrant stock database further supports this observation, showing that while Southeast Asia as a region may not have the highest global proportion of FMWs, several countries within it lead Asia in female migrant proportions (United Nations Population Division 2020).

Nearly half of the migrants in the region of Southeast Asia are female, where it stretches over 11 countries, including Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic (Laos RDP), Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste and Viet Nam. In certain periods (1990 to 2015), more than half of the region's migrants were female (United Nations Population Division

2020). The top five countries with the highest proportions of FMWs are Thailand (61.0%), Malaysia (56.7%), Laos RDP (55.9%), the Philippines (54.0%) and Cambodia (53.6%) (see Table 2)[14]. Four primary types of female migration within this region include: (a) typical migration of women as dependent spouses of male migrants both within and beyond Asia, (b) independent migration of women as students and professionals, (c) independent migration of women for labour, and (d) international marriage migration; notably, the latter two types have significantly shaped the current landscape of the feminisation of migrant labour in Asia, serving as strategies against restrictions on family unification policies, short-term rights of stay in receiving countries and limitations on personal development in countries of origin (Piper 2008; Brooks and Simpson 2013; Yeoh 2016, 2021; Bastia and Piper 2019; Siddiqui 2008).

Table 2. FMWs as Percentage of the International Migrant Stock by Region and Country of Origin, 1990-2020

Region, development group, country, or area	1990	1995	2000	2005	2010	2015	2020
By area of origin							
Asia	46.9	47	46.9	46.5	45.1	44.8	44.3
By region and country of origin							
Central Asia	51.8	51.6	51.7	51.3	50.8	51	51.4
Eastern Asia	49.1	49.7	50.6	51.4	52.4	52.7	53.5
Western Asia	48.1	47.3	46.2	45.7	45.3	44.9	44.8
Southern Asia	43.7	43	42.5	41.3	38.3	37.7	36.8
Southeastern Asia	50.5	51	51.3	50.9	50.2	50.3	49.5
Brunei Darussalam	40.7	40	39.9	41.3	41.5	42.4	43
Cambodia	50.8	50.8	51.3	52.6	52.7	52.9	53.6
Indonesia	41.5	43	44.3	44.5	44.3	44.1	44.3
Lao RDP	50.9	50.7	51.1	53	53.8	54	55.9
Malaysia	50.9	53.4	55.1	54.2	53.8	54.2	56.7
Myanmar	45.1	45.7	46.4	44.7	44.1	43.9	37.4
Philippines	58.9	58	57.3	56.3	54.2	53.9	54
Singapore	52.3	52.5	52.7	51.9	51.8	51.4	52.1
Thailand	60.6	62.2	62.9	63.6	63.3	62.2	61
Timor-Leste	47.4	49.6	49.8	47.1	45.7	44.8	44.9
Viet Nam	48.8	49	48.9	48.2	48.4	49.7	50.3

Source: International Migrant Stock, United Nations (2020), 'Data (Total, Origin)', available at: https://www.un.org/development/desa/pd/content/international-migrant-stock (accessed 15 August 2024). Note: the grey columns represent the four primary migrant source countries to Taiwan: Indonesia, The Philippines, Thailand, Viet Nam.

Identity, Roles, and the Influences of Asymmetric Status in Migration Through a Gender Lens

[14] Yet these statistics mainly reflect 'formal' and 'regular' migration channels, potentially overlooking a substantial number of MWs who travel through irregular and informal corridors, which are believed to constitute a significant proportion in this region.

Building on the understanding of feminisation of migrant labour from the previous section, these statistical patterns reveal deeper questions about how gender shapes both the structural positioning and lived experiences of FMWs. This is evident in the clear gendered division of labour amongst FMWs from Southeast Asia, who are predominantly concentrated in domestic work, caregiving, and nursing—sectors widely recognised as relatively low-paid and highly feminised (Rahman and Fee 2009; United Nations Women 2016; Yeoh 2016, 2021; Lan 2022). This division reveals broader societal, economic, and political structures within both destination and origin countries. For instance, female OFWs are frequently hailed as the nation's Bagong-Bayani [New Heroes] for their substantial economic contributions through remittances which in turn inspires other women in the Philippines to seek employment abroad (Hennebry et al. 2019; Yeoh 2021; Eugenio 2023). A similar dynamic exists in Indonesia, although a contradictory discourse of heroes versus victims persists concurrently (Chan 2014). In East Asian countries such as Singapore and Taiwan, migration could be served as a strategy to facilitate local women's participation in the workplace, helping them balance work and family obligations (Lan 2006; Yeoh 2016; Chien 2018; Liang 2023). This strategy stems from the Familialist Welfare Regime, where the family is seen as primary entity responsible for members' well-being, often placing this responsibility on women (Chien 2018; Yeoh 2021; Liang 2023).

The growing significance of feminised migration can be examined from multiple perspectives. Economically, FMWs are significant contributors to remittance flows, often sending a higher proportion of their earnings back home compared to male migrants (Jolly et al. 2005; Siddiqui 2008; IOM and Remittances Factsheet 2015). These financial supports play a crucial role in sustaining their households and communities, fostering local economies, and driving social development. Socially and culturally, the increasing feminisation of migrant labour highlights changing gender roles and expectations in both sending and receiving countries (Yeoh, 2016, 2021). However, FMWs also face unique challenges and discriminations, including gender-based violence, wage disparities, and limited access to social services (Pan and Yang 2012; Cheng 2016; Hennebry, Hari and Piper 2019; Rich et al. 2022). Despite these difficulties, migration can empower women by granting them financial independence and new social positions (Elmhirst 2002; Lian, Rahman and Alas 2016; Yeoh 2016; Hennebry and Williams 2021). Politically, the rise in FWMs has prompted governments and international organisations to re-evaluate policies for MWs, with a growing recognition of the need for gender-sensitive policies to protect MWs from exploitation and support their rights (ILMS Brief ASEAN 2020).

While significant gaps persist in understanding and supporting FMWs despite the aforementioned advancements. Data collection remains inconsistent, often failing to capture the full scope of women's migration experiences. Comprehensive policies are still needed to address the specific vulnerabilities of FMWs, such as legal protections against gender-based violence, human trafficking and exploitation, as well as access to healthcare and legal services (Pan and Yang 2012; Russell 2014; Lattof, Coast and Leone 2018; Tan and Kuschminder 2022). While some countries, like the Philippines, have developed relative comprehensive legal frameworks to support their OFWs, others lag in implementing effective measures. In Sri Lanka, for instance, where over half of the migrant population is female, policies have fluctuated between supporting women's participation and restricting it due to prevailing social norms, leading to unequal protection and support (Ueno 2013). In addition, societal norms and attitudes towards FMWs vary widely, impacting their integration and treatment in

both sending and receiving countries (Boyd and Grieco 2003).

The feminisation of migrant labour is a complex and multifaceted issue, reflecting broader economic, social and cultural changes. As Asis (2008) observed, the causes and effects of female migration were often assumed to mirror those of male migration. However, significant distinctions exist, particularly concerning motivations, expectations, and policy framework (Battistella and Conaco 1998; Jolly et al. 2005; Hennebry and Petrozziello 2019; Hennebry, Hari and Piper 2019), or even from an individual development perspective (Pearson and Sweetman, 2019). Understanding these distinctions requires recognising that migration transcends its role as a mere economic necessity; it is a dynamic process where identity, roles, and power structures shaped by asymmetric status—whether economic, social, or cultural—play critical roles (Weiss 2005; Carling 2014; Grabowska et al. 2017; Isaakyan and Triandafyllidou 2017). These asymmetries deeply influence how individuals perceive themselves, how they are perceived by others, and how they navigate their roles within transnational spaces. In the context of feminised migration, this understanding becomes particularly significant, as women are often more vulnerable in the process of 'becoming' MWs, facing additional constraints and opportunities that differ markedly from their male counterparts (Jolly et al. 2005; Pan and Yang 2012; Russell 2014; Lattof, Coast and Leone 2018; Tan and Kuschminder 2022).

For instance, for FMWs, identity is often negotiated against the backdrop of unequal power relations, where economic necessity, cultural expectations, and social status intersect (Parreñas 2001; Oishi 2005; Piper 2008; Constable 2009; Yeoh and Huang 2010). While FMWs may experience empowerment through enhanced financial autonomy, this empowerment is frequently constrained by broader societal norms and the structural inequalities being encountered (Bachan 2018; Chowdhory et al. 2022; Sufian et al. 2023). On one hand, sending remittances home may elevate a woman's status within her family, but on the other hand, it may also simultaneously reinforce traditional gender roles that expect her to prioritise family needs over her own aspirations. This tension between empowerment and limitation illustrates the complex ways in which identity and roles are shaped within migratory contexts.

The roles that FMWs assume in destination countries can further entrench or challenge existing power dynamics, especially when viewed through the lenses of feminised migration and the gendered division of labour (Piper 2008). Domestic work and caregiving, the sectors where many FMWs are employed, are often undervalued and associated with lower status (Chien 2018; Lan 2022; Liang 2023). This reinforces the hierarchical divisions that already exist within both local and transnational spaces. However, these roles also provide opportunities for renegotiating power dynamics, such as by acquiring new skills, engaging in advocacy, FMWs can contest the social and economic hierarchies that marginalise them. Meanwhile, cultural asymmetries further shape identities (Bhabha 1994; Ong 1999; Anthias 2001; Vertovec 2001; Levitt and Glick Schiller 2004). FMWs often straddle multiple cultural contexts, leading to hybrid identities that challenge simplistic categorisations. In many cases, FMWs adopt new cultural practices from their host countries while simultaneously reinforcing certain traditional values from their countries of origin. This fluid navigation between cultures can both empower and constrain, as FMWs must constantly negotiate their identities in ways that align with or resist dominant narratives imposed by their communities or host societies. Hence, migration, through a gender lens, is a process where identity formation, power

dynamics, and cultural influences are in constant negotiation.

The Potential and Implications of Migrant Remittances: A Gender Perspective

Migrant remittances are often regarded as a primary motivation for migration, serving as a significant contribution to both familial and national development (Kapur 2004; Miller and Ammendola 2005; Cohen 2005; Schiller and Fais, 2009). However, migrant remittances, same with migration itself, extend beyond economic significance (Cohen 2005; Levitt and Lamba-Nieves 2011; Meyer 2020), holding the potential to bridge social, political, and economic asymmetries by acting as transnational channels for redistributing resources and influences (Meyer and Ströhle 2023). This redistribution can reshape power dynamics within families, communities, and even across nations. For instance, remittances can empower marginalised groups by improving access to education, healthcare, and essential services, reducing vulnerability, and promoting upward social mobility; they may also enhance civic engagement, strengthen diasporic social networks, and provide seed capital for small businesses and community initiatives, thereby helping to reduce regional disparities (Weiss 2005; Carling 2014; Meyer and Ströhle 2023).

Remittance patterns often reflect the types and purposes of migration. In family-based migration strategies, debates typically revolve around how remittances are used, in which are either for human capital development (e.g., household maintenance, education, healthcare, and overall quality of life) or for physical capital investment (e.g., land, livestock, irrigation, businesses) (Rahman and Fee, 2009). Additionally, remittances can be categorised into two main types. One is 'family remittances', which is private funds sent to individual relatives in the country of origin, and the other is 'collective remittances', known as group-based contributions intended for community investment or humanitarian purposes (Goldring 2004). Notably, the relevance and attention of collective remittances has increased in recent years, particularly during global crises such as the COVID-19 pandemic, when remittance inflows surprisingly rose instead of declined (KNOMAD [World Bank Group] 2021; Dinarte-Diaz et al. 2022). This trend has been especially notable in regions with large diaspora communities, suggesting that remittances serve purposes beyond individual financial support, extending to broader community development and resilience.

Growing interest in remittances is largely driven by their scale and consistency. According to the KNOMAD [WORLD BANK GROUP] (2023), migrant remittance flows to Low- and Middle-Income Countries increased from USD 435 billion in 2016 to an estimated USD 669 billion in 2023, indicating nearly 55% growth over this period. This growth is anticipated to continue due to the increasing migrant population.

The scale of remittances becomes even more significant when viewed through a transnational lens. Take the Philippines as example, as one of the main migrant source countries of Taiwan, its inward personal remittances accounted for nearly 10% of its GDP (2023 figure, KNOMAD [WORLD BANK GROUP] 2024) (see Table 3). The actual value may be even higher, given that informal remittance channels often go unrecorded. Following this vein, discussions

often emphasis the meso- and macro-levels impacts of migrant remittances, including positive aspects like increased foreign currency reserves and stable fund flows, as well as potential negative effects such as increased inequalities between households with and without migrants, dependency on remittances, and potential price inflation (de Haas 2007; Rahman and Fee 2009; Cohen 2011).

Table 3. Inwards Personal Remittance Inflows amongst Taiwan's Migrant Source Countries (USD millions, %)

Taiwan's migrant source countries / Remittance Flows (USD millions)	2023	% of its GDP in 2023
Indonesia	14,467	1.1
The Philippines	39,097	8.7
Thailand	9,692	1.8
Viet Nam	14,000	3.2

Source: World Bank Open Data (2024), available at: https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT (accessed 1 August 2024).

While growing attention has been paid to the total volume of remittances, gender-based differences in remittance allocation, and control over their usage, there remains a notable gap in the literature concerning the micro-level impacts of remittances, particularly the gendered dynamics that emerge from feminised migration and labour. Existing research, nonetheless, mostly focuses on examining distinctions between male and female remitters in terms of their preferences for supporting human versus physical capital, the identity of recipients, and the role of gender in remittance management (Rahman and Fee 2009; Lopez-Ekra et al. 2011; Luna and Rahman 2019; Teye et al. 2023; Ullah and Chattoraj 2023; Teye, Awumbila and Keseboa Darkwah 2024), limited attention has been given to the personal and everyday experiences of MWs themselves.

To this point, existing studies indicate that FMWs are significant contributors to remittance flows and often remit a higher proportion of their earnings back home compared to male migrants (Jolly et al. 2005; Siddiqui 2008; IOM and Remittances Factsheet 2015). However, whether this pattern holds consistently across different regional and cultural contexts remains an open question, warranting further investigation. In the meantime, much of the existing literature, to date, has focused more extensively on the experiences of migrant wives (women who remain in the home country while their partners migrate). These studies explore how migration affects and, in some cases, empowers their lives through remittance inflows and the consequences of spousal separation (Lopez-Ekra et al. 2011; Green et al. 2019; Luna & Rahman 2019). From this lens, several areas of empowerment have been identified, including increased financial access and control, greater decision-making power in household matters, enhanced physical mobility, more independent living arrangements, and improved self-confidence tied to educational background (Lopez-Ekra et al. 2011; Luna and Rahman 2019, p. 325). Meanwhile, for

FMWs themselves, empowerment can manifest in different but equally significant ways, including economic sufficiency, financial independence, skill acquisition, and career advancement. These outcomes are often accompanied by a growing sense of personal agency, which may be supported by access to social networks, shifting gender norms, increased social capital, and opportunities for education, training, and self-realisation (Chowdhory et al. 2022). Nevertheless, these impacts unfold within more complex and multilayered migration contexts, influenced by a combination of institutional, societal, and personal factors. Government policies, family structures, cultural expectations, and the marital status of migrants all play crucial roles in shaping the outcomes of migration and remittance practices (Buchan 2018; Sufian et al. 2023). For this reason, further research is essential to unpack the nuanced and often overlooked gendered dimensions of remittances, particularly at the micro level of FMWs, where individual decisions, identities, and lived experiences intersect transnationally.

3. METHODOLOGY AND DATA

The research design combines quantitative surveys with qualitative interviews to capture individual experiences from an emic perspective. Research participants were Southeast Asian FMWs currently working in Taiwan who maintain regular remittance practices to their home countries and possess basic language skills in either English, Mandarin, or Taiwanese. This approach builds upon previous gender-focused migrant remittance studies in Taiwan (Lei 2016; Huang 2022), which each engaged 12 participants through purposive sampling for semi-structured interviews with Indonesian FMWs.

Data collection occurred from June to August 2024 through online surveys gathering demographic information and semi-structured interviews exploring five thematic categories. Participant recruitment utilised contacts with migrant networks and empowerment NGOs in Taiwan, including the Taiwan International Worker's Association[15] (TIWA, 台灣國際勞工協會), One-Forty[16] (台灣四十分之一移工教育文化協會), and others[17], with outreach also conducted via social media[18] and key migrant gathering locations[19]. Transcript analysis employed the Framework Method (Gale et al. 2013), which aligns well with our conceptual Hierarchical Social Terrain model. This method follows a logic of starting big to enhance flexibility and conceptual refinement throughout the analysis process. Using analytical software for consistency, we created broad initial codes based on the interview domains, then developed additional codes as themes emerged through an iterative process. This approach focused on ensuring coding reliability while identifying patterns across interviews that might reveal how gendered remittance practices both reflect and reshape transnational power dynamics. Ethical considerations were prioritised throughout, beginning with gatekeeper engagement and following comprehensive UCL research ethics committee approval and GDPR compliance.

This methodology enables us to investigate how the 'density gradients' described in our theoretical framework manifest in real-world contexts, and how FMWs navigate and potentially reshape these gradients through their remittance practices. By gathering perspectives from migrants currently engaged in these practices, the research provides insight into the lived experiences that link gendered remittance dynamics to broader patterns of labour feminisation, addressing our second research question regarding how these gender-specific dynamics contribute to the formation of feminised migrant labour in the Southeast Asia-Taiwan context.

[15] Taiwan International Workers' Association (TIWA) website: https://tiwa.org.tw/

[16] One-Forty website: https://one-forty.org/

[17] Other channels include: 1095, (壹零玖伍移民工文化協會) (https://1095.org.tw/), SEAT (南方時驗室) (https://www.facebook.com/seataichung/), KASAPI-Kapulungan ng Sammahang Pilipino (菲律賓外勞協會) (https://www.facebook.com/kasapi123?locale=zh_TW), Ikatan Pekeria Indonesia Taiwan (印尼勞工在台協會) (https://ipittaiwan31.blogspot.com/)

[18] Facebook group society: 挺移工 (TIG) https://www.facebook.com/groups/670185809780421

[19] Zhongli Station (桃園中壢火車站) and St Christopher's Church (台北中山北路聖多福天主堂)

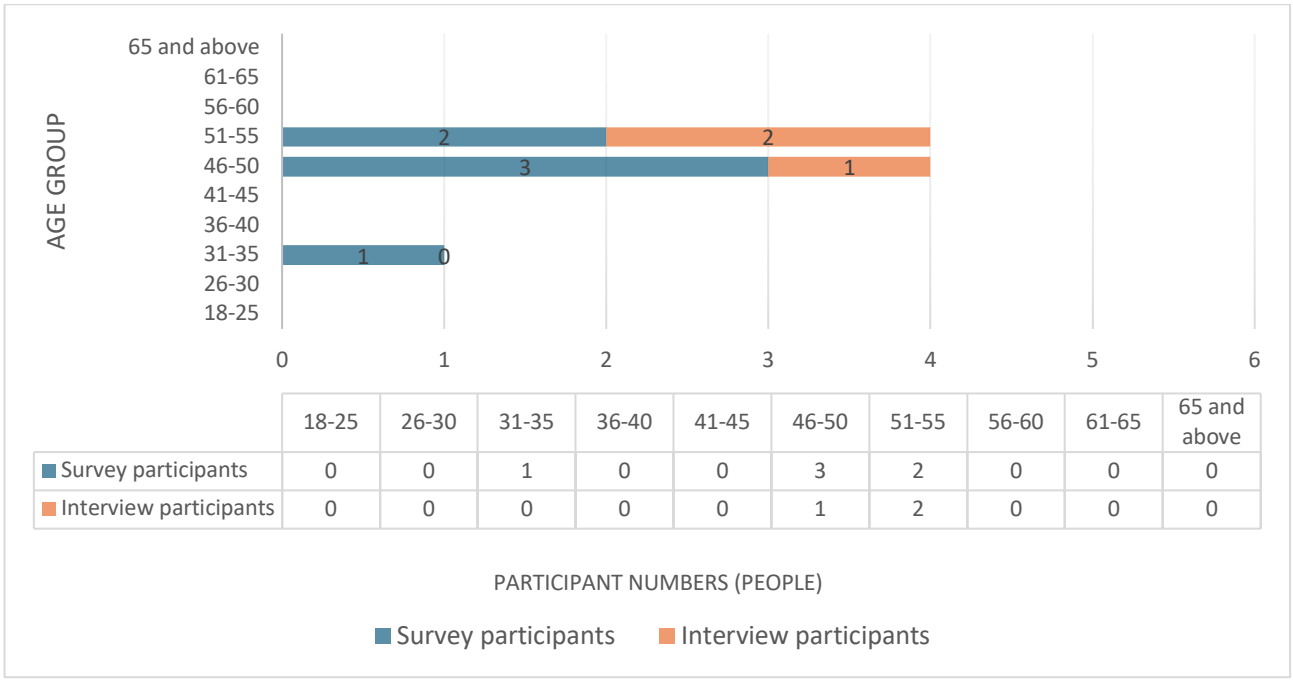
Research Data

This study engaged 21 Southeast Asian FMWs, comprising 18 Filipino, 2 Vietnamese, and 1 Indonesian participant. From this sample, 6 participants completed the quantitative survey, with 3 of these Filipino participants also proceeding to complete in-depth interviews. All interview participants were over 45 years of age (Figure 5) with intermediate English proficiency and were employed across different Taiwanese counties including Taipei (台北), Taoyuan (桃園), and Pingtung (屏東). The participants exhibited diverse educational backgrounds (Figure 6) but shared several demographic similarities. Most came from families with 4-5 siblings (Figure 7), typically occupying middle sibling positions. The majority had children, though not all were married (Figure 8 and Figure 9), with their children remaining in their home countries under extended family care. All interviewees possessed over 10 years of overseas work experience, primarily in caregiving roles.

Table 4. Purposes of Each Category and Corresponding Subsets of Interview Questions

Categories of Interview Questions	Subsets	Purpose
Working Overseas	(1) Motivations of working overseas (2) Cultural and social concerns behind the decision	To understand the driving factors behind individuals' decisions to work in a foreign country, including personal, professional and economic reasons.
Meaning of Remittance-Sending	(1) Personal significance (2) Impacts on relationship (3) Cultural and social significance	To delve into the significance of remittance-sending for individuals and their families and its broader cultural and social impacts.
Potential Impacts of Remittance-Sending	(1) Impacts on lives in both origin and destination countries (2) Personal development, and social and economic changes	To access the broader effects of remittance-sending on both the origin and destination countries, as well as on personal development and social change.
Relationship between Gender & Remittance-Sending	(1) Gender roles and expectations (2) Support and autonomy (3) Gender relations and networks (4) Control and use of remittances	To analyse how gender roles and expectations shape the experience and impact of remittance-sending.
Challenges in Remittance-Sending	(1) Challenges in both origin and destination countries (2) Financial systems, security and reliability (3) Advice for future improvement	To identify and address the obstacles and difficulties encountered in the process of sending remittances, including systemic and practical issues.

Figure 5. The Age Distribution of Research Participants



	18-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	65 and above
Survey participants	0	0	1	0	0	3	2	0	0	0
Interview participants	0	0	0	0	0	1	2	0	0	0

Figure 6. The Education Distribution of Research Participants

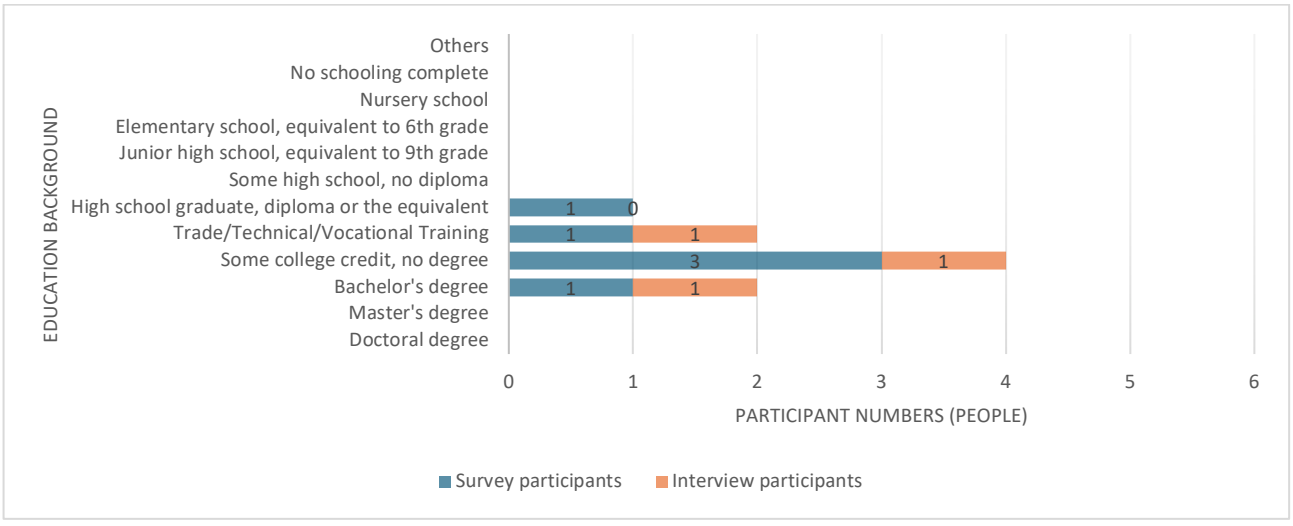


Figure 7. The Sibling Size and Birth Order of Research Participants

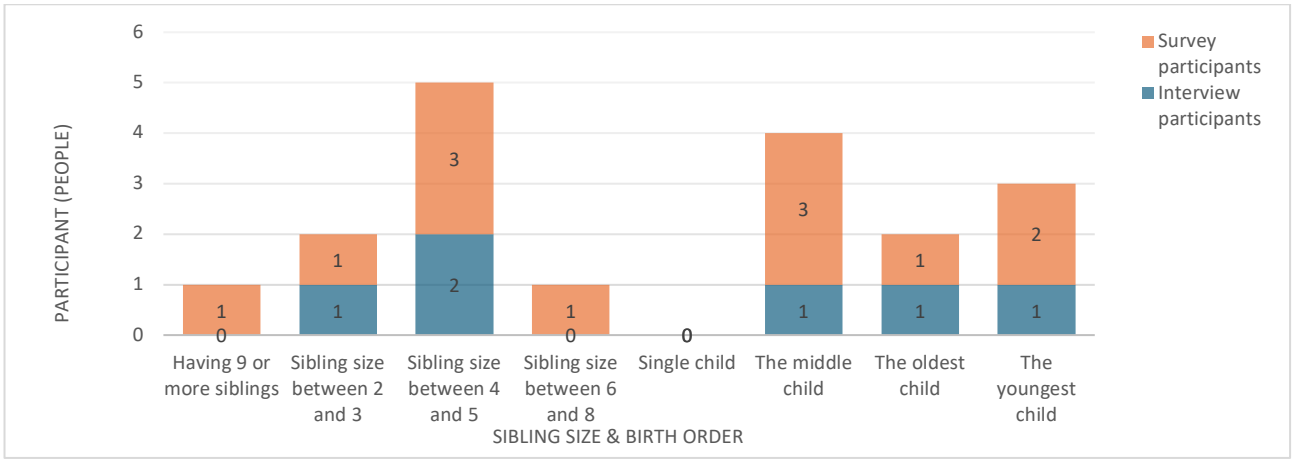


Figure 8. The Relationship Status of Research Participants

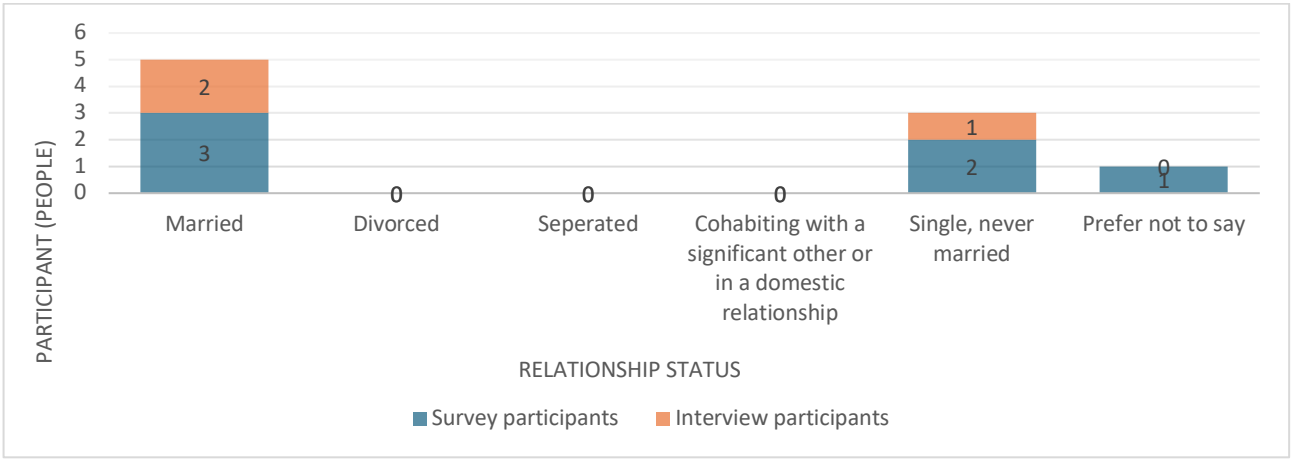
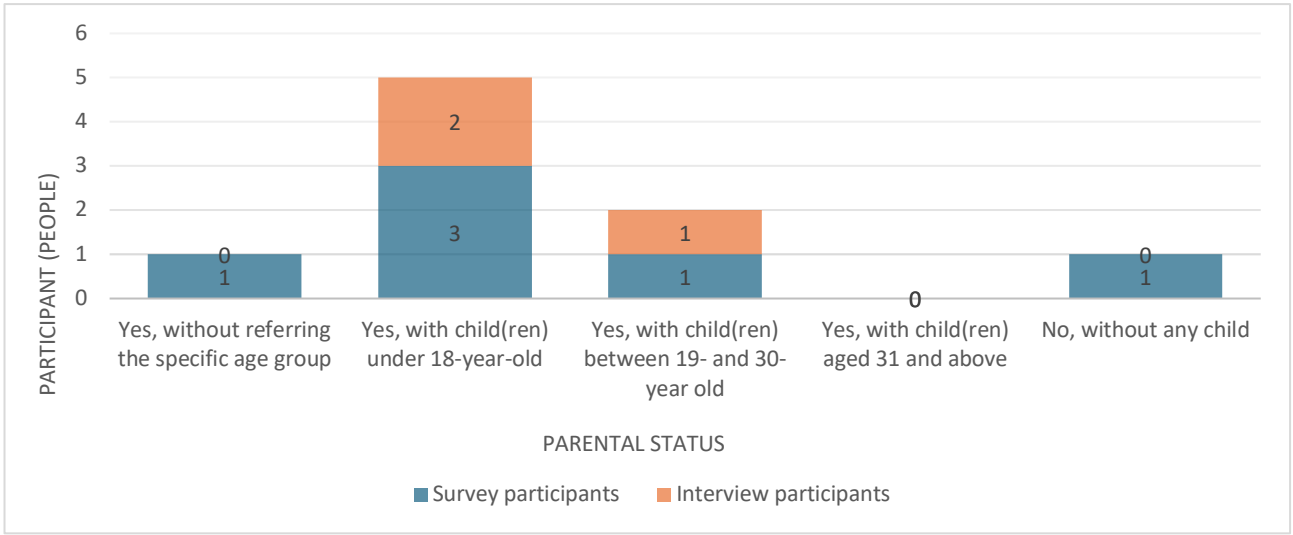


Figure 9. The Parental Status of Research Participants



4. FINDINGS

Sociocultural Motivations for Migration: A Gender Perspective

Lian, Rahman and Alas (2016) identity three primary migration motivations: (1) better salary, (2) better lives, and (3) having friends or relative already residing in the destination country. Economic necessity and stable livelihood prospects often drive migration decisions, aligning with the push-pull theory of limited domestic opportunities versus favourable foreign prospects.

A gendered perspective reveals additional complexities. Participants show a trend of reduced family size compared to their own sibship size, suggesting shifts in reproductive responsibilities. Caregiving duties are typically transferred to other female relatives rather than husbands during overseas employment. The roles of 'breadwinner' and 'mother' frequently intersect in their narratives, especially as women transition from self-exploration to becoming their families' main financial pillar.

CASE 1: SINGLE MOTHER WITH ONE SON – PARTICIPANT A

Participant A stands out due to her unique educational background. Her college major in computer science influenced her decision to work in Taiwan, drawn by the country's reputation in related industries. Unlike the other participants, she has the smallest sibship size, with only two siblings in total. After the passing of her oldest brother, she assumed the role of the eldest sibling in her family.

> 'My first working here in Taiwan is from the year 2004 to 2007, the time I was single. I just only trying to work other environment not in Philippines, just try to enhance my skills and ability working outside of my country.'

The evident social push force – a lack of stable job opportunities for women who have just given birth in the Philippines – led her to decide to work overseas again. During her first stint in Taiwan, between 2004 and 2007, she was single and childless. However, after returning to the Philippines, she gave birth and raised her child with her parents, which she described as a tough time:

> When the time I'm not working abroad, I felt guilty because I cannot help or share some amount to spend in our house. Because that time my son is just only two years old, I cannot work full time in Philippines, and only my parents is working, and not enough the money they earn for our daily life.

Language, differences in lifestyle, culture and religion are critical factors affecting migration decisions (Rahman and Kiong 2013). Many Western countries have integrated these aspects into mandatory courses for long-term stays or citizenship. However, these factors remain significant for short-term MWs, acting as a social pull factor that attracts individuals to certain destinations. As noted by Levitt (2001) and White (2021), similarities between sending

and receiving countries greatly influence migration mobility.

> 'The culture of Taiwan, Taiwan and Philippines are similar, especially in family culture, they share a little bit similarity between the Philippines and Taiwan. That's why I feel here just like at home, even though I am far away from my family.'

The ethnic, religious, and linguistic differences between the Philippines and Taiwan are notable. However, Filipinos might be less affected by these disparities compared to MWs from Viet Nam, Indonesia, or Thailand, due to their proficiency in English, which facilitates basic communication. This linguistic advantage helps mitigate some of the cultural and social challenges faced by other migrant groups.

> 'Usually, the modern Taiwanese are already speaking English. But the old age of Taiwanese people from 60s to 90s are not speaking English. So, I need to learn some Taiwanese so that to communicate and work with them.'

Additionally, her teenage son lives with her parents, while she also takes care of four other children belonging to her elder brother, who has passed away. However, her initial attempt to work overseas was not driven by the urgent need to raise her child. It was only during her second migration to Taiwan that this became a primary reason.

CASE 2: MARRIED WOMAN WITH ONE DAUGHTER – PARTICIPANT B

Taiwan was not Participant B's initial overseas work destination. Her survey response indicated incomplete formal education with only six months of vocational training. However, during the interview, she revealed having attended college without graduating. Financial constraints in her family led her to start working in her teens, cutting short her education.

> Oh, really, because way back to the 90s. I worked in Brunei already, yeah, but not too long, around one year, and then I go home. […] my mother said, 'You continue your study'. But it's too hard to continue studying. The money is not enough for food and clothes. [...] and then actually, I took college, but it's so hard. I did not finish my studies.

The economic and social factors became evident during the conversation with Participant B, as she frequently mentioned the higher salary in Taiwan and the affordability of daily essentials, such as food and vegetables.

> My motivation to work overseas is because in Philippines we cannot save enough money to feed our family, especially going to school. It's too hard for us to earn money. [...] Although it's so hard to live separately with your family but we have no choice.

