"The Village that Learns": A Learning Journey across Intraventions and Domains over Two Decades in a Rural Thai Community

Deborah A. Fields, Utah State University, deborah.fields@usu.edu (corresponding author)
Luis Morales-Navarro, University of Pennsylvania, luismn@upenn.edu
Paulo Blikstein, Columbia University, paulob@tc.columbia.edu

Abstract:
What does it mean to become *a village that learns*? In this paper we document the transformative learning journey of a small Thai village over 24 years, becoming a community that identified, tackled, and iterated on problems, altering their everyday practices and lives. In that process the village shifted from a subsistence agricultural community staggeringly in debt to one known for its sustainable environmental, agricultural, and financial initiatives. To understand the village's learning journey, we consider the village itself as the primary unit of analysis, applying an iterative case study approach, with chronological sequencing, thematic, and biographical narrative analysis across 37 hours of interviews and over 350 pages of scanned project documentation (mostly from village records and writings) collected across four visits. Throughout the paper we elaborate on the role of learner interest and agency, the necessity of infrastructural (often policy) changes, the prioritized role of children in leadership, and the method of "Thai Constructionism" that the village iteratively applied to support their learning. In the discussion we argue that to understand the village's learning journey, we must study it across multiple scales of time, multiple series of village-initiated formative *intraventions* across domains, and within larger ecological systems.

Keywords: intravention, constructionism, learning ecology, community learning, rural education

Introduction

In 2540/1997[1], Ban Samkha (บ้านสามขา), like many villages in Thailand, faced distressing conditions. The village and its families (~600 people) were buried under massive debt that they did not understand, water availability depended on the season (rainy or dry), crops sold at very low prices with nothing kept for personal consumption, and villagers—by their own admission—did not feel capable of understanding their problems, much less tackling them. By 2563/2020, however, Ban Samkha was known as a "model village" in the country for its financial, environmental, and agricultural sustainability initiatives, including a community bank, a successful homestay program (~3000 tourists a year), and a ban against herbicides and pesticides. In addition, the village developed an established sense of agency through the internalization and iterative application of a learning philosophy, namely constructionism, or a version of it that we specifically call "Thai Constructionism" because of its unique interpretations and practices in a broad, Thai community (see Blikstein & Fields 2021; Fields & Blikstein, under review). In the words of its own inhabitants, Ban Samkha became *a village that learns*.

The transformative story of Ban Samkha's journey to becoming a *village that learns* provides an opportunity to study durable learning in a community. The village's learning over time is the primary focus of this paper, which looks not only across its last 24 years, but even further back, as the village itself has a self-documented history stretching back to 2300/1757. This allows us to share the village's learning journey from their own perspectives with accompanying viewpoints from some mentors and institutions that worked with the village. Further, in contrast to the rich history of design interventions in education, the village itself was the primary agent in their own learning and emancipation (Freire, 1970). Thus we speak not of "interventions" in this paper but of *intraventions* (Sannino et al., 2016; Lemos & Liberali, 2019) that the village led, evaluated, and iterated upon. This does not mean that outside mentors or

[1] Throughout the paper we list years by the Thai solar calendar followed by the Gregorian calendar (i.e., 2540/1997).

institutions were not involved. Far from it. However, the villagers chose problems, researched them, designed changes (or social experiments), reflected, and continued with further intraventions. Many organizations and long-standing mentors form part of the learning ecology of the village, situated within national and cultural discourses as well as the immediate physical environment of the region.

This paper is part of a larger study on the development and pursuit of a unique implementation of Papert's and colleagues' constructionism (1980) in Thailand (see also Cavallo, 2000), which over two decades was reshaped through local internalization into Thai Constructionism (Fields & Blikstein, under review). With Thai Constructionism we refer to both a community distributed across Thailand (including members of Ban Samkha) and a learning philosophy that came to incorporate spirituality, a community-focus on learning by designing, and a method of planning, doing and especially reflecting (for details see Blikstein & Fields, 2021; Fields & Blikstein, 2018). This specific paper concerns Ban Samkha from 2540/1997-2563/2020, starting at the point in time designated by the village as the beginning of their learning journey. We consider the "village" the primary unit of analysis, while acknowledging its complexity and irregularity as a unit with the constant flux of individuals and families participating at different times and in different ways, with varying attitudes including enthusiasm, skepticism, and reluctance. Ban Samkha's learning journey took place across domains and within a broader learning ecology that will be of interest to organizations that seek to support sustainable change. The focus of the paper is *how Ban Samkha became a "village that learns."* we ask the following specific research questions:

1. How did personal and village practices change across different domains over time?
2. What formed the broader learning ecology of the village? How did that ecology influence the village's learning?
3. In what ways did village learning become generative, sustainable, and effective, and what methods supported that continuing learning?

Background

In order to study the village's learning we must look at it across multiple *scales of time*, multiple *domains* (e.g., finances, agriculture), and larger *ecological systems* (environmental, social, and cultural), as well as attend to *within-group diversity* in trajectories and periods of participation.

A Village Across Scales of Time

In most design-based research or social experiments, short timescales of 2-4 years only show initial application of educational designs or reforms, which may be buttressed by external resources (e.g., researcher-presence and extra funding). Yet most educational reforms die quickly after that time span (e.g., Cuban, 1984). Steiner-Khamsi (2014) recommends looking at a minimum of 5-10 years to see if a reform has been "internalized". Within this timeframe, coalitions between groups or institutions may dissipate (*Ibid.*), initial funding may run out, and technology and tools may break (e.g, Sipitakiat, 2020). However, with *intraventions* sustained over longer timescales, we can search for other forms of enduring progress such as changes in practice, policy development, implementation, or even infrastructuring (Penuel, 2019). Sannino, Engeström and Lemos (2016) measure the generativity of an intravention by "local continuity" (continued development of solutions), "domain appropriation" (development beyond the initial area or domain), and "method appropriation" (continued use of a method of analysis or research to new contexts) (p. 605). They claim that it is only at longer timescales that we can see evidence of not just a single intravention but the implementation of new and related forms (e.g., a method or application to new domains) in a community.

