Vivarium

Living Currencies for Socioecological Systems

"Such is life, although rarely is it described in this manner: an inserting itself, a drawing off to its advantage, a parasitizing of the downward course of energy, from its noble solar form to the degraded one of low temperature heat. In this downward course, which leads to equilibrium and thus death, life draws a bend and nests in it."

Primo Levi, The Periodic Table

Adar Zehavi

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Executive Summary

Exceptional self-organising movements, from the resistance networks of occupied Europe to Wangari Maathai's Green Belt Movement, have generated value that is illegible to conventional finance: a currency of trust, ecological knowledge, and shared risk that outlasts any donor cycle.

The research offers these movements a pathway to technical infrastructure that makes their multicapital flows governable, verifiable, and revenue-generating at scale. It offers system developers a route from concept to empirical design, and financial actors an evidence base showing that capital is producing economic and natural surpluses where it is deployed.

The core hypothesis of this research is that self-organising movements operate through a network of containers for multicapital blending: a locally bounded unit that successfully mixes financial, relational, cultural, and ecological capital in ways that produce measurable socioecological value.

Previous efforts to build such coalitions have fallen short because a clear enough map of the terrain was missing; this research is an attempt to provide one.

This research, developed since 2016 and grounded in desk research of Tarun Bharat Sangh publications from 2022–2025, alongside initial fieldwork with the Green Belt Movement in Kenya in early 2026, outlines the grammar of self-organising movements.

The Gap

What if the grammar for protecting life is captured in the narratives of those who sustain it?

This work begins with a family history. During the occupation of the Netherlands, my great-grandfather promised a Dutch farmer fifty guilders per head, per month, for protecting his family; a stake held not in an institution but in a relationship, contingent on continued alignment between intention and action. What kept my family alive was not the state but a network of risk-takers and risk-sharers.
This paper sets out to make that grammar legible, and to encode it.

Preface

Social Self-Organisation

What if self-organising social systems share a generative grammar that is emergent, scale-invariant, and interoperable?

Chapter 1

Conceptual Framework

A Similar Pattern at Every Scale

Durable social systems, from families to nation-states, share a similar grammar: a boundary that distinguishes the system from its environment, a method for identifying members, a vision that sets a direction, and rules to orient action. Together, this grammar produces a working model of the social world. The table below illustrates the scaling of social self-organisation.

LEVEL	BOUNDARY	IDENTITY	VISION	RULES	MODEL
Family	Kinship (biological or legal)	Birth and Care relationship	Survival and reproduction	Tacit, affective, embodied	Immediate environment; blood is thicker than water
Tribe	Physical proximity and shared possession	Descent and initiation	Collective protection	Oral tradition, elder authority	Extended kin environment; migratory livelihood
Nation	Permanent settlement, cultivated land	Common ancestry, family names	Shared origin and destiny	Territorial protection, customary law	Regional environment; first imagined community
Religion	Gods, secret rituals and sacred places	Birth into faith or conversion	Divine order moral universe	God's law, clerical authority, taxation	God's will; first abstraction of membership
Nation-state	Monopoly on legitimate use of force	Birth rights, naturalization	Declaration of independence	Rule of law	Prediction errors explained & managed
Movements	Interpretive consensus over shared values	Alignment btw. intention and action	Socioecological flourishing	Value-aligned goals, voluntary, non-violent	Planetary; Doomsday Clock

Table 1: the generative grammar of social self-organisation across scales

Conceptual Framework

Why Movements Outperformed Institutions

The Free Energy Principle as a Governance Argument:

Table 1 regards both movements and nation-states as self-organising social systems. This part provides a hypothesis as to why movements, at least historically, outperformed state's instituions.

The Free Energy Principle, drawn from Karl Friston's account of biological systems, holds that any system organising collective behaviour faces the same challenge: managing the gap between what its model predicts and what it actually observes. When prediction errors accumulate faster than a system can absorb them, it either adapts, reaching similar goals by different means, or settles toward equilibrium.

Many nation-states show signs of the latter: they still deploy coercion as a means to an end, yet face a structural ceiling: the monopoly on force produces stability that stifles adaptive response. Voluntary movements, on the other hand, face no such ceiling. Their source of legitimacy is the vision they pursue and their time horizon is open-ended. They use persuasion and consensus to coordinate and scale and by doing so they generate adaptive depth no coercive institution can match.

The Free Energy Principle thus offers the basis for a hypothesis of social power that can reason with the observation that agents, as depleted of political power as slaves and stateless persons, outperformed the rule of law. Not despite their circumstances but because of the structural properties of the collaborations they built and sustained in response to them. Read this way, political power is a form of collective intelligence: the capacity of a group to reach a shared goal, a more liveable future, by adaptive rather than coercive means.