I thought Taiwan is the safest country in Asia. [...] Here, another factor is the food and vegetables. It's similar to what we have in the Philippines, not too expensive. [...] The food and culture in Pingtung[20] is similar to the Philippines, especially about the weather. It's very hot in the same way.

Meanwhile, her teenage daughter lives with her elder sister rather than with her

[20] Pingtung county, the southernmost county in Taiwan, is characterised by its tropical monsoon climate and is well-known for its abundant agriculture and tourism.

husband, which resides in a different province, according to her.

CASE 3: MARRIED WOMAN WITH TWO SONS – PARTICIPANT C

Participant C has the longest employment duration in her current position, with about 20 years in caregiving. She left her undergraduate studies unfinished due to financial pressures, starting work to support her family. Her decision to work overseas was primarily driven by the need for a stable salary, safety, and affordable essentials.

> I just to work here because the salary is very higher than the salary in the Philippines. You know, the salary there is very low. And Taiwan is a very safe place. That's why I want to work here.

Unlike the two cases above, her two sons are already adults, though she did not specify where they live. Same with Participant A, she also mentioned taking care of her other siblings' children, as she believes she earns more money and has the capacity to help them.

The Meanings of Remittance-Sending

Migrant remittances have long been recognised as the most crucial factors influencing individuals' decisions to migrate (Stark 1991; Castles, Miller and Ammendola 2005; Cohen 2005; Schiller and Faist 2009). While economic push-pull factors are most evident, non-economic aspects of remittances, including social, technological, and political dimensions, are gaining attention (Levitt 1998; Lacroix, Levitt and Vari-Lavoisier 2016; Krawatzek and Müller-Funk 2020; Ali et al. 2024). This section proposes a framework examining the multifaceted nature of remittance-sending through FMWs' narratives, encompassing economic, cultural, transnational, and psychological values.

Economic Value

The economic value of remittance-sending is intuitive and clear-cut. This hierarchy is further supported and reflected in FMWs' own narratives. It underscores a more pronounced divide when compared to perspectives focused on social, cultural, or psychological aspects. The significant financial and economic disparities between sending and receiving countries, or between MWs and the families they leave behind, have inevitably shaped the form and trajectory or remittance flows.

> PARTICIPANT A: 'My mom, in her mind, she thinks we can live in the Philippines even we earn that small amount of money. I would tell them, what if I stay in the Philippines and I am not working here in Taiwan. Do you think I can help my brother's poor children? Do you think I can raise my child? I have to explain to my mother many times.'
>
> 'It's very important, I mean the remittances, especially to the Philippines' economy. The remittances of Filipino workers here in Taiwan is getting raised, and these could raise the economy in the Philippines because the tax we pay.'

PARTICIPANT B: 'What I have to say is to help other people, because some people in our country, not enough money for their children. And because we pay out tax, other people may be better off. [...] Yeah, to earn enough money so that I would not burden my daughter or my husband.'

'You can stay in the Philippines to earn money, even you did not work broad. But my own opinion is, if I did not work outside, my daughter, who can help my daughter to go to school? That's why I force myself to, oh, never mind, I can work abroad.'

PARTICIPANT C: 'It means a lot to me, because I can help my family. Because in the Philippines, the salary is very low, so I send money back. They can but what they want, and it helps a lot, like paying bills. That's very important. [...] My salary there is only 10,000 Philippine pesos (approximately $175). Here, my salary is about NTD 27,000 (approximately $830). It's three times difference.'

Social and Cultural Value

Beyond the economic impact of remittances, social and cultural norms shape how MWs engage in remittance-sending. These norms encompass the transfer of ideas, behaviours, social capital, and social expectations, such as gender roles, kinship, and obligation (Levitt 1998). Participants' narratives reveal a strong 'familialist welfare regime' (Chien 2018; Yeoh 2021; Liang 2023), emphasising concepts like 'responsibility' and 'coming back', reflecting Asian traditions of family reunions. The absence of mentions of public services like long-term care systems or children support in their home countries suggests an ingrained belief that caregiving is a family responsibility, aligning with norms in both their countries of origin and Taiwan.

One participant describes the 'New Heroes' (Bagong-Bayani) discourse in the Philippines as a 'toxic culture'. While this rhetoric recognises the importance of migrant remittances, it fails to address underlying issues, instead adding pressure on locals and perpetuating the trend of overseas work. The participant reflects on her experiences as an OFW:

'We can say, it's a toxic culture. That's what we call a Filipino toxic culture, family culture. Every time the Filipinos think that it's easy to earn money in other countries rather than in the Philippines. [...] Every time we get back to the Philippines, to have vacation, we are special. However, we did not feel that in a physical way. We did not see the tax, received by the Philippines' government, used for us. Just because, you know, the corruption.'

Nonetheless, all participants reveal their families do not pressure them to send money back, even though they are aware that some of their friends might be forced to do so. Even before working overseas, when they were employed in the Philippines or even when they were single, they routinely sent money to their families. In other words, remittance-sending can be seen as a reflection of close family ties, foregrounding individuals' perceptions of the operation and concept of family.

PARTICIPANT A: 'My parents never asking money from me to send to them. It's open, open heart. [...] I also raised my nephew and niece. [...] It's a big help for them as they are the poor kids of my eldest brother.'

PARTICIPANT B: 'Even before I still not get married. I mean, every month, this is

for my mother, and this is for my father, even for my eldest brother. Because I see it's so hard to live with very low salary.'

PARTICIPANT C: 'Even though I was working in the Philippines, I also sending money to my mother when I was not yet married.'

Gender and sibling roles are subtly reflected in the participants' narratives, albeit indirectly. Bratti, Fiore and Mendola (2016) have shown a positive correlation between larger sibship sizes and migration likelihood. With solely one participant having a sibling who also worked overseas, it is challenging to determine if sibship size influences migration decisions or if having multiple siblings abroad affects remittance patterns. However, the overall accounts suggest neither sibling order nor number significantly impacts remittance practices, nor does gender. Notably, the participants describe more equitable financial discussion within relationships, hinting at a potential shift away from traditional gender roles.

PARTICIPANT A: 'It's my responsibility to raise up them, because my eldest brother has passed away. In my mind, I am the breadwinner of the family.'

PARTICIPANT B: 'Sometimes my husband too, he asks me, will you please help me pay my electricity? Okay, I pay, but sometimes, no.'

PARTICIPANT C: 'Only one other sibling worked overseas before, but at this present time, no. [...] We have the same and similar pattern in sending remittances, because we are close family, and we love each other. So, we support each other.'

Transnational Value

The concept of transnationalism highlights how both origin and destination countries shape the experiences of MWs (Basch et al. 1994; Brettell 2015; Tedeschi, Vorobeva and Jauhiainen 2022; Meyer and Ströhle 2023). In the context of remittance-sending, transnational value emerges from the connections and sacrifices FMWs navigate between these two spheres. This is particularly relevant in Asia, where many migration regimes, like Taiwan's guest worker regime, promote temporary migration, making 'return migration' or 're-migration' the ultimate goal for most MWs. Exploring these dynamics through remittances offers insights into how MWs envision their eventual return.

PARTICIPANT A: 'My family told me that I have worked long time in Taiwan. They said that 'You don't need to work very long in Taiwan. You need to spend time here with your child.'

PARTICIPANT C: 'My family know I work hard here for the money, so they would always use the money in a nice way. [...] Even my sons and my husband, we are not together, but the salary from me combines us together.'

For two participants with teenage children, education is a critical investment, not only for their own children but also for their extended families. One participant highlighted the professional achievements of her relatives' children reflecting the importance placed on education and aspirations for the next generation.

PARTICIPANT A: 'My first niece will graduate this year in college. That's also an encouragement for me. [...] to see my nephew and niece, because of my money, my remittance back to the Philippines.'

PARTICIPANT B: 'Now I transfer my daughter from public school to private school. The monthly tuition is 3300 Philippine pesos, but now it's 24,500 Philippine pesos. The classroom has 36 or 46 people inside before, but in private school, I think it's only 19 or 20 or so. [...] In public school, there is only one teacher and no computer, so it's too late, yeah?'

'My second brother has two kids; one is accountant, and the other is English teacher. [...] My third sister, she has three kids, one is civil engineer, the other is accountant and the last study psychology. They work in private company in the Philippines. That's why I decided to work abroad. Because if I do not work overseas, it's so hard to earn money by selling rice.'

Beyond remittance-sending, participants often compare living conditions between Taiwan and the Philippines, focusing on areas like healthcare, politics, and development. Their narratives suggest that the perceived similarities and differences between the two societies shape their migration experiences, aligning with observations made by Levitt (2001) and White (2021). These comparisons often narrow or anchor their focus on specific issues, with corruption emerging as a recurring concern in these cases.

'The government of Taiwan and the Philippines is not the same. The Philippines has many, many corruptions.'

'We did not see the tax, received by the Philippines' government, used for us. Just because, you know, the corruption.'

'In our country, if some politics not corrupt, our country would be really rich. But the politics in the Philippines, I don't know how to say, but it is just making people poorer. [...] Because monthly, we remit, and we pay the tax. They give us nothing, because some of them get the money. But they did not pay tax, not like us.'

Healthcare is another key concern, especially for FMWs working as caregivers, who are often familiar with Taiwan's healthcare system, known for its affordability and comprehensive coverage. Nonetheless, the institutional distinction between two sides makes it unlikely for MWs to transmit these ideas back homeland as noted by Lei (2016).

PARTICIPANT A: 'Especially the National Health Insurance here in Taiwan, here I can use the National Health Insurance, but back to the Philippines, I don't feel we have that. That's a very big difference.'

PARTICIPANT B: 'The medical part in the Philippine is poor. Like Taiwan, the medical services are very good. We have Jian-Bao [健保]. In Philippines, even if we had so ill health, we still pay a lot of money. Oh, here in Taiwan, if we have, we just go to hospital and spend NTD 150 (approximately $4.62). It includes the medicine for one week. And no doctor treats differently.'

PARTICIPANT C: 'In the Philippines, if you don't have money, you will die. Because they send you in the hospital and the price for hospital is very high. Unlike here in Taiwan, oh, it's very cheap and only NTD 200 (approximately $6.16) you can have your medicines for three days.'

One participant, whose family works in agriculture, noted the developmental differences between the Philippines and Taiwan in this sector. This observation illustrates how MWs can catalyse societal change. In the Asian 'guest worker regime', MWs often aspire to apply their foreign experiences to optimise their homeland's development. This reverse influence highlights migrants' potential to facilitate change not only through remittances but

also transferring ideas and practices for long-term societal improvement.

> PARTICIPANT B: 'My husband manages our rice farm. We had store before the pandemic. We sell vegetable, meat, fish, but when the pandemic came, we lost we store. It was a very difficult time.'
>
> 'We actually have a lot of land to farm, but it's too hard. We sell the rice a little bit money. The fertiliser and the medicines to use, they are expensive. However, in Taiwan, the farmers are much better. To be a farmer in the Philippines, it's so poor. [...] If the Philippines is like Taiwan, especially the farmer, we would be very rich, I might not even need to work here. Because our land is 3.5 hectares for rice planting.'

Psychological Value

Psychological value in remittance-sending can be analysed through three key dimensions: emotional labour, identity formation, and the expression of attachment. Emotional labour captures the feelings tied to sending remittances and how these emotions either motivate or complicate the act. Identity formation reveals how remittance-sending reinforces MWs' self-perception, sense of belonging, and evolving identity, often requiring deeper context to fully grasp. The expression of attachment, closely related to transnational value, illustrates how remittances maintain emotional bonds with family and homeland while helping MWs manage the psychological impact of separation.

> PARTICIPANT A: 'I feel happy, comfortable because I know my family in the Philippines, they are living enough. [...] I never feel pressured. Since I go back here in Taiwan, I feel happy every time I send money, especially the time they call me and informed to me that they already received the money I sent to them.'
> PARTICIPANT B: 'My daughter, my father, they become happy. But I think I feel a little bit sad because my earning is a little bit cut. But I feel satisfied and fulfilled.'
> PARTICIPANT C: 'I am happy, of course, I feel always positive. [...] I feel more close to them, and more connection to them, because they know how much I love them. That's why I work hard here to give them money.'

Gender Dynamics in Remittance-Sending

Gender dynamics in remittance-sending can be difficult to recognise when directly engages in the process but become clearer when viewed through a transnational lens, highlighting potential underlying asymmetries. Previously, we introduced the concept of a Hierarchical Social Terrain, informed by theories of social remittances, transnationalism, and social positioning. These frameworks reveal how social roles, identities and subjectivities are closely intertwined and shaped mutually while Chapter 2.3 explored how remittances could empower migrant wives and FMWs by reshaping economic, social, and cultural dynamics, thereby influencing identity and subjectivity. Together, this builds on those insights by examining gender dynamics in varied social roles, exploring how identities like daughter, wife, mother, and women influence, and are influenced by, remittance-sending.

Manifestations Of Daughterhood In Remittance-Sending

Through the lens of daughterhood, FMWs derive psychological value from connections to their countries of origin, often focusing on children and mothers while mentioning male figures less frequently.

> PARTICIPANT A: 'Every time I send money back to the Philippines, my son, my nephew and niece informed me, and they would always said thank you that they already received the money. They always tell me to take care of myself here. Don't work too hard and remember to sleep well.'

PARTICIPANT C: 'Like my mother, she always telling me, thank you, thank you.'

Daughterhood is often expressed through collective contributions, as seen in how remittances improve material conditions and familial relationships.

> PARTICIPANT A: 'Changing for my family, my status. My family status in the Philippines has a little bit changing, not like before, we just only live in simple house. Our house is one floor, and there were always problems with the roof. Every time raining, the water is coming inside of the house. My parent they feel now live in comfortable way. It's changing to my life.'

> PARTICIPANT C: 'My mother house and my house have a great change. All are based from my remittances. And my nieces, I also gave them to go to college. It changed their lives too.'

Additionally, non-economic remittances, such as sharing healthcare practices, allow FMWs to express care and strengthen family bonds.

> PARTICIPANT A: 'I used to adapt the lifestyle of Taiwanese people, usually conscious for the health things. They need to eat plenty of vegetable, which we don't do that in the Philippines. [...] I am more conscious about my health now, because I live here alone, so I should take more care of my health. [...] when I was in the Philippines, I was in charge in the Kitchen. I was cooking and they were surprised, because it's different the way we used to. I did not use any seasoning. Oh, I only used salt and the condiments like soy sauce. In the Philippines, they refer using much seasoning, like NSG or other product.'

The Role of Wives and the Manifestations of Motherhood in Remittance-Sending

The traditional family structure often placed men as breadwinners and women in reproductive roles. However, the trend of feminised migration challenges this norm. As noted by (Lopez-Ekra et al., (2011), even with shifting gender roles, underlying ideologies persist, limiting the full transformation of gender norms through migration. The evolving roles of women, especially FMWs, highlight this gradual shift.

> PARTICIPANT A: 'Yes, in the past, the culture is like what you said that women should only stay in the house, cannot work, and the work should be only for men. But as a modern Filipino woman, we

have own decision. [...] For me, it's the changes to gender.'

PARTICIPANT B: 'The voice in the Philippines constructs why more Filipino women work overseas. If women cannot work as a domestic helper overseas, they have to take care of the house inside and take care of grandma or grandfather or the newborn. In the Philippines, that's the women's work. They cannot work as a sale lady, and it's also not easy to Filipino women.'

'Some of my siblings or my papa, they would ask me, why you go to work? Also, my daughter, she would ask her father, why you did not work or work abroad, why not you? [...] My husband, he cleans the house room, washes the dishes and wash the clothes. Some of men in the Philippines would do the housekeeping job, yeah, some of them.'

'Sometimes it's not enough. On my part, if my child asked me, 'Mother, can you buy me this? Because I need this one.' I will buy that for her. However, I am a little bit sad and a little bit happy at the same time as a mother to know that they did not grow up with me.'

PARTICIPANT C: 'No, it's because women can have less work than men in the Philippines. That's way we want to go abroad. If you are not college knowledge, you don't have that much salary.'

In fact, I specifically asked participants about their perceptions of money or savings management between genders, curious about whether this factor influenced their migration decisions. Interestingly, their responses were varied, which, although possibly due to the small sample size, provides a glimpse into this aspect and indicates the need for further exploration in future research.

PARTICIPANT A: 'No expectation difference. Because both Filipino men and Filipino women, if they work out of the country, they are equal and same to their remittances to the Philippines. [...] In Philippines, most women have own family. They are the one who do decision, yeah, for which the plan should do to the money. Mostly, the Filipino people, if they earn money, they automatically give to their wife, and the wife is the one who has own decision to do what they spend the money.'

'If Filipino men hold their salary enough for them to send back to the Philippines, they did not know how to plan or how to save. When the time they come back home in the Philippines, they are back to zero, I mean, they have no saving. [...] Unlike Filipino women, they always think on their mind or plan. They plan to their self, that they have a simple house or small business that they can build in Philippines.'

PARTICIPANT C: 'But in the Philippines, women give their money to their husband. [...] And yes, it's very common.'

Manifestations of Womanhood in Remittance-Sending

Womanhood encompasses a range of roles, identities, and subjectivities, including daughterhood, wifehood, and motherhood. These roles embody the concepts of 'being' and 'belonging', ultimately shaping a person's sense of 'becoming'. This journey of personal growth, often conceptualised as empowerment, begins with recognising what has been lost and what must be gained or restored. As previously discussed, FMWs

possibly experience empowerment through the acquisition of resources, agency, and achievements. The following narratives illustrate how migration and remittances-sending influence their roles, identities, and subjectivities, revealing a complex interplay between tradition and transformation.

Through remittance-sending, FMWs not only fulfil traditional expectations but also carve out new spaces for self-expression and agency. The act of providing financial support reconfigures their roles within the family, allowing them to assume positions traditionally reserved for men, such as primary breadwinners. However, this shift is not solely about taking on new responsivities; it is also about negotiating their identities within the boundaries of deeply rooted cultural norms. As daughters, wives, and mothers, they engage in practices that reflect both continuity and change, balancing respect for tradition with aspirations for autonomy and empowerment.

> PARTICIPANT A: 'I do my own money. I can go anywhere, and I can do what I want to do, also buy what I want to buy. It's more my personality enhanced. [...] I am as a single mother, I feel now I am more strength person, as independent woman working outside.'

> PARTICIPANT C: 'Here I learned how to save my money. Now I saved my money for my children also have my own money. [...] Just like my employer here in Taiwan, she is always telling me, 'No money, no honey'. That's what I learned in Taiwan as a woman we should also think about ourselves.'

> 'In my experience, I learned a lot because I think when you have no money, it's very difficult. That's what I've learned a lot in your culture, in Taiwan, you must have saving for your future. I see that all old women have saved money. They are not afraid of getting older, because they have money to use.'

These narratives reveal remittance-sending is more than just an economic transaction—it is a means through which FMWs navigate and redefine their womanhood. By taking on these roles, they reshape their identities in ways that challenge conventional gender norms while simultaneously reinforcing certain cultural expectations. The process of empowerment, therefore, is not linear but multifaceted, involving the negotiation of both personal ambitions and collective obligations. Through their narratives, FMWs demonstrate the manifestation of womanhood in the context of migration is a dynamic process, deeply informed by the intersection of tradition, change, and the pursuit of self-determination.

Challenges and Opportunities in Remittance-Sending

The 2021 introduced SARSs—a digital transaction service for MWs in Taiwan—has greatly transformed the overall financial ecosystem for MWs. As of May 2024, four corporations have been authorised to provide services: Welldone Company[21],, Eastern Union Interactive Corp.,[22] Digital Idea Multi-Media Co., Ltd.,[23] and May-God Human Resources Co., LTD.[24] Prior to 2021, MWs had the option of using bank transfers

[21] Welldone Company [統振股份有限公司]: https://www.welldone.com.tw/zh-tw
[22] Eastern Union Interactive Corp., [東聯互動股份有限公司]: https://www.eui.money/
[23] Digital Idea Multi-Media Co., Ltd. [數位至匯股份有限公司]: https://remit.digitalidea.com.tw/
[24] May-God Human Resources Co., LTD. [美家人力資源股份有限公司]: https://may-god.com/

or going through informal channels, such as grocery stores, karaoke bars run by Southeast Asians, or broker agencies (Kastner 2022). These brokerage firms would bundle remittances and send them collectively, often resulting in delays of several days or weeks. Despite the associated risks, including potential scams, MWs frequently preferred informal channels due to their lower fees, absence of minimum transfer limits, and greater accessibility compared to formal banking options. Several barriers drove MWs away from traditional banking services, including language difficulties, limited bank operating hours, digital literacy gaps, and conflicts between work schedules and banking hours (Nguyen Thi Thanh Yen 2022; Chen 2023). In response to these challenges, migrant empowerment NGOs in Taiwan now provide financial management courses designed to help workers navigate these various remittance channels while minimising associated risks.

The experiences of the FMWs participating in this research further confirm the challenges mentioned above.

> PARTICIPANT A: 'Maybe the service should be faster, because usually in Philippines, sending money back is urgent. [...] It should be one day or on that day can pick up the money in the Philippines.'

> 'My suggestion it's better all remittances here, it should be given a maximum of NTD 50,000 (approximately $1550) to NTD 100,000 (approximately $3100) per month. And the service charge is NTD 99 (approximately $3) every transaction, it's too much for me. Sometimes I have to use twice transactions, that's too expensive.'

> PARTICIPANT B: 'What I say is the processing is too low, one day before we put money inside the bank. When our family need, we need as soon as possible, especially if on Saturday and Sunday, they cannot use.'

> PARTICIPANT C: 'I use bank to bank, and sometimes I use the digital app, and sometimes in the Filipino Store, there's a remittance agency.'

> 'They are all legit, but I met scam before when I used Qpay (QuickPay)[25], I almost lost my NTD 20,000 (approximately $620).'

All participants reported that they acquired relevant financial knowledge independently, with only a few attending courses provided by agencies or the Filipino government. All currently use digital services rather than physical options.

[25] Qpay (QuickPay) is a money transfer mobile app introduced by the Taiwanese corporation Welldone company, which is the first corporation approved by Financial Supervisory Commission of Taiwan to implement SMSs.

5. DISCUSSION AND CONCLUSION

This mixed-methods study illuminates the gender-specific dynamics in migrant remittances through in-depth interviews and surveys with Southeast Asian FMWs in Taiwan, confirming the research questions that migrant remittances play a significant role in addressing the challenges faced by FMWs by facilitating a reconfiguration of their social positions, identities, and subjectivities in response to the complexities of feminised migration. The study reveals several key limitations that warrant acknowledgment: the exclusion of returnees limited understanding of long-term remittance impacts; gender analysis was constrained by lack of input from origin countries; language barriers limited representation from Vietnamese, Indonesian, and Thai speakers; and online recruitment may have affected participant trust compared to in-person methods. In addition, the study does not fully examine financial regulations and technological advancements that, as Meyer and Ströhle (2023) note, can transform remittance mechanisms.

While this research provides several distinctive contributions to migration literature. Most significantly, it introduces the Hierarchical Social Terrain framework, which reifies remittances as conduits for diverse values beyond monetary contributions, offering a multidimensional analytical approach that encompasses economic, social, cultural, transnational, and psychological dimensions. This framework challenges traditional economic push-pull theories by demonstrating how migration decisions are deeply intertwined with cultural and gendered expectations, broadening the scope of migration studies.

The study confirms the concept of social position as a 'relative measure' (White 2021), revealing how remittance flows operate along hierarchical gradients where greater differences between origin and destination contexts facilitate flows from higher to lower positions across economic, social, and cultural dimensions. Critically, these flows are not always linear and can be disrupted by institutional interventions, suggesting that education—both formal in sending countries and informal through NGO-led programmes in receiving countries—might help mitigate such disruptions. Moreover, this study also provides detailed socio-demographic profiling of FMWs, including linguistic abilities, employment backgrounds, family structures, and variables like sibship size and education levels, enriching migration literature with contextual factors often missing in studies focused solely on economic or social dimensions. These profiles demonstrate how structural barriers prevent FMWs from fully contributing to economic systems, with pathways of least resistance often socially constructed and reinforced over time through remittance practices.

Applying this theoretical framework to the empirical findings, the analysis demonstrates how FMWs' migration decisions reflect both individual agency and structural constraints within the 'varied transnational terrain' conceptualised in our framework. Participants' narratives revealed that remittance practices are deeply embedded in familial and societal expectations, reflecting broader cultural scripts about gender roles and obligations. While economic motivations remain paramount, these motivations are intricately linked with sociocultural responsibilities, particularly expectations to support extended families, demonstrating how cultural and psychological dimensions of

remittance-sending are equally significant in shaping FMWs' lived experiences.

More critically, this study reveals a notable shift in traditional gender roles through remittance-sending practices. Although women predominantly serve as caregivers in both destination and origin contexts, remittance-sending enables them to assume financial responsibilities traditionally associated with male breadwinners. This represents a gradual transformation of gender norms influenced by migration, though it does not entirely dismantle existing gender structures. Instead, it reflects an evolving interplay between traditional expectations and emerging economic realities, illustrating the dual role of remittances as both tools for empowerment and sources of potential marginalisation.

These individual-level transformations operate within broader structural patterns that reveal the systemic nature of feminised migration. The push-pull dynamics identified operate within a complex ecosystem where gendered expectations, economic necessities, and personal aspirations interact across gradient obstacles between origin and destination contexts. Within the Southeast Asia-Taiwan context, these remittance patterns reinforce the concentration of women in cyclical migration pathways that channel subsequent generations of FMWs into similar occupations. This demonstrates how remittances function not merely as economic transactions but as active agents perpetuating the feminisation of migrant labour, creating what can be termed 'remittance feedback loops' where successful practices encourage similar migration decisions among other women. Therefore, our analysis framework illuminates how remittance practices can simultaneously empower and constrain FMWs within these circular dynamics. Women gain unprecedented economic agency through substantial remittance capacity while challenging traditional gender hierarchies, yet their success may also reinforce essentialised notions of women's caregiving responsibilities, creating pressure for continued migration in care sectors rather than diversification into other economic opportunities.

Meanwhile, recent infrastructure developments like SARSs represent significant progress in formalising remittance channels, addressing issues related to informal and potentially risky remittance methods. This development can be analysed through the 'Environment Shifts' component of our framework, which reveals the need for more comprehensive interventions to create holistically inclusive pathways for FMWs that effectively disrupt the circular reinforcement of gendered migration patterns. These could include more diverse labour migration pathways, financial literacy programmes, bilateral agreements incorporating provisions for skill development and career advancement, and recognition systems that value MWs' contributions while addressing structural inequalities constraining their agency and opportunities. While this study focused primarily on individual remittance practices and their gender-specific dimensions, the broader institutional context—particularly the guest worker regime shaping temporary labour migration—warrants deeper investigation. Future studies should examine how institutional structures interact with remittance practices to shape migration pathways and gender dynamics, include both migrant and returnee perspectives to capture complete migration cycles, and employ multilingual teams to capture more diverse perspectives.

Taken together, the theoretical framework, empirical evidence, and policy analysis demonstrate a complex reality, that remittances operate as powerful mechanisms through which Southeast Asian FMWs both challenge and reproduce gendered power structures. While these

women gain unprecedented economic agency through remittance-sending, their practices simultaneously reinforce the very specific sector concentrations that limit their broader economic opportunities, creating self-perpetuating cycles of feminised migration that must be recognised and addressed in migration policy in the future.

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Topic 3: Citizen Science for Governance Reform in Vietnam: A Case Study of the Provincial Governance and Public Administration Performance Index (PAPI)

LUONG ME

Global Prosperity (GP) MSc programme

Abstract

Citizen science (CS) is widely discussed as a means of fostering collaboration between academic institutions and the public, empowering citizens in knowledge generation and policymaking. However, its application in Vietnam's politically restrictive civic environment remains underexplored. This dissertation investigates the feasibility of CS in such a context through the Vietnam Provincial Governance and Public Administration Performance Index (PAPI). The analysis draws on interviews with PAPI officials, local citizens, and government officials, complemented by a document review.

The findings reveal three key insights. First, although not explicitly framed as a CS programme, PAPI exhibits alignment with the contributory CS model through its citizen engagement strategies. Second, despite its notable impacts and efforts, citizen participation within PAPI remains limited, characterised by constrained participatory spaces and citizens' modest influence in decision-making processes. Third, challenges such as a lack of autonomy and safety concerns, rooted in Vietnam's political institutions, further reinforce these limitations.

This dissertation argues that addressing these barriers requires CS to be hybrid, adaptive, and implemented as part of a broader portfolio of interventions. This portfolio must include advocacy for educational reforms to enhance citizens' autonomy and capacity for meaningful engagement in the long term. It also identifies shortcomings in existing terminologies for defining hybrid forms of CS and proposes a framework to guide the selection of CS project types, along with a context-sensitive definition of CS. By evaluating PAPI's successes and limitations, this study illustrates the transformative potential of CS for governance reform in Vietnam's restrictive setting and provides actionable insights for PAPI and future initiatives.

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This dissertation is dedicated to the memory of my grandpa and my uncle, two of the most important people in my life, who always encouraged me to learn and strive. Their belief in me continues to inspire every step I take.

1. INTRODUCTION

Governance Reform and Prosperity

'Good governance is perhaps the single most important factor in eradicating poverty and promoting development', observed Kofi Annan, former UN Secretary-General. In the 21st century, achieving development and prosperity has become increasingly complex, demanding not only economic growth but also inclusive well-being and equitable opportunities for all (Moore, 2023). Yet, as societies grapple with these multifaceted challenges, governance - the cornerstone of inclusive prosperity - continues to fall short globally. Progress on Sustainable Development Goal (SDGs) 16, which advocates for peace, justice, and strong institutions, remains alarmingly stagnant, leaving millions unable to meaningfully participate in shaping their governance systems (UN DESA, 2024a).

Vietnam starkly exemplifies this paradox. While the country has been recognised as 'one of fastest-growing economies in the world' (London, 2022a, p. 2), it ranks just 2.6/10 on the Democracy Index - one of the lowest scores globally (Data Page: Democracy index, 2023). Citizens face restricted civic freedoms, limited transparency, and weak accountability mechanisms ('PAPI Index', 2023), placing Vietnam far behind SDG 16 targets, particularly in ensuring participatory decision-making (UN DESA, 2024b). This raises a pressing question: as Vietnam's economy flourishes, how can governance reforms ensure inclusive prosperity and protect its most vulnerable citizens from being left behind? This question underscores the urgent need for Vietnam to enhance participatory governance, align economic growth with global sustainable development goals and foster inclusive prosperity for all.

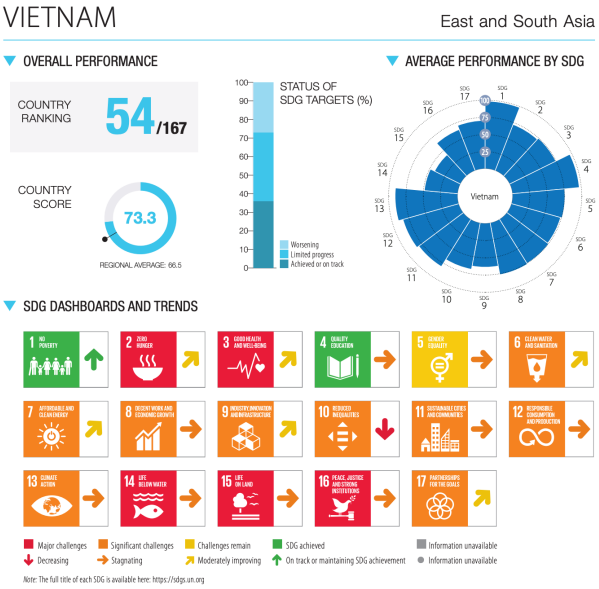

Figure 1. Vietnam's SDGs Progress (UN DESA, 2024a)

Exploring Citizen Science for Governance Reform in Vietnam

One potential approach to these governance challenges, particularly in fostering participation and accountability, is citizen science (CS). CS is broadly defined as a research practice involving collaboration between academic institutions, public participants, and stakeholders. It encompasses diverse levels of public involvement, ranging from data collection to active co-design of research processes (Haklay, 2015, pp. 18–20; Hecker et al., 2018, pp. 3–5; Woodcraft and Anderson, 2019, p. 13; Sauermann et al., 2020). With great capacity to empower public participation in knowledge generation and inform inclusive decision making, CS has gained recognition in European countries as an innovative approach to tackling challenges in participatory governance and improve democracy (Citizen Science for Europe, 2013).

Despite its growing prominence, the application of CS in Vietnam remains limited (Kính, 2023). While CS has gained some traction in environmental research, its integration into the social sciences, particularly in public administration, is virtually non-existent. This lack of application is likely closely tied to the limits freedom of expression and discourages active public participation in policy discussions in this country (London, 2022a).

The absence of CS in Vietnam's social sciences represents a critical gap in both research and practice. This study seeks to address this gap by (1) demonstrating the validity of CS as an approach for Vietnam's governance reform, and (2) exploring the adjustments required for its application within this context, including the development of an appropriate definition and a toolkit to support decision-making in the initiation and evolution of CS projects. It accomplishes this by examining existing activities within Vietnam's governance sphere that align with the core nature of CS.

A Case Study for Citizen Science Approach

The Vietnam Provincial Governance and Public Administration Performance Index programme (PAPI) offers a compelling case study for this research. Established by the United Nations Development Programme (UNDP) in 2009, it is one of Vietnam's largest governance-related sociological research initiatives. PAPI gathers feedback on citizens' experiences and perceptions of governance quality across all 63 provinces in Vietnam. Its insights enable stakeholders to identify areas for improvement, prioritise interventions, and advocate for governance reforms (UNDP PAPI, 2024). Additionally, its well-known collaboration with enumerators for data collection suggests an alignment with CS principles. PAPI's comprehensive scope offers a robust foundation for this dissertation's analysis. By examining PAPI through the lens of CS, this study investigates how the CS approach functions within PAPI and identifies pathways for its advancement. The analysis highlights the potential of CS to foster participatory governance in Vietnam while proposing adjustments to enhance PAPI's effectiveness. In doing so, it bridges a critical gap in discussions on CS applications and supports PAPI's mission to drive governance reform in Vietnam.

This dissertation addresses the following sub-questions: What is the current design of PAPI compared to CS? How has PAPI performed as a CS project? What are the key enablers, challenges, and adjustments for advancing a CS approach within the PAPI context? To explore these issues, the research draws on five primary interviews, 22 secondary interviews with various stakeholders, including PAPI leaders, government officials, and citizens, complemented by an expert discussion and document analysis. This approach offers a holistic view of PAPI, yielding practical insights and facilitating informed discussions. Throughout this dissertation, I argue that the PAPI programme closely aligns with the concept of a contributory CS project and its performance and impacts demonstrates the potential of CS to enhance participatory governance in Vietnam. However, significant challenges, such as limited autonomy and navigating political sensitivities, must be addressed for this potential to be fully realised. This dissertation advocates that CS projects in such contexts must be complemented by interventions to promote educational reforms that foster citizens' autonomy and meaningful engagement.

This argument is presented across six chapters:

- Chapter 1 introduces the context and rationale for this research.
- Chapter 2 reviews current debates about CS and related theoretical frameworks as well as the restricted context in Vietnam, providing a foundation for comparison and discussion.
- Chapter 3 describes the research design, implementation, and analysis.
- Chapter 4 presents key findings from six interviews, one discussion, and a series of document analyses.
- Chapter 5 compares these findings with existing literature, drawing insights and lessons about CS in Vietnam.
- Chapter 6 concludes the dissertation by summarising key insights and implications.