Village learning also requires attending to *multiple* timescales. Building on work on timescales in human development within cultural historical activity theory (CHAT, see Cole, 1996), Lemke argues that when studying institutions that "last long enough to observe major historical change in the system" (Lemke, 2000, p. 288) multiple scales of time can reveal inter-relationships and triggering events. As Cole and Packer (2016) reveal in their analysis of the duration and conclusion of the 5th Dimension after-school program, events as seemingly remote as a war and as gradual as gentrification can have a

direct impact on the continuity of an intervention (or intravention). In this paper, we approach this study with a "mesogenetic" lens (*Ibid.*), attending to three primary time levels of activities that were innately relevant to the changes in the village: macro level social processes (i.e., national & cultural discourses), meso level events and processes (i.e., beginnings and endings of intervention activities), and micro level processes (i.e., interactions between individuals, everyday levels of activity and behavior).

Intraventions Across Multiple Domains

Design interventions put researchers at the center of the work though they are not alone—participants play a core role in analysis and take designs beyond what researchers imagine (Brown, 1992; Engestrom, 2011; Penuel, 2014; Sannino et al., 2016). Expansive learning and transformative agency, the goal in formative interventions, requires breaking away from prior frames of action and working to change them, aiming at generativity (Meléndez, 2021). Sannino and colleagues (2016) describe this as "theoretically mastered concrete developments" (p. 605), which expresses practical changes and abstract ideas and methods that lead to continued development.

Yet researchers do not have to be involved. In *intraventions*, learners engage in formative interventions without researchers: "Collectives conduct formative interventions on themselves to address unsustainable contradictions and transform their activities—we call such efforts intraventions" (Sannino et al, 2016, p. 600). Concepts of formative interventions are also relevant to intraventions. For instance, recognizing a common problem can act as a "first stimulus" that brings a community to seek support and start the journey of a formative intravention. A "second stimulus" is a tool or sign that can help a community "gain control of and transform the problematic situation" (p. 604). Further, a germ cell (Davydov, 1990) is an expansive and abstract concept generated by a community—a core idea that can focus efforts and open up "possibilities of explanation, practical application, and creative solutions" (Sannino et al, 2016, p. 605). We use *intraventions* in this paper to emphasize that the villagers of Ban Samkha initiated analysis, design, and change on their own, albeit with support from many others.

Further, we argue for understanding the village's learning in relation to a *series* of intraventions *across domains*. Most work in intervention research (Penuel, 2014), social design experiments (Gutierrez & Jurow, 2016), or similar, tends to stay within a single type of environment, such as educational institutions or workplaces. Similarly, community-based design research (Bang, Faber, Gurneau, Marin & Soto, 2016) and cultural community psychology interventions (Tharp & O'Donnell, 2016) tend to focus on single domains such as education, delinquency, or intergenerational relationships. In the adjacent field of community-based conservation (CBC), village designs are also considered within a single domain: environmental conservation (e.g., Shukla & Sinclair, 2010). But challenges in Ban Samkha covered multiple domains, including finances, education, environmental conservation, agriculture, and enterprise. In studying the village's learning across domains, we are inspired by similar work by Lemos (Lemos, 2017; Lemos & Liberali, 2019, Sannino et al., 2016) who describes the "chain" of intraventions by a low-income, urban Brazillian settlement where two educators started a project on waste management that expanded into several intraventions related to different domains: waste, flooding prevention, and community safety. Longer timescales are essential in showing series of intraventions and how they are related across multiple domains.

Learning Ecology of the Village

Learners and communities are embedded within multiple, intersecting systems or social contexts (Engeström, 1999; Cole, 1996). Adopting Barron's (2006) term of a "learning ecology," we argue that villages have a learning ecology as well, with buildings, local environments, architectural systems, resources, and even weather patterns. These shape how people move and interact (Pinkard, 2019), and their personal and professional endeavors. Other institutions are part of this learning ecology, with potential expertise, resources (including signs and tools), volunteers (Bang et al., 2016; Engestrom & Sannino, 2021). Political boundaries (of territories) further affect what policies and procedures groups are bound to, what institutions they have access to, and what permissions, permits, resources, or policies need to be negotiated (*Ibid.*; Sannino et al, 2016). In addition to more tangible parts of an ecology, national

narratives and national identity can be highly relevant in people's and institutions' interactions (Wertsch, 2021). Even culturally-recognized awards can stimulate and legitimize certain efforts by a community (Lemos, 2017).

At the same time, the diverse members of a village are also part of its learning ecology. A community like a village is not necessarily unified by practice or interest, though there may be different communities of practice within the village, such as committees or farmers (e.g., Lave & Wenger, 1991). Villagers have different values, histories, wealth, levels of education, and connections to outside communities. While within-group differences are often challenges to community learning, they can also be a source of growth.

Methods

Data Collection

We collected data during four research visits to Thailand from 2017-2020, including three extended research visits to the village (see Table 1 for villager roles and hours spent in interviews). In total we interviewed 14 villagers (8 interviewed more than once) and 6 people from other institutions that mentored and/or learned from villagers, totalling more than 37 hours of interviews (27 interviews total), in addition to gathering over 350 pages of scanned project documentation. This documentation included annual Suksapattana Foundation (SF) reports, early SF letters and proposals, a book collectively written by the village (Ban Samkha, 2005), and extensive written reflections by one SF leader, all written in or professionally translated to English.

The interviews focused on the participants' personal and collective narratives of struggle and change, as well as their experiences learning with constructionism (the original topic of the broader study); later interviews (especially focus-group interviews on the third visit) also solicited specific details that had led to significant events and projects. Each village visit was brokered by a multilingual villager who had worked with Thai Constructionism from the earliest days and who was extremely well networked within the village. Before each visit we communicated some requests—e.g., to interview core leaders in the Thai Constructionist work, to include a range of people with different perspectives and participation in village intraventions, to have a second or third interview with an individual to follow-up with new questions. Drawing on our stated visit research goals and the availability of individuals within time constraints of jobs, meetings, and other obligations, the villager chose who we interviewed. Usually interviews took place in people's homes, and we had other opportunities to interact with villagers through our homestay (utilizing the village homestay program), during shared meals, and in some tours of the farms and forest. During the first two visits, interviews were generally with one villager at a time. During our final visit (January 2020), we strategically requested focus group interviews so that we could engage villagers in discussions about important events determined from earlier analysis (see next section).