Conceptual Framework

The Theory of Transferability

What makes a movement exceptional?

The generative grammar of self-organising movements establishes the structural logic of socioecological movements (see figure 1). The theory of transferability asks what distinguishes an exceptional self-organising movement from a well-organised initiative with a regenerative agenda?

Figure 1:

Vision: a movement's grand narrative, the active regeneration of the conditions for flourishing that orients participants and capital.
Boundaries: an interpretation of core social values through the principle of equality. Humanity is considered one species among other living systems.
Identity: membership earned through demonstrated alignment between movement's goals and agentic action. The movement does not need to collect personal data; data generated by participants remains theirs.
Rules: governance power proportional to the agent's exposure, consensus-based coordination, surplus distribution proportional to contribution, all types of capital legible for contribution.

Condition One: A local unit of change

The majority of environmental initiatives deploy financial capital and treat local communities as labour rather than as the locus of governance. Yet the most fundamental condition of a self-organising movement is the existence of a local unit, often a Self-Help Group (SHG), that can be recognised within its social environment. These units connect socioeconomic and ecological activities in ways that produce synergy between social and ecological systems. This condition is more demanding than it appears. A unit of change becomes operational once it mixes financial, relational, and cultural capital well enough to cross a threshold of autonomy, i.e., the point at which continued participation becomes more rational than exit, even under pressure.

Condition Two: Value-aligned goals

The second condition is the development of value-aligned goals from which prediction errors can be generated and reduced. While goals, such as the UN SDG framework, assume the world is sufficiently known to specify desired outcomes in advance, value-aligned goals assume an

Conceptual Framework

How Movements Scale

unstable, and unknown environment and aim to design the conditions that would improve stability rather than assume it. In this framework, prediction errors are treated as signals through which the social system calibrates action. The capacity to hold this orientation under pressure, and to transmit it to new participants, is what makes a movement's prediction model legible.

Condition Three: a proven learning capacity

The third condition is the demonstrated capacity to move from experimentation to protocol i.e., to convert shared experience into stable rules, supply chains, and governance procedures that can be encoded and transmitted. The first months to five years are dedicated to learn what needs to be known, what should be monitored, and to identify the thresholds that must be crossed at each stage for the movement to reach its stated goals. Over time these experiments stabilise into rules and formal procedures. The capacity to learn is what makes the difference between a movement that scales and one that remains locally exceptional.

Condition four: a tipping point modality

The fourth condition is threshold-based propagation: identifying the agents whose adoption makes further adoption more probable, and sequencing engagement accordingly. Change spreads as early adopters, whose commitment is legible and credible to others, accumulate until the movement's vision becomes the path of least resistance for a broader population. Over time this produces a recognisable pattern: decreasing effort generating increasing socioecological value, as the movement's logic embeds in local institutions, regulations, and supply chains. The broader population is asked only to do no harm, and government institutions are engaged where alignment exists.

The Movements

What do participating movements reveal about the material conditions under which self-organisation becomes durable and financeable?

Chapter 2

The Empirical Foundation

The Green Belt Movement

Value-aligned-goal: To plant 15 million trees, one for each Kenyan citizen

The Green Belt Movement (GBM) was founded in Kenya in 1977 by Nobel Laureate Professor Wangari Maathai (1940–2011) and the National Council of Women of Kenya (NCWK).

What began as a response to rural women's observations that streams were drying up and soils eroding, became one of Africa's most enduring environmental and civic movements.

Over five decades, GBM has facilitated the planting of tens of millions of trees across Kenya, while organising communities around land rights, democratic governance, and women's empowerment. GBM operates through a decentralised network of community tree nurseries, connected through shared protocols, values, and a common vision of ecological restoration and civic dignity.

It is this combination of local rootedness and distributed coherence that makes GBM an unusually generative case for studying how regenerative movements scale without losing integrity.

GBM staff take part in the global “Draw the Line” march in Nairobi, September 2025, ahead of COP30

An agroforestry nursery grower, Sep. 2025

Nursery growers carrying trees to Nandi Forest, Oct. 2025

The Empirical Foundation

Tarun Bharat Sangh

Value-aligned goal: To rejuvenate the Arvari River in Rajasthan, India.

The Arvari River in Rajasthan had been dry for nearly sixty years before flowing again in the mid-1990s through collective action led by local communities and Tarun Bharat Sangh (TBS). What began with the construction of a single johad gradually evolved into one of India's most influential movements for ecological restoration and community self-governance.

TBS was founded in 1975 and later shaped under the leadership of The Waterman of India, Dr. Rajendra Singh, who initially came to rural Rajasthan with the aim of improving community health. He came to realise that medicine alone could not address the conditions people faced: the deeper challenge was water scarcity itself.