2. LITERATURE REVIEW

This literature review examines key discussions and debates surrounding the CS approach, identifying and highlighting its impacts and gaps in application within governance, particularly in low-democratic contexts. It then outlines the key characteristics of Vietnam's current governance framework, which may influence the applicability and effectiveness of CS. To evaluate this effectiveness and applicability, the review introduces theoretical frameworks, including multi-level perspective analysis, the open citizen science assessment framework, the ladder of participation, levels of participation, and concepts of power and empowerment analysis. These theories and frameworks provide a holistic perspective tailored to the complex context of this dissertation, supporting deep analytical and comparative discussions.

Defining Citizen Science

Even though CS has garnered significant attention across various disciplines, there is no universal definition, even within Europe, where it has been extensively discussed. Haklay et al., (2021, p. 22) identifies the philosophical challenge of defining CS, noting that its practices often 'cross many disciplinary boundaries in academia.' He outlines multiple dimensions of CS definitions: the descriptive dimension, emphasising collaboration activities between public participants and research institutions, which is found across many CS definitions; the instrumental dimension, which adapts CS definitions to organisational goals; and the normative dimension, which focuses on the values and norms underpinning CS (Haklay et al., 2021). This highlights that any existing definition of CS may not be suitable for other contexts. Therefore, this study does not adopt an existing definition in its entirety but instead uses the broad descriptive dimension as a foundation, defining CS as the collaboration between public participants and research institutions in scientific activities, as this reflects the core character of CS. At the same time, it explores how citizen engagement and other dimensions can be characterised in Vietnam governance context. This approach provides a flexible framework for context-specific applications.

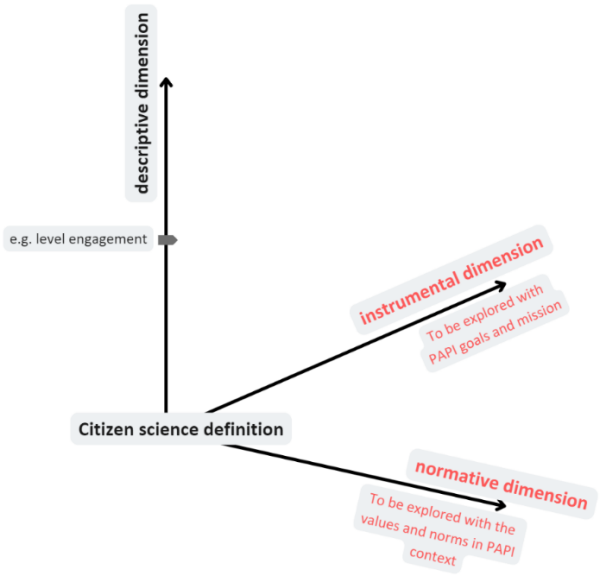

Figure 2. Exploring definition of CS within Vietnam governance context through PAPI (author)

Citizen Science's Potentials

Scholars have identified various transformative potentials of CS, which highlight its significant role in bridging societal, academic, and governance challenges. These include:

- **Collaborative and Context-Sensitive Approaches:** By transitioning from top-down to bottom-up models, CS facilitates decision-making that incorporates diverse public values and contextual realities, fostering collaboration between citizens and institutions (Woodcraft and Anderson, 2019; Vohland et al., 2021; Baumann et al., 2023; Mintchev et al., 2024).
- **Generating Inclusive, Community-Driven Data:** CS engages diverse participants to produce data rooted in community needs, addressing sociocultural diversity gaps in traditional science communication and directly informing inclusive and locally relevant policies (Hinckson et al., 2017; Bonhoure et al., 2023).
- **Empowering Public Participation:** Through active involvement in knowledge creation and decision-making, CS enhances public empowerment, strengthens civic engagement, and supports democratic governance (Hecker et al., 2018).
- **Addressing Critical Data Gaps:** CS is increasingly employed to fill essential data gaps, particularly in monitoring progress on global frameworks such as the SDGs (Fraisl et al., 2020).
- **Enhancing Governance:** By fostering transparency, accountability, and inclusivity, CS strengthens governance systems and contributes to evidence-based, participatory decision-making (Haklay, 2015).

Notably, the collaborative processes integral to CS, whether explicitly intended or as a by-product, enhance citizens' capacities to engage in civic and political life (Robinson et al., 2018). This includes the development of research capacity, which Appadurai (2006, p. 167) conceptualises as a 'right of a special kind', an essential means for individuals and

communities to shape their futures and address pressing challenges.

Expanding on the dimensions of capacity building, Mintchev et al., (2022a, p. 6) classify two levels of knowledge that citizens may acquire through collaboration: 'cognitive' level, referring to new information previously unknown to citizens, and 'embodied learning', described as the 'lived experience of physical and affective encounters that evoke emotions such as surprise, sadness, concern, compassion, joy, pride, and satisfaction' (Mintchev et al., 2022a, p. 6). These levels of knowledge, as the authors argue, act as catalysts for innovative ideas, and when combined, they culminate in actionable interventions that tangibly improve community life.

The authors further emphasise the importance of establishing support structures that empower citizens not only to develop research capabilities but also to utilise these skills to advocate for meaningful change they seek (Mintchev et al., 2022a, p. 3). Such structures ensure that citizens' newly developed capacities are consistently mobilised to shape futures aligned with their aspirations and community needs.

This impact pathway is compelling to explore in Vietnam's governance sphere, where citizen engagement has been criticised as superficial (PAPI Index 2023, 2024, pp. 44–49), highlighting the need to equip citizens with the capacity to take a more proactive stance. However, the restrictive nature of Vietnam's governance context may also constrain the scope of CS practices, raising critical questions and uncertainties: To what extent can CS projects support capacity building in such settings? Furthermore, in scenarios where substantial capacity building is required, does the projects remain within the domain of CS, or does it transition into a broader capacity-building framework?

These questions are pivotal in assessing the viability of various CS practices, particularly sustained models like those advocated by Mintchev et al. (2022a), and in defining appropriate approaches for restrictive contexts such as Vietnam. My analysis of PAPI's performance and the challenges related to capacity building for public participants in Chapter 4 will provide deeper insights into these issues and allow for a more nuanced discussion.

The Limited Discourse on Citizen Science in Governance and Low-Quality Democracies

Despite the potential of CS in fostering participatory governance, the application of CS, remains limited in its research fields and contextual applications. CS originally emerged from the natural sciences, particularly in fields such as ecology, environmental science, and astronomy. It was designed as a method to involve the public in large-scale data collection efforts, enabling professional scientists to collaborate with volunteers or laypeople to gather data across vast geographical areas or over extended periods (Haklay et al., 2021).

Over time, the scope of CS expanded beyond these initial fields, with its methodologies adopted in disciplines such as the social sciences and humanities (Kythreotis et al., 2019). However, these disciplines remain underrepresented in CS projects, largely due to the traditional focus on quantitative data collection and the historical divide between the natural and social sciences (Campos et al, 2021).

In addition to disciplinary limitations, discussions on the application of CS are predominantly concentrated in European contexts, where institutions are generally more open to citizen and civic engagement. By contrast, there is a notable lack of discourse on the application of CS in societies with restricted democratic governance or limited civic freedoms. This gap is significant, as CS has the potential to enhance democratic processes, empower communities, and promote inclusivity. Yet, its applicability in restrictive contexts where much greater effort is required, remains underexplored, raising critical questions about its feasibility and adaptation in such environments.

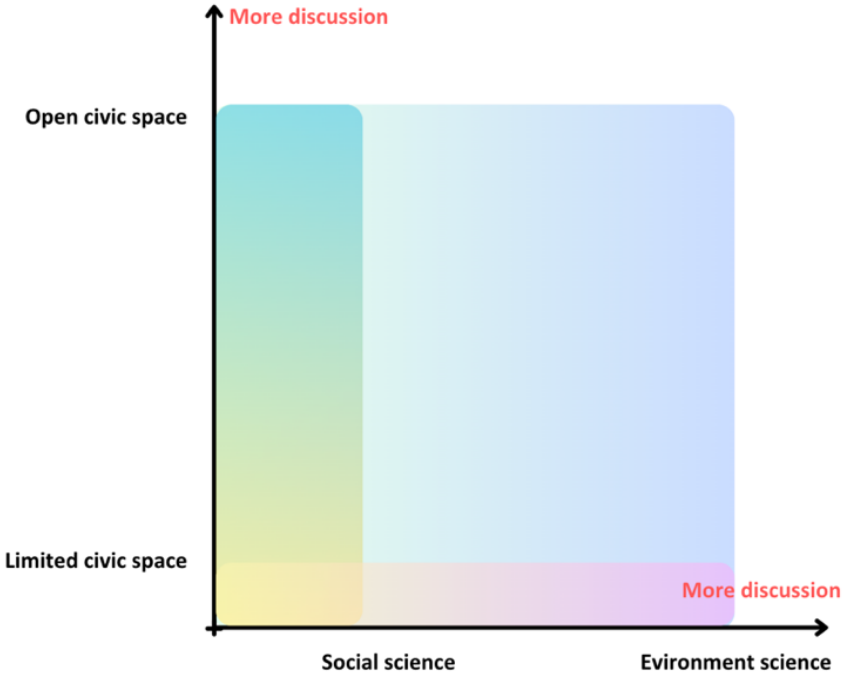

Figure 3. Discussion about citizen science's application (author)

Citizen Science Models and Level of Engagement

As the application of CS varies across contexts, understanding different CS models and the characteristics of their citizen engagement is crucial for initiating as well as developing a CS project. Shirk et al. (2012) categorised five common models of engagement, with ascending levels of citizen participation, defined by the scope of their involvement in the work.

- Contractual projects: Communities request professional researchers to conduct specific scientific investigations and report the results.
- Contributory projects: Members of the public primarily contribute data to projects designed by scientists.
- Collaborative projects: The public contributes data while also assisting in refining project design, analysing data, and disseminating findings.
- Co-created projects: Scientists and the public collaboratively design projects, with active involvement

from participants throughout most or all aspects of the research process.
- Collegial contributions: Non-credentialed individuals conduct research independently, sometimes with varying degrees of recognition from institutionalised science and professionals.

Echoing these models, Haklay (2013) outlines four levels of citizen participation in science projects: crowdsourcing, distributed intelligence, participatory science, and extreme CS. These levels emphasize progressively higher degrees of a specific nuance: citizens' cognitive engagement.

- Crowdsourcing: Participants act as passive sensors, primarily contributing data.
- Distributed intelligence: Participants contribute to data interpretation based on their knowledge.
- Participatory science: Citizens actively engage in the design and analysis stages of the project.
- Extreme CS: Participants fully collaborate or lead throughout the project, including problem definition, data collection, and analysis.

Haklay's framework resonates with the 'ladder of participation' (Arnstein, 1969), which describes varying degrees of citizen involvement in decision-making processes. Arnstein's ladder progresses from Non-participation (e.g., Manipulation, Therapy), to Tokenism (e.g., Informing, Consultation, Placation), to Citizen Power (e.g., Partnership, Delegated Power, Citizen Control).

While both models address participation, they differ in perspective (Haklay, 2013):

- Arnstein focuses on the redistribution of power between citizens and authorities.
- Haklay focuses on the extent of citizens' involvement in the research process.

Although these frameworks provide tools to classify and evaluate CS projects, they are insufficient for guiding decisions about when and where these types of projects or levels of engagement should be applied. Haklay, p. (2013, p. 10) and Vohland, Land-Zandstra, et al. (2021) argues that participation should not be judged rigidly. Citizens can progressively build their knowledge and move up the ladder of participation through engagement. At the same time, aiming for the highest suitable level of involvement within a project can enhance overall impact (Haklay, 2013). However, there is still a lack of discussion on how projects can transition between levels over time and what constitutes the 'highest level that is suitable' (Haklay, 2013, p. 10).

This gap is particularly relevant in contexts with limited civic engagement, as explored in this research, where achieving higher levels of involvement may require trade-offs in terms of resources, risk, and short-term impacts. Moreover, it is crucial to consider the level of engagement that the institution hosting the CS project can accommodate while trying change the institution itself. This underscores the need to explore a framework that guides the initiation of CS projects, enabling practitioners to select appropriate entry projects and adjust over time. This dissertation aims to contribute to the development of such a framework within the field of governance in Vietnam.

Citizen Science, Participatory Action Research, and Activism

It is noticeable that as CS projects progress toward higher levels of citizen engagement, their design aligns more closely with the principles of Participatory Action Research (PAR) (Kindon et al. 2007; Castán Broto et al., 2015; Vohland et al., 2021). PAR, originating in the social sciences, explicitly focuses on addressing power dynamics, promoting equity, and fostering social change. It emphasises community-driven processes, engaging participants in every stage of the research cycle - reflection, planning, action, and evaluation (Kindon et al. 2007).

While CS and PAR share a commitment to public engagement and empowerment, they differ in scope and intent:

- PAR operates primarily within a community-driven framework, seeking to address inequalities through co-ownership of research outcomes (Castán Broto et al., 2015).
- CS is more adaptable, encompassing both institutional and community-driven approaches.

This adaptability makes CS well-suited to large-scale or policy-oriented initiatives, such as the PAPI programme, where collaboration with diverse participants and institutional support is critical for success.

Additionally, the evolving nature of CS raises critical questions about its relationship with activism. In restrictive governance settings, where traditional advocacy and protest are heavily regulated or suppressed, CS can serve as a discreet yet impactful mechanism for amplifying citizens' voices and addressing community needs. By engaging participants in activities such as data collection, problem identification, and local solution development, CS can embody the principles of 'quiet activism'. As Pottinger, p. (2017, p. 15) suggests, 'quiet activism' entails small, embodied, and often subtle acts of resistance that challenge dominant systems without overt confrontation.

The Limited Civic Space and Governance Context in Vietnam

The lack of discussion about CS in restricted contexts, as mentioned earlier, is particularly pronounced in single-party governance systems such as Vietnam, which operates under a distinct and centralised governance structure. Since gaining independence, Vietnam's institutional framework has been shaped by the dominant role of the Communist Party of Vietnam (CPV) (London, 2022a, p. 2). The government, under the leadership of the CPV, has articulated a commitment to building a rule-of-law state, as outlined in its Constitution (2013). This document guarantees citizens the rights to freedom of speech, press, access to information, assembly, association, and demonstration, which are to be exercised through mechanisms such as direct democracy, the National Assembly, People's Councils, and other state agencies. Furthermore, the CPV promotes the principle of 'Dân biết, dân bàn, dân làm, dân kiểm tra, dân giám sát, dân thụ hưởng,' which translates to ensuring that citizens are informed, participate in discussions, take action, inspect, monitor, and benefit from governance and public administration processes (CPV, 2021).

However, despite these declarations, the implementation of these rights remains superficial in practice (PAPI Index 2023,

2024, pp. 42–50). Political power is highly centralised within the CPV, which not only dominates legislative and executive functions but also deeply penetrates civic and cultural domains. The National Assembly and People's Councils, though formally representative, function primarily as rubber-stamp bodies due to the CPV's stringent control over candidate selection and election processes (Schuler, 2022, pp. 51–54). Similarly, while citizens are encouraged to participate in governance, genuine mechanisms to ensure accountability or foster meaningful public participation are lacking (PAPI Index 2023, 2024, pp. 42–50). This gap undermines the transformative potential of CS as an innovative approach to enhancing participatory governance in Vietnam.

At the same time, this highlights significant challenges for the application of CS. Firstly, the CPV's control over the regulation of speech, ideas, and information. The press in Vietnam is not independent but instead functions as the voice of the Communist Party, as explicitly stated Press Law (2016). Because these channels are controlled by the government, citizens are unable to use them to express or access critical opinions about the government. This strategy mirrors the firewalling approach employed in mainland China (London, 2022a, p. 3), resulting in an environment where Vietnamese citizens may live in an information bubble created by the government. Within this bubble, they are unable to fully understand how governance operates or critically engage with issues that require discussion.

Secondly, the CPV's governance ideology not only affects how citizens are informed but also shapes how they engage with the system. Over the years, the CPV has influenced citizens' perceptions through the education system, which, like in many other countries, often serves as a 'social stratification machine' (London, 2022b, p. 42). Rather than disrupting patterns of institutionalised inequality, it reproduces and intensifies them, particularly political inequalities that perpetuate the CPV's dominance (London, 2022b). Consequently, citizens may not learn to critically assess the functioning of the government, leaving them ill-equipped to engage meaningfully.

Thirdly, civil society, often a crucial driver of social innovation and governance reform, faces severe constraints in Vietnam. There is no formal legal recognition or protection for civil society organisations, leaving them vulnerable to accusations of illegality (Wells-Dang, 2022). Activities aimed at fostering independent societal change are frequently met with state resistance, reinforcing the top-down structure of governance. For instance, international observers have criticised Vietnam's harsh treatment of activists, including environmentalists and social reform advocates, many of whom have been imprisoned on ambiguous charges, such as 'tax evasion'(UK FCDO, 2023; BBC, 2023). The regulatory framework governing CPV members further reinforces the centralisation of power and highlights the sensitivity surrounding participatory efforts like CS. Party regulations explicitly prohibit advocacy for concepts such as separation of powers ('tam quyền phân lập'), civil society ('xã hội dân sự'), pluralism and multi-party systems ('đa nguyên đa đảng'), or the depoliticisation of the armed forces ('phi chính trị hoá lực lượng vũ trang') (Regulation No. 37-QĐ/TW, 2021). These restrictions illustrate the CPV's intent to maintain its hegemony while limiting opportunities for alternative voices and participatory governance initiatives. Even when citizens identify governance issues and attempt to engage, their efforts are strictly controlled.

This political context permeates all aspects of social life, shaping the relationships between citizens, the government, and other stakeholders (London, 2022a, p. 3). While this creates opportunities for CS to explore its potential, it also poses significant

challenges due to a system resistant to grassroots empowerment and independent civic engagement.

Citizen science in Vietnam and Similar Context

Echoing the limitations discussed, CS in Vietnam remains a nascent field, with its discourse largely confined to environmental science (Quy Nhan et al., 2015; Phan et al., 2022; Kính, 2023; Duong et al., 2024). The Ministry of Science and Technology primarily views CS as a method for data collection, a trend reflected in much of the existing research adopting this approach in the country (Nguyễn and Borton, 2021). The UNDP in Vietnam recently published a Collective Intelligence Playbook, adapted from the UK Nesta publication, which introduces the concept of CS. It defines CS as a 'process where scientists (usually unpaid) volunteer to work together to collect or process scientific data or observations' (Peach et al., no date, p. 96). This adheres to a traditional interpretation of CS as a crowdsourcing tool for data collection, thereby limiting its broader potential impacts, as discussed earlier.

One local application of this model is evident in the VOV Traffic Channel, which broadcasts live traffic information and congestion warnings. This programme enables citizens to share real-time traffic updates, helping road users avoid jams and identify better routes or travel times (Vietnam News, 2022).

However, it is important to note that the term 'citizen science', when translated into Vietnamese, is closely tied to the concepts of citizenship and civic engagement (Nguyễn and Borton, 2021), which can introduce sensitivities. In practice, however, it aligns more closely with the idea of 'community science'. Related Vietnamese terms include community development (phát triển cộng đồng), community-based solutions (giải pháp dựa vào cộng đồng), self-managed community (dân cư tự quản), community science (khoa học cộng đồng), and community-based science (khoa học dựa vào cộng đồng). These terms are predominantly used in environmental contexts or narrowly focused on creating social solutions, rather than encompassing the broader spectrum of social research processes.

A similar stage of CS development can be observed in China, where the political system shares similarities with Vietnam. Wu et al. (2023) in their assessments of CS in water management in China, highlights challenges arising from top-down policymaking. They observe that 'CS programs distinguish between real data gaps and political will not to monitor or share information,' an issue requiring further discussion and negotiation (Wu, Washbourne and Haklay, 2022, p. 12). Key insights from Chinese practices include adopting the term 'public participation' instead of 'citizen science,' improving training initiatives, and aligning policies to support effective implementation (Wu, Washbourne and Haklay, 2022, 2023).

Evaluating Citizen Science Projects

Evaluating CS projects is essential for understanding their strengths and limitations, enabling further advancement and adaptation. Kieslinger et al. (2018)

propose an open CS assessment framework, which evaluates CS projects across three key dimensions: the scientific dimension, focusing on the project's scientific design and contributions; the participant dimension, emphasizing public engagement and involvement in research processes; and the socio-ecological and economic dimension, assessing the project's contributions to societal and economic development. These dimensions are analysed at 'process and feasibility' level as well as at the 'outcome and impact' level (Kieslinger et al., 2018, p. 86). This framework supports strategic planning, impact assessment, and adaptive management, but its general nature and limited consideration of context require tailoring for accurate analysis in projects like PAPI.

For evaluating the scientific and socio-ecological dimensions, the 'Multi-Level Perspective' (MLP) framework is highly relevant as it is widely used to analyse socio-technical transitions (Geels, 2019). The MLP identifies three interconnected levels:

- **The landscape**, which includes slow-moving trends (e.g., cultural norms and demographics) and disruptive events (e.g., crises or technological breakthroughs) that exert pressure on socio-technical systems.
- **The regime**, referring to dominant systems that deliver core societal functions (e.g., governance), but which resist change due to institutional inertia and vested interests. Vietnam's single-party governance system, for example, represents an entrenched regime with significant barriers to transformation.
- **The niche**, which serves as a protected space for radical innovations driven by researchers, activists, or smaller networks. These innovations can challenge dominant systems during periods of instability.

While the MLP offers a robust analytical tool for understanding transitions, it has been critiqued for its lack of focus on individual agency, power dynamics, and contextual interactions (Smith et al. 2005).

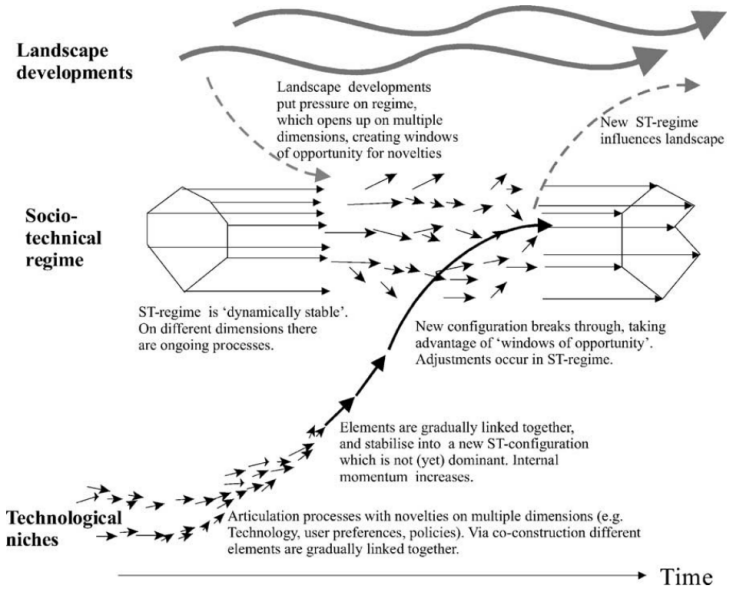

Figure 4. A dynamic multi-level perspective on system innovations (Geels, 2004)

Shirk et al. (2012) echo the importance of power dynamics in citizen engagement, arguing that evaluating participant engagement requires assessing the power citizens hold within the research process, which contributes to define their five models of engagement mentioned earlier. VeneKlasen and Miller's (2002) power framework complements this by exploring four key dimensions of power:

- **Power to**, representing the capacity to act and achieve goals through access to resources, skills, and knowledge.
- **Power with**, referring to collaborative action based on shared objectives and cooperation.
- **Power over**, reflecting the ability to control or influence others, often through dominance or coercion.
- **Power within**, which relates to internal agency, self-confidence, and belief in one's ability to drive change.

Gaventa (2006) expands on this analysis by identifying three spaces of power:

- **Closed spaces**, where decisions are made without public participation.
- **Invited spaces**, where individuals are invited to participate but within predefined boundaries.
- **Claimed or created spaces**, where marginalised actors establish autonomous platforms to shape agendas and voice concerns.

In this dissertation, the open CS assessment framework can be applied to evaluate PAPI's performance, while the MLP framework and power analysis provide deeper insights into why PAPI performs in certain ways, how its performance influences governance transitions in Vietnam and how local governance, in turn, affects PAPI. By combining and adjusting these existing frameworks, the evaluation of CS projects becomes more nuanced and holistic.

Limitations and Issues Related to Citizen Sciences

This sub-section presents existing debates on the limitations and risks of CS application, which inform potential similar issues within PAPI context.

Subjectivity and Bias in Observation

Purdam (2014) highlights the inherent subjectivity in citizen scientists' observations, shaped by their socio-cultural backgrounds, beliefs, and motivations, which can introduce biases and affect research outcomes. Particularly concerning is the potential exclusion of vulnerable or marginalised groups who may be less likely to participate in CS projects but whose perspectives are crucial for a comprehensive understanding of the issue being studied (Purdam, 2014). This is especially important in the context of Vietnam, where rapid economic growth has generated uneven distributions of benefits, costs, risks, and opportunities.

Ethical Implications of Citizen Observation

The role of citizen scientists as observers raises significant ethical concerns, particularly regarding surveillance and privacy. Lyon (2002) observes that citizen monitoring of social behaviours can blur the line between legitimate data collection and invasive surveillance. This risk is heightened

in politically sensitive contexts, where such activities may be perceived as tools for state monitoring or the suppression of dissent.

In Vietnam's governance context, this dynamic could manifest inversely, with citizens monitoring the government as part of efforts to promote democratic accountability. While this approach has the potential to enhance transparency and empower communities, it also introduces sensitivities within a politically restrictive environment. Such activities could be construed as subversive or threatening to state authority, complicating their implementation.

This dual dynamic underscores the need for clear ethical guidelines and robust safeguards, perhaps even a reimagined form of CS. These measures should aim to ensure that citizen observation aligns with its intended purpose of fostering accountability and transparency while safeguarding individual rights and maintaining community trust.

Power Dynamics and Influence on Policy

While CS holds potential to empower citizens and contribute to evidence-based policymaking, concerns remain about how the data collected by citizens is utilised by those in positions of power. The political context in which CS findings are presented can greatly influence their interpretation and application. There is a risk that data may be selectively employed to advance specific policy agendas, rather than authentically representing the needs and perspectives of the wider population (Purdam, 2014).

Furthermore, the relationship between professional researchers and citizen participants introduces additional complexities. Citizens may feel compelled to align with researchers' expectations or may lack the necessary training to fully grasp the broader implications of their contributions. This dynamic can create an imbalance of power, where the input of citizens is undervalued or insufficiently integrated into the final outcomes of the research (Purdam, 2014). Addressing these challenges requires careful attention to equitable collaboration, capacity building, and the ethical use of data to ensure that CS fulfils its promise of inclusivity and empowerment.

3. RESEARCH DESIGN

This chapter outlines the conceptualisation, data collection, analytical methods, and adapted theoretical frameworks employed throughout this dissertation, capturing the process from the project's inception to the synthesis of findings. To ensure the study's relevance and feasibility, the research design was collaboratively reviewed with the PAPI team and refined based on their feedback during preliminary consultations prior to the commencement of the research.

General Design

Research Paradigm

I adopted a pragmatic paradigm for this dissertation, focusing on practical solutions to enhance citizen engagement in governance through the application of CS. Pragmatism provided the methodological flexibility needed to integrate qualitative methods such as case studies, interviews, and discussions, alongside robust theoretical frameworks like the MLP and power frameworks (Understanding Pragmatic Research, no date). These frameworks informed a structured and nuanced analysis while accommodating the complexity of Vietnam's governance context.

Research Questions

Initially titled 'The Potential Application of Citizen Science to Expand the Impact of the Vietnam Provincial Governance and Public Administration Performance Index (PAPI),' my dissertation focused on the following sub-questions:

- Q1: What is the current design of PAPI compared to CS?

Examined PAPI's framework and practices for alignment with CS principles.

- Q2: What are the potential long-term impacts of integrating CS into PAPI's activities?

Explored theoretical and practical benefits, particularly for participatory governance.

- Q3: What are the key enablers and challenges of the CS approach in the PAPI context?

Analysed feasibility, resources, and barriers for CS adoption.

As research progressed, I recognised PAPI's existing alignment with CS's characters and its dependence on Vietnam's governance context. This led to a refined focus on advancing PAPI as a CS project. The updated research questions are:

- Q1: What is the current design of PAPI compared to CS?

Explores how PAPI already embodies CS principles.

- Q2: How has PAPI performed as a CS project?

Evaluates PAPI's performance as a CS initiative to inform future exploration.

- Q3: What are the key enablers, challenges, and adjustments for

advancing a CS approach within PAPI's restricted context?

Identifies actionable steps for enhancing CS in PAPI and provides lessons for similar contexts.

These refinements align with the original focus on advancing CS within PAPI while reflecting its current application. The dissertation title was revised to: 'Citizen Science for Governance Reform in Vietnam: A Case Study of the Provincial Governance and Public Administration Performance Index (PAPI).'

Research Methodology

This research employed a mixed-methods approach, combining a case study and an expert discussion (Table 1). The case study utilised PAPI's extensive documentation and data resources, complemented by semi-structured interviews with key stakeholders, to explore citizen engagement strategies and the integration of CS principles. These methods provided a holistic view of PAPI and CS's theoretical and practical applications within Vietnam's governance context.

Case study

The case study examined the development and implementation of the PAPI programme, focusing on citizen engagement strategies within the PAPI index and the Citizen Powered Innovation Initiative (CPII). Document analysis was conducted to understand PAPI's design, implementation, and outcomes, informing the development of tailored questions for semi-structured interviews. The interviews captured additional perspectives from UNDP officers and local authorities, ensuring a diverse range of viewpoints across the data set. This combination of methods ensured a robust validation of insights.

Expert discussion

To enhance the findings, a structured discussion with a PAPI expert was incorporated. This discussion presented initial findings, validated the accuracy of collected data, and explored the practical applicability of CS concepts within PAPI and Vietnam's governance context.

Table 1. Exploring research questions through mix-methods (author)

MAIN TOPIC	RESEARCH QUESTIONS	SUPPORTING QUESTION	RESEARCH METHODS			NOTE
			Case study		Online discusion	
			Documents review	Online interview		
Citizen Science for Governance Reform in Restricted Contexts: A Case Study of the Vietnam Provincial Governance and Public Administration Performance Index (PAPI).	Q1. What is the current design of PAPI compared to CS?	1.1. What is the design of PAPI programme in general?	x		x	
		1.2. How are provinces' residents surveyed for the index?	x		x	
		1.3. How are citizen engaged as enumerators?	x	x	x	
		1.4. What is the design of CPII and the process to design and implement CPII?	x	x	x	
		1.5. How are local provincial residents involved in CPII?	x	x	x	
		1.6. What are similarities and differences between PAPI, CPII with other citizen social science interventions?			x	Post-analysis comparison
	Q2. How has PAPI performed as a CS project?	2.1. What is current performance of PAPI in different aspects?	x	x	x	Post-analysis comparison
		2.2. What affected the performance of PAPI?		x	x	
		2.3. What can PAPI perform better compared to other CS projects?			x	Post-analysis comparison
	Q3. What are the key enablers, challenges, and adjustments for advancing a citizen science approach within the PAPI's restricted context?	3.1. What are enablers for PAPI to adopt other CS practices?		x	x	
		3.2. What are challenges for PAPI to adopt other CS practices?		x	x	
		3.3. How did PAPI navigate the institution for its implementation as a CS project?		x	x	
		3.4. What are potential further adjustments for PAPI to ultilise CS?			x	Post-analysis comparison
					x (exploration)	
					x (validation)	

Data Collection

This study utilised two types of documents for the case study:

- Official reports and publications:

Selected from PAPI's official website and the UNDP Independent Evaluation Office, these documents provided a comprehensive view of the programme from January 2018 to June 2024, ensuring relevance to the current context.

- Unpublished documents (used with consents):

Obtained from PAPI's internal storage, these focused on citizen engagement in the PAPI index and CPII. Key materials included:

- Notes and transcripts of interviews with enumerators, enumerator recruiters, and citizen.
- Meeting notes from discussions with public servants.

These documents, created during interviews and meetings I conducted in Vietnamese between April 2023 and February 2024, provided critical insights into PAPI's citizen engagement strategies.

To supplement the document analysis, I conducted five semi-structured interviews with PAPI stakeholders: one CPII manager, two provincial public officers from Ha Giang, one provincial public officer from Quang Tri, and one district-level public officer from Ha Giang. Participants were selected based on their direct involvement and diverse roles within CPII, ensuring a broad and diverse range of perspectives to complement insights obtained from secondary interview transcripts. Interview questionnaires were tailored to each interviewee based on initial document analysis. Additionally, a discussion with a PAPI expert was conducted to present initial findings and gather insights on advancing CS approaches.

All interviews and the discussion were conducted online via Zoom to include participants from various locations across Vietnam. The final dataset comprised:

- 7 reports on PAPI design and results (2018–2024).
- PAPI mid-term evaluation report (2019).
- 12 transcripts of interviews with PAPI enumerators.
- 10 transcripts of interviews with citizen engaged in CPII.

- 4 meeting notes with village leaders involved in CPII.
- 2 interview notes with PAPI enumerator recruiters.
- 5 transcripts of interviews with stakeholders conducted for this dissertation.
- 1 transcript from the expert discussion conducted for this dissertation.

This dataset, combining English reports and Vietnamese transcripts, underpins the analysis presented in this dissertation.

Data Analysis

Analysis tool and process

I applied thematic analysis using NVIVO software, combining deductive and inductive coding approaches with both description-focused and interpretation-focused coding. Following data familiarisation, I began by creating broad categories aligned with my three research questions. Description-focused coding was used initially to summarise and categorise surface-level content, with codes labelled and placed into these predefined categories. Codes that did not clearly fit were placed in an 'Other' container to allow for flexibility. Interpretation-focused coding was later employed to group the codes into meaningful themes. The codes in the 'Other' container were reviewed at the end of the process, with relevant codes integrated into existing themes, some used to create new themes, and others determined to be irrelevant for the analysis.

The analysis process posed several challenges, particularly in managing diverse data types from diverse perspectives. The initial coding phase generated numerous descriptive nodes, which made grouping them into coherent themes difficult. The absence of clear standards for distinguishing or merging nodes sometimes reduced the nuance of themes, complicating the process further. Additionally, analysing documents in both Vietnamese and English introduced complexity. To address this, I streamlined the process for later Vietnamese documents by grouping Vietnamese codes under existing English themes once certain themes had already emerged, while continuing to create new themes when they emerged. These themes were iteratively refined and reviewed four times to ensure coherence and accuracy before I incorporate them the drafts of this dissertation.

Another challenge during the writing process was the evolution of arguments. As my ideas developed during writing and reflection process, I lacked the time to revisit and regroup NVIVO nodes and themes comprehensively. Consequently, while the findings and arguments in this dissertation are firmly grounded in the collected data, they may not perfectly align with the structure of nodes and themes in NVIVO.

My approach to coding was iterative and adaptive, rather than strictly following a single method. The combination of deductive and inductive coding allowed me to define themes that were comparable with existing CS literature while identifying new, context-specific factors unique to Vietnam's governance framework. Deductive coding enabled themes that are comparable with established discourses on CS, helping evaluate their relevance in the Vietnamese context. Conversely, inductive coding uncovered distinctive factors, shedding light on how Vietnam's unique governance context influences the feasibility and distinctiveness of CS approaches. This combination ensured both theoretical alignment and contextual responsiveness. This process was adapted based on insights

from Braun and Clarke's approach to reflexive thematic analysis (Byrne, 2022).

Theoretical Framework for Analysis

To evaluate the performance of the PAPI programme through the lens of CS, I adapted the open CS assessment framework (Kieslinger et al., 2018). These adjustments were designed to provide a more specific focus on governance and public administration within Vietnam's restricted context.