Although the native language of Ban Samkha villagers is Lanna, and still the language used in everyday life, the interviews were conducted in Thai (in which all residents were verbally fluent), English, or a mix of the two. To support communication, we spoke with translators extensively before interviews to develop a common understanding of research interests and IRB concepts of privacy and research protections, resulting in more meaningful translation and interpretation. All interviews were translated (if applicable) and transcribed by professionals.

Our data are limited by the relatively small sample: 14 participants representing only a fraction of those involved in constructionist efforts in Ban Samkha and of the village population at large (~600 people). Further, interviews were primarily based on memories, some 20+ years old. However, villagers kept their own extensive records of events, and in focus groups we explicitly encouraged sharing different perspectives of the same events. Further, we supplemented interviews with written documentation as much as possible. For the sake of space, we refer readers to Blikstein and Fields (2021) for more detail on participants, interviews, and data collection methods of the broader study.

Participant	Date and Length of Interviews
Villagers of Ban Samkha	
Teacher, member of various village committees, Foundation liaison	December 2017 (1 hr) January 2020 (2 hrs + 2 hrs focus group + 3 hrs group with village leader)
Homestay tourism organizer, Foundation liaison, former student, former teacher	June 2018 (2 hr) January 2020 (2 hrs)
Weaver, member of village festival committee	June 2018 (1.5 hrs)
Organic farmer, former community store manager, member of various village committees	June 2018 (1.75 hrs in two-person focus group)
Organic farmer, member of various village committees	June 2018 (1.75 hrs in two-person focus group)
Farmer, leader of sub-district agricultural associations, homestay leader, county tourism chairman, member of various village committees	June 2018 (1.5 hrs) January 2020 (2 hrs in village focus group)
Village leader since 2010, assistant village leader 2000-2010	December 2017 (1 hr) January 2020 (3 hrs with foundation liaison)
Temple financial manager/committee, member of various village committees	December 2017 (1 hrs)
Homestay and community bank organizer, young adult leader	January 2020 (2 hrs in two-person focus group)
Teacher & young adult leader	January 2020 (2 hrs in two-person focus group)
Farmer, community store manager, member of various village committees	January 2020 (2 hrs in focus group)
Homestay host (1)	January 2020 (2 hrs in focus group)
Homestay host (2)	January 2020 (2 hrs in focus group)
Dry mushroom entrepreneur, young adult leader	January 2020 (2 hrs in focus group)
Research Participants in Other Organizations	
Nonformal education leader, 23 years involvement in village	December 2017 (1 hr) June 2018 (2 hrs)
Head of Foundation, 20 years involvement in village, connected to many businesses	Dec 2018 (1 hr) June 2018 (2 hrs) January 2020 (2 hrs)
Foundation leader, expert in water management, meditation and Buddhism expert/teacher	June 2018 (8 hrs + written documentation) January 2020 (4 hrs + written documentation)
Villager from another Thai locale, visited Ban Samkha once and knows villagers from Foundation leadership events	December 2017 (1 hr) June 2018 (1.5 hrs) August 2019 (2 hrs)
Industry member & long-time constructionist participant who stayed in Ban Samkha for 6 months and shared reflections from time there	December 2017 (1 hr) + written notes
Villager from another Thai locale, visited Ban Samkha and studied community store	June 2018 (1 hr) August 2019 (2 hrs)

Table 1. List of interviewees in the village and participating organizations.

Analysis

In developing the case study we conducted iterative analysis, including chronological sequencing, thematic analysis, and biographical narratives (Merriam, 1988). Before our third data collection visit to the village, we created a comprehensive timeline of key village events based on interviews in the first two visits as well as the village book that recounts events between 2540/1997 and 2548/2005. Then, during our third research visit, using a version of the timeline on four large sheets of paper with movable sticky notes, we invited villagers in focus groups to check and debate ordering, add new events, and encourage discussion (see Figure 1). At this time, the villagers gave us organizing concepts for different periods of their village development (see multiyear headings in Figure 3, e.g., "2539/1996—2542/1999: Research on Finances Using Everyday Data"). Based on these interviews as well as publicly available documentation, we revised the timeline (1996-2020), our primary artifact of analysis, (see Figures 3-6, 10). The timeline shows events color-coded by domain (e.g., finance, education), with arrows showing direct connections between events, e.g., how the youth English language camp (education domain) in 2002 led directly to the Children's Brain Bank (finance domain). Embedded symbols show infrastructures the village created, such as policies and physical construction (e.g., buildings, reservoir). The timeline is a collaboratively created artifact, developed across researchers and villagers, and further checked by two Thai Constructionist leaders outside the village.

The analysis visualized in the timeline allowed us to see interrelationships between events within and across domains. Biographical narrative analysis (Connelly & Clandinin, 1990) of key village figures and systematic, thematic analysis (Yin, 2018) of key events from multiple perspectives and across aspects of learning ecologies complemented the historical timeline analysis, as illustrated in the Results section.

Figure 1. Villagers, translator, and researchers reviewing, editing, and debating the timeline in January 2020. Markers and post-it notes were used to add or amend and reorder different key events in the village.

Limitations and Ethics

Intercultural collaborations require transparency with local partners, acknowledging the dynamics of power of doing research (e.g., Serpell, 2014; Engeström et al., 2014). Yet, acknowledging the importance of clear ethical-political positionality in conducting CHAT research (Stetsenko, 2021), we reflect upon the limitations of our work and its ethical considerations. For context, we were invited by SF as academics and as outsiders to conduct independent research on the history of the constructionist movement in Thailand, its strengths and its weaknesses as leadership shifts to new generations. The village became one focus site within the larger study.