Over four decades, TBS has supported communities in restoring rivers, building thousands of rainwater harvesting structures, and organising collective stewardship around water, livelihoods, and local governance.

TBS operates through decentralised village networks connected through shared values, practices, and a common commitment to restoring the relationship between people and water.

Central and State Governments formally acknowledged the need to preserve the uninterrupted flow of the Ganga | image: TBS.


TBS Jaisalmer, Rajasthan, May 2026


Tarun Bharat Sangh, April 2016

Nyeri County, Kenya; Rajasthan, India.

Narrative Foraging

From Tacit Knowledge to Life-Histories:

THE TERM

Narrative Foraging is a field methodology for identifying structural grammar from life-history interviews, converting tacit community knowledge into legible, transferable evidence for funders and system stewards.

AIM

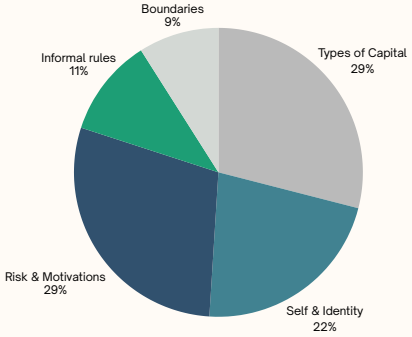
- To identify narrative evidence of self-organising dynamics.
- To explore how abstract concepts such as novelty, autonomy, anticipation and synergy are expressed in local terms.

METHODOLOGY

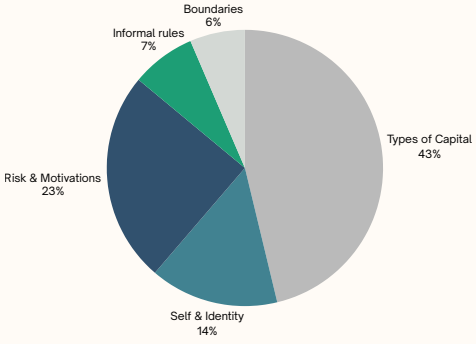
Kenya (GBM): fieldwork conducted over five days in four villages in Nyeri County, with 39 participants. 24 life-history interviews and two timeline-mapping sessions.
India (TBS): Testimonies from 40 community members and TBS staff across 17 villages were identified from five books written and published by TBS between 2022 and 2025, authored by Dr. Indira Khurana and Waterman Dr. Rajendra Singh.

ANALYSIS

Using a grounded theory–inspired coding approach that combined deductive and inductive analysis. 306 excerpts from GBM and 95 excerpts from TBS were identified and coded.



Tarun Bharat Sangh:
95 excerpts



The Green Belt Movement:
306 excerpts

Conservative Flows: Capital That Compounds Locally

Across the coded testimonies, regeneration takes hold through accumulation, not a single exchange. Movements begin by diffusing cultural capital, ecological knowledge and indigenous practice, alongside an immediate benefit such as firewood (Figure 1). Receptive villagers then add their own social and economic capital and convert it to the symbolic capital of a registered nursery (Figure 2). Once a nursery is planting and earning from the seedlings it sells, those gains compound into more nurseries registered, more trees planted and more economic and natural capital generated in a once depleted lanscape (Figure 3).

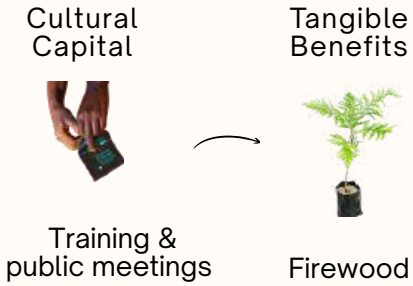


Figure 1: GBM engages early adopters through public meetings and offering an immediate benefit - indigenous trees for firewood planted on farms.

Figure 2: Receptive villagers contribute their economic and social capital by registering as a nursery group, enabling regeneration to take root. Compensation based on trees planted and survival rates was reported to be sufficient for paying school fees in the immediate term.

Figure 3: Over a decade, GBM activities generated broader economic and symbolic gains for both members and the movement, including expansion of nurseries and gains in natural capital, the same distributed, protocol-driven growth that the Governance section examines in detail.

The Empirical Foundation

Stewardship Without Authority

Risk exposure & decision-making:

The data also revealed that within each unit of change, members choose how much of their capital to risk or contribute, and that risk exposure translates into decision-making power, within the unit, the region, and the movement at large. This contractual approach to contribution and risk-sharing is the movement's core governance modality: power is proportional to exposure, not to seniority or wealth.