Table 2 - Citizen science assessment framework for PAPI (adapted from Kieslinger et al., 2018)

Dimension	Process and feasibility	Outcome and impact
Scientific	• Scientific objectives • Scientific questions • Data quality	• Scientific publications • New knowledge resources
Participant	• Channel and diversity of participants invited • Role and space of participation • Support mechanism • Safety and ethics	• Inclusivity and diversity in participation • Level of participations • Empowerment
Governance and public administration reform	• Types of stakeholders engaged • Role of stakeholders • Alignment with policy goals	• Landscape trend • Local regime • Innovation

Among the three dimensions, I adjusted the criteria for the participant dimension by incorporating power forms and spaces frameworks (VeneKlasen and Miller, 2002; Gaventa, 2006, 2021) to enable a deeper analysis. The socio-ecological and economic dimension was refined to focus specifically on governance and public administration reform, integrating the three levels of socio-technical transition from the MLP analysis (Geels, 2019). This combination ensures the analysis accounts for the contextual factors missing in the original criteria. The scientific dimension was streamlined by reducing the emphasis on criteria related to the data platform. This adjustment was made to align with the scope of this dissertation and to prioritise the research's impact on governance reform. (Detailed adjusted questions addressing these criteria are provided in the appendices.)

Together, these tools provide a more comprehensive understanding of PAPI's performance and its alignment with CS (Figure 5), ensuring that their combined strengths mitigate each other's limitations, as discussed earlier in the literature review.

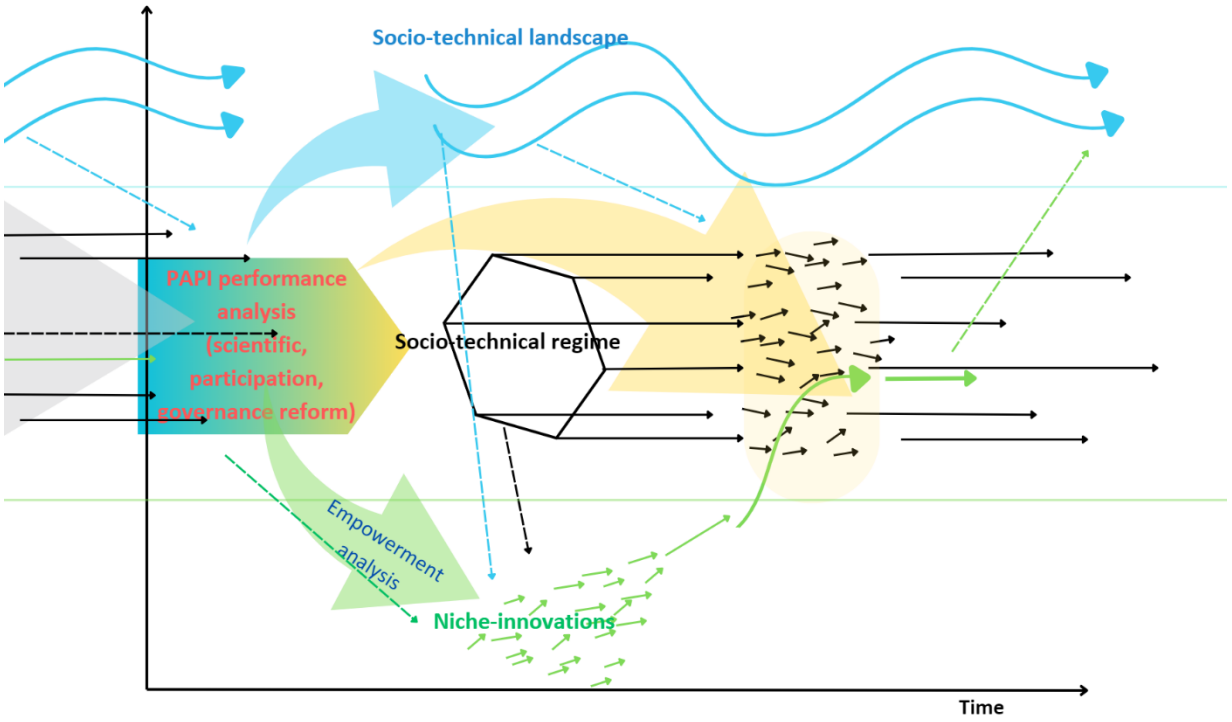

Figure 5. How theory frameworks complement each other to explore PAPI as a CS project (adapted from Geels, 2004)

Research Position, Risks and Limitations

Research Position

I acknowledge my positionality as someone who has worked with the PAPI programme as a consultant over the past two years. This background provides me with a deep understanding of PAPI's operations and context, which has informed my research design and analysis. However, it also introduces potential power dynamics, particularly as my prior role on the donor side may have influenced interactions with participants representing recipient entities, such as local authorities. To mitigate this, I explicitly clarified my independence from UNDP and other affiliated parties at the outset of each interaction. Additionally, I conducted interviews in neutral settings and relied on open-ended questioning to encourage participants to share honest and critical perspectives. Nevertheless, I remained aware that my positionality might influence the data collection process and subsequent analysis.

My personal background also influences my approach to this research. As a queer Vietnamese man, born and raised in a low-income family, with a rare family surname, I bring lived experiences of marginalisation and being perceived as part of an ethnic minority. These experiences provide a

nuanced understanding of inequality and societal challenges. While this perspective enriches my analysis, it also means that my focus on societal problems and injustices may inadvertently amplify their significance in my analysis.

CS aligns with both my academic and personal interests as a tool to address systemic inequalities. This dissertation, therefore, reflects not only an academic inquiry but also an aspiration for social change. While I view my positionality as a strength, it inevitably influences the methodological and analytical choices I make, underscoring the depth of my engagement with the subject.

Risks and Ethical Considerations

The translation of CS into Vietnamese is a sensitive term within the governance field, presenting risks when discussing how government institutions influence its potential. To mitigate these risks, I avoided directly mentioning the terminology during discussions and interviews. Instead, I referred to the characters of CS, defined as the collaboration between citizens, researchers, and stakeholders, to minimise risks associated with the translated term.

All risks associated with this research were clearly explained to participants, who were reminded of their right to refrain from answering any questions they felt unsure about. Participants were partly anonymised by retaining their titles and assigning shuffled associated numbers. All data was securely stored within the UCL system, with no access granted to external stakeholders. Only secondary interview transcripts and meeting notes with existing consent for further analysis were collected. CS was not explicitly mentioned in any of these discussions. The names of individuals involved were anonymised using the same process as other participants. Additionally, the expert discussion added an additional layer of risk mitigation, as the findings were consulted with a professional who has extensive experience navigating research sensitivities in this field before finalisation.

Limitations

The research design faces limitations in its dataset. While it includes perspectives from citizens directly involved in PAPI as enumerators and CPII participants, it does not fully represent the broader citizen population not involved in these initiatives. This design prioritises an in-depth exploration of the existing collaboration between PAPI and its participants. Consequently, the views of everyday citizens, the ultimate beneficiaries of PAPI and CPII, may not be fully captured.

4. FINDINGS

This chapter presents the main findings from the data analysis, addressing the supporting research questions outlined in chapter 3. These include the design of PAPI and its alignment with CS (Q1); the performance of PAPI across scientific, participation, and governance and public administration dimensions (Q2); and the enablers and challenges of advancing the CS approach within PAPI's context (Q3), as identified by relevant experts and stakeholders. These findings offer a comprehensive understanding of PAPI and establish a foundation for the discussion in the next chapter.

PAPI Design Compared to Citizen Science

This section examines PAPI's structure and activities. It highlights PAPI's theory of change, which empowers citizens to demand improvements and fosters collaboration with provincial authorities, as well as the programme's evolution towards deeper citizen engagement. Through document analysis, including seven official reports and a UNDP mid-term evaluation, this section assesses the implicit alignment between PAPI's framework and CS while serving as background for discussing opportunities for greater methodological integration.

Theory of Change

PAPI's strategy for fostering citizen-centric governance in Vietnam follows a clear process, as detailed in its Mid-Term Evaluation of PAPI (2020):

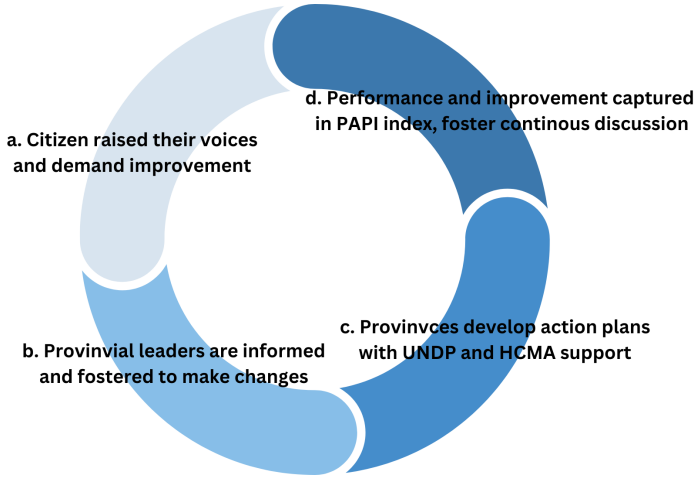

Figure 6. PAPI's theory of change as illustrated in its evaluation report (author)

a. Citizens raise their voices and demand improvement:

PAPI conducts nationwide surveys capturing citizens' experiences across eight governance dimensions. By publishing

results, citizens are empowered to identify shortcomings and demand changes, aligning with Vietnam's state motto: citizens are informed, engage in discussions, take action, inspect, monitor, and benefit from public administration and governance processes (CPV, 2021).

b. Provincial leaders are informed and fostered to create change:

PAPI index results, disseminated via elected bodies, provincial departments, and media, inform provincial leaders. Public visibility incentivises leaders to address governance gaps, as improvements enhance their political standing.

c. Provinces create action plans with UNDP and Ho Chi Minh National Academy of Politics's (HCMA) support:

UNDP and HCMA facilitate diagnostic workshops to help provinces interpret results and develop targeted action plans. These plans include clear responsibilities, measurable targets, and monitoring frameworks. Additionally, UNDP supports further research on specific issues and assists provinces in developing effective, innovative solutions.

d. Improvement is captured, and competition created:

PAPI annually assesses provincial improvements. Its competitive, results-based approach, amplified by media coverage and public scrutiny, motivates continuous governance enhancements.

Activities Over Time

PAPI's activities have evolved over time to deepen citizen engagement. Between 2018 and 2020, PAPI primarily focused on measuring and publishing its annual index. Key activities during this period included publishing the PAPI index, organising launch events involving stakeholders and participants, engaging media and other communication channels to disseminate results, and advocating for governance improvements by sharing findings with provincial authorities. The measurements for each year were published the following year, establishing PAPI as a benchmark for assessing governance performance (Figure 7).

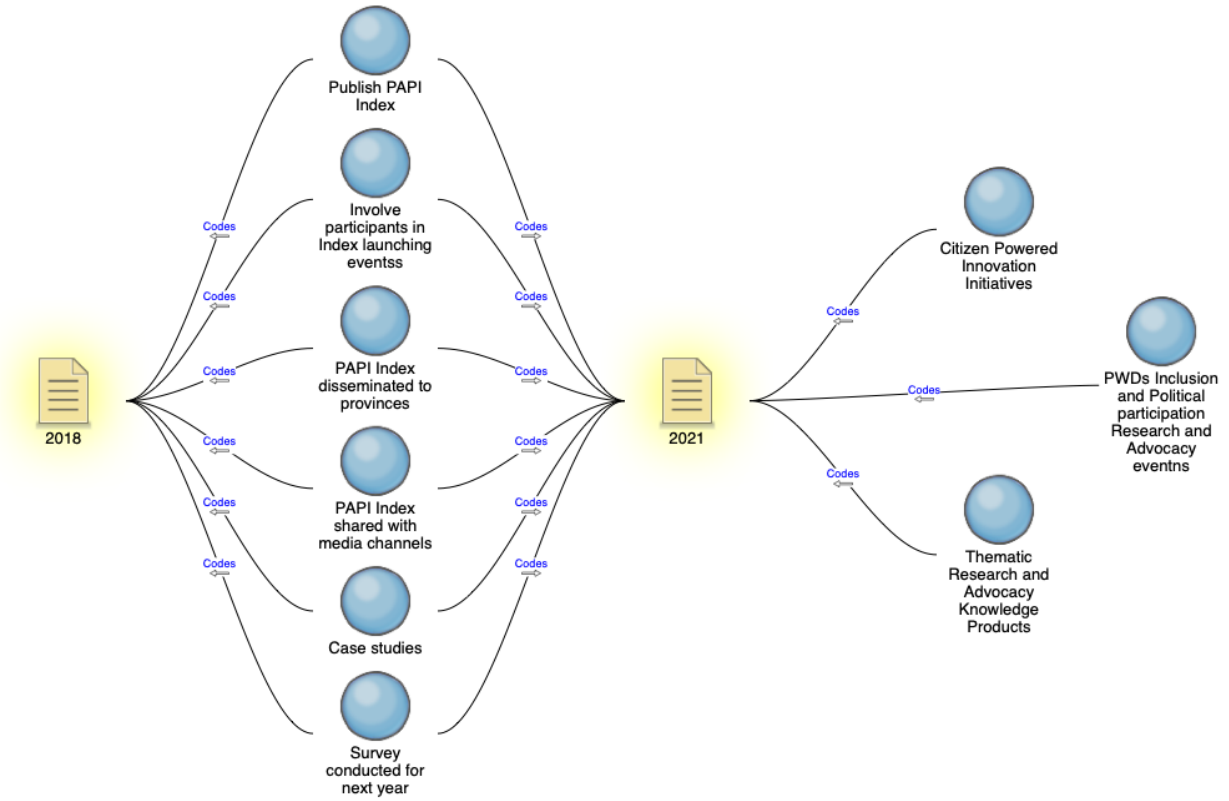

Figure 7. PAPI's design and activities from 2018 to 2021 (author)

In 2021, PAPI introduced new activities to enhance its citizen engagement efforts. These included the Citizen Powered Innovation Initiative (CPII), which directly involved citizens in the implementation of solutions. Additional activities included research and advocacy for the inclusion of people with disabilities (PWD) in political engagement and the development of thematic research and advocacy knowledge products (Figure 7). These additions mark an effort toward more inclusive and participatory approaches to governance improvement.

From 2023, PAPI further expanded its scope by incorporating international expertise to inform its activities. It also introduced research and advocacy initiatives focused on land transparency and gender equity, addressing critical governance issues with greater citizen relevance and impact (Figure 8).

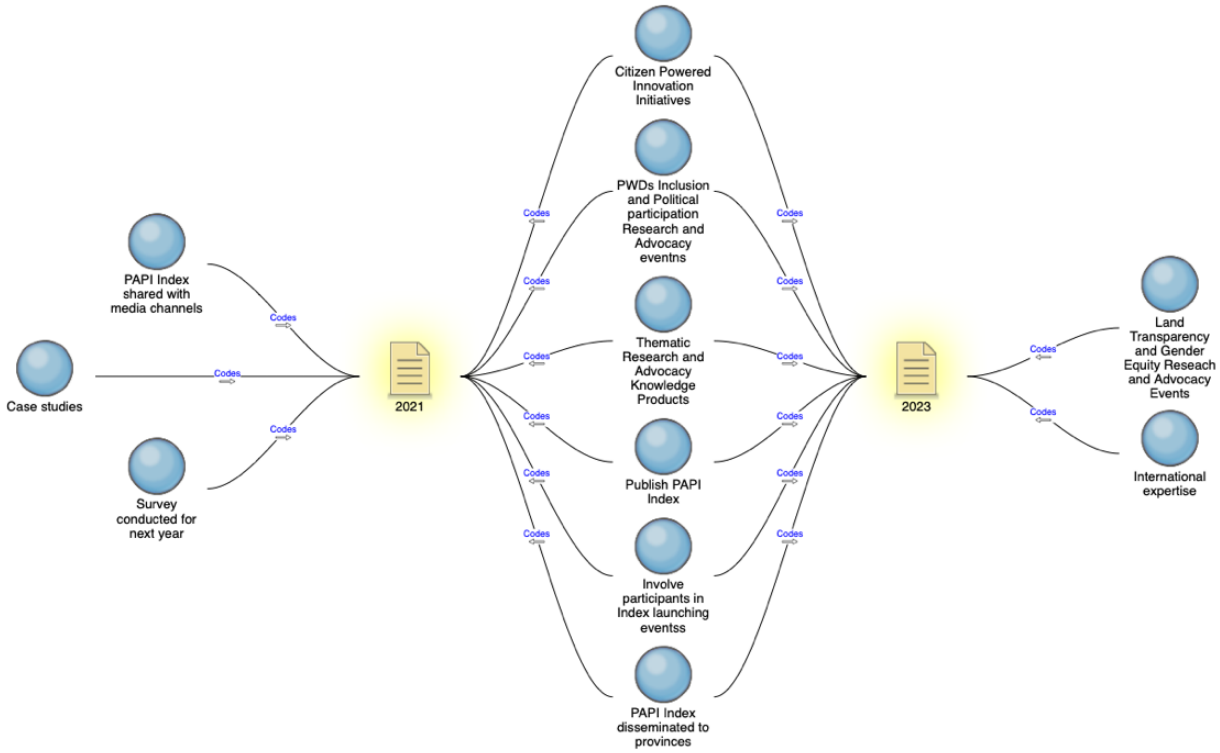

Figure 8. PAPI's design and activities from 2021 to 2023 (author)

Key Components

The PAPI programme comprises three key components aimed at enhancing citizen-centric governance in Vietnam:

PAPI Index: The core of the programme, the PAPI Index, gathers citizen feedback through a structured survey conducted by trained university students across Vietnam. These enumerators travel to provinces outside their home areas to conduct face-to-face interviews, capturing citizens' experiences with governance and public administration. The index evaluates key dimensions, including local participation, transparency, accountability, corruption control, administrative procedures, public service delivery, and, more recently, environmental governance and e-governance. By involving citizens as both respondents and enumerators, the PAPI Index reflects their perspectives and fosters engagement in governance evaluation.

Thematic Research and Advocacy: Follow up in-depth studies are conducted to address governance issues identified through the index. These studies delve into areas such as land transparency, gender equity, and inclusion, offering actionable insights for policymakers and supporting targeted advocacy efforts.

Identifying and Advocating for Good Practices: This component promotes innovative solutions to challenges identified by the PAPI index. A notable example from this component is the digital transformation task force (DTTF). DTTF is a citizen-based initiative created to improve access to online services and promote digital inclusion. It is part of the Citizen Powered Innovation Initiative (CPII) (Figure 9) and works in collaboration with local authorities in provinces like Ha Giang and Quang Tri. Local citizens are recruited and trained as DTTF members to help others use digital platforms, making online services more accessible. This effort reduces the digital

divide and enhances governance efficiency. By working closely with authorities, the DTTF supports better service delivery and ensures that governance processes are inclusive and accountable.

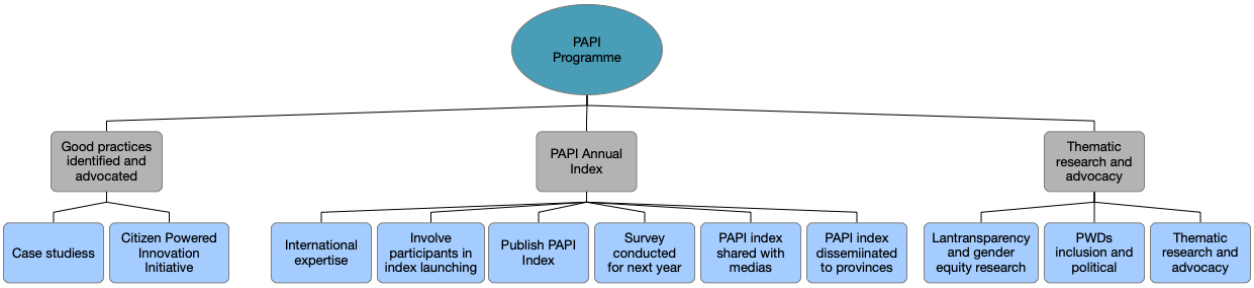

Figure 9. PAPI's main components (author)

In summary, the PAPI theory of change encapsulates the programme's vision for citizen-centric governance, serving as a guiding framework for its overall design. The analysis of its components further reveals citizen involvement across various aspects, ranging from data collection to the implementation of solutions. Moreover, the evolution of PAPI activities over time underscores its commitment to deepening citizen engagement. This progression exemplifies PAPI's alignment with the core nature of CS.

PAPI Performance as a Citizen Science Project

Building on the exploration of PAPI's overarching design and the argument that it constitutes a CS project, this section evaluates its performance, focusing on a detailed examination of the PAPI Index and CPII. The evaluation aligns with the adapted CS assessment framework (Table 2), examining their design, processes, outcomes, and impacts across three key dimensions: scientific, participatory, and governance and public administration reform.

This analysis highlights PAPI's significant contributions to scientific knowledge and governance reform in Vietnam, particularly through its extensive citizen-based data and efforts to foster meaningful interaction between citizens and public servants. Additionally, this evaluation identifies PAPI's limitations, notably the tokenistic nature of citizen participation in some aspects.

Scientific Dimension

The scientific dimension of PAPI is primarily represented by the PAPI Index and the thematic research component. This sub-section focuses on the PAPI Index, while thematic research, as a follow-up effort of PAPI, is briefly considered an outcome that fosters new research. Findings in this section are based on seven official reports of PAPI published on UNDP website, and a mid-term evaluation report, published by UNDP Independent Evaluation Office.

a. Process and feasibility

The PAPI Index is built upon clear and well-defined objectives, as highlighted in its reports and publications. Its primary aims

are twofold: (1) to empower citizens with tools to evaluate local government performance and advocate for improvements, and (2) to encourage local authorities to engage in self-assessment, foster healthy competition, and drive continuous governance enhancements (UNDP PAPI Project Portal, no date). These objectives have shaped PAPI's design, strengthening citizens' roles in governance evaluation and accountability in Vietnam.

In terms of research questions, PAPI index's inquiries are shaped by its objectives and clear set of pillars (PAPI Index 2023, 2024). The survey questionnaire reflects these scientific goals and undergoes regular refinement to ensure relevance to Vietnam's evolving context (Mid-Term Evaluation of PAPI, 2020). However, limitations persist, as the questionnaire is designed in Vietnamese, the predominant language, posing challenges for ethnic minority groups with limited proficiency in the language. Translation into minority languages can introduce subtle discrepancies, as noted by a field controller and enumerator: 'I think there needs to be a set of standards for non-Vietnamese speakers. Because there are words without standards, the more you translate, the further it deviates from the actual meaning.' (Enumerator 7, interview, Mar 2024)[26].

In terms of data collection and quality, since 2021, PAPI has adopted a robust sampling method, resampling districts biennially using a multi-stage, clustered Probability Proportional to Size (PPS) approach (PAPI Index 2023, 2024, pp. 104–107). This method ensures fair representation, addresses resource constraints, and avoids biases from districts with disproportionately poor performance. This iterative approach reflects PAPI's commitment to continuous improvement.

According to enumerator recruiters, PAPI's data collection relies on structured, face-to-face interviews conducted by trained enumerators at respondents' locations, ensuring accessibility and accuracy. To safeguard data quality and integrity, experienced field controllers, often promoted from enumerator roles, closely monitor the process to minimise risks of interference or misconduct by local authorities.

b. Outcome and impact

Over 15 years, PAPI index has surveyed 197,779 citizens, built and analysed a robust dataset, publishing 15 annual index reports and over 30 thematic studies. These outputs have significantly contributed to understanding critical governance and public administration areas such as budget transparency, public sector innovation, grassroots democracy, anti-corruption, and e-governance. Additionally, PAPI has explored emerging themes like the COVID-19 response, gender and politics, and environmental governance. Through in-depth analyses, PAPI identifies governance gaps and raises new research questions to inform further inquiry into Vietnam's governance landscape (UNDP PAPI Project Portal, no date).

Participation Dimension:

Public participants are primarily engaged in the PAPI programme through the PAPI Index and the CPII. Within the PAPI Index, citizens participate as survey respondents and enumerators, some of whom transition into

[26] Original quote: 'Anh thấy cần có bộ tiêu chuẩn cho người không nói tiếng Việt. Vì có những tiếng không có tiêu chuẩn nên các bạn càng dịch càng xa ý nghĩa thực tế.'

field controller roles. In the CPII, citizens contribute as members of the DTTF. Among these roles, enumerators (including field controllers) and DTTF members play proactive roles in PAPI activities. Therefore, this dissertation focuses on their participation.

As of this dissertation, PAPI has engaged over 4,000 enumerators and more than 100 DTTF members. This analysis demonstrates that while citizen contributions are vital to PAPI's success, their roles are primarily limited to data collection and intervention execution. Despite their engagement, citizens have limited influence over the overall process.

This section is based on the analysis of the unpublished documents, five interviews and an expert discussion conducted with stakeholders for this dissertation. Given the overlapping complexity of criteria within the process and feasibility spheres, as well as the outcome and impact spheres, the findings are presented in an integrated manner. This approach ensures a clear connection between design factors and their outcomes, while avoiding unnecessary repetition.

a. Channel and diversity of citizen engaged

In terms of the channels and diversity of citizen engagement, PAPI's recruitment process for enumerators has evolved from relying on NGOs to leveraging Facebook, university networks, and recommendations from previous enumerators. The process primarily targets social science students, often in their final years of study or recent graduates. As a result, enumerators typically share similar backgrounds, with basic research skills and experience in social sciences. This is explained by enumerator recruiter to ensure that enumerators have competencies to conduct interview and collect data for PAPI index's survey.

In contrast, under the CPII, citizens are chosen by local government leaders to join the DTTF based on their roles, such as village heads or leaders of the Farmers' Union and Youth Union. Membership was later expanded to include anyone who showed interest and commitment (Public Official, interview, Jul 2024). This group is more diverse in terms of ethnicity, including individuals from both the Kinh (Vietnamese) majority and ethnic minorities such as the Dao, Tày, Mông, and Pà Thẻn. They also come from diverse occupations, with many being farmers. However, many of these individuals have limited access to digital training, which poses challenges in acquiring the skills needed for digital transformation.

b. Role and space of participation

In terms of roles and spaces for participants, according to a recruiter, enumerators within the PAPI Index have a clearly defined role of travelling to provinces to conduct interviews with local residents using the PAPI Index survey questionnaire. These interviews typically last 45 to 90 minutes and are described by enumerators as more 'intense' compared to those in other research projects. This task is explicitly outlined in a series of documents, including job descriptions and enumerator guidelines (Enumerator Recruiter 1, interview, January 2024). Enumerators' involvement with PAPI usually concludes after the data collection phase. Without opportunities for deeper engagement, this limited scope of work leaves enumerators feeling like mere 'question-asking workers,' (Enumerator 3, interview, March 2024)[27]. While some enumerators may advance to roles such as field controllers or enumerator recruiters, there are no official or clear mechanisms for promotion to these roles. Consequently,

[27] Original quote: '…em cảm thấy mình chỉ như thợ đi để hỏi thôi'.

their engagement remains confined to the closed and invited space, and the level of citizen engagement within the PAPI Index is restricted to the distributed intelligence level, positioning the PAPI Index as a contributory CS project. However, it is noteworthy that during interviews with enumerators, when asked about their interest in further involvement with PAPI, a common response was that they did not know how to collaborate beyond data collection.

One notable exception is an enumerator who progressed to a field controller role and later became a technical consultant. A PAPI expert suggested that the participant's success was driven by their passion and non-traditional educational background, which enabled them to stay engaged and proactive despite PAPI's lack of official collaboration opportunities beyond data collection. Their commitment caught the attention of the PAPI team, leading to further collaboration. This example represents an ideal case for further discussion.

> [Enumerator name] exemplifies a successful progression from an enumerator to a field controller and now a national consultant. This highlights the importance of recognising and fostering individual interest. Often, individuals may not proactively express their passion, leading to their potential being overlooked. In this instance, the participant advanced step by step, showcasing genuine interest and commitment (PAPI expert, discussion, Sep 2024)[28].

On the other hand, citizens involved in the CPII as members of the DTTF have a broader scope of work. DTTF was initially mobilised to support local communities in navigating the online public service portal. Over time, recognising their effectiveness, local authorities broadened their mandate to include promoting economic and social development, discouraging early marriage, and addressing outdated customs, and more (Public officer 1, interview, Jul 2024). Another public officer shared:

> Online public services are just one of the activities of digital transformation. The commune has implemented many other activities, and this team is the main force supporting these efforts, such as setting up VNID and the 4.0 Marketplace. The team is very enthusiastic and responsible. (Public officer 2, interview, Jul 2024)[29]

Although this broader scope provides more opportunities for citizen contributions, their involvement is limited to executing predefined tasks or interventions. For example, DTTF activities are designed in advance, with citizens engaged to deliver these activities rather than shape them. As a result, their engagement occurs in a 'closed space' (Gaventa, 2006), and their level of involvement fluctuates between non-participation and tokenism (Arnstein, 1969). Although meeting notes and reports indicate that DTTF members shared numerous ideas on how they wished to contribute further, the limited space for engagement restricted their capacity to act on these ideas.

[28] Original quote: '...ví dụ điển hình là [x] phát triển từ điều tra viên lên trưởng nhóm và hiện là tư vấn. Đó là về việc nhận ra sự quan tâm của họ và nuôi dưỡng nó. Đôi khi, các bạn không thể hiện sự quan tâm của mình một cách chủ động nên mình bỏ qua họ. Trong trường hợp này là nhìn thấy [x] thể hiện sự quan tâm và cam kết thực sự.'

[29] Original quote: 'Dịch vụ công trực tuyến chỉ là một trong các hoạt động của chuyển đổi số thôi. Xã triển khai nhiều hoạt động khác, và đây là lực lượng chính để hỗ trợ triển khai các hoạt động này, ví dụ như cài đặt VNID, chợ 4.0. Tổ trưởng là cán bộ không chuyên trách, rất nhiệt tình và có trách nhiệm.'

SUGGESTION FROM THE DIGITAL TRANSFORMATION TASK FORCES DURING THE TRAINING SESSIONS

Activities they wish to undertake	Support they need
• Organize similar training sessions in the village for young participants, enabling them to continue guiding others.	• Additional videos/brochures are needed for distribution to provide guidance. • Training sessions should involve younger members within the village, not just village leaders or deputies. Families with young individuals should nominate participants who can apply the knowledge gained within their households. • Provide 1-2 computers per village and 1-2 projector sets per commune for shared use during training sessions.
• Assisting citizens with simple procedures, providing on-site guidance to those with devices. • Assisting citizens in setting up their electronic identities. • Supporting citizens with simple procedures as taught in the recent training sessions.	• Tablets, smartphones, and internet connectivity are essential tools. Smartphones are necessary for convenience and efficiency. • Financial support for transportation expenses is required. • More training to better understand the steps in the online procedure. • Citizens must have their verified phone number, a smartphone, and an ID card.
• Assisting citizens in registering Zalo accounts and creating Zalo groups for sharing and communication. • Supporting citizens in integrating their health insurance and driver's license for more convenient use.	

Figure 10. DTTF members suggest ideas they wish to implement (Me and Dang, 2023)

c. Support mechanisms and empowerment

In terms of support mechanisms and empowerment, from the perspective of 'power to,' which refers to skills and knowledge (VeneKlasen and Miller, 2002), both PAPI enumerators and DTTF members receive capacity-building support. Enumerators are trained in interview techniques, data entry, and communication, while training for DTTF members equips them with skills such as creating digital accounts, submitting online forms, and processing online payments. However, both groups expressed concerns about insufficient training. An enumerator stated, 'more training about research objectives of PAPI is crucial, not just the process, to ensure data quality and accuracy' (Enumerator 7, interview, March 2024).[30] This limitation was echoed by an enumerator recruiter, who explained that the limited training was due to resource constraints (Enumerator recruiter 1, interview, January 2024). On the other hand, enumerators indicated that the fieldwork experience enhances their' knowledge of public administration, supports them in exercising their right as a citizen, improve their research competency, and provides them with insightful observations on governance issues.

> There were things I had never known or explored before joining PAPI, but thanks to PAPI, I had the chance to learn about them. For example, I gained an understanding of household registration or administrative procedures, as I needed to research these topics to explain them to the public. I later support people with

[30] Original quote: 'Anh nghĩ một trong mấu chốt lớn của PAPI là làm việc kỹ với PVV về nghiên cứu, chứ không chỉ là trải nghiệm, nếu không thì PVV có thể làm cho xong.'

these procedures (Enumerator 9, interview, March 2024).[31]

Next, in terms of 'power with,'(VeneKlasen and Miller, 2002) which refers to resources, all enumerators and some DTTF members received salaries for their work (some DTTF members indicated they were unpaid due to funding distribution plan of local authorities). Enumerators earned approximately 700,000 VND (GBP 30) per day, while DTTF members received 700,000 VND per month. These salaries included all related expenses. Citizens involved in both activities reported that the compensation was insufficient to conduct their work effectively. Nonetheless, their experiences with PAPI helped them build networks and social capital, supporting them in other aspects of life, such as future work opportunities (Enumerator 8, interview, March 2024).

> It takes a lot of time to travel, I need to be passionate about the work, and I have to give up many household tasks to carry out these duties, while the allowance is quite meagre, often not enough even for fuel costs, especially during youth-focused months, when I have to travel frequently and use my own money (DTTF member 3, interview, May 2023)[32]

In terms of 'power over,'(VeneKlasen and Miller, 2002) which refers to the authority granted to citizens through their roles, neither enumerators nor DTTF members had the power to influence the design of activities or research. However, DTTF members highlighted that the title of DTTF member gave them authority to provide guidance and answer others' inquiries, noting that without the role, other citizens would not look for them when they need help (DTTF member 2, interview, May 2023).

Finally, in terms of 'power within,' (VeneKlasen and Miller, 2002) refer to motivation and belief, enumerators shared that their experiences with PAPI, such as traveling to different provinces and observing the lives and challenges of local people, especially regarding public administration issues, inspired them to contribute further and maintain their willingness to be involved. On the other hand, DTTF members mentioned their motivation to engage originated at the outset, rather than being influenced through the engagement process. They stated that they 'were happy that [they were] chosen to support their community and aspire to create a better life for [their] community even though working with CPII was challenging' (DTTF member, interview, May 2023).[33]

d. Safety and ethics

In terms of safety and ethics for citizens, within the PAPI Index, it is noted that the involvement of local authorities in survey respondent invitation and their collaboration with enumerators to facilitate interviews often exposes the identities of enumerators and field controllers. The relationship dynamics, where enumerators collect citizens' feedback on public administration - directly linked to the performance of local authorities - create tensions between enumerators and local officials. This highlights a critical risk that puts pressure on enumerators and impacts

[31] Original quote: 'Về kiến thức thì có những thứ trước khi đi PAPI em chưa bao giờ biết hay tìm hiểu tới, mà nhờ PAPI thì em tìm hiểu về mấy cái đó. Ví dụ như là lý lịch thư pháp, hay kiến thức hành chính thì em biết nhiều hơn vì em phải tìm hiểu để giải thích cho người dân, sau này thì em áp dụng hỗ trợ mọi người.'