The research team is made up of a White American woman and two Latin American men who emigrated to the U.S. as adults; all have advanced academic degrees and work in the field of education. Although one author has a 10-year research relationship with Thailand and two of the authors have made over a dozen research visits to Thailand over the past five years, read extensively, and developed decades-long relationships with some of the Thai leaders, we are not cultural experts on Thailand, nor do we pretend even vague competency with the local languages; we bring the affordances and limitations of outsiders (i.e., Rogoff, 2003). SF's 20-year, supportive relationship with the village opened up access and trust. Simultaneously, we worked intensively to communicate the independence and confidentiality of our research apart from SF. For external validity we have engaged in "member checking", through the multi-stage data collection process with feedback (including focus group interviews) at several stages of analysis and writing. Two long-term Thai Constructionists, in particular, have reviewed this and other papers to support analytical rigor as well as political and cultural sensitivity.

In consultation with research ethics experts, we chose to identify the village by name because the development of Ban Samkha has been previously discussed in Thai Constructionist literature (e.g., Sipitakiat, 2010; Sipitakiat, 2020) and sustainable development literature (e.g., Koanantakool, 2004; Bruneau, 2009) as well as the village's own book (Ban Samkha, 2005). Citing the village and contemporary Thai authors provides a counter and complement to the predominance of North American and European academic authors. Throughout the paper, we seek to protect the identity of our informants by keeping names and identities of individuals as anonymous as possible.

Results

Introducing Ban Samkha

Ban Samkha is a rural village founded around 2300/1757 among the hills and forests of Northern Thailand (Ban Samkha, 2005). A stream runs near the village school, and distinct wet and dry seasons define and limit agriculture and household water use. For centuries, people in Ban Samkha farmed rice and fruits, raised animals, and foraged products such as ant eggs and mushrooms from the forest. Like other villages in Thailand, Ban Samkha has an elected village head, a council, school board, and various committees. It shares the mountain and forest with neighboring villages. Ban Samkha has a primary but not a secondary school. Going to secondary school requires traveling to Lampang, the provincial capital, which is around 40 minutes away by car on partially-paved roads. Young adults often live in cities for years pursuing education and careers, sending money home for family support.

During the past several decades, as modern farming technologies were introduced and better roads connected the village to the provincial capital, village life started to change and debt increased significantly. Many farmers bought "iron buffalos" or walking tractors, started selling rice and produce to middle-people from outside the village, and began utilizing chemical fertilizers, pesticides and herbicides (Ban Samkha, 2005). These rapid changes in agricultural practices increased farming expenditures and dependence on middle-people to sell produce and buy farming supplies. Villagers took out loans to buy farming equipment and home appliances, acquire vehicles for the new roads, and send children to secondary school. By 1997, the villagers collectively had more than 18 million baht of debt (31 million baht or 1 million USD adjusted for inflation, roughly equivalent to US$ 12,000,000 if converted per

purchasing power parity (PPP[2])) gathering interest at high rates (Koanantakool, 2004). It was in this context that the Asian Bubble burst caused distinct urgency to face these growing financial problems.

Cultural and Historical Background: Asian Bubble Burst and Sustainable Villages

After 40 years of uninterrupted economic growth, accompanied by the industrialization of urban areas and rural-to-urban migration, the 2540/1997 crash of Asian markets, which started in Thailand, became a turning point for the country. In 2541/1998, Thailand's economy contracted 11%, leaving the country with its highest unemployment levels in modern history and significantly impacting rural areas due to their dependence on migrant worker remittances (Hewison, 2000). That year, the cost of living increased 40% and a record number of students dropped out of school (*Ibid.*). The crisis provided the perfect context for the government to evaluate their development strategy and renew interest in sustainable village development. This led to a response framed under the umbrella term of "sufficiency economy", which articulated some of the Thai "New Theory" concepts that centered family and village development as vehicles for national development, where the countryside could become a "safe-haven" in times of crises (Schaffar, 2018). As such, family and community production was promoted, so that villages would not be completely reliant on the global economy.

In consequence, the Royal Project Foundation (RPF) gained importance as a catalyst of village development. RPF was created in the 1960s to put "New Theory" into practice, improve the living conditions of hill tribe peoples and decrease opium growth. Over the decades, and under the post-crisis "sufficiency economy" movement, it became an organization that promoted best practices in sustainable small-scale agriculture in villages across the country (Vidyarthi, 2015). These included initiatives in organic farming, rural tourism, community environmental protection, fire prevention, and water management (Bhaktikul, Aroonsrimorakot & Laiphrakpam, 2021). Although RPF did not *directly* intervene in Ban Samkha, its efforts demonstrate the broader concern with local development at the time (i.e., late 1990s) .

Seeking Help: Beginnings of "Research"

The 2540/1997 financial crisis combined with a drought became the "first stimulus" crisis that spurred the village to seek help for their problems. But, crucially, more than "help," they sought *knowledge*. Villagers reached out in a coordinated effort to many different organizations, seeking support. Then a small group of ~14 villagers formed the Debt Research Group, meeting several hours every night for nearly a year to study the problem of village debt, supported with input from a Japanese nonprofit. After many months, the group finally felt like they had a grasp on the amount of debt in the village. Though they did not understand how so much debt had been amassed, they realized that researching their finances and making payments was important.

Concurrently (2541/1998) during the ongoing search for external knowledge, one of the teachers met a computing workshop leader associated with the emerging Thai Constructionist community (and SF in particular). This led to an opportunity to attend a computer workshop in Lampang. Ban Samkha chose three adults to attend, including the teacher. Further, the teacher believed that the village children—in Ban Samkha "children" is used to describe non-adults including secondary school youth and some college students—could help them "learn computers" since it was so new. Out of forty villages who began the workshop, only Ban Samkha villagers completed the workshop over four months—a substantial undertaking given the distance and timing (after school and before homework).