This method also proves cohesive and durable, as the nursery records indicate: GBM nurseries produce seedlings before the rainy season and maintain survival rates above 70%. Despite the movement having been inactive in Nyeri County for more than 15 years, roughly 10% of nurseries found market fit and remain operational, a remarkable figure given that most externally funded environmental programs leave no operational legacy once active support ends.

TBS communities, for their part, mobilise 25% of the cost of each water-harvesting structure in advance, a notable commitment given their socioeconomic circumstances. This recursive dynamic is characteristic of self-organising systems: governance emerges from the interplay of constraints and agency rather than from external authority.

Becoming part of a greater whole:

Identity formation played a critical role in stabilising the movement's coherence. Participants articulated their motivations not only in economic or ecological terms but in relational and intergenerational ones.
They spoke of their commitment as an act of care for future generations, as a continuation of ancestral practices, and as an expression of civic responsibility. Members reframed affiliation as empowerment rather than aid, embedding ecological restoration within a broader identity of self-determination. Identity thus became an informational constraint that aligned individual action with collective purpose.

“It was a way of socialising, and when you are together, you lift... one another... We were so close and we felt so good when we were doing that work... When we were planting the indigenous trees, we were going very far to collect the seeds... and you want to plant more than your friend, and you are kind of... competing, and that competition kept us strong and kept us going, and we felt good.”

Participatory mapping, Mutethii-ini Village, 19.02.2026

Read together, these testimonies reveal a living architecture of self-organisation.

System Architecture

Societal prediction models have reached their structural limits. What would it take to build what comes next?

This chapter is a forward-looking design proposal; the research plan that follows funds it through demonstrated results, not promises.

Chapter 3

Code & Emergence

Coding Movements

The Right to Exit as The primary governance mechanism:

The architecture proposed here aims to emulate and amplify the way self-organising movements operate. It rests on three layers. The management layer, composed of the movement's main risk-takers, is responsible for sense-making and for keeping the digital record honest against on-the-ground reality. The ledger layer, composed of agents specialising in peer-to-peer code, maintains records, executes authorised updates, and can manage several currencies; it is compensated for its services but holds no decision-making power and is replaceable. The social layer is the people staking and contributing towards the movement's value-aligned goals, who hold the right to exit.

The most important governance principle in this architecture is the right to exit: the qualitative shift from the Leviathan, in which participation is compelled. Participation in a movement is voluntary and maintained through the ongoing choice to remain. Members are its most important governance and capital-generating actors precisely because they are its most embedded ones. They are the first to notice when protocols drift from ground reality, and their continued participation is the most credible signal of the movement's governance health.

A movement that requests contribution without meeting its obligations, or that tolerates corruption and mismanagement, will lose members and capital, and that loss registers immediately in the value of its currency. Democratic selection therefore operates not through periodic votes but through the continuous, distributed exercise of the right to exit: leadership that drifts from the vision loses the members whose participation gives it legitimacy, and the architecture reflects that loss transparently and in real time.

Socioecological Movements

Socioecological Currencies

These three layers coordinate through the movement's socioecological currency, defined in the pages that follow. Legitimacy rests not on commitment to an idea but on the continued capacity to close the gap between the socioecological system's current state and the state its vision demands. Participating movements share one orienting purpose: to slow, stop, and ultimately reverse the Doomsday Clock, the Bulletin of the Atomic Scientists' measure of our proximity to collapse. To better understand the difference between current instruments and the architecture proposed here, the table below compares the architecture of sovereign money, carbon credits, and the socioecological currency.

	Nation-state	Existing tools e.g., Carbon Credits	Socioecological currency
Backing	State authority and sovereign debt	Political agreement on an accounting unit. Value rests on regulatory mandate	Verified socioecological assets and the movement's productivity ratio
Issuance	Central bank creates money through debt; supply is politically managed	Issued against projected avoided emissions, a future that may never materialise	Issued continuously as agents stake or contribute capital, each token is a claim on real assets
Governance	Periodic elections and central bank mandates	Regulatory bodies and market makers, Participation compelled by compliance regimes	Risk exposure determines decision weight. Participation is voluntary
Failure mode	Inflation, debt crisis, currency collapse Citizens absorb the full cost	Double-counting, phantom credits, greenwashing. The failure is invisible until it is systemic	Productivity ratio falls; currency loses value immediately. Members exit Failure is visible
Ecological Relationship	Indifferent	Transactional. Ecology is a source of offsets	Constitutive. Every token is tied to a place being monitored and regenerated. Holders are embedded in it
Democratic logic	Periodic elections; conditional entrance	Market price. Governance is purchasable	Continuous exit and entry. Authority derives from vision

Table 2: The difference between existing tools for regeneration and socioecological currencies

Socioecological Movements

Value and the Unit of Account

What the currency measures: the quality of regeneration

The value of a socioecological currency reflects what agents, human and non-human, actually control: the quality of the conditions under which nature can regenerate. Nature's own services are measured but never claimed by the system. What the currency tracks is the quality of regeneration, a movement's capacity to sustain and expand its socioecological bank.