[32] Original quote: 'Tốn nhiều thời gian để đi, phải nhiệt huyết để đi làm, phải bỏ nhiều công việc gia đình để thực hiện các công việc trong khi phụ cấp khá ít ỏi, nhiều khi không không đủ xăng xe, đặc biệt các tháng thanh niên, đi nhiều phải bỏ tiền túi'

[33] Original quote: '…vui vì được tín nhiệm, mình cũng muốn hỗ trợ mọi người cho cuộc sống tốt hơn, dù làm thì vất lắm'

their safety. During an interview, one enumerator shared:

> It's stressful because I don't know how local authorities will react if the results aren't favourable. Last year, during fieldwork, I reported that local authorities in province [name] tried to influence citizens' answers to the survey, which resulted in that province not being ranked in the final index report. After that, I was contacted by provincial officials but felt too afraid to respond, which left me anxious about future collaboration. (Enumerator 2, interview, 2024).[34]

Governance and Public Administration Reform

This subsection presents findings on how PAPI has ensured the implementation of the programme, given its sensitive nature, and how it has impacted governance and public administration in Vietnam over the past 15 years.

a. Process and feasibility

PAPI index collaborates with a range of implementing and funding partners to ensure the programme's success. Its implementing partners include international organisations, academic institutions, research centres, government agency and NGOs:

- United Nations Development Programme (UNDP): Focuses on empowering individuals and promoting inclusive development in Vietnam. UNDP provides strategic oversight for PAPI, ensuring its alignment with global governance standards.
- Centre for Community Support and Development Studies (CECODES): A non-profit research organisation under VUSTA that specialises in community-focused research. CECODES supports PAPI's field operations and data analysis.
- Centre for Research and Training of the Vietnam Fatherland Front (VFF-CRT): Facilitates PAPI's field activities and fosters stakeholder engagement at both local and national levels, contributing to Vietnam's political, social, and economic development.
- Real-Time Analytics (RTA): Applies advanced data analytics to quickly process survey data, enabling timely and actionable recommendations for policymakers.
- Ho Chi Minh National Academy of Politics (HCMA): A key institution for governance training, HCMA connects PAPI findings with political leadership through academic research, policy education, and integration into government training curricula.

PAPI programme's funding partners include the Government of Spain (2009–2010), Government of Switzerland (2011–2017), Government of Australia (2018–2021), Government of Ireland (2018–2021), and UNDP Viet Nam (2009–present). These partners provide critical financial resources, enabling PAPI to sustain operations, expand coverage, and implement innovative methodologies. Their support ensures PAPI's ability to deliver reliable, evidence-

[34] Original quote: 'rất căng thẳng vì [tôi] không biết chính quyền địa phương sẽ phản ứng như thế nào nếu kết quả không thuận lợi. Năm ngoái, trong quá trình thực địa, [tôi] có báo cáo bên tỉnh [x] đã cố gắng ảnh hưởng đến câu trả lời của người dân, dẫn đến việc tỉnh này không được xếp hạng trong báo cáo chỉ số cuối cùng. Sau đó, phía bên tỉnh họ liên hệ [tôi] tránh không trả lời'

based insights to policymakers and stakeholders.

The PAPI programme aligns with global trends, notably SDG 16 (Peace, Justice, and Strong Institutions), through its focus on governance, transparency, and accountability. Within CPII, the DTTF model supports the Prime Minister's Circular 06 on digital transformation, leveraging UNDP's technical and financial support alongside local authorities' implementation efforts to ensure success.

b. Outcome and impact

At the landscape level, the PAPI Index supports SDG 16 by addressing corruption (target 16.5), effective institutions (target 16.6), and inclusive decision-making (target 16.7), enhancing its global relevance and attracting interest from international stakeholders. While PAPI does not directly shape global governance frameworks, its data-driven approach highlights gaps, informs discourse, and maintains external pressure on Vietnam to align with global standards of transparency, accountability, and citizen engagement.

At the regime level, PAPI serves as a benchmark for measuring government performance through citizen feedback, highlighting gaps in transparency, public service delivery, and accountability. Provincial authorities have acknowledged shortcomings and developed targeted action plans, with follow-up support from PAPI. In 2023, 62 out of 63 provinces adopted the PAPI Index, and 50 published specific action plans in response to its findings (Figure 11). Evidence-based reports and workshops have provided actionable insights, enabling provinces to identify root causes of underperformance and implement solutions, creating 'windows of opportunity' (Geels, 2004) for dialogue, innovation, and incremental reforms.

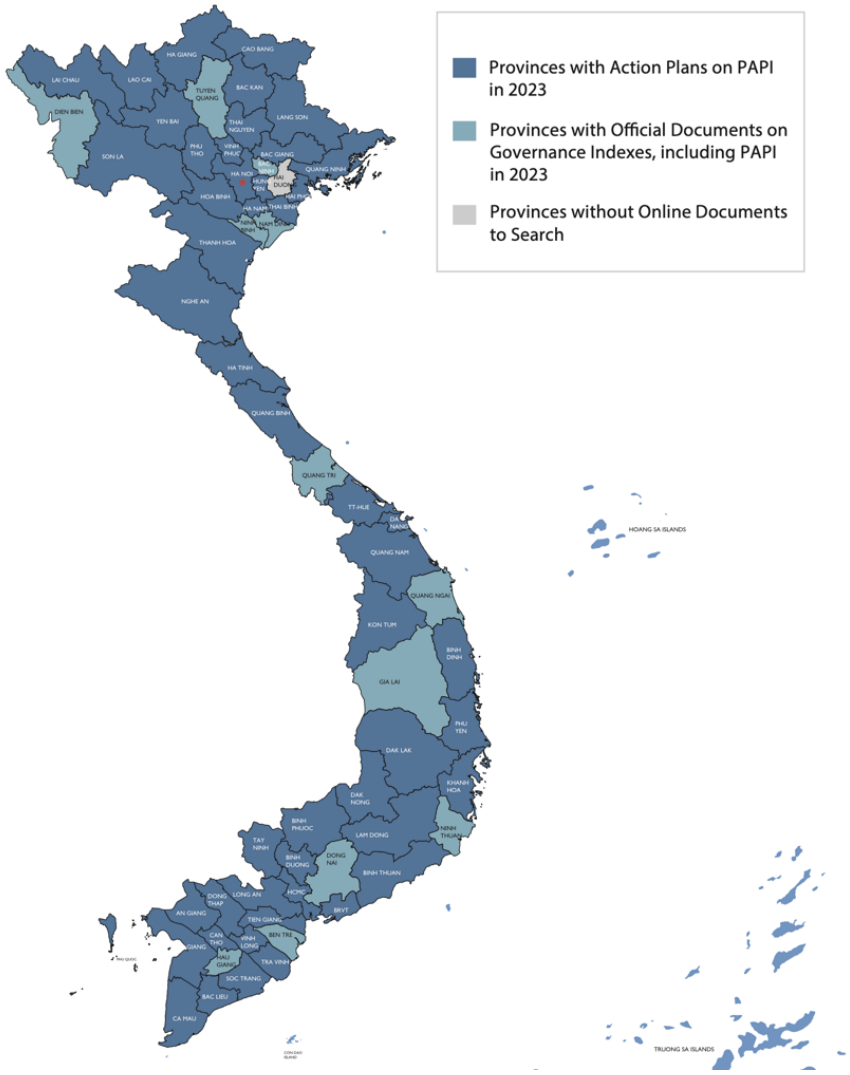

Figure 11. Mapping of Provincial Governments' Responses to PAPI in 2023 (PAPI, 2023)

Furthermore, PAPI facilitates collaboration between authorities and citizens, as seen in CPII. Local authorities have noted that 'seeing [DTTF's] enthusiasm makes [them] feel more passion for the work, motivating [them] to serve the citizen better' (Public officer 3, interview, July 2024). Moreover, observing the challenges citizens face has shifted their mindset from a top-down approach to a citizen-centric perspective (Public officer 3, interview, July 2024).[35] The DTTF within CPII, therefore, acts as innovations required to bridge gaps in government performance. Thus, at the niche innovation level, PAPI has fostered new initiatives, bringing them closer to influencing the governance regime.

[35] Original quote: 'Thấy họ hào hứng mình cũng thấy hiệu quả và mình có thêm đam mê trong công việc để phục vụ người dân.'

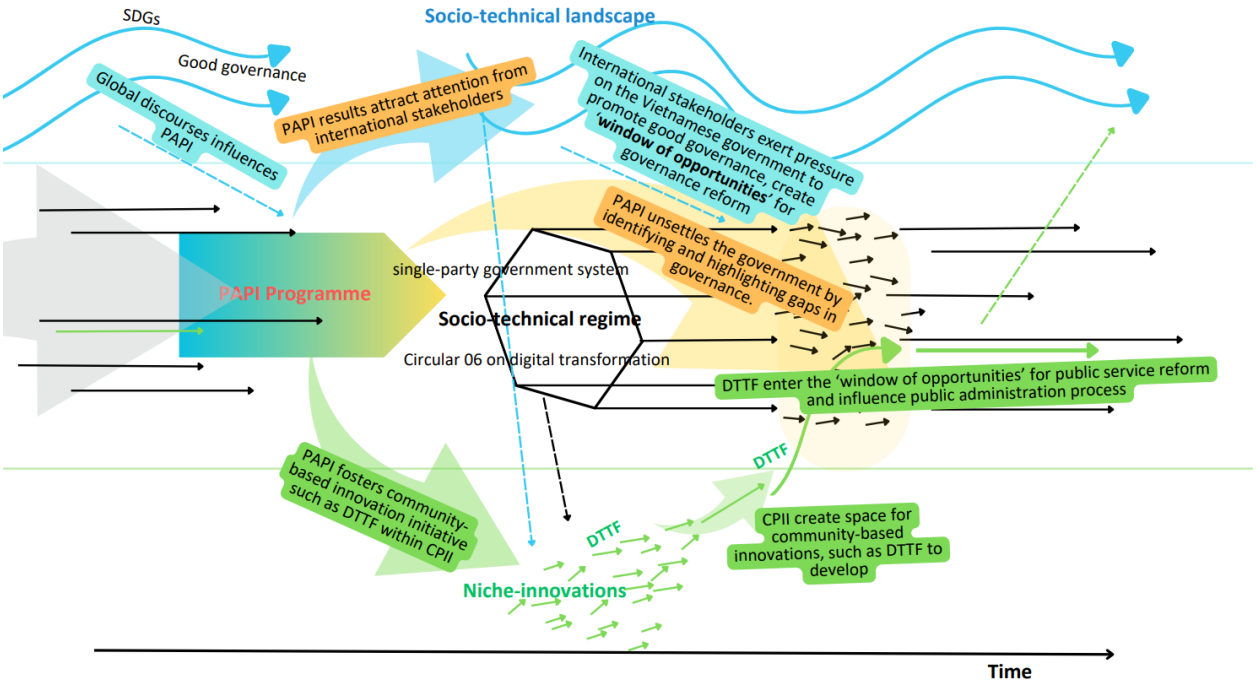

Figure 12. PAPI's impact picture (adapted from Geels, 2004)

Enablers for Citizen Science Approach within PAPI

Following the performance analysis of PAPI, this subsection presents the enablers and favourable factors that contribute to the impacts and success of PAPI. These findings are draw from interviews conducted with PAPI's stakeholders and the discussion with PAPI expert.

Reputation and Relationship with Government Partners:

PAPI has built a strong reputation and trust with government agencies over its 15 years of implementation. This formal partnership with local authorities ensures smoother processes and access to official information, as highlighted by an enumerator:

> The difference with PAPI is that, unlike other research programmes where we have to manage everything ourselves, with PAPI, we work with local authorities who support us, giving us access to official information and connect us with local residents for interviews. (Enumerator 11, interview, March 2024).[36]

Financial Resources for Related Interventions

PAPI benefits from dedicated financial resources. This financial leverage, supported

[36] Original quote: 'Khác biệt ở PAPI so với dự án khác là mình làm với chính quyền, họ cho mình thông tin và kết nối mình với người dân, mình không phải tự làm mọi thứ.'

by UNDP and other stakeholders, enables PAPI to conduct interventions that might otherwise struggle for funding in Vietnam's governance and development field. A PAPI's leader noted: 'because we work with UNDP, we have the financial resources to do this work. Outside of this, society would need to find the money to carry out such initiatives, wouldn't they?' (PAPI expert, discussion, September 2024).[37]

Enthusiasm of Citizen

The enthusiasm of citizens paves the way for deeper engagement in future initiatives. Both PAPI enumerators and DTTF members have shown strong commitment and provided valuable suggestions for more targeted, hands-on training to enhance their skills and foster greater involvement. Their expressed willingness to collaborate highlights the promising potential for expanding CS activities in the future.

Favourable Policy and Related Programmes

During the interviews, public officials highlighted that policies such as Circular 06 on digital transformation have fostered collaboration among local authorities, departments, and communities for initiatives like DTTF. Local authorities view these initiatives as feasible and scalable, with potential to extend beyond digital transformation into other areas. This paves the way for further collaboration between the PAPI programme, local authorities and citizen. (Public officer 1, interview, July 2024).

Next, when discussing CS, CPII manager identified opportunities for integrating CS approaches into related projects within UNDP, including thematic research, workshops, and other interventions under UNDP's Governance and Participation Unit. This underscores the potential to synergise UNDP programmes with CS initiatives:

> UNDP oversees many other projects. CS enhances the understanding of citizens and could also complement the EUJULIE programme, which focuses on promoting public access to and understanding of the justice system (CPII manager, interview, June 2024).[38]

Moreover, stakeholders, including the HCMA, are planning to integrate PAPI insights into their curricula (Mid-Term Evaluation of PAPI, 2020). As a key partner, HCMA is well-positioned to play a pivotal role in promoting CS, especially as the concept gains traction globally and garners attention within Vietnam's environmental science initiatives. These educational collaborations have the potential to enrich academic discourse and equip future governance leaders with the tools to drive meaningful change.

Dedicated Leadership

The success and longevity of PAPI is also link to its dedicated leadership. Over 15 years, PAPI's leaders have demonstrated a strong commitment to driving the programme forward. 'PAPI would not have survived until today with so many challenges if I were not

[37] Original quote: 'Đấy là mình làm UNDP mình có tài chính để làm việc này, nếu ở ngoài họ kêu gọi ở đâu ra, đúng không,'

[38] Original quote: 'UNDP có nhiều dự án khác nhau. Thesis này có thể làm pilot để thử nghiệm thêm, add in thêm phần khoa học công dân vào. Khoa học công dân làm tăng cường hiểu biết, EUJULIE cũng có hoạt động tăng cường tiếp cận và hiểu biết về tư pháp cho người dân'

committed about it,' PAPI expert stated (PAPI expert, discussion, September 2024).[39]

Barriers to Advance Citizen Science Approach within PAPI

This section outlines the barriers to citizen engagement activities as identified by stakeholders, drawing primarily on interviews and the discussion.

Mandate and Resources of PAPI

PAPI aims to transform Vietnam's governance from a top-down system to a more participatory one, a long-term process requiring incremental change. It lacks the resources to implement capacity-building initiatives needed for higher level of citizen engagement. A PAPI expert noted that its mandate focuses on feedback collection rather than capacity-building (PAPI expert, discussion, September 2024). Additionally, provincial officials also cite limited time, resources, and capacity as barriers to conducting extensive training activities for citizen as members of DTTF (Public officer 2, interview, July 2024).

Institutional Context and its Influence on CS Application

a. Governance legacies:

Despite efforts to involve citizens, PAPI operates within the constraints of Vietnam's institutional framework. As highlighted in the MLP analysis, PAPI influences and is influenced by Vietnam's governance regime. PAPI and partners' current approach to citizen engagement, through enumerators and the DTTF, limits participation to closed and invited spaces (Gaventa, 2006), restricting citizens' ability to influence programme design or direction. PAPI expert noted that 'Vietnam's single-party system, top-down policymaking, and constrained civic space, has fundamentally shaped [PAPI] interventions.' (PAPI expert, discussion, September 2024).[40]

Additionally, mirroring the broader Vietnamese context discussed in the literature review, PAPI expert observed a lack of proactivity among participants. Citizens also expressed a willingness to contribute but felt unclear about how to do so as presented earlier. This reflects issues of passive citizenship rooted in Vietnam's education system. PAPI expert observed during a workshop with HCMA: 'In classrooms, teaching is one-way, teachers talk, and students listen. Active learning doesn't exist; passive learning dominates' (PAPI expert, discussion, September 2024).[41]

Furthermore, citizens with aspirations for governance reform often face discouragement. A case shared by PAPI expert:

> A former enumerator shared [with us] that one of the things she learned from PAPI was to say no to corruption. She later became a public servant. She practiced this but could not sustain their role in the government system [due to

[39] Original quote: 'Nếu mình không thực sự cam kết và đam mê thì có lẽ PAPI đã dừng lại từ lâu rồi.'
[40] Original quote: 'Bối cảnh ở Việt Nam mình là single-party system, top-down policymaking, và constrained civic space, giới hạn những gì mình có thể làm.'
[41] Original quote: 'Trên lớp học thì thầy cô nói, sinh viên nghe thôi, không có học chủ động, chủ yếu là bị động.'

existing culture and practices] and had to move to the private sector. (PAPI expert, discussion, September 2024)[42].

b. Country development context:

In PAPI's context, many interventions are led by third parties including UNDP, the extent of their effectiveness depends on the government's willingness to allow external actors to participate. At the time of this dissertation, interviewees in Vietnam, along with global discussions, indicated that the Vietnamese government remains hesitant to open space for such discussions, particularly those related to public administration (Pincus, 2022, p. 175). PAPI expert shared:

> In Vietnam's current context, the contributory model is the most feasible approach given the prevailing conditions, as the government remains reluctant to collaborate. During the early stages of the CPII, a call for proposals was issued to encourage public sector innovation, but the response was minimal. As a result, the process had to be reversed, with efforts focused on persuading local governments to engage. (PAPI expert, discussion, September 2024).[43]

c. PAPI's adaptation:

PAPI expert highlighted the importance of adapting to the local context, including adjusting terminologies such as replacing terms like 'advocacy' with 'development' or 'innovation.' They also emphasised the programme's persistence and careful approach, beginning with small interventions and gradually evolving over time. These contextual adaptations have been instrumental in contributing to PAPI's success (PAPI expert, discussion, September 2024).

In summary, this section has outlined the key limitations of the restricted context in which PAPI operates. This constrained environment has shaped both the design of PAPI's citizen engagement activities and the autonomy of citizens to participate. These findings align with the broader Vietnamese context discussed in the literature review.

[42] Original quote: 'Một phỏng vấn viên từng share là đi PAPI học cách say no với corruption, sau đó vào làm nhà nước họ cũng thực hành đấy nhưng không trụ được trong môi trường nhà nước và phải nhảy ra làm doanh nghiệp…'

[43] Original quote: 'Ở Việt Nam thì đúng là chỉ làm được contributory thôi, vì government họ chưa cơi mở hợp tác, hồi đầu CPII mở call for proposal cho đổi mới sáng tạo khu vực công mà họ phản ứng rất chậm, thành ra mình phải vận động ngược lại để họ engage.'

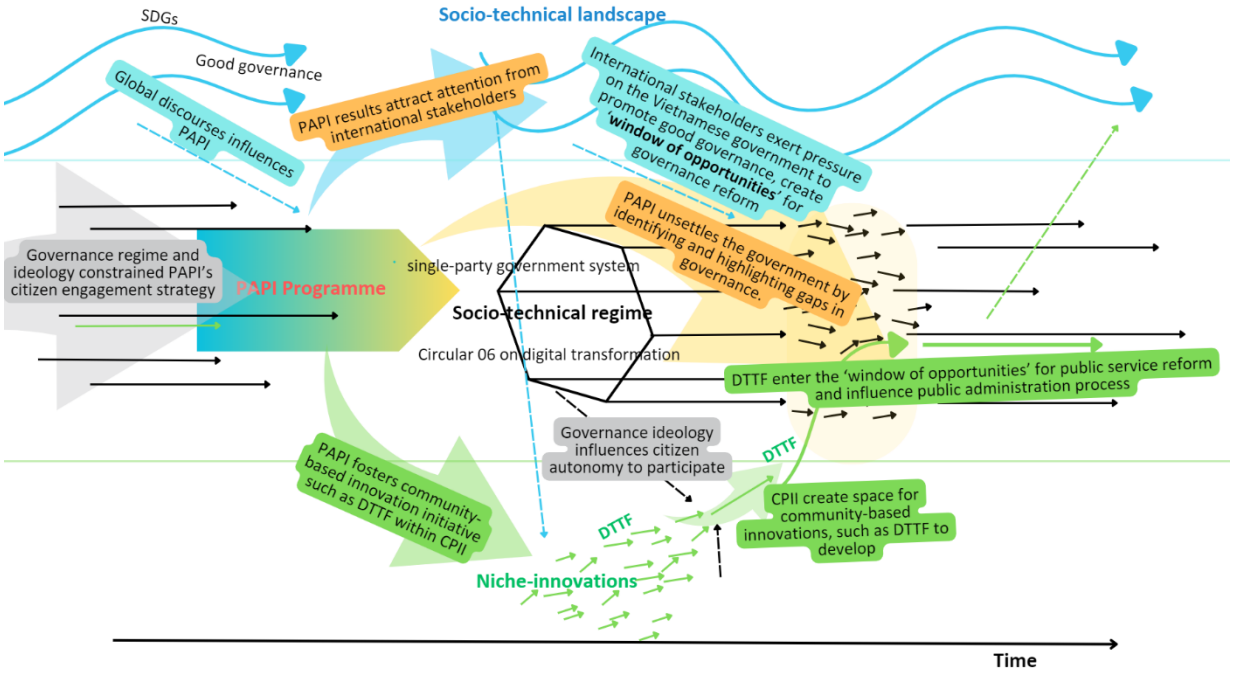

Figure 13. PAPI influences and is influenced by governance context (adapted from Geels, 2004)

5. DISCUSSION

PAPI Current Stage as a Citizen Science Programme and Advancement Opportunities

As illustrated in the previous chapter, PAPI's design is well aligned with the nature of CS. This approach has enabled PAPI to collect rich, high-quality data and implement innovative interventions, ultimately contributing to governance reform in Vietnam. Based on these findings, I argue that CS, as exemplified by PAPI, holds significant potential to foster governance reform in the restrictive contexts of Vietnam.

Currently, PAPI's engagement with citizens closely aligns with the contributory project model. While citizens participate in both data collection and implementing solutions, PAPI's approach remains more top-down compared to practices like those outlined by Mintchev et al. (2022b). As a result, citizens have limited opportunities to develop their own grassroots solutions, which restricts the potential diversity of innovations that could emerge.

Nevertheless, this model may represent a suitable starting point within Vietnam's context, considering the governance system and the current level of citizen autonomy. It enables citizen participation in data collection and advocacy while addressing institutional constraints. As PAPI evolves, its participation model could progress to higher engagement levels, as exemplified by an enumerator-turned-consultant, demonstrating the potential for greater impact (Haklay, 2013).

However, it is notable that commonly used frameworks, such as typologies (Haklay, 2013), citizen engagement project models (Shirk et al., 2012), or participation ladders (Arnstein, 1969) fail to fully capture the nature of citizen engagement within PAPI. Different components of PAPI engage distinct groups of citizens: enumerators in the index component and DTTF members in the CPII component. Although citizens participate in various phases and activities, they are not the same individuals. While existing frameworks can define specific activities, they fall short of representing PAPI's overall engagement strategy. Engaging different groups across activities appears better suited to PAPI's sensitive context, as I will discuss later. This suggests that typologies and models of CS in Vietnam's restrictive political environments may need to evolve into hybrid forms, requiring further research and experimentation.

Potential Experiments for Advancing Citizen Science in PAPI

Building on comparisons with other CS practices and considering PAPI's existing activities, the PAPI programme could experiment small interventions to achieve higher levels of citizen participation. These suggestions are based on two key considerations: first, successful interventions in other countries that PAPI could experiment with; and second, the strengths of CS that can complement PAPI's current limitations. The aim is to build additional 'support structures' (Mintchev et al., 2022b, p. 3) for citizens to leverage their skills toward tangible actions and meaningful changes.

a. Experiment participatory CS projects in small scale:

While transforming the PAPI index into a fully participatory CS project may not be feasible, smaller initiatives like CPII and thematic research can incorporate active citizen participation. Engaging citizens in design, implementation, and follow up phases could foster grassroots-led initiatives that complement PAPI's top-down impact.

b. Strengthening Advocacy:

PAPI's advocacy is primarily led by its team, who analyse and present citizen feedback to policymakers (Mid-Term Evaluation of PAPI, 2020). This process could be enhanced by involving citizens, such as enumerators or DTTF members, to share their stories directly alongside PAPI during workshops with provincial authorities. Such an approach would foster dialogue between citizens and authorities, promoting sustained engagement even if PAPI's role diminishes over time.

c. Building a Network of Citizen Scientists:

UNDP supports Vietnam's development through various programmes requiring citizen collaboration, as highlighted by the CPII manager. Establishing a network of citizen scientists could provide a foundation for long-term partnerships, strengthening not only the PAPI programme but also other UNDP's activities, while also enabling resource synergy for citizen engagement between UNDP' programmes.

d. Enriching Thematic Research:

Mid-Term Evaluation of PAPI (2020) highlight the need for deeper thematic research to address issues raised by the index. Citizen observations can provide rich qualitative data, uncovering governance challenges. Currently, enumerators' field observations are insightful but not included in PAPI reports. Collecting and integrating these insights into thematic research could enhance evidence-based policy recommendations.

e. Enhancing Communication and Public Awareness:

Observations from citizen could also serve as powerful narratives to highlight key governance issues, as enumerators often share that their observations inspire and move them deeply. Currently, media coverage often prioritises surface-level trends rather than the deeper issues identified by PAPI (Mid-Term Evaluation of PAPI, 2020). Stories grounded in enumerators' or DTTF members' lived experiences could be a compelling way to deliver insights and inspire further engagement (additional quotations from enumerators are included in my previous research report on their experiences and perceptions of PAPI, provided in the appendices).

By experimenting with these interventions, PAPI could move to higher level of citizen engagement, enhancing its impact, and addressing its current limitations.

Citizen Science's Definition for Governance Reform in Vietnam

To effectively utilise the CS approach and advocate for its advancement within Vietnam's governance sphere, it is crucial to establish a definition tailored to this unique setting. This definition can be guided by the three key dimensions discussed earlier:

- The descriptive dimension: This dimension highlights the collaboration between public participation and research. By adhering to academic standards, it enhances the definition's credibility,

reinforces the project's academic rigour, and steers it towards scholarly excellence. This approach is consistent with the characteristics of CS in other contexts and draws on lessons from PAPI's success. PAPI's commitment to high academic standards has earned widespread stakeholder acceptance, a key factor in its achievements.

- The instrumental dimension: Insights from PAPI underscore the need for Vietnam's governance system to adopt a citizen-centric mindset and inclusive participatory mechanisms. Accordingly, the CS definition in Vietnam should align with this imperative, emphasising governance that amplifies citizens' voices and fosters participatory spaces.
- The normative dimension: This dimension must account for the political sensitivities unique to Vietnam's context. Lessons from PAPI's practices, including careful adjustments to terminology and the gradual evolution of activities, highlight the need for flexible and sensitive language in CS definitions. For example, adopting the term 'community science' instead of CS could help mitigate sensitivities.

Combining these dimensions, this dissertation proposes the following definition of CS in the Vietnamese governance context, follow the term khoa học cộng đồng (community science): 'A collaborative approach that engages citizens and stakeholders in research to develop solutions that promote citizen-centric governance. This approach encourages strategic and flexible engagement, enabling citizen participation to evolve into impactful roles, regardless of their initial level of involvement.'

This definition serves as a guiding idea for future projects to adopt CS as a concept that builds on lessons learned from PAPI. Such a discourse, encompassing the broader governance principle that require advocacy, can encourage CS initiatives to echo PAPI's efforts in fostering governance reform in Vietnam.

An Adaptive Decision Toolkit for Citizen Science Typologies

PAPI's approach of starting cautiously and evolving gradually to adapt to its restrictive context resonates with the need highlighted in the literature review: a framework to determine appropriate starting points for CS projects, the key considerations for their evolution, and the models they should adopt to maximise impact within their conditions.

Building on this insight, this section proposes a toolkit designed to guide reflection and decision-making for initiating and adapting CS projects. The toolkit is informed by findings from PAPI's participation performance, identified barriers, and adaptive practices. Through an analysis of PAPI's participation dimensions, two critical criteria have been identified as foundational: citizen power and autonomy, and the space for engagement. These criteria serve as a basis for tailoring CS approaches to specific governance contexts and ensuring their sustained effectiveness.

Firstly, higher levels of citizen power and autonomy lead to deeper engagement and greater project impact. This is evident in the comparison between typical engagement with PAPI enumerators, who expressed a willingness to collaborate further but did not know how to do so, and the exceptional case of an enumerator who became a PAPI consultant by persistently demonstrating effort, passion, and skills. Both started at the same position, but the enumerator with a higher degree of passion and a stronger

skillset progressed further. This highlights how empowerment would foster higher engagement.

Citizen power and autonomy in this engagement can be translated from VeneKlasen and Miller's (2002) four key forms of power, each reflecting different aspects of citizens' ability to engage and enact change:

- Power with: The collaborative resources citizens leverage to achieve shared objectives, such as networks, alliances, and collective support.
- Power to: The skills, knowledge, and capabilities citizens develop to enable independent and proactive action.
- Power within: Citizens' inner sense of confidence, self-efficacy, and motivation that drives meaningful participation in societal processes.
- Power over: The authority or influence citizens are granted or assert to shape decisions and governance processes effectively.

The project must consider both the existing powers of participants and the extent to which it can further empower them. This leads to the following guiding questions. With the project's support, will participants:

- Exhibit no power? Will they remain passive contributors without influence or decision-making capacity?
- Gain basic power? Will they acquire the ability to perform structured tasks within the research framework, guided by clear instructions?
- Acquire sufficient power? Will they develop advanced skills and knowledge, enabling them to carry out tasks with minimal external support?
- Attain leadership-level power? Will they achieve the capacity to co-design, independently lead, or conduct research projects?

Secondly, the space in which citizens participate represents another critical dimension, informed by PAPI's lessons. PAPI's collaboration with government authorities played a crucial role in its achievements, as the involvement of these authorities was integral to implementation. However, the governance context also significantly shapes the space for citizen engagement. This dynamic is exemplified by the experience of CPII, which began as an initiative to empower citizens but ultimately became shaped by a government-driven, top-down plan. This underscores the importance of carefully considering this dimension to ensure the alignment of citizen engagement practices with governance structures and goals. Spaces of engagement can be conceptualised using Gaventa (2006) power spaces framework, categorised into three primary types that reflect varying degrees of openness for citizen participation and influence:

- Closed Spaces: These are environments where activities are predetermined by authorities or institutions, limiting citizens to roles with minimal input or discussion, such as data collection tasks.
- Invited Spaces: These spaces provide structured opportunities for citizens to engage in broader discussions or decision-making processes. However, their influence is often restricted, with decision-making authority remaining constrained.
- Open Spaces: These settings are characterised by collaboration, enabling co-design processes and granting citizens the autonomy to initiate and shape activities. Such spaces foster genuine agency and encourage innovation.

The selection of engagement spaces should be informed by two key considerations, drawn from PAPI's lessons on its institutional barriers and the adaptive adjustments it implemented:

- What is the most open feasible space of engagement that aligns with the priorities and constraints of government partners?
- What is the most open feasible space of engagement that the project can actively advocate for?

The interaction between citizen power and the space of engagement forms the foundation for initiating and evolving CS projects. The table below illustrates how these dimensions interact and guide practitioners in selecting appropriate types of CS projects after considering guiding questions.

Table 3. An Adaptive Decision Toolkit for Citizen Science Typologies (Draws on VeneKlasen and Miller, 2002; Haklay, 2013; Gaventa, 2021)

Open Space Fully open opportunities for citizens to engage.	There are multiple opportunities to engage, but citizens lack power or autonomy to act. Engagement remains limited to the **crowdsourcing model.**	There are multiple opportunities for engagement, but citizens have limited power and autonomy. Engagement operates at the **distributed intelligence level.**	Participants have advanced skills to utilise multiple opportunities but may require some support. Engagement aligns with the **participatory science level.**	Participants have strong competencies and are provided favourable opportunities to lead interventions. Engagement reaches **extreme citizen science.**
Invited Space: There are limited or superficial opportunities for citizen engagement.	Citizens lack the capacity to utilise existing opportunities. Autonomy constraints limit engagement to **the crowdsourcing level.**	Citizens perform well structured tasks such as classification or annotation. Engagement aligns well with **distributed CS models.** **(E.g. PAPI enumerator)**	Citizens use advanced competencies to co-design and contribute actively to the research process. Engagement fits the **participatory science level.**	Citizens demonstrate leadership competencies, but constraints on engagement spaces limit their autonomy. Engagement remains at the **participatory science level.**
Closed Space: Constrained by institutional setup; no citizen engagement in decision-making	The most limited condition for citizen engagement. Citizens provide data or resources (e.g., carrying sensors). Suitable for **crowdsourcing CS models.**	Citizens perform structured tasks in specific research areas. Engagement aligns with the **distributed intelligence model.**	Citizens have strong potential, but limited opportunities prevent full utilisation. Engagement remains at the	Citizens have significant competencies, but constrained spaces prevent them from achieving autonomy. Engagement is restricted to the

		(E.g. PAPI enumerator)	distributed intelligence level.	distributed intelligence level.
Space of Engagement/ Citizen Power	**Citizen Power:** No Skills or Knowledge	**Citizen Power:** Basic Skills for Structured Tasks	**Citizen Power:** Advanced Skills, Minimal Support	**Citizen Power:** Lead or Independent Researcher

Open Space

Fully open opportunities for citizens to engage. There are multiple opportunities to engage, but citizens lack power or autonomy to act. Engagement remains limited to the crowdsourcing model.

There are multiple opportunities for engagement, but citizens have limited power and autonomy. Engagement operates at the distributed intelligence level. Participants have advanced skills to utilise multiple opportunities but may require some support. Engagement aligns with the participatory science level. Participants have strong competencies and are provided favourable opportunities to lead interventions. Engagement reaches extreme citizen science.

Invited Space:

There are limited or superficial opportunities for citizen engagement. Citizens lack the capacity to utilise existing opportunities. Autonomy constraints limit engagement to the crowdsourcing level. Citizens perform well structured tasks such as classification or annotation. Engagement aligns well with distributed CS models.

(E.g. PAPI enumerator) Citizens use advanced competencies to co-design and contribute actively to the research process. Engagement fits the participatory science level. Citizens demonstrate leadership competencies, but constraints on engagement spaces limit their autonomy. Engagement remains at the participatory science level.

Closed Space:

Constrained by institutional setup; no citizen engagement in decision-making

The most limited condition for citizen engagement. Citizens provide data or resources (e.g., carrying sensors). Suitable for crowdsourcing CS models. Citizens perform structured tasks in specific research areas. Engagement aligns with the distributed intelligence model.

(E.g. PAPI enumerator) Citizens have strong potential, but limited opportunities prevent full utilisation. Engagement remains at the distributed intelligence level.

Citizens have significant competencies, but constrained spaces prevent them from achieving autonomy. Engagement is restricted to the distributed intelligence level.

Space of Engagement/

Citizen Power Citizen Power: No Skills or Knowledge Citizen Power: Basic Skills for Structured Tasks Citizen Power: Advanced Skills, Minimal Support

Citizen Power: Lead or Independent Researcher

While Haklay's (2013) typologies are utilised in this table for their focus on citizen autonomy, they may require adaptation and hybridisation to suit Vietnam's context. Alongside the guiding questions, this table

serves as a practical tool for selecting CS project types. However, as no existing typology fully captures hybrid forms of CS, such as in the PAPI case, the toolkit will require ongoing experimentation and refinement to remain effective over time.