These two initial outward-seeking efforts—on finance and on computers—provided the "second stimuli" that allowed villagers to initiate what became a series of intraventions in each domain. Outside organizations provided methods that the village used to analyze finances as well as their own learning. The computing workshop in particular started a decades-long (and ongoing) relationship with a few people who became long-term mentors from SF (each visiting the village more than 100 times since

[2] Amounts were converted for inflation (accordingly to each period) and then for Purchase Power Parity, using data from: https://knoema.com/atlas/Thailand/topics/Economy/Inflation-and-Prices/Purchasing-power-parity

2543/2000). The workshop and decades-long relationships introduced Thai Constructionism as a method for the village to understand and manage their own agentic learning. Thai Constructionism prioritizes learner agency and interests, with mentors and facilitators never telling but rather thinking alongside and supporting learner inquiry (Blikstein & Fields, 2021). Applied in the village it became a cyclical and expansive method for identifying learner problems, researching those problems, planning, iterating, and reflecting—then applying the process over and over again in an expansive way (see Figure 2). Thus, it played a key role in the village's expansive, generative learning.

The village's story of transformative learning covers more than twenty years and at least five domains (e.g., finances, technology and education, water and environment, farming, and tourism). In this paper about the village's learning, we have chosen to provide the greatest detail on the part of the journey that focused on water management because it demonstrates the importance of the village's learning ecology, the diversity of learners and changing participation within the village over time, as well as the application of Thai Constructionist method the village appropriated to manage their learning. Yet the work in water management would not have taken place without five years of earlier learning in finances and technology/education. Further, continued learning took place after the initial water management work. Therefore we contextualize the water management work with a brief overview of intraventions in finance and technology/education preceding that period and with a short synopsis of later intraventions that followed from it. Throughout, we encourage readers to look across the timeline (see Figures 3-6, 10). Figure 3 provides the entire timeline of the many interrelated events in the village, color-coded by domain, with arrows between events we were able to identify through analysis, and with symbols denoting various infrastructures. Figures 4, 5, and 10 provide zoomed-in views of the same information for ease of reading. Events noted on the timeline are **bolded**.

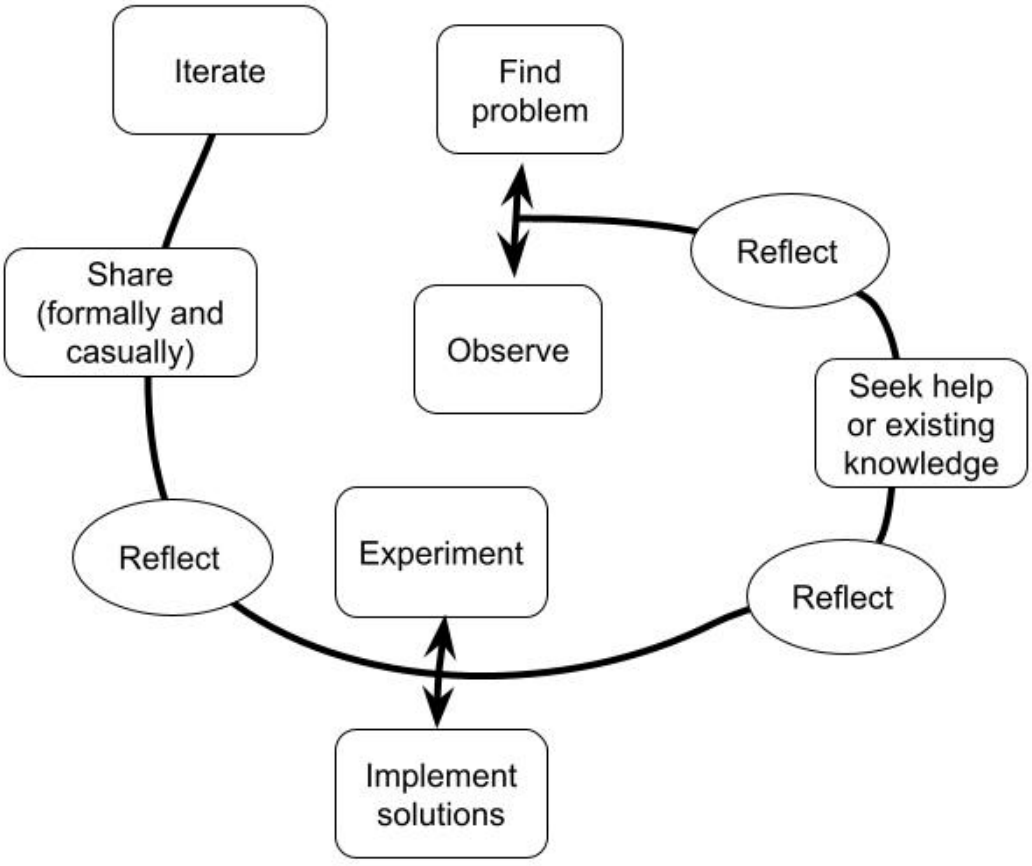

Figure 2. Representation of Ban Samkha's Thai Constructionism "research process."

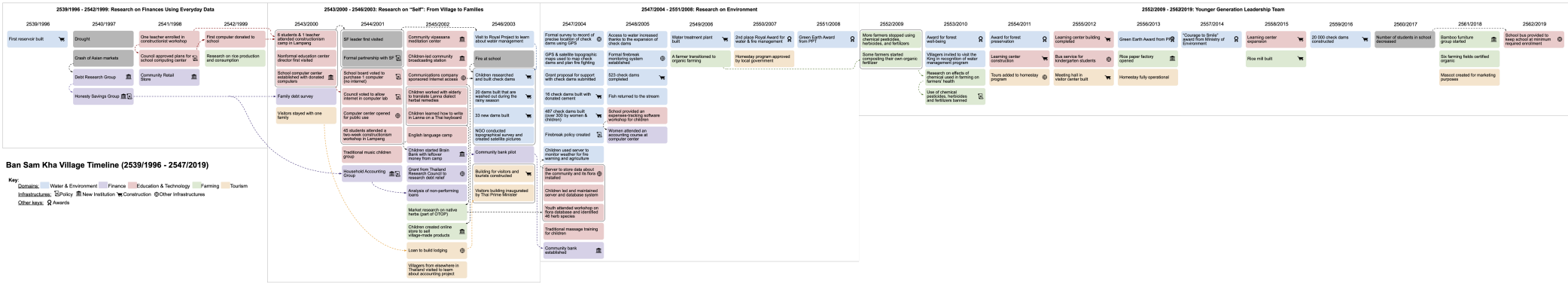

Figure 3. Ban Samkha Timeline: 2539/1996-2563/2020.