Its unit of account expresses this as a ratio: socioecological value generated over time invested. Socioecological value is verified through real-world assets, hectares of regenerated forest, restored rivers, protected biodiversity corridors, alongside human wellbeing read through Sen's capabilities and Bourdieu's forms of capital (see chapter 4); ecological and human health are co-monitored, co-reported, and co-valued. Time invested is recorded in the participation ledger, where every contribution of capital, labour, knowledge, or relationship is normalised into time units representing how long it took a participant to accumulate that capital.

The ecological system under regeneration is itself translated into time: the durable conditions for life it will sustain. A high-value currency therefore represents a movement that invests less time as capital while producing and protecting more time as living ecosystems in their climax state.

Since value is measured this way, the currency does not flatten the difference between a million dollars accumulated quickly and a decade of relationship-building, field knowledge, or land stewardship; it makes them structurally legible, and lets a movement blend large financial capital from the Global North with the on-site contributions of rural populations without collapsing its governance.

The measure of value is a capability rather than an output: it tells an observer not only what a movement has produced but how efficiently and sustainably it is structured to keep producing. A movement that regenerates more with less becomes more valuable; one whose socioecological bank degrades, or whose participation outpaces ecological growth, becomes less so. In this way the currency stays honest, in real time, about each movement's capacity to help reverse the Doomsday Clock.

Socioecological Movements

The Currency's Anchor

Real-world assets as the source of credibility

The unit of account requires a real-world socioecological footing: verified assets producing live, credible data on both ecological and human wellbeing. This anchor is the currency's source of credibility. It keeps the currency from floating free of living reality and becoming speculative, because every token in circulation reflects a human commitment tied, ultimately, to a place being monitored, protected, and regenerated.

A movement without genuine socioecological footing cannot issue a credible currency under this architecture, whether its assets are forests, rivers, urban neighbourhoods, hospitals, or schools. The principle is the same: the unit of account must be grounded in something alive, measurable, and cared for.

Socioecological Movements

Staking & Contributing

Two Classes of Tokens:

Tokens are issued to reflect a participant's stake or contribution toward the movement's goals: total supply grows with participation, and value per token tracks the movement's productivity ratio. Every token represents real commitments and outputs, including debt taken on to participate, recorded as negative time that reflects the risk carried and is offset by the surplus that regeneration later generates.

Staking tokens and contributor tokens are kept as distinct instruments so that liquidity in everyday life, paying for food, equipment, or school fees, never turns governance power into something wealthy actors can buy.

Staker Tokens:

Issued to participants who commit capital without guaranteed compensation, holding it until a stated value-aligned goal is achieved. Staking is calculated relative to the time it took a participant to accumulate their capital, not its market value. The tokens carry governance weight for agents with integrated roles in the movement. Integrated members can act autonomously within their unit of influence, in alignment with value-aligned goals. Cross-unit rule changes require broader consensus.
Staker tokens absorb losses first if the movement fails. Thus, they are the instruments of long-term commitment and shared risk.

Contributor Tokens:

Issued as compensation for specific, well-defined deliverables: data collection, ledger maintenance, ecological monitoring, infrastructure upkeep. The movement commits to resourcing their work and compensating upon verified delivery. This token is liquid and redeemable for other capital types, including national currencies. Designed to be exchangeable on M-Pesa or equivalent platforms without governance implications. Holding only contributor tokens confers no decision-making power. The governance layer is protected from purchase.

Research Plan

How can the governance logic of self-organisation shape socio-ecological currencies?

Chapter 4

Research Plan

Conceptual Framework

Where This Work Sits in the Field

The research sits at the intersection of three active fields, each of which has named the problem this research proposes to address without yet building the infrastructure to do so.

Multicapital frameworks, from the CCF to the Capitals Coalition protocols, are increasingly applied across contexts from agroforestry to site remediation, but remain diagnostic: they map and assess capital assets without producing measurement infrastructure that is legible to financiers or capable of routing value back to communities.

Natural capital accounting in forest and agroforestry contexts is advancing rapidly, with new tools for quantifying ecosystem services including carbon, biodiversity, and hydrological regulation, but these tools are disconnected from local governance systems and do not capture the non-linear, time-lagged accumulation dynamics that make long-term investment structurally different from conventional asset classes.