Partnership with Government and Policies for CS

The PAPI programme's success highlights the importance of leveraging stakeholder relationships, particularly with government partners, and aligning with local policies. Collaboration with local authorities has allowed PAPI to conduct interviews nationwide, even addressing sensitive topics, thereby contributing to SDG 16 measurements. Similarly, CPII's alignment with the government's Scheme 06 on digital transformation secured support and active provincial engagement. This underscores the strategic value of government alignment for ensuring the feasibility and scalability of CS projects in governance, echoing lessons from China's CS projects in water management, where alignment with government policies advanced governance goals while securing support (Wu, Washbourne and Haklay, 2023).

Capacity Building and Education Reform for CS

The analysis of public participants in the PAPI Index and CPII reveals challenges at the intersection of citizen social science and educational interventions in Vietnam's context. Many rural participants lack higher education and skills necessary for trends like digital transformation. For instance, DTTF members transitioning from farming to tech-based roles often require basic training, such as computer literacy. Similarly, PAPI enumerators, while eager to contribute more, lacked clarity on how to further engage. This reflects the inadequacies of Vietnam's governance structures and the education system in preparing citizens for active decision-making (London, 2022b, p. 42). It strengthens Purdam's (2014) concerns about data bias arising when disadvantaged groups are excluded due to 'insufficient' competencies.

Addressing these gaps is vital for achieving long-term, meaningful citizen engagement in CS. However, significant capacity building and resources are required, given institutional inequalities across the country. PAPI, constrained by its resources and mandate, cannot independently bridge this gap. Partnerships with capacity-building programmes and advocacy for systemic education reform are essential to tackle root causes. High levels of CS engagement in this restricted context, therefore, must result from collaborative, multi-stakeholder efforts rather than a single initiative, and would need time to evolve. Within PAPI's framework, leveraging partnerships with academic institutions like the HCMA could support this aspect. In the short term, PAPI's pragmatic approach of selecting citizens with suitable capacities for specific activities, such as engaging students as enumerators, perhaps, remains the most viable option to start.

Risks of Citizen Science Interventions

Analysis of PAPI interventions reveals ethical concerns, particularly the balance between citizen involvement and institutional responsibilities. In CPII, citizens undertake significant workloads to support inclusive public services but have limited

influence over decision-making. Insufficient compensation and support further weaken their empowerment, potentially exploiting their enthusiasm instead of fostering genuine agency. Strengthening mechanisms for fair support and recognition of citizen contributions could mitigate these issues and enhance the long-term impact of such initiatives

Moreover, citizens participating in CS projects on governance risk creating tensions with local authorities, as evidenced by the experiences of PAPI enumerators, which echoes the risk of surveillance (Lyon, 2002). Although these tensions did not escalate for PAPI enumerators, as they do not reside in the communities where they work, this underscores a critical consideration: recruiting local citizens, common in other CS projects, may not be viable in sensitive contexts. PAPI's collaboration with non-local enumerators has mitigated this risk, offering lessons for similar initiatives.

Hybrid Form of Citizen Science for Vietnam's Context

The analysis of public participants in the PAPI Index and CPII leads back to questions about the boundaries between CS, PAR, and quiet activism, as well as how these approaches can complement one another in the context of Vietnam. In the CPII, DTTF members actively engaged to create meaningful positive impacts for their community. At present, this functions as a social intervention. Involving them more directly in the research, design, and implementation of solutions could align closely with the principles of the PAR model. Besides, PAPI's cautious and incremental approach to interventions, including collaboration with many enumerators for data collection, reflects elements of quiet activism by fostering small yet impactful collective engagement (Pottinger, 2017).

As CS projects expand, the distinctions between CS, social interventions, PAR, and activism become increasingly blurred. PAPI exemplifies a hybrid model that integrates these approaches, illustrating the intersection of CS, PAR, quiet activism, and governance reform. Additionally, PAPI's engagement with non-local citizens for data collection, engagement with different groups of citizens in distinct activities, though not without limitation, demonstrates adaptive measures to address resource limitations and contextual sensitivities. This adaptive and integrative approach highlights the flexibility required in restricted settings.

Ultimately, CS, with its inherent adaptability, can evolve into a portfolio approach that integrates multiple methods and interventions. Further research into the boundaries and intersections of CS, PAR, and quiet activism within Vietnam's context could uncover hybrid forms of CS tailored to this setting. Additional studies are also needed to conceptualise adaptive measures for CS initiatives in this context. Such investigations would enhance the efficacy of CS, whether implemented independently or alongside other approaches in Vietnam.

6. CONCLUSION

Through an exploration of the PAPI programme via the lens of CS, this dissertation presents insights into PAPI and offers suggestions informed by the CS approach.

Firstly, through its structure, activities, and performance, this dissertation demonstrates that the PAPI programme aligns with the core character of CS. Although the programme does not explicitly claim to follow this approach, its purpose-driven design aims to improve governance based on citizens' needs. It operates by collecting feedback from citizens as survey respondents and data gathered by citizens as enumerators, integrating innovative, citizen-based interventions to address the issues identified. This alignment underscores PAPI's potential as a CS initiative.

Secondly, the analysis highlights PAPI's systematic impact over 15 years of implementation. By engaging citizens, the programme has facilitated the collection of extensive citizen-based data, advanced its research objectives, and contributed valuable insights into governance and public administration in Vietnam. PAPI publications, including the PAPI Index and thematic research, serve as critical resources for scholars and provoke important questions for future research. The programme has successfully amplified citizens' voices to governments and stakeholders, establishing itself as a benchmark for governance reform and garnering international support for governance improvements in Vietnam. Furthermore, PAPI has fostered innovations that address governance gaps through citizen-based solutions.

Despite these achievements, the analysis reveals limitations in citizen engagement within PAPI. Citizens primarily contribute through data collection, with limited opportunities to influence the design or deliberation of activities. While the CPII component illustrates the potential for citizen-driven interventions, citizens' roles remain largely confined to execution. Resource constraints and capacity gaps further limit engagement, positioning PAPI at the contributory level within the spectrum of citizen science projects. Nevertheless, an exceptional case of an enumerator advancing to consultancy role and participating in co-design activities highlights opportunities for greater engagement.

Thirdly, drawing on comparisons with other successful CS projects and addressing PAPI's limitations, this dissertation proposes several experimentations: fostering citizen-led initiatives within CPII, involving enumerators in disseminating PAPI findings through workshops, building a network of citizen scientists for UNDP, expanding citizens' roles in thematic research, and utilising enumerators' as well as DTTF members' observation for communication. These measures could enhance PAPI's impact within its existing structure.

On the other hand, through PAPI, this dissertation examines existing discourses about CS, their feasibility, and the adjustments needed for governance and public administration field in Vietnam.

It identifies shortcomings in existing terminologies for categorising CS projects within this context. This is because practices such as engaging the same citizen groups across various activities or recruiting citizens in targeted areas may not always be

feasible, necessitating more hybrid forms and adaptive strategies. Lessons from PAPI also demonstrate that CS in this context needs to begin cautiously and evolve gradually. Drawing from this, I propose a context-sensitive definition of CS under the term khoa học cộng đồng (community science) to navigate political sensitivities effectively. To support the application of CS in this context, I present the Adaptive Decision Toolkit for Citizen Science Typologies, which provides criteria for selecting CS project types that consider citizen autonomy and engagement spaces.

Moreover, the successful development of CS projects requires strategic partnerships with governments and academic institutions to mitigate resistance and mobilise resources. Additionally, long-term advocacy for education reform is critical to building citizens' capacity for meaningful engagement. This dissertation argues that CS should be part of a broader portfolio of interventions, integrating advocacy for education reform to enhance citizens' autonomy and support active citizenship. While existing literature highlights the importance of training within CS projects, this dissertation advocates for further expanding these efforts, particularly in restricted governance settings.

In conclusion, this dissertation highlights the potential of CS for governance reform in Vietnam through the PAPI programme. Advancing the CS approach offers PAPI a promising pathway to enhance citizen engagement and impact. Future research exploring the boundaries and intersections of CS, PAR, social intervention, and activism, as well as conceptualising hybrid and adaptive models of CS in restricted governance settings, will further support the flexible application of CS.

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Topic 4: Exploring the Impact of Regenerative Finance on Colombia's Prosperity

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Abstract

ReFi has emerged as an ecological movement and alternative financial system to accelerate the transition from an extractive to a regenerative economy. By integrating advanced technologies like blockchain with regenerative principles, ReFi seeks to create transparent and inclusive NbS, from agroforestry to wildlife restoration. A core principle of ReFi is to promote holistic approaches that address multiple impact dimensions beyond carbon offsetting, including biodiversity protection and community development. To achieve this, ReFi practitioners emphasise decentralised, bottom-up approaches that ensure equitable economic and social benefits for all stakeholders involved in climate resilience efforts.

Despite these ambitious objectives and emerging global attention on ReFi, a significant research gap remains regarding its effectiveness, particularly in biodiversity-rich countries with large rural and Indigenous populations, such as Colombia. This study addresses this gap by comparing ReFi's theoretical propositions, established through a literature review, with empirical evidence from a comparative case study of six ReFi initiatives operating in Colombia. The data obtained from semi-structured interviews with founders and practitioners provides valuable insights into the movement's current state, significant challenges, and opportunities to progress. The research reveals that while ReFi has transformative potential for creating participatory solutions for planetary regeneration, it remains in its infancy and faces structural implementation and scalability barriers. These challenges are primarily linked to negative perceptions of cryptocurrency and Web3, the dominance of traditional carbon market entities, and difficulties in translating regenerative principles and technologies into actionable, grassroots solutions that communities can widely adopt.

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1. INTRODUCTION

Background

The alarming consequences of climate change have prompted societies worldwide to explore innovative economic models, redirecting resources towards investments in NbS, such as reforestation and renewable energies projects, to mitigate greenhouse gas emissions and foster resilient ecosystems (UNEP, 2020). Carbon credit markets have emerged as the leading instrument for financing NbS. In this system, NbS project developers issue credits based on how much carbon they help remove or prevent from entering the atmosphere. These carbon credits can be sold to companies or public entities to help them meet their carbon reduction targets. This creates an incentive system that redirects financial resources towards achieving climate goals.

However, the absence of robust project verification and a unified credit origination and traceability system has undermined the effectiveness of the carbon markets, leading to the proliferation of fraudulent practices such as credit double-counting and greenwashing (Marchant, Cooper and Gough-Stone, 2022). Additionally, the market's structure, relying on various intermediaries such as credit registry companies, third-party verifiers, and brokers, results in high costs and complexity for developing and issuing carbon credits. Consequently, this exclusionary dynamic has prevented small landowners and rural communities from participating in and benefiting from carbon markets (Bumpus, 2011). Additionally, it has perpetuated unequal development patterns and restricted opportunities for local communities to contribute to the governance and design of emerging green finance instruments (Bozmoski, Lemos and Boyd, 2008).

Moreover, the carbon market has conducted global efforts to achieve carbon neutrality as the ultimate solution for climate change. However, this emphasis has overshadowed more systemic and long-term solutions, such as redefining economic value and wealth in harmony with the planet's health or altering destructive societal consumption behaviours (Bachram, 2004). This approach has also faced criticism for enabling organisations to continue extractive practices by simply purchasing carbon credits instead of actively transforming their operating models. Furthermore, various carbon project developers have been found to lack ethical standards, prioritising profitability over sustainability (Lohmann, 2005). This is exemplified by practices such as degrading biodiversity-rich ecosystems through the establishment of monoculture carbon-offsetting plantations and displacing local communities to make way for new carbon projects.

Furthermore, the current voluntary carbon market arrangement, primarily dominated by corporations and financial intermediaries from the Global North, frequently dictates and alters land management and economic systems in the Global South, where most NbS are implemented. The absence of social equity criteria and accountability in these carbon projects exacerbates this issue, perpetuating historical colonialist dynamics (Evite and Zara, 2023). According to the Carbon Brief (2023), there have been over 61 documented instances of manipulation and exploitation in carbon projects, which include harm to Indigenous communities, disruptions to food and natural production, overestimation of offsets, and illegal land use. These incidents have predominantly

been reported in Latin America (Dunne and Quiroz, 2023).

Since 2017, ReFi has emerged as an alternative environmental movement in response to these challenges (Schletz et al., 2023). ReFi advocates aim to create economic systems, practices, and strategies that fund regenerative and restorative outcomes while incorporating ethical and inclusive practices (Carbon Copy, 2024). By harnessing blockchain-based mechanisms such as D-MRV, nature tokenisation, and DAOs, ReFi aims to create more efficient and equitable financial and regenerative models by removing intermediaries, lowering entry costs, ensuring fair resource distribution, and balancing decision-making among stakeholders (Hartley and Rennie, 2022). For such aspirations, the nature of blockchain technology may enhance transparency by making all participants and climate-related transaction records publicly available, avoiding fraudulent practices such as credit double-counting. Consequently, this approach strives to strengthen the integrity of green finance instruments and significantly increase the accessibility and participation of vulnerable communities in the Global South.

One of the most promising countries for ReFi to flourish is Colombia, renowned as the most biodiverse country per square kilometre globally (BIOFIN, 2023) and home to over 170 indigenous and ethnic communities, who manage approximately 25% of the nation's land and water resources (Jordan, 2023). This unique biodiversity and community stewardship have captured the attention of climate scientists and entrepreneurs worldwide who aim to protect crucial ecosystems while fostering sustainable models for local communities. However, significant challenges in implementation persist, such as aligning global conservation objectives with the communities' cosmovision of land management and establishing profitable models that incentivise locals to participate in environmental efforts. Although Indigenous and rural communities share a deep understanding of the importance of nature, the country's violent internal conflicts and lack of economic opportunities have generated widespread poverty and inequality among them (Lemus, 2014). Therefore, many are forced to exploit their lands through environmentally damaging activities such as cattle ranching or illegal mining to survive.

Aims and Objectives

ReFi has garnered significant attention in digital media and entrepreneurial circles for its innovative approach to climate change mitigation, frequently associated with terminology such as ‘holistic thinking,’ ‘blockchain for good,’ and ‘regenerative economy.’ However, given the ongoing issues and fraudulent practices in carbon markets, it is essential to investigate whether these concepts genuinely lead to transformative, actionable solutions or simply perpetuate the dominant climate narrative without driving meaningful progress.

The primary goal of examining ReFi in Colombia is to assess its real-world effectiveness beyond the appealing rhetoric often associated with it. This research aims to identify key implementation challenges and evaluate whether ReFi genuinely promotes participatory, climate-positive models. To achieve this, it will compare practical use cases to determine if they effectively reduce economic and social disparities, particularly among the most disadvantaged communities in developing countries. The study will focus on ReFi’s advancements in Colombia, considering its environmental, social, and entrepreneurial dimensions.

Research Questions

By comparing the theoretical principles and rhetoric of ReFi discussed in the literature review with the practical challenges identified in the comparative case study, this study aims to address the following research questions:

1. How is the ReFi movement advancing in Colombia, and what impact is it generating on local communities?
    1.1. What are the main challenges ReFi initiatives face regarding implementation and scalability?
    1.2. How do ReFi initiatives engage and measure their impact on local communities?

Ultimately, the goal of this study is to offer valuable insights for future policymakers and entrepreneurs to guide the development of effective regenerative models both locally and globally by analysing the ReFi movement's progress, challenges, and community impact in Colombia.

Structure

The research will begin with a comprehensive literature review in Chapter 2, examining the functioning of the current green finance system and highlighting critical issues in developing climate change solutions. This includes addressing concerns such as fraud and manipulation in carbon credit markets and the persistence of colonialist practices that exacerbate social inequities between the Global North and South. The literature review will then introduce new paradigms of sustainability and prosperity, the principles of regenerative movements and the emergence of ReFi. Finally, the literature review will contextualise Colombia's unique natural characteristics, the complex interplay between conflict, peacemaking, and conservation, and the country's green taxonomy and environmental policies. This review will lay the groundwork for analysing the narratives and data collected from the interviewees.

Subsequently, Chapter 3 will outline the comparative case study methodology, which includes semi-structured interviews with the founders of six ReFi organisations in Colombia and two external experts in biodiversity and green finance. Chapter 4 will present the findings from these interviews, organised through a thematic analysis. Building on these findings, Chapter 5 will offer an in-depth discussion, critically comparing the theoretical framework established in the literature review with the study's data to address the research questions. Finally, Chapter 6 will conclude the research and outline its limitations and recommendations for future studies.

2. LITERATURE REVIEW

Green Finance

To achieve the temperature and adaptation goals outlined in the Paris Agreement (2015), it is imperative to transition towards carbon-neutral economies by 2050. NbS are poised to play a pivotal role in this transition, potentially contributing up to 30% of the mitigation and adaptation necessary to limit global warming to 1.5°C (IUCN, 2022). These solutions encompass three primary strategies: reducing greenhouse gas emissions, capturing and storing atmospheric carbon dioxide, and enhancing ecosystem resilience.

Despite the critical importance of NbS, less than 2% of global financial resources currently support these mechanisms (Landholm et al., 2022). The CPI (2021) also estimates that funding for climate resilience efforts must increase by at least 590% annually to meet the 2030 internationally agreed climate goals and avert severe global warming. This funding gap is due to various factors, including inefficient mechanisms, high upfront costs, uncertain investment returns, regulatory barriers, and a lack of market transparency and stakeholder coordination (Fu, Lu, and Pirabi, 2023; Agrawal et al., 2024). However, The GFP (2022) has reported a 317% increase in regulations, policies, and market-based instruments supporting NbS financing since the Paris Agreement, indicating the global development of 'green finance.'

Green finance encompasses financial instruments and strategies to foster investments in NbS projects, environmental products, services, and policies to develop sustainable economies (Fleming, 2020). This includes mobilising capital for diverse climate-related investments, such as renewable energy technologies, energy-efficient infrastructure, regenerative agriculture, and sustainable transportation (Soundarrajan and Vivek, 2016; Fu, Lu, and Pirabi, 2023). Although green finance lacks an official definition or specific scope (Lindenberg, 2017), it arises from the recognition that traditional financing alone cannot support the transition to a low-carbon or carbon-neutral economy (Campiglio, 2016). Ultimately, scaling profitable green finance models aims to incentivise public and private entities to prioritise sustainable investments over those that contribute to unsustainable growth (GPF, 2020), such as coal mining or oil drilling. Moreover, green financial instruments and legal frameworks aim to mitigate the high-risk profile of NbS investments by providing guidelines for long-term funding strategies and patient capital. This includes new return and capital performance metrics aligned with ESG criteria (Appendix A) and the UN SDGs (Appendix B) (Bhatnagar et al., 2022).

Although still insufficient, green finance has experienced significant global growth in recent years, exemplified by the issuance of green loans and bonds surpassing 1 trillion USD (CBI, 2024). Additionally, there has been a notable rise in green investment funds and the integration of environmental criteria into public investment decisions, driven by collaborations among central banks, governments, and multilateral institutions (Dikau and Volz, 2021). For instance, UNEP (2018) has outlined three key strategies to promote global green finance efforts. First, it supports the public sector by reviewing policy and regulatory frameworks for financing systems and developing green taxonomies. Second, it fosters multi-stakeholder partnerships by engaging critical financial market actors,

including banks, investors, micro-credit entities, insurance companies, and the public sector. Finally, it empowers community enterprises to develop Nature-based Solutions (NbS) through micro-credit initiatives.

Nature Commodification

A fundamental mechanism in the global adoption of green finance has been the 'commodification' of nature through carbon and biodiversity accounting systems (Martineau and Lafontaine, 2019). This process involves three main phases, as Keucheyan (2014) outlined. First, nature is conceived as 'capitalised property,' capable of generating future income streams, providing services and incurring liabilities and obligations (Birch, 2017). Second, nature is abstracted or 'disembedded' from its holistic context. Finally, it is transformed into a fictitious, commensurable commodity with an assigned exchange value, such as tons of CO2, for commercialisation. According to various scholars, this process dissociates nature from its essence by promoting a purely utilitarian view that lacks emotional and affective dimensions (Paterson and Stripple, 2012; Lohmann, 2010; Descheneau, 2012).

However, the commodification of nature is more similar to the provision of services than the trade of conventional commodities like gold or coal, which can be easily extracted, bought, and sold (Bridge et al., 2019). For instance, in the case of carbon, the 'service' refers to nature's evaluated and verified capacity to reduce atmospheric carbon emissions or maintain ecosystem resilience. This perspective of nature as a service has given rise to alternative models, such as PES.

ES were first defined by Costanza and colleagues in 1997 as 'the benefits that human populations gain, directly or indirectly, from ecosystem functions' (Costanza et al., 1997: 253), estimating their global value at 33 trillion USD. Building on this concept, PES operates as a voluntary transaction, where an ES buyer purchases a well-defined service from an ES provider, contingent on the assurance of its provision (Wunder, 2005). Since its inception, PES has been extensively analysed, offering a promising market-based mechanism to preserve biodiversity and promote sustainable development by internalising the previously overlooked value of natural services (Costanza et al., 1997).

An exemplary case of PES emerged in 1996 when the Costa Rican government established a program to incentivise reforestation through a combination of rules, regulations, and financial rewards. Private landowners received compensation from a government-managed fund supported by private and international donors in exchange for providing ecosystem services such as forest protection, agroforestry, and sustainable forest management (Porras and Chacon-Cascante, 2018). This strategy addressed market failures caused by resource extraction, helping to generate private benefits and encourage sustainable practices that preserve ecosystem resilience (Van Hecken and Bastiaensen, 2010).

Nevertheless, PES and other forms of nature commodification have been heavily criticised as forms of 'fetishisation.' Marx's concept of 'commodity fetishism' (1867) depicts how capitalist systems obscure the social and environmental relationships behind production, focusing solely on economic measures like pricing. In the context of nature, this narrow view can mask nature's broader social and cultural significance, preventing societies from recognising the exploitative relationships that can emerge in market-based green instruments. Allowing nature to be traded creates power imbalances in production, distribution, and consumption, leading to pricing, payment conditions, and market

access inequalities. Thus, profits from these transactions often flow to dominant groups, such as large corporations and carbon registries, rather than the communities directly connected to these ecosystems (Kosoy and Corbera, 2010; Pérez-Català, 2014). This dynamic results in unequal and exclusionary outcomes (Muradian et al., 2013) and perpetuates the controversial notion of 'selling nature to save it' (Pérez-Català, 2014).

Instruments

The commodification of nature has led to the development of various green finance instruments, with green bonds and carbon credits being the most widely adopted. These instruments have been pivotal in mobilising capital for Nature-based Solutions (NbS) and other sustainable projects. Green bonds are used to fund environmentally beneficial initiatives, while carbon credits enable entities to offset their emissions by investing in reduction efforts. This proliferation has also spurred the creation of new institutions, including green banks, exchange platforms, and specialised funds (GFP, 2020).

Green Bonds

Green bonds are debt instruments used to raise capital for projects with environmental benefits (Bhutta et al., 2022). They operate like traditional bonds, providing regular interest payments and returning the principal at maturity, promising that the funds will be used for green projects such as renewable energy, energy efficiency, and sustainable infrastructure. While organisations like ICMA have set criteria for green bonds, granting a green label if projects meet the GBPs, a key concern for investors remains regarding the verification of promised environmental benefits (Beschloss and Mashayekhi, 2019). Although larger, experienced investors can assess these benefits through impact reports and due diligence, smaller investors may lack the resources for such evaluations.

Carbon Markets

Alternatively, carbon credits are tradable units of GHG, usually measured in tons of CO2e, that have been either reduced or removed from the atmosphere (Best, Burke, and Jotzo, 2020). These credits are traded in both voluntary and regulatory carbon markets. Carbon markets involve pricing and trading two types of carbon credits: allowances, which grant regulated organisations the right to emit carbon dioxide, and offsets, which are transferable credits generated from activities that reduce emissions (Bridge et al., 2019).

Regulatory Carbon Markets

In a cap-and-trade system, such as the EU ETS, the largest of its kind, a regulatory authority sets a maximum limit, or cap, on total allowable GHG emissions for a specified group of entities, including nations, industries, or companies (Convery, Perthuis, and Ellerman, 2008). Emission permits are auctioned or allocated based on reduction targets, and the cap is divided into individual allowances or credits, which are distributed to the regulated entities. Entities that emit less than their cap can sell surplus allowances to those exceeding their limits or save them for future use (EDF, 2020). This system incentivises emission reductions by trading and banking credits (Buckley, Mestelman, and Muller, 2005). Additionally, regulatory authorities typically lower these caps over time, encouraging industries to improve their emission reduction efforts while continuously managing costs effectively.

In contrast, a baseline-and-credit scheme assigns each entity a baseline permittable emissions level based on past data or performance standards relative to output instead of absolute caps. Firms earn credits

by emitting less carbon than their baseline, which can be saved or sold to others exceeding their limits. Unlike cap-and-trade systems, these credits are often calculated on a project-by-project basis and must be certified and registered before trading (Enabulele, Zahraa, and Ngwu, 2016), usually after reductions have been achieved (Betz et al., 2022; Buckley, Mestelman, and Muller, 2005).

Additionally, some countries have opted to introduce a carbon tax that requires companies or individuals to pay a fixed amount per unit of GHG emissions. This tax may apply at various stages, such as the supply, retail, importation, or use of fossil fuels, with rates varying by fuel type or sector. In some jurisdictions, including South Africa and Colombia, carbon offsets from projects that reduce, remove, or avoid emissions are allowed as an alternative to paying the carbon tax (Advani et al., 2021).

The decision to implement a carbon tax, cap-and-trade system, or baseline-and-credit scheme involves trade-offs between price certainty and emission reduction guarantees (CKH, 2022). A carbon tax offers cost certainty by setting a fixed price per unit of emissions, but it doesn't guarantee specific reductions. Setting the tax rate is also politically challenging, as a low rate may fail to drive reductions, while a high rate could impose significant costs and stifle economic growth (Goulder and Schein, 2013; Revelle, 2009). In contrast, cap-and-trade systems ensure measurable emission reductions through an absolute cap and promote investment but are more complex and costly to implement (Allayannis and Tenguria, 2009). Baseline-and-credit schemes set emissions targets based on production intensity rather than absolute limits, protecting companies facing international competition and avoiding cost pass-through to consumers. However, these schemes introduce uncertainty due to fluctuating production levels and emission intensities, complicating predictions of total reductions. Additionally, they are vulnerable to manipulation of baselines (Buckley, Mestelman, and Muller, 2005).

Aspect	Taxes	Markets: Cap-and-trade Schemes	Markets: Baseline-and-credit Schemes
Certainty	↑ Fixed price ↓ No emissions-reduction certainty ↓ Setting the tax rate is difficult	↑ Emissions-reduction certainty ↓ Price not fixed	↓ No emissions-reduction certainty ↓ More uncertainty on participants' obligations
Complexity	↑ Meant to be simpler for policymakers and companies	↓ Complex and costly for policymakers and companies	↓ More complex and costly for policymakers and companies
Acceptability	↓ Historically less politically acceptable	↑ Historically more popular	↓ Historically less popular

Figure 1: Adapted from Carbon Taxes Versus Markets (CKH, 2022).

Voluntary Carbon Markets

Unlike regulatory markets, voluntary carbon markets are driven by organisations, industry associations, and individuals who

choose to offset their emissions beyond legal requirements. Participants in these markets purchase carbon credits to meet self-imposed sustainability goals motivated by corporate social responsibility, consumer demand, or brand enhancement (Favasuli and Sebastian, 2021). There are two main types of carbon credits: avoidance credits, which prevent emissions by protecting ecosystems like forests and peatlands, as seen in REDD+ projects, and removal credits, which actively remove CO2 from the atmosphere through methods like reforestation or technological solutions such as carbon capture and storage (Plasencia, 2024). Avoidance credits are more controversial and uncertain because they focus on preventing future emissions rather than reducing current levels. In contrast, removal credits are generally considered more valuable because they directly reduce current atmospheric CO2, providing a more immediate and measurable impact on climate mitigation.

Over the past two decades, voluntary carbon markets have significantly advanced environmental initiatives within the private sector (Spilker and Nugent, 2022). These markets involve various stakeholders and intermediaries, including project developers, carbon buyers, standard organisations, verification bodies, financial institutions, and brokers operating in spot or cash markets (Bose et al., 2021). Standard and verification entities often compete to develop advanced methodologies and rules for calculating benefits and generating carbon credits for both avoidance and removal projects. Verra, CAR, ACR, and Gold Standard are among the most established entities known for their sophisticated methodologies. In contrast, smaller niche standards are gradually emerging, often providing lower-quality credits (Ahonen et al., 2022).

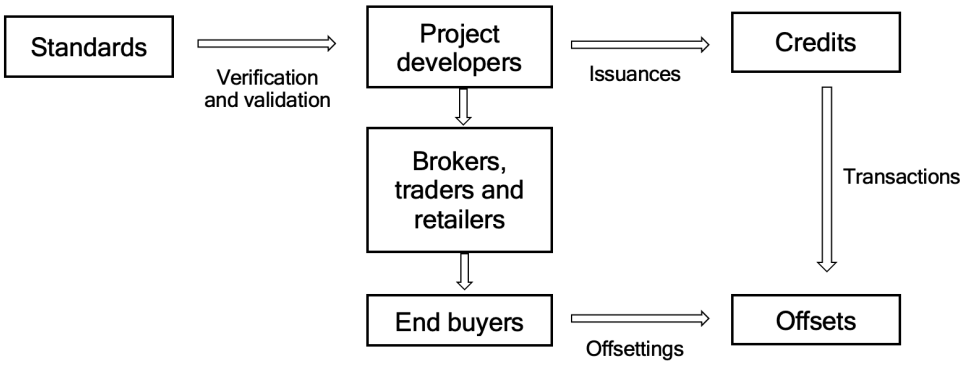

Figure 2: Adapted from The Structure of The Voluntary Carbon Market (Favasuli and Sebastian, 2021).

Nevertheless, using carbon credits as a corporate climate strategy has become controversial, with some companies using offsetting to avoid meaningful long-term climate action (Kreibich and Hermwille, 2021). Moreover, the fragmented landscape of voluntary carbon standards has led to discrepancies, as each registry sets its own methodology, raising risks for environmental and data integrity, with double-counting being a predominant issue (Ahonen et al., 2022). Double-counting occurs when multiple national or international entities claim the same carbon

offset. This usually happens due to obscure reporting and verification processes, a lack of inter-registries governance or centralised carbon tracking systems (Schneider and La Hoz, 2018). Consequently, carbon reduction efforts become inaccurate, overestimating total emission reductions and undermining market integrity. This duplication also creates a false sense of progress, reducing the incentive for further emissions reduction efforts (Kreibich and Hermwille, 2021). While significant funds are directed towards establishing voluntary carbon trading schemes, minimal resources are allocated to their regulation or unification (Bachram, 2004). This imbalance has left the market alarmingly dependent on the integrity of these institutions to report emissions and reductions accurately, which has led to severe credibility issues.

For instance, a recent investigation by the Guardian and Die Zeit in collaboration with SourceMaterial NGO (Greenfield, 2023) revealed that the forest avoidance projects certified by Verra, the largest carbon standard used by major corporations like Disney, Shell, and Gucci, are mostly ineffective and lack any positive ecological impact. The research also indicates that over 90% of Verra's rainforest offset credits, commonly used by companies claiming to be 'carbon neutral,' are likely 'phantom credits' that are not genuinely protecting the delimited forest areas.

Carbon Colonialism

It is widely acknowledged that those most responsible for the life-threatening impacts of climate change are often the least exposed to its severe effects and have the most resources to protect themselves (Paul, 2021; Bhambra and Newell, 2023). The WID reported that the wealthiest 10% of the global population is responsible for nearly 48% of worldwide emissions, with the top 1% alone accounting for 17% of the total (Chancel, 2021).

Furthermore, proposed climate change solutions often reinforce, rather than address, social and ecological inequalities. For instance, various Global North countries reduce carbon emissions by outsourcing carbon-intensive processes, such as manufacturing, to the Global South (Newell, 2021). Additionally, the neoliberal logic of carbon markets allows organisations in the Global North to offset their emissions by establishing carbon projects in underprivileged communities in the Global South, where labour costs are lower and natural resources are abundant, instead of decreasing reductions internally (Bumpus and Liverman, 2008; Bachram, 2004; Dentzel, 2023).

Moreover, while carbon offset projects are often promoted as 'triple win' initiatives benefiting investors, the environment, and local communities (Larsson and Orvehed, 2021; Richards and Lyons, 2016), this portrayal remains more discourse than reality. In practice, many NbS projects in the Global South replicate historical patterns of exploitation, such as detrimental labour conditions and 'green grabbing,' a term defined by Fairhead, Leach, and Scoones (2012) as 'the appropriation of land and resources for environmental purposes.' This process often fosters inequitable development, exacerbates poverty, and can be seen as a form of neocolonialism (Dehm, 2016).

Green grabbing has primarily occurred through the establishment of large-scale monoculture plantations, which are single-species tree farms mainly created for carbon sequestration. These plantations frequently result in power imbalances, such as land use and ownership shifts, and local livelihood disruptions, transferring control from local communities to corporations or foreign investors (Kröger, 2014; Liu, Kuchma, & Krutovsky, 2018).

In Latin America, for instance, the Plantar organisation, backed by major international

investors such as the World Bank PCF and the Canadian government, established a 12,300-hectare eucalyptus plantation to generate around US$25 million in carbon credits. Although tree planting can restore degraded landscapes and provide timber, fast-growing species that require large amounts of water may threaten biodiversity and cause socio-environmental harm. Therefore, introducing this water-intensive species into Brazil's Cerrado savannah depleted vital water sources and negatively impacted local biodiversity by eliminating native animals and vegetation (Lohmann, 2005; WRM, 2003).

In addition to the ecological disruption, the social impact on local communities was devastating. The company illegally dispossessed Indigenous people of their lands, caused water scarcity for agriculture, destroyed jobs and livelihoods, and further threatened the health of the community (Bachram, 2004). Additionally, many locals working on the plantations reported exploitative labour conditions. Despite protests from over 70 Brazilian communities, churches, and labour organisations, calls to halt investments in the Plantar project have been mainly disregarded (WRM, 2003). Beyond the Plantar case, more than 60 additional incidents of environmental exploitation and alteration were documented by The Carbon Brief by 2023, highlighting how current carbon market systems may disproportionately impact the poorest, most vulnerable, and excluded communities, especially in rural areas (Dunne and Quiroz, 2023).

A less explicit form of colonialism in current carbon markets is the dominance of the 'Western discourse,' which often prioritises technological, economic, and scientific discussions, excluding other forms of knowledge (Mignolo, 2019). Moreover, this perspective overlooks local and Indigenous value systems, such as Sumak Kawsay, Suma Qamaña, and Buen Vivir in Latin America, which emphasise more sustainable ways of 'living in harmony and plenitude' (Artaraz et al., 2021). Thus, these Indigenous frameworks may offer more effective approaches to understanding the holistic relationship between humans and the Earth and implementing NbS (Larsson and Orvehed, 2021).

To address climate change effectively, it is essential to recognise the distinct realities faced by the Global South and the Global North, which involve different capacities, resources, perceptions, and political priorities (Strazzante, Rycken, and Winkler, 2021). This requires decolonising climate practices, starting with decolonising the mind and envisioning a future free from imposed ideals. Consequently, humanity must move beyond the Western rhetoric of 'development,' including the prevailing concept of 'sustainable development,' and embrace diverse and sustainable economies that position the economy as a component of society rather than placing society in subordination to the economy (Mignolo, 2019).

From Sustainable to Regenerative

The original aim of sustainable development, as articulated in the WCED report: 'Our Common Future,' is to fulfil the requirements of current generations without jeopardising the ability of future ones to satisfy their own needs (Brundtland, 1987). However, a growing school of thought argues that the widespread adoption of linear and destructive economic practices has already undermined planetary boundaries, demonstrating that merely maintaining the current state of the environment is insufficient to ensure a secure future for subsequent generations (Müller, 2020).