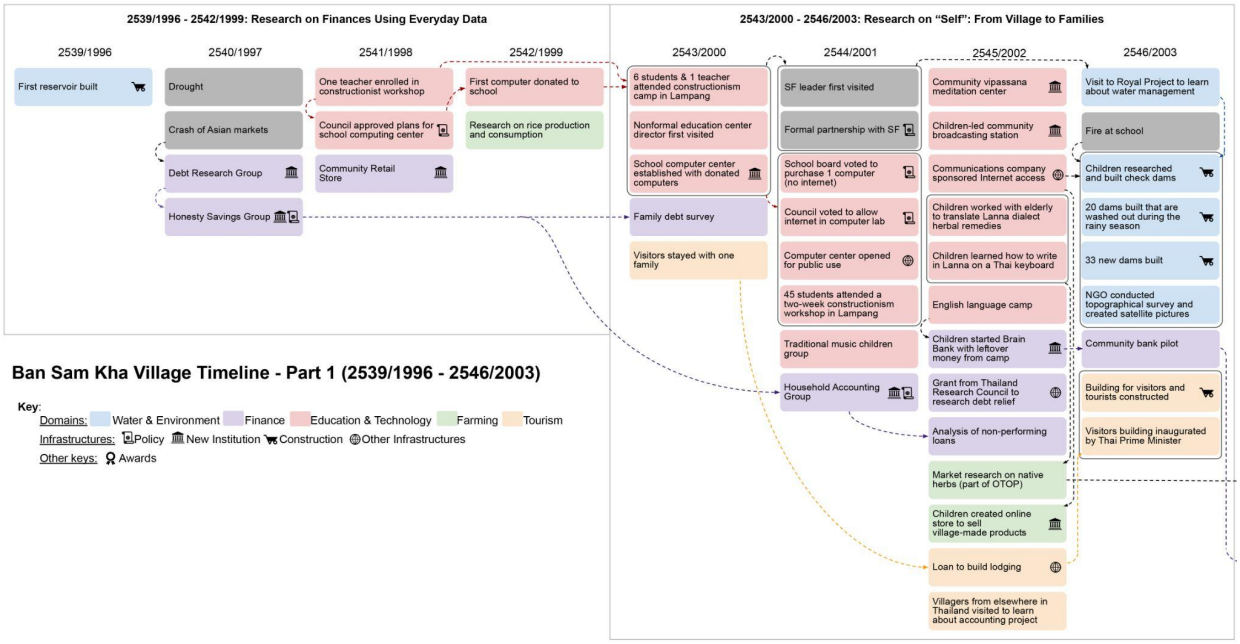

Figure 4. Ban Samkha Timeline:Part 1 (2539/1996-2546/2003).

A Series of Intraventions in Finances

The series of intraventions related to finance (see timeline, Figure 4) began with an initiative around collective village savings: the **Honesty Savings Group**, where 40 families each contributed 30 baht/month to a collective fund used to make payments on the most urgent loans (for a similar arrangement common in Latin American communities, see Martin, Goldman & Jiménez, 2009). "I didn't know whether it could solve the debt of the community or not. It was all about learning" (interview, 2020[3]). This intravention set the stage for later work that evolved around the growing idea (germ cell) "keeping it in the village": "it" being money and food (for a deeper look within this same project at the exploration of intraventions in finance at the evolution of this germ cell over time see Morales-Navarro et al., 2022).

Next, in 2541/1998 the village established a **community-owned convenience store** (a competitor to two local convenience stores). This led to more formal accounting training for villager-cashiers and brought in outside expertise about marketing and product placement. Since the store-generated earnings belonged to the village, for the first time ever, the villagers were able to invest in their own initiatives.

The next intravention (2544/2001) was the **Household Accounting Group**, a village-mandated (i.e., infrastructured) system of analyzing family expenses. Brokered by SF, a janitor from a nearby industrial plant presented a simple accounting system to the village, where families tracked income and expenses by hand on paper spreadsheets. Small groups met monthly for accountability, with a 30 baht/month (45 baht or 1.4 USD if adjusted for inflation, and roughly the equivalent of $17 USD/month if adjusted for PPP) allowance for each family accountant. Thus the research on village debt evolved into research on family debt, which led to insights about over-expenditures that allowed for changes in family financial practices.

Soon after, the children used savings from an educational English camp to create the **Brain Bank** (2545/2002), a youth-led institution that issued loans to villagers. Uniquely, individual villagers themselves chose what interest they could pay, including unusual forms such as providing expertise on raising crops or animals. Not all loans were paid back in a timely manner, leading to some difficult

[3] All interview quotes unless otherwise noted are English translations of Thai.

learning, but slowly financial equilibrium was achieved. This success, along with a deeper understanding of interest and loans, led to the development of a **Community Bank:**

> "...we saw the bigger picture, that we were really getting taken advantage of… We would have our own savings, give out our own loans, have interest at a better rate than the bank, and we would get all the profit." (interview, 2020)

Some villagers attended a year of classes to learn how to manage the bank, and all of the "profits" stayed in the village. Indeed, saving money became so important to the village that it was institutionalized in many areas, including creating savings accounts for each child in school and requiring that everyone participated in accounting training.

A Series of Intraventions in Education and Computing Technology

At the same time, and in some ways intersecting with the intraventions in finance, the years 2541/1998-2545/2002 were instrumental in education and a related investment in computer technology and Internet (see Figure 4). The **Computing Workshop**, mentioned above, was the start of the village's strongly debated decision to establish a **computer lab**. At the same time, the village pursued a few different computing workshops at the nonformal education center in Lampang, primarily attended by the youth, including an intensive two-week constructionism workshop on **Microworlds Logo and Photojournalism**, and an **English Camp** (which led to the savings invested in the Brain Bank). The school computers were also used for the financial work in the village: the community store eventually switched to spreadsheets software, 5th-6th grade students received training on using computers for family accounting, and parents learned accounting skills after hours.