Systemic finance research has identified a persistent gap between the governance logic of self-organising movements and the legibility requirements of capital providers, with participatory MRV work in REDD+ contexts demonstrating that community-based monitoring is both cost-effective and more accurate than remote assessment. Yet this work has not been integrated with multicapital frameworks or connected to financial instruments that would make its outputs investable. This research aims to build the infrastructure that connects all three.

Research Plan

Conceptual Framework

Theoretical Foundations

The framework rests on a baseline empirical model, the Community Capitals Framework, and three theoretical pillars, which together constitute a structural account of human flourishing, distributed governance, and capital conversion in self-organising movements.

The Community Capitals Framework (CCF):

Flora and Flora's Community Capitals Framework (2004; 2008) provides the closest existing model to what this research is building, and the empirical baseline against which its propositions are tested. The CCF posits that community flourishing is an emergent property of seven interacting capital forms: natural, cultural, human, social, political, financial, and built. Sustainable communities require balanced investment across all seven, and conversion between capital forms is the primary mechanism of community development.

The CCF emerged from participatory action research, with theoretical roots in Bourdieu, symbolic structuralism, and social constructivism, making it directly continuous with the other theoretical pillars of this research. The GBM nursery group is the CCF's replicable unit instantiated in a Global North–South ecological movement context. This research uses the CCF's architecture as the structural reference for its diagnostic and measurement phases.

Amartya Sen's Capabilities Framework:

Human flourishing is understood as an expansion of the range of freedoms a person can deploy across domains. A nursery member who moves from subsistence agriculture to compensation for trees, access to credit, social recognition, and the capacity to pay school fees is experiencing flourishing across material, relational, and ecological dimensions simultaneously.

Research Plan

Conceptual Framework

The capabilities framework provides the normative measure for the research: analysis asks not only what participants gained materially, but what range of freedoms they were able to deploy following movement participation.

Bourdieu's Theory of Capital Conversion:

The units of change are the structural site within which financial capital, primarily from the Global North, mixes with locally generated cultural, social, symbolic, and ecological capital. The explanatory claim is not merely descriptive: the structural conditions of the unit, shared boundary logic, agent identification, vision, and rules, are what make capital mixing possible and self-sustaining. Remove any one condition and the unit either fails to form or dissolves under pressure.

Bourdieuian capital conversion events, moments when symbolic recognition enables access to credit or social trust enables land use, are the mechanism by which multicapital value accumulates in the movements' networks. The research encodes this conversion logic into the architecture proposed in Phase Three.

The Free Energy Principle:

Drawing on Karl Friston's account, movement participants are understood as active modellers of their environment. Their capacity to reduce the gap between expectation and experience, through shared vision, encoded rules, and mutual accountability, sustains the persistence and expansion of the movements. This framing connects individual agency to collective self-organisation and provides the theoretical basis for the agentic network architecture proposed in Phase Five: a system capable of acting on the world in pursuit of value-aligned goals, rather than in response to external instructions.

Research Plan

Conceptual Framework

Hypothetical Model:

Taking the Green Belt Movement as an example: if the movement's social and cultural capital consolidates over time, then the financial capital required per additional unit of change will decline while ecological and social output per unit remains stable or rises.

If trees are planted and protected over time, through the nursery network, then measurable ecosystem services, i.e., carbon sequestration, biodiversity, soil and water regulation will emerge on a decade-plus lag and accumulate non-linearly, such that the natural capital value of a mature GBM forest exceeds any valuation made at the point of investment.

If members are engaged in the nursery network over time, then their capability set will expand across economic, human, social, and symbolic dimensions simultaneously, in ways that are not reducible to income.

If all three propositions hold together, then the nursery group functions as a conservative rather than dissipative multicapital unit, and the evidence base exists to make that claim verifiable to external financiers.

On Multicapital and Polycapital:

Two terms appear throughout the research plan and require explicit definition.

Multicapital:

Multicapital describes the mixing of locally generated social, cultural, symbolic, and ecological capital with primarily global flows of financial capital. The unit of change is the structure within which these capital flows become conservative rather than dissipative: value circulates and compounds within the units rather than being extracted by external actors.

Polycapital:

Polycapital describes how different financial flows, catalytic, philanthropic, commercial, can be oriented and orchestrated toward the movement's own value-aligned goals. It refers to the blending and routing logic through which capital from the Global North enters the units of change and is directed by the movement's governance structure rather than by funders' preferences.

Existing multicapital frameworks (Capitals Coalition, 2020; Thomas & McElroy, 2014) assess value but do not route it against the regulatory and metabolic costs of coordination; existing polycapital frameworks (Gazibara / TransCap Initiative, 2022) orchestrate capital without the governance logic needed to make those flows conservative rather than extractive. This research builds the infrastructure that connects the two.