This ideological shift challenges conventional, anthropocentric, and

reductionist approaches to sustainability, which traditionally view humans and nature as separate entities and consider environmental resources to exist primarily to serve human consumption (Müller, 2020; Gibbons, 2020). In recent decades, the regenerative movement has sparked significant debate in organisational studies, yet its framework and differentiation from other movements, such as the circular economy, remain subjects of discussion (Konietzko, Das, and Bocken, 2023). Despite this, the movement has gained traction under various terms, including 'regenerative economics,' 'regenerative development,' and 'regenerative sustainability' (Pedley, 2024). At its core, this intellectual current advocates for practices that not only aim for a net-zero environmental impact but strive to create a net-positive effect, embracing regeneration's intrinsic ability to 'bring into existence again' (Muñoz and Branzei, 2021; Stokel-Walker, 2022).

Moreover, proponents of regenerative movements argue that current strategies to adress the 'grand challenges' threatening Earth's living systems are fragmented and overly narrow in focus (Müller, 2020; Munafò et al., 2017). The central issue stems from the tendency of scientists and scholars worldwide to work in isolation or within their siloed disciplines, lacking sufficient interdisciplinary collaboration and shared understanding.

As a solution, the regenerative movement, generally aligned with decolonisation discourses, advocates for integrating non-physical, cultural, and spiritual dimensions into green finance and NbS (Jain, 2021; Fullerton, 2015). Therefore, regenerative advocates envision a future where both the biosphere and social systems are revitalised, fostering a mutually supportive relationship between individuals and their environments and enhancing one another's potential (Du Plessis & Brandon, 2015). Consequently, scholars like Gibbons (2020) emphasise the need to reconcile the outer and inner dimensions of sustainability to operationalise this vision.

Traditionally, sustainable development has centred on creating policies, governance structures, and financial instruments to halt environmental degradation, addressing only 'the outer.' However, achieving systemic change requires fostering consciousness, spirituality, reflexivity, diversity, and shifts in collective values (Horlings, 2015). Thus, sustainability should evolve beyond top-down bureaucratic strategies to embrace bottom-up initiatives rooted in participatory governance, social services, rituals, ceremonies, education, and consciousness-based practices that honour the sovereignty of Indigenous and local communities (Velasco-Herrejón, Bauwens, and Calisto Friant, 2022).

Prosperity and Regeneration

Accordingly, transitioning to regenerative futures requires fundamentally rethinking how societies measure wealth and well-being (Fullerton, 2015). Traditionally, neoliberal and Keynesian perspectives have focused on individual or national capital accumulation, most notably through metrics like GDP (Jain, 2021). However, GDP 'fetishises' prosperity by considering only monetary transactions related to goods and services. This offers an incomplete view of the economy by ignoring the social and environmental systems it relies on (Costanza et al., 2009). To truly achieve well-being and shared prosperity, nations must acknowledge the failure of the notion of endless economic growth (Jackson, 2009). Despite the global economy growing fivefold over the past century, humanity has degraded 60% of the world's ecosystems, and one-fifth of the worldwide population earns just 2% of global income, with inequality now at unprecedented levels (Mastini, 2017).

Therefore, new metrics of prosperity should be integrated into national and international policies, prioritising aspects of well-being such as the capacity to give and receive love, earn respect from peers, contribute meaningfully to society, and cultivate a sense of belonging and trust within the community (Jackson, 2009). Nevertheless, scholars such as Moore et al. (2015) argue that while redefining prosperity requires moving beyond income-based metrics, the goal is not to impose new universal standards, potentially preserving the Western discourse. Instead, the goal is to develop context-specific definitions of prosperity that embrace diverse perspectives and practices at a local level.

An alternative way to rethink prosperity is by recognising the diverse types of capital that exist on the planet. Roland and Landua (2013) draw on permaculture's design philosophy and practical approach to sustainable living and land management to propose a framework of eight forms of capital: financial, material, living, social, intellectual, experiential, spiritual, and cultural. These forms represent a broad spectrum of resources that, when considered together, provide a more holistic and sustainable understanding of wealth. This perspective shifts the focus away from purely monetary metrics, acknowledging that long-term prosperity depends on the health of ecological systems, the strength of social relationships, and the richness of cultural and experiential knowledge.

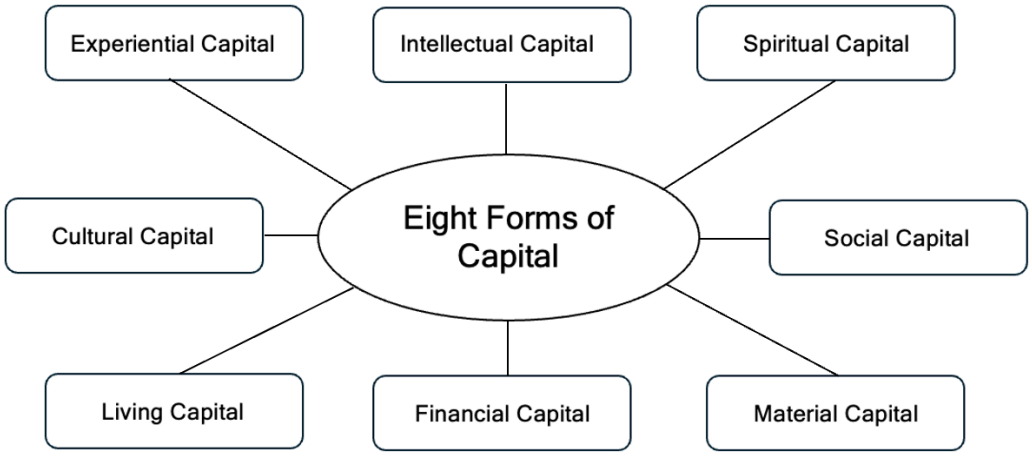

Figure 3: Adapted from Regenerative Enterprise (Roland and Landua, 2013).

Ultimately, while the crisis in the current sustainability and economic development paradigm threatens civilisational collapse and species extinction, it also presents a unique opportunity to develop more effective strategies (González-Márquez and Toledo, 2020). However, this transition is particularly challenging, as it requires humanity to fundamentally rethink and redesign its entire collective model of progress (Buckton et al., 2023). Thus, moving toward regenerative systems will depend on the convergence of multiple academic disciplines, including ecology, quantum physics, systems theory, psychology, neuroscience, design, urban planning, and sustainability (Gibbons, 2020).

Regenerative Capitalism

In 2010, John Fullerton, an American economist and impact investor, founded the Capital Institute to reimagine economics and finance in service of life systems. Five years later, in 2015, Fullerton introduced the concept of 'regenerative capitalism,' widely considered the foundational basis of ReFi. Fullerton's framework is based on the hypothesis that naturally sustainable and regenerative patterns, such as self-organisation, self-renewal, and holistic functioning, within which all living systems are interconnected to achieve 'systemic health', can be applied to non-living or socioeconomic systems. Essentially, it involves biomimicking nature's behaviours, such as wholeness, adaptability, and interconnectivity, while applying them to diverse fields, including agriculture, healthcare, finance, and urban planning (Stokel-Walker, 2022).

Although Fullerton (2015) strongly criticises neoliberalism, arguing that it continuously extracts money, talent, and resources from local communities, he clarifies that regenerative capitalism is not a confrontation between capitalism and socialism, as both can be equally unsustainable. Instead, he suggests market-based and business practices may help accelerate the transition to regenerative futures. Fullerton's concept of capitalism encompasses an integrated understanding of multiple forms of capital, as previously proposed by Roland and Landua (2013). To illustrate this vision, he outlined eight principles intended to guide planet-scale regeneration initiatives.

In Right Relationship	• Economic value should be aligned with the health of the whole system through the principles of reciprocity and mutualism.
Views Wealth Holistically	• True wealth includes multiple forms of capital, beyond financial, to encompass ecological systems, relationships, and well-being.
Innovative, Adaptive, Responsive	• Adaptability and innovation are crucial for health and survival, focusing on long-term systemic health rather than short-term gains.
Empowered Participation	• All individuals must contribute to and engage with the system, balancing their needs with the health of the larger whole.
Honours Community and Place	• Resilient communities are rooted in their unique histories and places, while universal principles are adapted to local contexts.
Edge Effect Abundance	• Creativity thrives at the edges of systems, fostering innovation and growth through collaboration and diversity.
Robust Circulatory Flow	• A healthy economy, like a living organism, requires the continuous flow of resources, information, and empathy to maintain its health.
Dynamic Balance	• Regenerative systems seek harmony by balancing various forces (e.g., competition vs. collaboration) to maintain overall system health.

Figure 4: Adapted from Eight Principles of Regenerative Economy (Fullerton, 2015)

Regenerative Finance

ReFi is a concept that emerged in early 2017 (ReFi DAO, 2023) with the aim of developing real-world applications and financial instruments to direct resources towards

regenerative initiatives. Due to its novelty, ReFi lacks a universally accepted definition, precise framework, and standardised applications (Schletz et al., 2023). As a result, its scope and practical application continue to evolve. However, two key elements are commonly shared across various interpretations of ReFi. First, it draws heavily from regenerative economic theories, notably Fullerton's 8 Principles of Regenerative Capitalism (Carbon Copy, 2024). Second, ReFi is recognised as a digital-first movement that capitalises on Web3 innovations, particularly blockchain technology, while incorporating other emerging technologies, such as the IoT and AI, to enhance climate-positive actions and create an inclusive, transparent, and accessible green financial system (Grasmann, 2022).

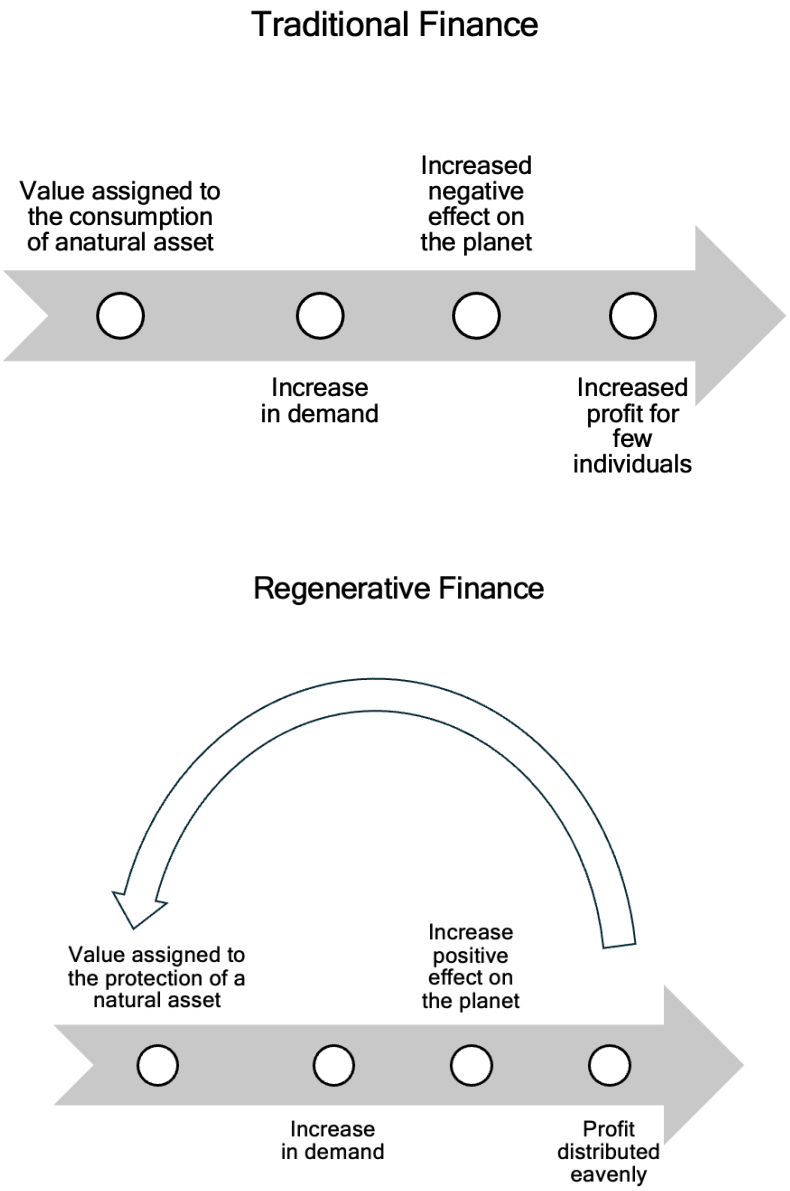

Figure 5: Adapted from Regenerative Finance vs. Traditional Finance (Toucan, 2023)

Web3 and Emerging Technologies

Web3 has been described as the third stage in the evolution of the Internet (Dentzel, 2023). The first stage, Web1, emerged in the early 1990s and was characterised by static, limited-functionality web pages. The second stage, Web2, represents the current internet paradigm, characterised by user-generated content and interactive platforms, but controversially marked by the significant concentration of data and information power in the hands of five major tech giants: Google, Amazon, Facebook, Apple, and Microsoft (Fenwick and Jurcys, 2022). Web3 represents a significant shift towards decentralisation, enabling users to own and control their data through blockchain technology and other innovations. More than just an evolution of the web, Web3 embodies a pronounced political narrative often called the 'web of everything and everybody.' Central to this vision is the concept and primary objective of Web3: creating a web owned and operated by its users (Buldas et al., 2022).

Web3 encompasses design attributes that can support the operability of regenerative finance instruments (Marr, 2023). It offers transparency, with transactions recorded in an unalterable database or blockchain, allowing participants to verify compliance with agreed-upon rules. Its decentralised nature ensures that no single entity can unilaterally set rules or control user behaviour without consent, allowing users to maintain independent control over their data and assets (Dentzel, 2023). Additionally, Web3 is censorship-resistant, as it lacks central authorities dictating content acceptability. This makes it universally accessible, requiring no permissions or approvals regardless of location or status. Finally, Web3 is interoperable, allowing users to build upon or integrate with existing systems without needing external approval (Toucan, 2023).

These design principles are made possible through blockchain technology, which serves as the foundational infrastructure for Web3 (McKinsey & Company, 2023). In simple terms, a blockchain is a digital ledger distributed across a network of computers. It records transactions in a series of linked blocks, with each new block building on the previous one. This structure ensures immutability because once a block is added, it cannot be altered, as all network participants receive updates simultaneously. Therefore, Web3 enthusiasts maintain that blockchain has five key attributes: immutability, accessibility, transparency, and security (Dentzel, 2023).

Real-world Applications

To explain the benefits of merging Web3 and other digital-first innovations with regenerative economic principles, Schletz et al. (2023) introduced the concept of a

'ReFi stack.' This stack outlines three primary use cases where ReFi leverages these technologies: enhancing NbS reporting, monitoring, and verification through digital methods (D-MRV); capital raising and trading through tokenisation and asset pooling; and establishing decentralised governance structures, such as DAOs. The various processes behind the functioning of the ReFi stack are managed through smart contracts, which are blockchain-based automated application logic designed to ensure seamless interoperability across different computer networks. Smart contracts automatically execute transactions once all parties fulfil their obligations according to predefined rules and verification criteria (Franke et al., 2020).

D-MRV

Traditionally, MRV involves multiple steps to quantify emission reductions and other

metrics from a specific NbS project, including extensive data collection, time-consuming analysis, third-party verification, and complex reporting. This process is often costly, time-consuming, and prone to errors (World Bank, 2022). Moreover, its reliance on manual data recording and in-person surveys makes it vulnerable to fraud and manipulation. D-MRV methods utilise digital data collection techniques to address these issues, such as drone-based earth observation, satellite geospatial data, and local smart sensors or IoT devices enhanced by algorithmic models or AI. These approaches improve information availability, interoperability, and transparency (CLI, 2019; World Bank, 2022; Schletz et al., 2023).

Following digital data collection, the use of blockchain for securing data on a distributed ledger can facilitate the transition to public and democratic 'warehouses' or 'oracles.' These platforms enable NbS and carbon project developers to access, validate, and share data on-chain, ensuring that the information remains both accessible and verifiable (Al-Breiki et al., 2020; Mammadzada et al., 2020). This approach enables various institutions and stakeholders to coordinate and adopt mutually beneficial standards, reducing data collection and transaction costs and minimising gaps and overlaps (Abbott, 2014). Furthermore, decentralised D-MRV platforms reduce green finance's dependence on costly and bureaucratic centralised standard registries, such as Gold Standard or Verra. This shift empowers smallholder farmers and Indigenous communities to generate, verify, and commercialise new nature or social impact credits (Climate Collective, 2022).

For instance, ReFi's initiative, Regen Network, has developed the Regen Registry, an open-source platform designed to facilitate cost-effective and comprehensive D-MRV. Their mission is to democratise green finance by enabling communities of earth stewards, scientists, technologists, and climate entrepreneurs to use publicly available data to create new forms of ecological assets (Linggih, Bryant, and French, 2023). A notable example is how the Sharamentsa Indigenous Community in Panza, Ecuador, were able to create biocultural credits through Regen public data to protect and monitor a critical 10,000-hectare jaguar habitat (Regen Network, 2024). This case exemplifies how Web3's principle of 'universal accessibility' through D-MRV is applied in ReFi, challenging traditional standards and empowering Indigenous communities to participate in nature markets. It also aligns with regenerative capitalism principles, such as 'honouring place and community' and 'empowering participation'.

Funding and Trading through Tokenisation

Tokenisation can significantly enhance transparency in green finance by creating digital representations of carbon, biodiversity, and other instruments that are recorded and traded on a blockchain ledger (Schletz et al., 2023). This process draws on nature's commodification by converting tangible and intangible assets, such as renewable energy generation, land rights, or cultural heritage, into digital tokens. These tokens contain immutable metadata, including the metric, issuing country, project name, and generation year (Valdivia & Poblet, 2022; García; Franke et al., 2020), making them highly reliable. Tokens can be categorised as fungible tokens, which are interchangeable with another token of the same type, and NFTs, which are unique representations of specific assets. NFTs can represent a wide range of assets, from digital versions of financial instruments like stocks and bonds to non-financial assets such as art, real estate, and land ownership certificates (Idelberger and Mezei, 2022).

Consequently, by tokenising nature using blockchain capacities, it is possible to create a record or digital asset containing sensitive climate or social-related information, ensuring that the data remains unchanged, secure and verifiable over time. The public attribute of blockchain networks also ensures the traceability of token states and transactions, enhancing transparency and streamlining processes (Voshmgir, 2019). This process may foster increased trust and auditability, particularly in carbon markets where corruption or distrust exists (Greenfield, 2023), while ensuring verifiable digital ownership as assets evolve or change hands. Therefore, the commercialisation of on-chain tokens on trusted digital trading platforms could expedite resource allocation to regenerative initiatives by reducing intermediaries, transaction times, and costs while ensuring secure cross-border operations (Valdivia & Poblet, 2022).

Moreover, tokenisation enables the 'fractionalisation' of assets by dividing large, often premium-priced digital nature financial instruments into smaller, more affordable units or tokens. This attribute seeks to increase liquidity and promote climate-related funding by attracting a diverse range of non-institutional buyers, consistently leading to a more accessible market (Persson, Buenadicha and Gómez, 2023). Indeed, the entire ReFi movement has gained momentum due to this phenomenon (Dentzel, 2023). The Toucan Protocol has transformed a substantial amount of legacy or off-chain carbon credits into on-chain BCT tokens (Watson, 2022). Instead of being tied to specific projects, these tokens are combined, creating larger 'pools' designed to stabilise prices and enhance market efficiency (Hartley and Rennie, 2022). This approach has supported over $4 billion in carbon credit trading volume, accounting for 85% of all digital carbon credits (Braithwaite, 2024).

In Latin America, Moss Earth is converting traditional REDD+ credits from the Amazon rainforest into reserve assets to create MCO2 tokens, which users can buy, trade, or retire (Moss Earth, 2020). Additionally, Moss Earth can pre-issue MCO2 tokens to finance NbS projects before completion (Teixeira & Asher Schapiro, 2022). This approach helps scale new forest conservation initiatives in the region. Once the project is completed and the actual carbon offsets are verified, a smart contract allows token holders to sell their tokens or receive the equivalent amount in carbon credits.

These and other tokenisation use cases have drawn significant attention from major traditional carbon registries. For instance, ACR and Gold Standard have announced plans to explore the development of digital tokens to represent carbon credits. Similarly, Verra launched an open consultation on 'Third-Party Crypto Instruments and Tokens' (Toucan, 2022) to investigate how blockchain technologies could enhance their services. Although widespread adoption of tokenisation may not resolve the fundamental issue related to commodification and 'fetishisation' of nature, it demonstrates the potential for mitigating problems like double-counting and fraud in carbon markets. Additionally, tokenisation could enhance liquidity and increase global participation in green markets.

DAOs

The final component of the ReFi stack is the DAOs. These are member-owned digital communities with decentralised governance built on Web3 principles, tokenomics, and smart contracts (Loannis and Pantelidis, 2024). Initially, the community develops and establishes the DAO's principles and rules, including voting rights and resource management mechanisms, which are then encoded in smart contracts to ensure automatic enforcement and transparent governance (Santana and Albareda, 2022).

Tokens are fundamental to DAOs, representing an individual's stake and membership within the organisation, similar to stocks in traditional corporations. Moreover, token holders are usually granted voting rights and the ability to participate in the governance processes (Finck, 2018).

DAOs' decentralised governance capability seeks to address the inefficiencies, opacity, and corruption often found in traditional organisational decision-making (Wright and De Filippi, 2015). By replacing the reactive procedural security of current legal and contractual systems, DAOs reduce management costs and decision times through process automation and eliminating intermediaries. Additionally, they mitigate the principal-agent dilemma by adopting a non-hierarchical governance model that combines computational code, behavioural economics, and game theory (Voshmgir, 2019; Guskow Cardoso, 2023).

Despite having governance rules encoded on the blockchain, DAOs still heavily rely on off-chain mechanisms for ongoing issues such as rule adjudication and conflict resolution. Effective management of these analogue processes is essential to avoid problems like forking, where the community splits into factions with differing views (Schletz et al., 2023). Additionally, many DAOs fail to deliver on their decentralisation promises, often replicating traditional organisational power imbalances (Jirásek, 2023; Axelsen, Jensen and Ross, 2022). For example, large DAOs may suffer from low community engagement in decision-making processes and the concentration of power among a few influential token holders (Bellavitis, Fisch, and Momtaz, 2022; Zhao et al., 2022).

This suggests that the 'DAO' label is sometimes more rhetorical, used to attract users rather than reflect true decentralisation. Therefore, it is crucial to rigorously evaluate each DAO's governance structure and practices (Bassi and Bandirali, 2023). Nevertheless, 'impact' DAOs such as Proof of Humanity DAO, GoodDollar, and Gitcoin DAO have been successfully implemented in managing different use cases, ranging from humanitarian aid to ecological asset markets, demonstrating both their effectiveness and potential for scalability (Jirásek, 2023).

To better understand DAOs as a central component of the ReFi ethos, it is helpful to view them as practical applications of Ostrom's (1998) regenerative theory on the governance of CPRs. CPRs, such as forests, pastures, or fishing grounds, are shared resources vulnerable to overuse and depletion, a dilemma commonly referred to as the 'tragedy of the commons' (Hardin, 1968). Historically, centralised control was considered essential for effectively managing these resources. However, Ostrom's Nobel Prize-winning research challenged this assumption. Through numerous case studies, she and other academics demonstrated that local communities could successfully self-organise to manage CPRs sustainably (Ostrom, 1992; Newig and Fritsch, 2009; Gari et al., 2017). Ostrom identified eight fundamental design principles for effective bottom-up CPR governance, including establishing clear boundaries, implementing collective-choice arrangements, and maintaining the capacity to monitor and adapt to changing conditions.

Consequently, the technologies behind DAOs have the potential to facilitate CPR governance and create new models for community-oriented environmental initiatives that address the tragedy of the commons. This is achieved by ensuring transparent and equitable governance among members through smart contracts for voting and decision-making (Poux, Filippi, and Ramos, 2020). Additionally, by accounting for and monitoring CPRs, these resources can be tokenised and integrated into shared 'liquidity pools.'

General Challenges

The promise of ReFi lies in integrating the principles of regenerative economics into financial systems and instruments. However, ReFi must clearly distinguish itself from traditional extractive economic models and develop practical approaches that genuinely embody the 'Re' in ReFi (Schletz et al., 2023). Disrupting these extractive dynamics requires more than just improving information flows and coordination; it necessitates a fundamental rethinking and alteration of the core principles of the existing system. Moreover, most of the most significant ReFi projects are currently focused on commodifying and consequently tokenising carbon credits and other forms of natural assets. Thus, scholars contend that, to date, ReFi has predominantly perpetuated existing extractive logic, resulting in the commodification of nature and the reinforcement of colonialist practices (Schletz et al., 2023; Meyer et al., 2024). This issue arises from distrustful narratives about 'climate-smart blockchain platforms,' which perpetuate North-South inequalities and have a limited impact on local communities. This phenomenon is often called 'crypto colonialism' (Howson, 2020).

To fully realise their potential, ReFi models must embed regenerative and circularity practices within their core business and operational frameworks, recognising that blockchain is an enabling technology rather than a remedy for climate change. Without this essential integration of regenerative principles, persistent issues in transactional systems, such as bureaucratic inefficiencies, opacity, and double-counting, are unlikely to be addressed by simply adopting new digital technologies. These challenges may instead evolve and become further complicated by the intricacies of cryptographic algorithms, machine learning, and cybersecurity vulnerabilities in IoT sensors and decentralised ledgers (Kumarathunga et al., 2023).

Additionally, while blockchain technology presents a promising framework for innovative and participatory governance, its decentralisation and openness could establish a paradox. It may enable inferior or fraudulent ReFi projects with low-quality natural credits to overshadow genuine climate-positive initiatives (Hartley and Rennie, 2022). To mitigate this risk, the ReFi movement must establish industry standards and cultivate cooperative networks among projects (Meyer et al., 2024).

Consequently, to achieve maximum collaboration and scalability, ReFi practitioners and entrepreneurs must bridge the gap between 'crypto savvy' and 'non-crypto' audiences by developing user-friendly and easily understandable models. Engaging traditional climate audiences, such as scientists, engineers, and researchers, is also crucial (Hartley and Rennie, 2022; Schletz et al., 2023). This effort is particularly important given the recent controversies in the 'crypto' industry, including scandals, catastrophic company collapses, declining cryptocurrency valuations, and reduced funding levels, which have damaged the overall perception of blockchain technology (Johansson, 2022; Carbon Copy, 2024). Consequently, the ReFi movement faces the additional challenge of securing support from multilateral organisations, banks, governments, and corporations to scale ReFi projects and effectively achieve a significant global impact.

Additionally, the ecological impact of blockchain technology has become a controversial area in the last few years, identified in numerous academic studies (Atkins et al., 2021), industry reports (Bendiksen and Gibbons, 2019) as well as public and government reports (OSTP, 2022). Nevertheless, for many ReFi community members, blockchain technology's energy consumption can be solved by transitioning from PoW to PoS

(Wendl, Doan and Sassen, 2023). PoW relies on 'miners' to validate transactions by solving complex algorithmic problems. This system operates as a competitive environment where only the first miner to solve the puzzle receives a reward in the form of native cryptocurrency. Thus, miners employ high-powered computers that consume substantial amounts of energy to function effectively and remain competitive (Kalnoki, 2022).

In contrast, the PoS method rewards validators based on the amount of cryptocurrency they stake as collateral rather than the computational power they use. This seemingly minor change significantly reduces the energy consumption associated with blockchain activities. Since PoS does not require extensive computer power to function effectively, it allows for more transactions to be validated with much lower energy usage than the PoW mechanism (Hartley and Rennie, 2022). Therefore, most ReFi projects are currently being developed on blockchains that utilise less energy-intensive consensus mechanisms and protocols, such as Celo, Polygon, and Ethereum, reducing the energy footprint by nearly 99.95% (Beekhuizen, 2021). To illustrate these advancements, organisations such as BICOWG were established to address blockchain's reputation as an energy-consuming technology and to coordinate climate-positive efforts within the sector (Schletz et al., 2023).

Despite ReFi's operability interrogations and unsolved challenges, the urgent environmental crises the world faces today necessitate a radical rethink of economic models by both corporate and governmental bodies to move away from climate-destructive practices. Therefore, a more forward-thinking paradigm embracing the active regeneration of ecosystems is essential. There is an international consensus that climate change mitigation will require far-reaching technological changes in the energy sector and other areas, including finance (Grubb, 2004). Thus, ReFi and other technology-driven movements should be encouraged. These movements suggest a shift from a mindset of culpability and remediation to one of opportunity and value creation, potentially offering the most viable solution for regenerative development.

Colombia's Ecological Landscape and Environmental Policies

Colombia is the second most biodiverse country in the world and the first per square kilometre (Ritchie, 2023). With only 0.7% of the Earth's land surface, Colombia contains more than 10% of the known terrestrial biodiversity of the planet (ICI, 2024). There are more bird, amphibian, butterfly and frog species in Colombia than in any other nation (WWF, 2017). The country is distinguished not only by its abundant natural resources and diverse ecosystems but also by its rich ethnic and cultural heritage, with over 170 Indigenous and ethnic communities (Jordan, 2023). The country encompasses a variety of landscapes, including forests, two coastlines (Pacific and Atlantic), jungles, deserts, wetlands, mountains, and moors. Furthermore, Colombia's ecological richness and substantial renewable energy potential, combined with its pioneering green taxonomy, the first of its kind in the Americas, has attracted international climate scientists, entrepreneurs, and institutions (Climate Bonds, 2022; Escobedo, 2022), making it an ideal location to explore the advancement and potential of ReFi.

Nature, Peace-making and Conservation

Colombia has endured decades of internal conflict and widespread displacement, which has significantly impacted the country's development. Ranking third in the world for IDP, Colombia is surpassed only by Syria and the Democratic Republic of Congo (IDMC, 2021). The conflict has resulted in more than 450,000 deaths and the displacement of over 3.6 million people (2, 2022), mainly from rural communities. Additionally, the rise of illicit activities such as coca plantations and illegal mining has severely damaged the country's environment (Suarez et al., 2016).

The paradox lies in the fact that while the conflict has exacerbated environmental degradation and hindered rural development, it has also inadvertently led to the conservation of some of Colombia's most unique and essential ecosystems. The prolonged civil war has prevented extensive exploitation of these areas due to their inaccessibility and insecurity. As a result, ecosystems such as the high Andean moorlands known as 'paramos' and parts of the Amazon and Choco rainforests have been preserved (Davalos, 2001). Moreover, scholars such as Canavire-Bacarreza, Diaz-Gutierrez and Hanauer (2018) found that municipalities located near conservation parks or reserves designated by the government before 2002 experienced a significant increase in guerrilla attacks and heightened poverty.

Moreover, after the 2016 peace agreement between the FARC guerrillas and the Colombian government, abandoned 'war' territories have become highly vulnerable to various old and new opportunistic illegal actors (Guasca, Vanneste and Van Broeck, 2022). These include guerrilla groups such as the ELN and FARC dissidents, neo-paramilitary organisations, and criminal gangs known as 'Bacrims,' all violently competing for control of extensive territories and lucrative illicit industries (Maher and Thomson, 2018). These illegal entities clash with, or sometimes collaborate with, multinational actors in the mining, oil, palm oil, agriculture, ecotourism, timber, and construction sectors, all aiming to dominate new lands for titling and exploitation. Surprisingly, Colombia's peace-making process has triggered a 44% increase in deforestation after the peace agreement was signed (McClanahan et al., 2019), highlighting the importance of implementing environmental policies to support the country's social transition (Prem, Saavedra and Vargas, 2020).

Green Taxonomy and Policies

In April 2022, Colombia achieved a significant milestone by becoming the first country in America to establish a national green taxonomy (Ramirez, Velázquez and Vélez-Zapata, 2022). This framework categorises economic activities according to their impact on specific environmental objectives, making it easier for lenders and borrowers to identify sustainable investments (World Bank, 2022). The taxonomy is intended to encourage public and private capital to be directed towards Colombia's environmental priorities. It recognises a local approach towards land use and agriculture, as they represent one of the most significant economic and pollution-heavy sectors. Additionally, Colombia was one of the first countries to establish a multi-sector MRV framework, developing an online platform and implementing a management strategy across various governance levels, including both public and private sectors (Transparency Partnership, 2019).

With these policies, Colombia has established itself as a forward-thinking leader in the fight against climate change by integrating ESG criteria into public investment and adopting a green taxonomy

that aligns with international sustainability standards and agreements (Ramirez, Velázquez, and Vélez-Zapata, 2022; Morcillo and Arocha, 2023). The country has also designated 30% of its land and waters as conservation areas (Conservation International, 2022). To achieve a 51% reduction in greenhouse gas emissions by 2030 and a carbon-neutral economy by 2050, Colombia has set ambitious NDCs with 196 initiatives (UNEP, 2021). To support these goals, Colombia has enacted and implemented four pivotal laws: the Clean Transport Act, the Environmental Crimes Act, the Energy Transition Act, and the Climate Action and Decarbonization Act (World Bank, 2022).

Colombia has been actively engaged in carbon markets since the Kyoto Protocol's inception in 1997, consistently supporting global market-based mechanisms to achieve climate goals. The country has also participated in various international carbon market initiatives, such as the World Bank's Program for Market Readiness (SPAR6C, 2024). Domestically, Colombia has introduced carbon pricing and market instruments to encourage voluntary mitigation projects, including two national carbon standards: CERCarbono and BioCarbon. In 2016, Colombia implemented a carbon tax to incentivise sustainable practices, allowing private entities to offset this tax by using domestic carbon credits. This approach has spurred the development of over 110 active NbS and voluntary carbon market projects (Climate Focus, 2022).

Although Colombia has implemented robust green policies, there is still a disconnection between national mandates and their implementation and oversight at the regional level. This detachment is exacerbated by historical corruption issues that have affected the Colombian government's performance (Pring and Vrushi, 2019; Školník, 2020; Oviedo, 2022), resulting in resource constraints and challenges in project execution (Climate Action Tracker, 2023). Unfortunately, corruption is notably prevalent in regional entities responsible for environmental affairs (Tarazona, 2022). NGOs such as Carbon Market Watch and the CLIP (2021) have published reports highlighting the inefficiency of the Colombian Ministry of Environment in implementing carbon policies. These reports indicate that two large-scale carbon projects overstated their emissions reductions and generated fictitious credits, which oil companies purchased to comply with national carbon tax legislation. This resulted in millions of dollars in losses for the government (Stoefs, 2021). Additionally, the CLIP noted: 'This case demonstrates that, although Colombia has been a pioneer in creating financial incentives for communities to preserve valuable forests, the system has significant shortcomings. The government is not effectively overseeing it, and there is a lack of transparency and traceability (Dufrasne, 2021).

ReFi in Colombia

The complex current landscape in Colombia, marked by its rich biodiversity, ongoing peace-making and social fabric reconstruction processes, and the institutional gaps between ambitious green policies and their implementation, has captivated national and international scientists and entrepreneurs, including those committed to regenerative movements. Consequently, the domestic ReFi ecosystem has begun to emerge over the past three years. Although exact numbers are not available, it is estimated that between 10 and 20 projects have been established with the aim of regenerating the country's unique ecosystems, improving the well-being of local communities, and bridging the technological and information gaps that exist (CFA, 2021) to build resilience through NbS.

Some of these entrepreneurs work independently, while others are part of conglomerates or 'nodes' within the global ReFi DAO, located in major Colombian cities like Medellin and Bogota (ReFi DAO, 2024). They employ a variety of business models, ranging from generating gold-tokenised liquidity pools to prevent mining to creating biodiversity credits using Indigenous MVR methodologies. These initiatives will be investigated in the upcoming comparative case study.