Pursuing traditional knowledge became a priority in village education work (in line with broader cultural discourses valuing traditional village knowledge—see Noble, 2019; Schaffar, 2018), in part through children's investigation of **traditional music, massage, local herbs,** and **local herbal remedies** (2543/2000-2544/2001). In particular, documenting local herbs (on the computer) led the youth toward formal learning of Lanna, the indigenous language of northern Thailand and the language in which family herbal remedies were stored. This led to integrating specific software that allowed for Lanna to be typed on a Thai language keyboard. Through all this the youth became more adept at the basics of Internet research, as well as a Thai Constructionist mindset—supported by their teacher, who was learning with constructionist SF mentors. This encouraged learner agency in identifying and researching problems, planning and implementing solutions, and reflecting and iterating.

Interpretation: Early Intraventions and Self-Research

Five things stand out from these early beginnings that played an important role later:

1) The village took agency in *seeking outside resources*, collectively recognizing a need for expertise.
2) Many decisions required policy-level involvement from the village (note the policy symbol in the timeline). We draw attention to these as *infrastructural changes* (Penuel, 2019) in village life, with policies like choosing to install computers and Internet or mandating participation in Honesty Savings and Household Accounting. Each of these intraventions was hotly debated, with skeptics and pioneers. Many people participated unwillingly, at least at first: "Everyone had to do it. No one wanted to," (interview, 2020).
3) From the first computer workshops, the village actively involved *children* as learners and teachers. This conscious decision set the stage for intraventions (e.g., the Brain Bank) where children led new change.
4) Nearly all of these endeavors involved *outside support* of some fashion: in methods of thinking, expertise, or resources (see Bruneau, 2009)—and almost all were brokered (Wenger, 1998) by two Thai Constructionist mentors who not only visited the village over 250 times, but also extensively talked by phone to think alongside villagers in between visits.

5) The method of *Thai Constructionism* dramatically disrupted villagers' ideas about what learning was and provided a method (especially a second stimulus) for continued learning and reflection. The beginning of water management intraventions provide a closer look at the village's learning.

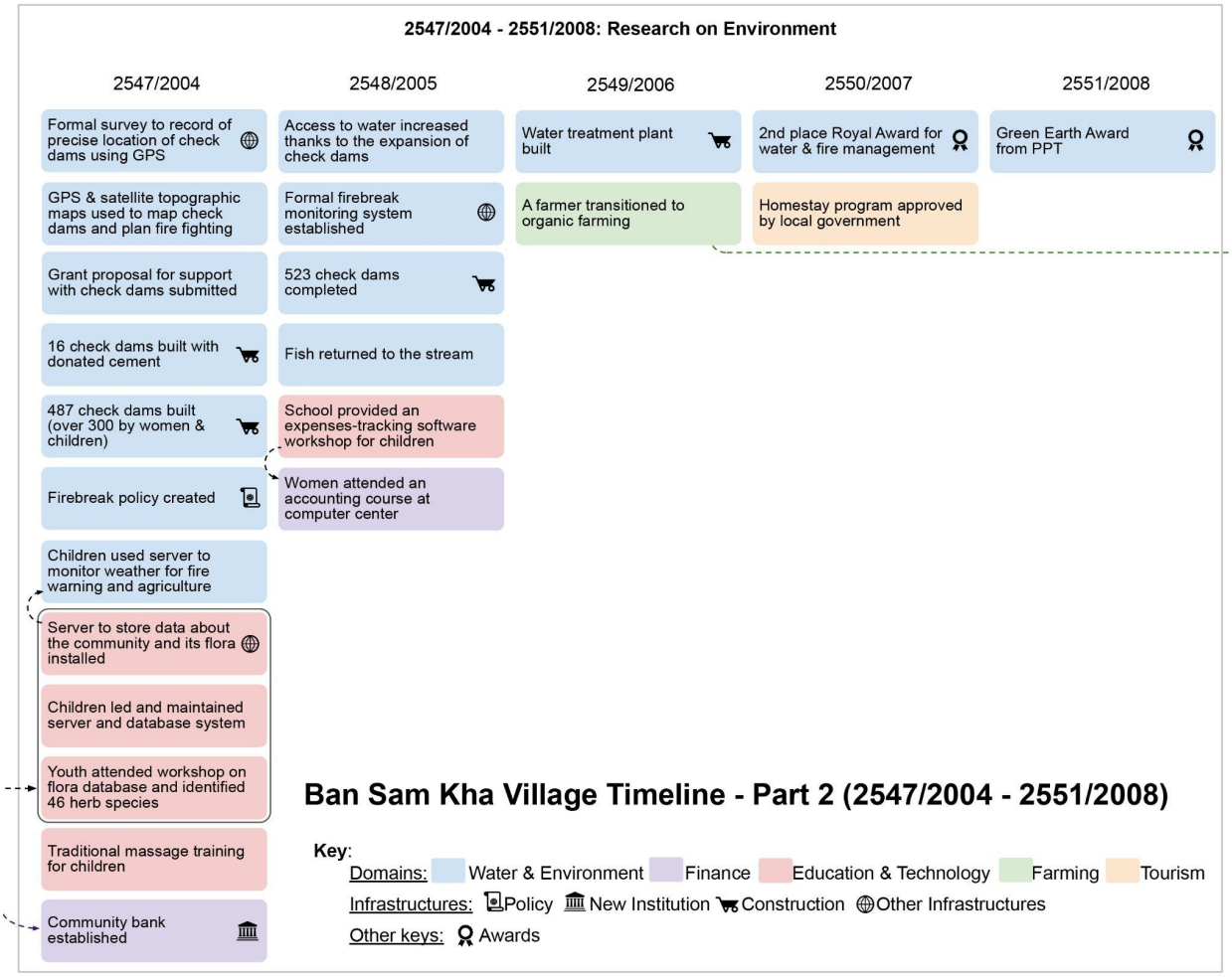

Figure 5. Ban Samkha Timeline:Part 2 (2547/2004-2551/2008).