Research Plan

Methodology:

Participatory Action Research:

This research adopts a participatory action research (PAR) design, specifically the transformative action research strand articulated in Steve Waddell's work on large systems change and systemic transformation.
Several design commitments follow from this:

- Data collection tools are co-designed with participants. Movements select the regions for phase 1 and 2.
- Tools are shared, but data belongs to the movements. Partner access to findings requires explicit approval.
- The framework is transferable, built on open-source code, and designed to become a shared commons

Progression across phases is contingent on the movements' approval at each gate condition. The research does not proceed on promises; it proceeds on demonstrated results verified by participants. This logic mirrors the movement's own governance structure: accountability proportional to exposure.

Research Plan

Design & Research Questions

Design:

This research plan aims to build the data and technical infrastructure needed to translate the tacit knowledge of self-organising movements into a governable, revenue-generating system. It unfolds through rigorously gated phases funded by demonstrated results rather than promises. Its core mandate is to identify the conditions under which financial flows become transformational rather than transactional, and to develop the instruments that direct capital toward those conditions.

Research Questions:

This research asks the following interrelated questions:

RQ1 | Structural:

How do units of change deploy capital towards the attainment of the movement's value-aligned goals?

RQ2 | Diagnostic:

How can a replicable field methodology render these practices legible to movement participants and credible to aligned funders simultaneously?

RQ3 | Technical:

How can the governance logic and capital-conversion dynamics of self-organising movements be translated into a network architecture that tracks, verifies, and routes multicapital value?

RQ4 | Financial:

How can a unit of account be developed to measure the ratio of socioecological capital generated to resources invested by the movements and their members?

Research Plan

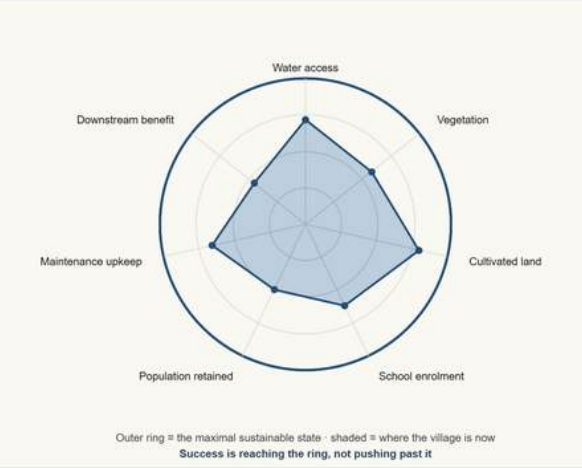
Research Phases

Data tracks:

The research trajectory moves from narrative to data, from data to architecture to interface to live deployment. Each phase has a defined gate condition that must be satisfied before progression.

Phase One: Multicapital fieldwork

Multicapital framework: tool-development and testing with up to 100 participants.
Natural capital: baseline data collection of the quality of ecological services in a similar depleted and a protected landscapes drawing on ecologies in the immediate vicinity of the studied region.



Phase Two: Pilot collection

Multicapital framework: data collection continues across at least 30 units of change.
Natural capital: developing measurement protocols, intervals and metrics that are both good indicators of ecological wellbeing and are feasible for integration and adoption by members.

Phase Three: Backend architecture

The co-designed data collection tools are translated into a working backend system. The system tracks how multicapital accumulates over time and compares it to the movements' records. The gate condition is technical fidelity: the system must accurately reflect what participants co-designed.

Phase Four: Interface build

A working demo is built. Movements' members and teams interact with the system for the first time, through an interface designed around their existing practices. The natural capital layer is connected at this stage and linked to the multicapital flows already tracked in the system. The two data streams meet here for the first time. The gate condition is usability without external guidance: adoption rates determine whether the research proceeds.

Research Plan

Research Phases

Phase Five: Controlled live testing

The full system runs in a controlled environment. Real data from the units of change flows through it. Revenues generated on natural and multicapital surpluses are calculated and verified by participants. There is no public exposure and no external obligations at this stage. This phase exists to find what does not work before it matters. The gate condition is that calculations are consistent, verifiable, and trusted by participants.

Phase Six: Live deployment

The system goes live under the movements' governance. The rules encoded in the system can only be changed through a process the movements control. Units of change that have been generating unaccounted value for decades now have a tool that tracks it, verifies it, and routes revenues back to the communities that created it. The gate condition is the movements' board approval.