3. METHODOLOGY

Research Design

The comparative case study method was chosen as the primary research methodology for this qualitative study because of its proven ability to empirically test existing theories and develop new conceptual understandings of the phenomenon under investigation (Eisenhardt, 1989; Maxwell, 2013). Comparative case analysis has been widely used in political science research, aiding in the understanding of complex economic behaviours and emergent social movements (Dion, 1998), such as the emerging regenerative movement. This approach is particularly valuable in contexts where the framework's boundaries are not clearly defined, as is the case with ReFi, which has primarily been shaped by media narratives and isolated case studies (Meyer et al., 2024).

Furthermore, comparative case studies are particularly effective in situations where data is scarce or fragmented, as they allow researchers to derive meaningful insights from real-world contexts by identifying and analysing causal patterns across cases with shared objectives or characteristics (Yin, 1998; Goodrick, 2014). This methodological advantage aligns seamlessly with the specific aims of this research, which intended to uncover implementation challenges and success factors (patterns) and determine whether the anticipated benefits, such as improvements in community well-being and the promotion of more participatory NbS (common objectives), are being realised in ReFi projects across Colombia. Additionally, the selection of multiple cases in various regions intended to build a generalised analysis of the movement's progress within the nation.

Additionally, this research incorporated potentially significant variables identified through a detailed literature review, including the hypotheses of regenerative capitalism and the narratives of the ReFi movement as presented in various digital reports (Carbon Copy, 2024; Kumarathunga et al., 2023; Hartley and Rennie, 2022). This approach combines deductive and inductive reasoning, enabling a practical 'reality check' (Krishnamoorthi and Mathew, 2018) where the case study findings could be contrasted with the emerging theoretical assumptions. Ultimately, the design of this research is meant to validate the potential of ReFi as a transformative economic and social movement, as has been proposed in recent years. It also provided insights into the causal factors that may either promote or hinder the development of a more effective, sustainable, and regenerative financial framework.

Data Collection

Semi-structured interviews were chosen as the primary data collection method because they are particularly effective for obtaining in-depth, nuanced information from participants, allowing for open-ended questioning and exploring underlying meanings and motivations (Adams, 2015). This approach was critical given the exploratory nature of the research, which aimed to understand the 'how' and 'why' behind the decisions and actions of ReFi founders and practitioners. Additionally, the interpersonal and interactive style of semi-structured interviews fostered a conducive environment (Arksey and Knight, 1999; Brinkmann and Kvale, 2018) in which interviewees felt comfortable sharing their genuine impressions on sensitive topics such as structural challenges facing ReFi

scalability and the role of public institutions and international agencies in promoting or obstructing the movement's progress. This data gathering was essential because minimal research has systematically interviewed entrepreneurs and practitioners in this field (Meyer et al., 2024).

All interviews were conducted via video conferences and began by establishing the context of the academic research, clearly articulating the motivation and objectives, and ensuring the confidentiality of all information shared. Each participant was informed about the recording of the interview, and their consent was obtained. Interestingly, all participants expressed that they were unconcerned about anonymisation or the use of pseudonyms. In fact, the majority expressed a strong desire to have their organisations named to promote their work and the broader regenerative movement in Colombia. The interviews adhered to the best practices of the case study, structuring a questionnaire (Appendix C) to progress from general to specific topics (Adams, 2015). It started with open-ended, non-sensitive questions aimed at gaining a general understanding of each ReFi initiative's context and each interviewee's professional profile.

Subsequently, more targeted and technical questions were posed regarding the main challenges encountered during the implementation and operation of their projects or business models and the role that Web3 technologies played in their design and success. The interviews then transitioned into more sensitive areas, such as the current state of ReFi in Colombia, examining the impact of the Colombian government, as well as non-profit and international institutions, on shaping the movement. Following this, a series of targeted questions were asked about community impact, specifically exploring whether and how their initiatives were affecting communities and what metrics could be developed to measure these impacts. At the end of each interview, participants were asked about their vision for the ReFi movement, encouraging them to reflect on its long-term implications and potential evolution. This aimed to capture their aspirations, expectations, and perceived challenges that might shape ReFi's future trajectory.

Sample

A purposive, non-probabilistic sampling technique was employed to capture a range of perspectives within the Colombian ReFi ecosystem. This approach was chosen because the study's objectives required including specific groups or individuals with knowledge or relevant perspectives to answer the research questions. Thus, the sample was deliberately selected to include participants who could provide the most appropriate and insightful contributions (Mason, 2002; Robinson, 2014).

The research incorporated three distinct groups of interviewees: founders of specific ReFi initiatives or startups focused on funding regenerative projects within targeted communities; founders of national or regional ReFi gremial associations; and non-ReFi climate experts closely connected to the development of regenerative movements in Colombia. The inclusion of this third group aimed to enrich the understanding of the broader ecosystem by providing external insights that contributed to the objectivity and credibility of the research, enhancing its academic rigour and balancing the data obtained from ReFi practitioners.

The organisations led by founders in the first two categories were selected as the comparative case studies. Although their structures and operational models may vary, the research criteria focused on evaluating the initiative's ability to impact local communities' well-being, identifying

common implementation challenges, and understanding the movement's overall development across the nation. Thus, all initiatives were included in the multi-case study, whether for-profit or non-profit, and whether their goal was to fund specific projects or support the overall growth of the ecosystem.

After identifying these categories, the first ReFi organisation was located through online investigation. Upon successfully contacting the founder and conducting a semi-structured interview, a snowball sampling technique was subsequently employed. This sampling method leveraged the social connections, in this case from the initial interviewee, to identify and reach further potential participants (Naderifar, Goli and Ghaljaei, 2017). Snowball sampling proved particularly advantageous, given that the ReFi community in Colombia remains a niche area with limited publicly accessible information. Using purposive and snowball sampling methods, eight interviews were conducted, including four with ReFi individual initiatives founders, two with gremial or 'node' founders, and two with non-ReFi climate professionals. This process resulted in the consolidation of six case studies.

Case 1: Koko DAO

Koko DAO is an organisation based in Huila, Colombia, founded by Ana María Mahecha and dedicated to preserving 400 hectares of endangered native forest through the emission of on-chain credits to avoid deforestation (Gitcoin, 2024). The startup collaborates with rural communities and small landowners who typically lack the resources or sufficient land to participate in carbon market forest preservation schemes. Koko DAO leverages satellite data and geospatial models by utilising the Gain Forest open-source D-MRV oracle, enabling small-scale conservation projects to generate affordable ecological credits. In addition to its conservation efforts, Koko DAO provides employment opportunities for community members, offering equitable compensation for their contributions to protecting and restoring nature. The organisation also provides training programs in regenerative agriculture, empowering communities to build sustainable futures.

Case 2: Alternun

Alternun, a company co-founded by Noach Kettler Yakowitz and José Santiago Gómez, offers a novel approach to the gold mining industry by eliminating the need for physical extraction. Alternun's core idea is to eliminate the need for gold extraction, which typically leads to environmental harm and community displacement, by finding alternative ways to verify and account for gold reserves. Considering that 90% of extracted gold is currently used merely as a store of value (Ross, 2024), Alternun has developed a model that uses blockchain technology to verify and tokenise these gold reserves underground while maintaining the ecosystem's health. This methodology creates 'liquidity pools,' where investors can benefit from the fluctuating value of tokenised gold while earning profits by funding regenerative projects like solar farms and agroforestry on the land above the unextracted reserves (Escarraga, 2023). All decisions are managed through a DAO, promoting a more sustainable and equitable distribution of resources.

Case 3: Savimbo

Savimbo, founded by Dr Drea Burbank, is an initiative based in the Putumayo region of the Colombian Amazon. It focuses on creating a conservation economy that supports small farmers and Indigenous communities in their efforts to protect forests and wildlife. The company's mission is to enhance the climate market participation of these groups by offering salaried or pre-paid conservation and reforestation activities, which then generate

biodiversity credits that can be sold for shared profits.

These biodiversity credits are secured and traded on the blockchain, representing one hectare of fully conserved biodiversity hotspots. Each credit is verified by photographic or video evidence, ensuring transparency and accountability. This initiative focuses explicitly until this moment on safeguarding ecosystems within a jaguar corridor, a region home to rare and endangered species such as harpy eagles, spectacled bears, and jaguars. Savimbo emphasises the integration of tradition with modern technology, describing its approach as a 'digital handshake' between the past and the future, ensuring that the conservation efforts of local guardians are recognised and rewarded.

Case 4: The Barichara Regeneration Fund (BRF)

The BRF was founded by Joe Brewer, one of the first regenerative enthusiasts associated with the Capital Institute. The fund focuses on restoring a 500,000-hectare area in the Northern Andes of Colombia, particularly within the High-Andes tropical dry forest ecosystem. The initiative addresses ecological challenges such as deforestation, soil degradation, and biodiversity loss by integrating holistic ecological, social, and economic community efforts. A significant aspect of the BRF's approach is the creation of community participatory structures to manage the collected funds. Web3 technologies are employed to raise capital for local projects and monitor environmental health (Gitcoin, 2023). The BRF supports various projects within this bioregional framework, including efforts in syntropic agroforestry, community reforestation, and cultural education.

Case 5: ReFiDAO Medellín

ReFiDAO Medellín is Colombia's first regenerative finance node within ReFiDAO, the world's largest network of regenerative initiatives. The DAO, co-founded by Tereza Bízková and Juan Giraldo, focus on fostering community-driven incubation programs, investments, and dialogues around Web3-enabled regenerative-oriented innovations (ROIs). ReFiDAO Medellín aims to address the most pressing socio-economic and environmental challenges within the city and the surrounding regions. This includes poverty, inequality, youth unemployment, land degradation, and limited access to essential resources such as energy, water, sanitation, housing, and education by advancing climate-positive practices and sustainable solutions (Chen, 2023).

Case 6: ReFiDAO Bogotá

Bogota's DAO node, founded by Yesica Garcia, promotes regenerative finance and Web3 technologies in the Colombian capital and the Cundinamarca region through collaboration, education, and community engagement. Focused on fostering sustainable financial and environmental practices, ReFiDAO Bogotá organises educational events, workshops, and reforestation projects that raise awareness about the transformative potential of blockchain, tokenisation, and Web3 (ReFiDAO, 2023). The node aims to build a diverse, collaborative community of experts and innovators dedicated to addressing social and environmental challenges while contributing to a more equitable and sustainable local community.

Non-ReFi Interviewees

As mentioned, two additional non-ReFi climate experts were interviewed. First, Dr Evert Thomas, affiliated with the CGIAR, focuses on the conservation and sustainable use of forest genetic resources across Latin America, including Colombia. His work involves developing advanced online tools for agroforestry systems to improve native cacao and Amazon nut genetic resources for tree-based restoration. At the time of the

interview, Dr Thomas was exploring the development of on-chain biodiversity credits as a potential funding mechanism for his projects.

Second, Diego Chaparro is a senior associate at CO2CERO, a 12-year-old Colombian carbon project company specialising in sourcing and developing projects such as REDD+, small hydro, and mangrove conservation. CO2CERO commercialises carbon credits in international voluntary markets and Colombia's domestic carbon tax. While CO2CERO has traditionally operated within conventional carbon market structures, similarly to Dr Thomas, Chaparro was exploring using carbon tokens and NFTs as innovative advancements for his organisation.

Participant Name	Role	Organization	Code
Ana María Maecha	Founder and CEO	Koko DAO	F1KD
Noach Kettler	Co-founder and COO	Alternun	F2AN
Dr. Drea Burbank	Co-founder and CEO	Savimbo	F3SV
Joe Brewer	Co-founder	BRF	F4BRF
Tereza Bizkova	Co-founder	ReFiDAO Medellín	F5RDM
Yesica Garcia	Founder	ReFiDAO Bogotá	F6RDB
Dr. Evert Thomas	Senior Scientist	CGIAR	EX1CG
Diego Chaparro	Global Sales Lead	CO2CERO	EX2CC

Figure 6: Participant Name Coding Table

Data Analysis

Following data collection, reflexive thematic analysis was employed to identify patterns or themes within the data (Wæraas, 2022). The flexibility of this method made it particularly well-suited for this research, allowing it to function both as a realist approach, capturing actual events and experiences directly linked with the founding and scale of ReFi initiatives, and as a constructionist approach, exploring how broader societal discourses shape these realities (Braun and Clarke, 2006). This dual perspective facilitated a critical comparison between the emerging narrative of ReFi and the realities observed in the interviewee's testimonials.

During the encoding of data from the video call transcriptions, an inductive approach was applied to allow themes to emerge from the data. In this study, the codes were not grouped based on semantics but rather by inferring that they shared a similar meaning, 'value' or 'latent coding' (Byrne, 2022). As a result, manual coding was necessary as the data required a more creative and active approach than using software. This decision enabled the identification of nuances and patterns that would not have been evident if only semantic matches had been considered. After completion of the analytical process, six themes and twelve subthemes were constructed (Appendix D) to illustrate the findings.

4. FINDINGS

Regulatory and Institutional Barriers

All ReFi founders identified institutional and regulatory barriers as significant challenges. The primary barrier was the generally negative perception of cryptocurrencies and the Web3 ecosystem. This perception has impeded investment and collaboration efforts between ReFi projects and Colombia's international multilaterals, NGOs, and local government agencies. Participant F1KD highlighted these challenges:

One of the major challenges here is that our natural allies, such as NGOs like UNICEF, various environmental organisations, and United Nations investment funds, should ideally be supportive. However, from personal experience, I can tell you that they are hesitant to get involved. They prioritise their brands and reputation above all else, and they don't want to be associated with crypto because they don't understand it. They only hear about scams and negative aspects. Consequently, approaching what should be our natural allies has been difficult. This is also reflected in the Colombian government's lack of interest in focusing on partnering with us.

The second identified barrier relates to the predominant carbon markets, which are governed by exclusionary institutions that appear to resist alternative models, such as on-chain biodiversity and tokenised credits. These large registries seem uninterested in, or actively lobby against, adopting decentralised or locally driven approaches to generating carbon credits. As F3SV expressed:

They're making things as difficult as possible. I've heard Verra charges intermediary fees, and the ones paying Verra exploit our population. Most of Verra's funding comes from large, centralised farming and logging companies. They don't work for us. They've been quite combative on the global stage, attempting to push us out of business in various ways.

The third barrier identified by all interviewees, including non-ReFi founders, is the presence of institutional voids in Colombia. These voids stem from the absence of the Colombian state in regions where ReFi initiatives are being implemented, obstructing the formation of public-private collaborations crucial for effective community management and resource mobilisation. This lack of state involvement also increases security and operational risks for ReFi founders and their collaborators due to the ongoing armed conflict and the activities of illicit organisations in high-biodiversity areas.

Participants F2AN, F4BRF, F5RDM, and EX1CG discussed their experiences engaging with local rural governments and central authorities in Bogotá and Medellín. Although these interactions were generally cordial, the founders expressed frustration over the lack of follow-through on actionable commitments. Despite these challenges, F4BRF highlighted an opportunity within these institutional voids:

Colombia is a paradox: it has really good legal structures but very poor legal enforcement and implementation. There's also a significant lack of cultural capacity to carry out that implementation. However, if Colombia's cultural strengths could be

better organised, they could be absolutely transformative. I know very well that Colombian institutions are weak, and that's exactly why I believe this change can happen here. Regenerative models often emerge after a collapse, much like the cultural renaissance that took place in Detroit after its industrial economy collapsed in the 1990s.

Economic Model and Market Viability

The founders of the studied cases expressed widespread concern about the challenge of developing profitable or economically sustainable models. Koko DAO, BRF, ReFiDAO Medellín, and ReFiDAO Bogotá rely entirely on institutional donations or peer-to-peer contributions via Web3 platforms, while Savimbo and Alternun partially depend on these sources of support. This reliance is primarily driven by difficulties in accessing or commercialising the biodiversity and reforestation credits they produce, further exacerbated by external market forces and scepticism toward tokenised instruments, as discussed in Theme 1.

Of all the initiatives, Alternun stands out as the only organisation actively pursuing a profitable model for both the company and its clients, employing strategies such as gold reserve appreciation and investments in renewable energy sources. Addressing this challenge, F1KD affirmed:

The issue is that it's not scalable unless we generate acceptance within regulations, for example, with companies that need to comply with things like Colombia's 15% carbon tax. If we can't integrate our solutions and technology into government and corporate requirements—like for supermarkets or other consumers—scaling is impossible. Good intentions only get you so far. Up to now, we've been funded by donations and grants, but it's not sustainable. Coming from a background where I used to sell products or services, this reliance on donations is exhausting.

There was a consensus among interviewees that developing more financially sustainable models depends on diversifying nature assets and portfolios. These credits or tokens could be issued and verified using advanced methods like D-MRV or simpler practices such as fauna video recording, ensuring the involvement of local actors. This approach aims to reduce reliance on existing carbon credit mechanisms, which limit the scalability of ReFi models and fail to address core climate issues. Instead, the new credits would emphasise environmental resilience and social reconstruction, supporting a more holistic regenerative approach. F5RDM further elaborates on this idea:

I believe that the most viable ReFi use cases are still closely tied to DeFi, which seems completely natural. For centuries, we've perceived value primarily through financial lenses. Now, we're shifting towards a more holistic view of value, incorporating different forms of capital—intellectual, spiritual, community, and others. This transition is a challenge we need to work through. So far, the most successful use cases I've observed focus on creating new markets with different types of tokens. These include biodiversity tokens, like on-chain carbon credits. Additionally, one of my colleagues is working on a project involving impact tokens. For example, how do you tokenise or quantify something as traditionally intangible as female education, water sanitation, or even peace? She's working on projects like that.

A key subtheme in the discussion of ReFi operating models is the importance of ensuring that payments are either directly made to or shared with communities. In the case of Savimbo and Koko DAO, this manifests as direct payments to community members via blockchain-based wallets or

wire transfers in exchange for their contributions to verifying nature data, engaging in reforestation, and providing other ES. Conversely, in BRF, Alternun, and the Medellin and Bogota ReFiDAOs, the focus is on establishing collective or shared funds to decide how to allocate resources democratically.

F3SV underscores the significance of these reciprocal economic relationships, particularly with Indigenous communities, highlighting how this approach has facilitated the development of her ReFi project in the Colombian Amazon. She explains:

I didn't come in as a carbon colonialist saying, 'I want to start a green business.' They approached me and said, 'We want a green economy.' So, I started using my expertise in building economies to assist them. Their focus was on economic solutions because they were adamant—and I agreed—that the primary drivers of deforestation in the Amazon are economic. They wanted a for-profit business model, firmly believing that the charitable sector fosters dependency. Globally, they viewed it as white people profiting from oil, petroleum, and mining, then donating money back when it suits them. They rejected that dynamic. Their argument was, 'We provide a global service by keeping our trees standing, and we deserve to be compensated for it.' It was a challenging request but absolutely vital. They also insisted on no strings attached, which is crucial for Amazonian businesses—no long-term contracts or restrictive conditions.

Paths for Community Prosperity

Two key benefits emerged when interviewees discussed the impact of their initiatives on community prosperity and success metrics. The first benefit, which aligns with Theme 2, is the empowerment of local populations through economic alternatives provided by ReFi. This empowerment occurs by integrating communities into carbon and nature markets, offering them new opportunities to shift away from environmentally damaging practices, such as deforestation or mining, towards regenerative practices.

These alternatives, as articulated by F1KD, go beyond mere financial payments. They emphasise the creation of meaningful work and sustainable livelihoods:

They're not deforesting because cutting down trees is enjoyable. No, it's a matter of necessity, hunger, and the desire to move forward. I don't believe in the concept of simply paying them not to cut down trees. Instead, you need to create jobs, generate opportunities, and inspire curiosity in people. Imagine if I told you, 'Here's 100,000 pesos a day, but don't do anything.' Obviously, that wouldn't work because, at our core, we all have a human need to be productive, to progress, to educate our families, and so on.

Most interviewees identified the second path to impacting communities as empowering them to manage their lands and implement regenerative activities based on their ancestral knowledge or through resource and investment management. Thus, the concept of shared stewardship was found to be central to these regenerative practices.

F4BRF articulates this notion through a metaphor:

In ReFi, we need a protective 'membrane' around a territory, allowing communities to selectively choose which resources to bring in and which to keep out. Just as a biological cell uses active transport to block toxins and seek nutrients, a community should control its own processes to promote health and

well-being. This means setting its own agenda, deciding what to welcome, what to remove, and controlling the pace of change—because even beneficial things can overwhelm a community if introduced too quickly.

Web3 enabling mechanisms

Although the interviews did not delve deeply into the technologies behind the initiatives, seven out of eight participants noted that Web3 capabilities were highly advantageous for managing and trading credits or tokens. They highlighted how Web3-based exchanges and crypto crowdfunding platforms like Gitcoin and Giveth facilitated the sale, tracking, and direct funding of their initiatives.

The perception of DAOs, however, was mixed. Founders from Savimbo and BRF viewed DAOs as largely impractical due to their high costs and complexity, which conflicted with the grassroots, community-centered approach they aimed to support. Conversely, founders of the ReFIDAO nodes in Medellin and Bogota see DAOs as crucial for operating in ReFi's ecosystem.

F1KD elaborated on this divide by distinguishing between the conceptual and technological aspects of DAOs:

In KokoDAO, we are a 'hybrid' DAO because it is very difficult to create a 100% online, decentralised DAO in rural communities. However, if you observe how these communities are organised, they are essentially DAOs in how they make decisions and vote, and they obviously don't naturally call themselves that.

Movement Expansion and Alliances

The mixed sentiment about DAOs also reflects differing views on how the ReFi movement should grow in Colombia. Some participants favour a more 'centralised' approach, which involves integrating new initiatives as nodes or directly partnering with a regional or national ReFiDAO. This model is seen as beneficial for improving coordination and providing unified access to funding opportunities. As F2AN illustrates:

For Alternun, ReFiDAO Medellín has been a great sponsor; they helped us with capital funding of 10,000 USD so that we could develop some of the platform's functionalities. They also support us tremendously by giving us visibility and inviting us to events they host, and whenever there is space for us, they always extend an invitation.

Nevertheless, for F3SV, there is a detachment with the 'regen guys' in the central nodes, who have utopian ReFi visions but are not connected to the real problems in the rural regions. Similarly, F1KD expressed her concern about the concept of nodes, thinking that this hinders the development of a differentiated brand for every startup. She also highlighted the necessity for the ReFi community in Colombia to build solutions around real problems:

In blockchain technology, we must focus on finding people with real problems who can build solutions within their region or community. Instead of creating problems that don't exist, we should identify real issues that ReFi could address and guide these people on how to solve those problems using blockchain, technology, or crypto. I see many meet-ups happening (sponsored by the ReFiDAO nodes). Still, it feels like the same people are attending without actually seeking out industries or businesses that could benefit from blockchain. It's crucial to break out of this niche and find new

industries—whether it's farming, dairy production, or pharmaceuticals—that could benefit from ReFi in Colombia. Until we demonstrate real use cases for crypto in Colombia, I'm not sure we're truly making progress.

Technology and Education Gaps

Beyond the external challenges of expanding the movement nationally, two structural issues were identified in spreading ReFi concepts in Colombia. The first issue is the complexity of the narratives. Five interviewees noted that technical language related to Web3 creates a double barrier. Firstly, this complexity dissuades potential sponsors and strategic partners, many of whom lose interest due to the abstract nature of blockchain technology. Secondly, it hinders engagement with communities that lack familiarity with blockchain, making it difficult to involve them in co-creating solutions. Consequently, founders agreed on the urgent need to 'translate' these regenerative principles and technological concepts into more straightforward language that resonates with the diverse realities of their target audiences. Effectively addressing this challenge is crucial for the broader dissemination of the movement.

Additionally, there is a lack of technological infrastructure in remote areas of the country where most initiatives aim to operate, such as limited internet access or the lack of smartphones to provide community members with blockchain-based wallets for direct payments. According to two founders, this issue cannot be resolved simply by providing communities with the necessary technology to make the operational models function. The introduction of blockchain, which could easily be misused in a country like Colombia with its history of conflict and illegal activities, could be highly counterproductive, as described in F5RDM:

One of my biggest worries with the crypto blockchain part is the unintended consequences. It's not just about giving people wallets and tools—we really need to make sure they have the knowledge to use them responsibly. Blockchain is great, but without proper understanding, people could easily lose their wallet codes or, worse, get scammed. Bad actors are everywhere, not just in Colombia, and that's a real risk. So, we have to think carefully about how to avoid these situations in the communities we work with. Once you're dealing with people's money and identities, the responsibility becomes huge, and we need to invest more in education to prevent these problems.

5. DISCUSSION

The discussion chapter critically analyses the findings. It addresses the research questions by contrasting the comparative case data scrutinised through thematic analysis with the relevant theoretical frameworks and data established in the literature review. This chapter provides insights into the current state of the ReFi movement, highlighting its challenges and examining its impact on local communities.

ReFi Advancement in Colombia

The findings indicate that Colombia's ReFi movement is still in its early stages, characterised by a limited number of active initiatives and regional nodes, with only a few hundred advocates. Despite this nascent phase, the establishment of ReFi organisations in biodiverse regions such as Barichara, Huila, and Putumayo, where rural and Indigenous communities are actively involved in project design and benefit-sharing, demonstrates a genuine commitment to the principles of regenerative capitalism, such as 'honouring community and place' (Fullerton, 2015). Moreover, Colombia's rich biodiversity (Ritchie, 2023; International Climate Initiative, 2024; WWF, 2017) and the stewardship of its lands by local Peoples (Jordan, 2023), as highlighted in the literature review, were widely acknowledged by interviewees as unique potential drivers for further ReFi implementations.

The comprehensive utilisation of Web3 technologies across the studied cases confirms the strong interdependence between ReFi initiatives and these digital innovations. In all studied cases, the applicability of Web3 technologies closely aligns with ReFi's technology stack proposed by Schletz et al. (2023), which includes on-chain D-MRV, funding and trading mechanisms through tokenisation, and decentralised governance. This categorisation has proven to be a highly relevant practical framework for defining the scope and functionalities of ReFi. The applications mentioned in the stack were consistently employed to support individual ReFi initiatives' operational models and to build the movement at regional and national levels using decentralised structures or DAOs.

Main Challenges

However, the collected data reveal several structural barriers that impede the broader adoption and impact of the ReFi movement. These challenges can be grouped into three main areas: perception and trust issues, the dominance of carbon markets and prevailing narratives, and the disconnect between technological narratives and local realities. Regarding trust, although cryptocurrency trading is just one application of blockchain technology, high-profile scandals, fraud, and the current volatility of Web3 ecosystems, as noted by Johansson (2022), have caused significant scepticism around ReFi. This distrust is further exacerbated by the widespread awareness that blockchain technology is energy-intensive (Atkins et al., 2021), undermining its suitability for regenerative and climate-positive initiatives. While technological advancements, such as the shift from PoW to PoS, have partially alleviated these concerns (Wendl, Doan, and Sassen, 2023), doubts about the environmental sustainability of ReFi persist, complicating efforts to strengthen its credibility.

Furthermore, the claimed benefits of transparency and inclusion in ReFi require closer examination. Kumarathunga et al. (2023) argue that the complexities of cryptographic algorithms, cybersecurity vulnerabilities, and the abstract nature of decentralised ledgers may complicate rather than facilitate green finance, a concern also raised by the interviewees. Additionally, the anonymity and lack of regulatory oversight associated with blockchain and crypto assets make them attractive to criminal networks, particularly in Colombia, where illegal activities and institutional corruption are prevalent (Pring and Vrushi, 2019; Školník, 2020; Oviedo, 2022), especially within environmental entities and transactions (Tarazona, 2022). Consequently, the misuse of these technologies poses significant risks, including money laundering, fraud, and cross-border crime, which could undermine the intended benefits of ReFi for local communities. These concerns were frequently highlighted by ReFi founders, who emphasised the critical need for targeted awareness campaigns and comprehensive educational initiatives to mitigate these risks and ensure the responsible use of Web3 technologies within the sector.

Nevertheless, it is essential to evaluate if opposition to Web3 technologies is justified on technical, environmental, and social grounds and whether traditional entities involved in green finance exploit this distrust to hinder emerging initiatives that challenge their economic dominance and interests. Traditional carbon markets, which rely on centralised, top-down approaches and multiple intermediaries to secure financial returns, often result in profits being captured by everyone except the communities they are intended to support (Bachram, 2004; Bhambra and Newell, 2023). This contrasts sharply with ReFi's decentralised, community-driven ethos (Hartley and Rennie, 2022). Such misalignment can breed resistance, stifle innovation, and maintain the status quo in climate action, a paradigm that urgently requires transformative change, as highlighted by several scholars (Grubb, 2004; Muradian et al., 2013; González-Márquez and Toledo, 2020). The misalignment may foster resistance, suppress innovation, and preserve the status quo within the climate change paradigm, which urgently demands transformative modification, as several scholars emphasise (Grubb, 2004; Muradian et al., 2013; González-Márquez and Toledo, 2020). Moreover, data from ReFi founders indicate that this dominance is actively maintained through lobbying efforts that oppose the adoption and resource allocation to Web3 initiatives.

When well-implemented, ReFi's approach of trading new types of nature assets, such as biodiversity and social impact tokens, and improving the traceability of these trades, can offer significant benefits for green finance. Non-ReFi climate specialists interviewed in the study confirmed that this approach could mitigate harmful practices highlighted by scholars and journalists, such as carbon offsetting through monoculture plantations, double-counting, and reliance on multiple intermediaries (Lohmann, 2005; CLIP 2021). However, it fails to address the pronounced issue of commodity fetishism (Marx, 1867) and the commodification of nature and social relationships in the establishment of NbS, as emphasised by Martineau and Lafontaine (2019). As a result, ReFi may need to develop alternative use cases and operating models that rely on more than just the tokenisation and commercialisation of nature. This approach would help ensure that ReFi promotes holistic climate solutions, prioritising fundamental changes in production systems and consumption behaviours and fostering a deeper, more conscious understanding of planetary health.

While initiatives like Savimbo incorporate Indigenous practices to verify biodiversity

projects, there remains a prevalent tendency, particularly among urban ReFi nodes in Colombia, to prioritise Web3 narratives in project development and emphasise the fictitious rhetoric that blockchain technology, with its 'smart capabilities', is the principal solution to climate challenges (Howson, 2020). This approach often diverges significantly from the realities of rural communities in Colombia. On the one hand, it perpetuates exclusionary climate strategies by extending Western discourses through technical jargon, thereby reinforcing colonialist practices and maintaining power imbalances (Mignolo, 2019; Larsson and Orvehed, 2021). On the other hand, it creates barriers to scaling ReFi by obstructing the co-design of climate solutions that address local communities' needs and favouring external complex narratives over practical, community-driven problem-solving.

Impact and Metrics in Community Prosperity

This disconnect from local realities is also evident in the design of benefits and success metrics and how founders perceive ReFi initiatives' impact on communities. Essential foundations of prosperity, such as providing better economic opportunities and promoting local value creation through shared land management and democratic financial structures, are widely recognised by scholars (Moore et al., 2015) and acknowledged as desirable outcomes by founders. However, their initiatives can also support other dimensions of prosperity, including access to affordable housing, education, basic health services, and enhanced community power, voice, and sense of belonging. Despite this, ReFi initiatives often fail to map these and other prosperity dimensions and tailored metrics that reflect the specific contexts and worldviews in which they operate, a gap observed in most studied cases. Therefore, ReFi initiatives should focus not only on implementing the regenerative principle of 'creating a robust circulatory flow of resources' but also on integrating strategies that foster other forms of capital, such as intellectual and cultural capital (Roland and Landua, 2013). This can be achieved through educational programs, cultural activities, and community workshops.

Paradoxically, to bridge this disconnect, ReFi practitioners must move beyond their digital-first environments to engage directly with communities and local entities, gaining a deeper understanding of their needs and visions of prosperity and well-being. Such field engagement will facilitate the essential integration of Indigenous and rural value systems (Artaraz et al., 2021), enabling ReFi's technological functionalities to be translated into practical, community-specific solutions. This approach can also support the development of self-sustaining operational models or social enterprises less reliant on external grants by partnering with local organisations and leveraging their unique financial structures. This imperative to strengthen grassroots connections and incorporate diverse types of knowledge in ReFi was effectively articulated by F4BRF: We must transform land ownership and move away from commodification and transactionalism—key economic concepts we need to reconsider. We must shift away from poverty mindsets, decolonise our thinking, and re-indigenise our approach to stewardship and care.

6. CONCLUSION

This study has explored the emerging ReFi movement in Colombia, highlighting its potential impact on local communities as well as the challenges it faces regarding implementation and scalability. The research confirms that, beyond its increasing visibility in digital media and Web3 communities, ReFi projects are actively being applied in areas closely linked to climate resilience. ReFi provides sustainable economic alternatives and empowers communities to manage and care for their lands. Thus, ReFi holds promise as an alternative financial model that could significantly advance the development of innovative strategies to combat climate change. Moreover, the study validated the use of Web3 technologies in the examined cases, concluding that despite barriers related to technological infrastructure, expertise, and ethical concerns, proper use of blockchain can effectively address critical issues within the fragmented and heavily criticised carbon markets.

To facilitate the continued expansion of the movement, it is essential to address structural challenges. Therefore, ReFi advocates must pursue two parallel strategies: local engagement and institutional collaboration. At the local level, it is vital to implement strategies that educate communities about the benefits and limitations of blockchain technologies while also helping them build autonomous technical skills. Creating pathways for utilising these technologies without imposing specific technical narratives will encourage regenerative principles of creativity and participation, leading to more adaptable and resilient projects.

Simultaneously, on the institutional front, ReFi should focus on establishing partnerships with international organisations, multilateral banks, and local governments. Despite ReFi's decentralised nature, forming these alliances is crucial for elucidating the true potential of Web3, rectifying previous movement shortcomings, and garnering additional resources to support ReFi development. For the ReFi movement to scale effectively and achieve its intended impact, it must transition from relying solely on isolated donations or crowdfunding platforms to securing capital from corporations and institutional players. Additionally, ReFi practitioners are advised to partner with and leverage the expertise of NGOs and other social impact organisations. This collaboration will be crucial for designing non-economic programs and metrics for communities, thereby enhancing the overall impact of their initiatives. Thus, maintaining a constructive balance between cooperation and competition with dominant institutions and stakeholders in green markets will be advantageous.

7. LIMITATIONS AND RECOMMENDATIONS

This study's limitations include its focus on a specific geographic context and a relatively small sample size, reflecting the nascent stage of ReFi in Colombia. To gain a more comprehensive understanding of ReFi's grassroots impact, future research should incorporate perspectives from community members directly involved in or affected by ReFi initiatives. This approach would offer a more nuanced and objective view of how these initiatives influence local communities and help develop a practical framework for integrating community-centric metrics of prosperity.

Looking ahead, research should transition from diagnosis to theory-building to establish a clear and robust ReFi framework. Such theoretical development would enable more rigorous assessments of ReFi initiatives' effectiveness through quantitative and empirical methods. Expanding the research to include multiple countries and a larger, more diverse sample could provide a broader perspective on the global ReFi landscape. Additionally, exploring various cultural and economic contexts will enhance understanding of how ReFi principles are adapted and implemented across different settings, contributing to a more holistic view of the movement's impact and potential.

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About the IGP

The Institute for Global Prosperity (IGP) is redesigning prosperity for the 21st century.

Our vision is to build a prosperous, sustainable, global future, underpinned by the principles of fairness and justice, and allied to a realistic, long-term vision of humanity's place in the world.

The IGP believes that citizens and communities should be at the centre of efforts to reimagine prosperity. IGP's research is about working with residents and community groups to understand what prosperity means to local people and to bring their priorities into policymaking. We believe that involving the experiences, knowledge, and expertise of local people is the key to change.

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