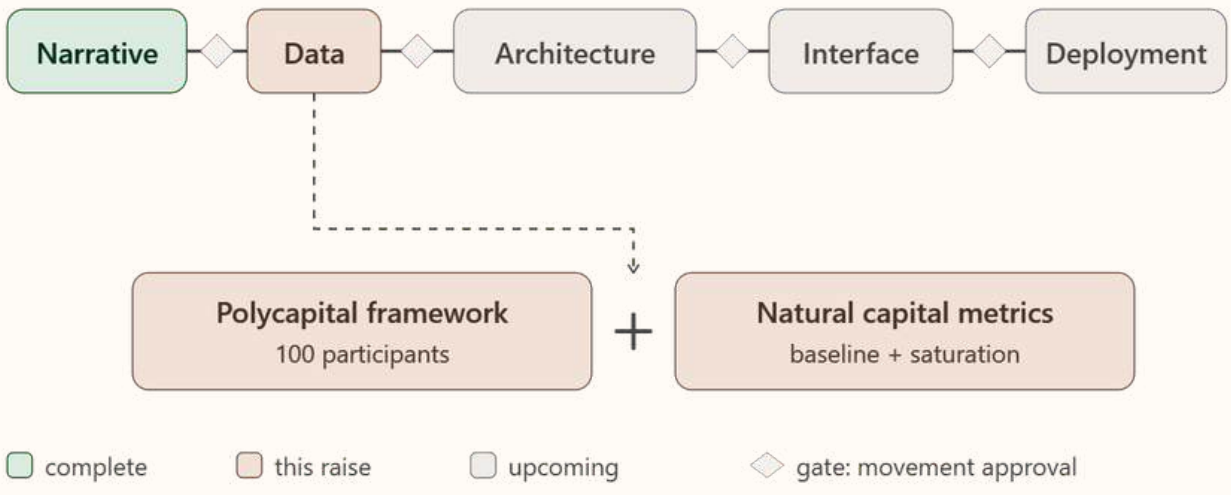


Figure 1: main research phases; the data collection phase include two stages to ensure falsification before progressing to system architecture

Research Plan

Ethical Considerations

The research operates under four ethical commitments that are binding rather than aspirational.

Data sovereignty

All data belongs to the movements. No findings are shared with external partners without explicit approval. This is not a standard confidentiality clause; it is a structural feature of the research design.

No ready-made solutions

Parameters are co-designed with members. The research does not arrive with a pre-built system seeking validation. It arrives with a method for co-producing one.

Payment for results

The research asks for financial remuneration for successfully completed phases. This ensures it is funded by demonstrated results rather than promises, and that the movements retain the power to halt the research without financial penalty.

Open infrastructure

The framework is transferable. It is built on open-source code and designed to become a shared commons, not proprietary infrastructure controlled by the researcher or any external partner.

The research generates knowledge about communities whose value has been systematically under-acknowledged by global financing systems. The ethical obligation is not only to protect participants but to ensure that the knowledge produced increases their bargaining power within those systems rather than extracting value from them for external use.

Research Plan

Timeline & Key Milestones

#	Activity	Gate Condition	Estimated Duration
1	Multicapital fieldwork at scale (100 participants) + natural capital baseline	Framework holds at scale; GBM approves	2-4 months
2	Pilot collection (30+ units of change + regenerated landscapes)	Legible patterns persist; process trusted by communities	6-10 months
3	Backend architecture development	System reflects co-design; GBM verifies	3-4 months
4	Interface build + natural capital integration	Participants can use system without guidance	6-12 months
5	Controlled live testing	Calculations consistent and trusted	6 months
6	Live deployment	Board and coalition approval	

Glossary:

Unit of Change:	The smallest cell of a self-organising movement that can be reproduced across regenerated landscapes (e.g., a registered nursery or village water council).
Value-aligned Goals:	A shared generative model that stipulates the movement's direction (e.g., "rejuvenate the Arvari River") used to generate and reduce prediction errors.
Multicapital:	The blend of locally generated social, cultural, symbolic, and ecological capital with global financial capital.
Polycapital:	The routing logic that orchestrates catalytic, philanthropic, and commercial flows toward the movement's goals.
Conservative Flow:	Value that circulates and compounds inside a unit rather than being extracted by outsiders.
Productivity Ratio:	Socioecological value generated ÷ time invested; the measure that governs the currency's value.
Socioecological Currency:	A currency backed by verified socioecological capacity, not state debt or carbon offsets.
Staker Tokens:	Governance-bearing tokens for participants who commit capital at risk; they absorb losses first.
Contributor Tokens:	Liquid, spendable tokens issued for verified deliverables; they carry no governance power.
Right to Exit:	The core governance mechanism: alignment maintained by the freedom to leave, not by compulsion.
Narrative Foraging:	The field method for identifying structural grammar from life-history interviews.

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"In this downward course, which leads to equilibrium and thus death, life draws a bend and nests in it."

Primo Levi, The Periodic Table

The Invitation

The project completed its Narrative Foraging phase, it has GBM and TBS partnership, and it is now seeking coalition partners to fund for Phase #2.

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