Early Sustainable Water Management Intraventions

One of the most profound changes in Ban Samkha was the development of a sustainable water management strategy. This was an extension of the germ cell to keep money in the village—literally keeping water in the village. The village pursued this only after understanding and researching their needs regarding finances and debt:

> "After the research of 2544 [2001], we knew that our income mostly came from the environment, the forests and mountains. When we knew where the money came from, we became interested in the environment. It started after the research, the research told us to do so," (interview, 2020).

Thus after six years of work on debt and financial management (with parallel efforts in education and computers), the village sought to study their environment as a source of income. As their learner interests shifted to their natural surroundings—topics which were strongly present in contemporary Thai "New Theory" discourses (Schaffar, 2018)—villagers periodically worked with other organizations for support. But the onus of the work was on the village. This sub-case allowed us to investigate at smaller levels of time and activity *how* these changes came about. Despite a mediocre start, intraventions in water management eventually led to dramatic changes in village mindsets, practices, roles, and collaborative

effort, as well as substantial physical and societal infrastructural changes, including year-round water that dramatically expanded agricultural practices.

Once the village expressed interest in the environment, the SF sponsored **visits to the Huay Hong Krai RPF** and another project area so that villagers could see check dam projects and related research/reforms in areas with similar geographies. Check dams (see Figure 6) are low-cost community-made structures built across streams with local materials (timber, stones, sandbags—or concrete, in the case of permanent check dams) to help replenish groundwater, restore the surrounding ecosystems, and ensure year-round water supply for farming (Khonkaen & Cheng, 2011). In the geography of Northern Thailand which has many mountains and hills, check dams are built to slow downward water flow during the wet season, with the effect that water is more available during the dry season. RPF promoted building check dams across Northern Thailand as part of a larger effort to advance community-based sustainable forestry and farming practices (*Ibid.*). By 2544/2001, for example, the Huaisai Royal Development Study Center was already using GIS and GPS technologies to work with farmers and villagers to build networks of check dams (Amarakul, Sanyong, Tananchai, Phaengwungtong & Luek-u-suke, 2001). When the Ban Samkha villagers visited the Huay Hong Kai RPF in 2546/2003, they learned from lectures and demonstrations—yet took no action.

Figure 6. Two check dams in the mountains of Ban Samkha. Lower dam is made of cement and rocks.Upper dam (with children standing over it) is made of wood and leaves (photo credit: Arnan Sipitakiat).

There were several reasons why the villagers did not immediately apply what they had learned about water management. First, they assumed the task was beyond their ability. As one farmer stated, "I still didn't think it would work because we are different. Huai Hong Kai is a royal initiative project. They have funding that we don't have," (interview, 2017). More importantly, building check dams required a dramatic change in belief and behavior about the role of fire in the village's environment. Since check dams are largely built with felled trees, sticks, leaves, and rocks, forest fires would burn the dams. But

burning the forest annually was an established and valued tradition in the village and neighboring villages:

> "In my village or every village in Thailand… if we burn, it looks clean and we can walk in the forest, we can climb up to the mountain… if we burn the leaves, we will get some wild vegetables, popular vegetables: star gooseberry," (interview, 2017).

Fires were sources of beauty and abundance, believed to nourish foraging crops like mushrooms and gooseberries. While villagers were told by RPF lecturers that not burning the forest would result in the same luxury plants, the whole idea ran counter to generations of cultural practices and senses of beauty. Thus, starting water management was not a simple task: it involved significant changes in mindset and everyday practice in addition to building new structures.

It was not until March 2546/2003 that a **forest fire** started near the village school, instigating a cascading series of events that jump-started the check dam project. With the fire, village children began to research check dams "to protect the school from forest fire," (interview 2018, English[4]). Notably, their teacher supported this research not by directing students on what to do, but with a Thai Constructionist mentality encouraging student agency:

> "When we were learning, the teacher did not tell us the names of things. The teachers just gave us questions and asked the students to find out what something was… So we used the Internet to help and if we couldn't find it we would go to ask someone who might know about it... It made us like researchers, it taught us how to observe the things around us" (interview, 2020).

So the **children began building check dams** by the school (with a few adults watching for safety).

The children's work was "very slow." With just 20-30 village kids, they could only make "one or two check dams a week... because they can just haul only the small rocks," (interview, 2018, English). But the children persevered. Over time, the children had to move further into the forest to build the dams, arriving home late:

> "The mommies came and said, 'Time to go home.' And then we said, 'No, mommy, we're not finished. We cannot go home.' And then mommies helped…
> Three, four weeks later… The daddies would come home and ask, 'No child, no wife. No dinner. What's wrong?' Then they came and participated like the moms," (interview, 2018, English).

Disruption of daily family practices led to greater awareness first by mothers, then by fathers. This story of first children, then mothers, and finally fathers joining has become a common village narrative about the beginnings of the water management project. By some accounts, around 10 families participated, eventually sending adults in shifts so that no one bore too much of the burden. Yet while relatively few families participated in check dam building, the parallel work on fire management necessitated the entire village.

A student helping with the earliest check dams described the adults' shifting attitudes toward fire management and the check dam project:

> "I think that the adults may not have believed it first thing. [Later], they believed it but they thought they had no time to do it because they work like almost every day… One year there was the fire... then the adults thought, '...It's very close; we should begin,'"(interview, 2018).

The combination of the fire near the school, the children's building efforts, and the knowledge from the RPF began to change attitudes. The children engaged in active persuasion and eventually received the support of the village head. Naysayers were told that to see the benefits of the dams, it would take "approximately four to five years". The majority agreed to try, to "see how it works" (interview, 2018). Processes of Thai Constructionism came to the fore in these discussions. Instead of burning the forest, some leaders argued that they "have to record, have to observe." Various committees met, debated, and

[4] Some interviews were in English and are noted. All English interview quotes were edited a little for readability (similar to editing translations from Thai).

selected areas to do research: "we burn and don't burn and compare." Evidence built that not burning supported better foraging. Thus changes took place based both on trust in children's arguments and through local, reflective research.

By the start of the summer rainy season (June) in 2546/2003 the villagers, mostly children and women, had built around **20 check dams**. But when the rainy season came, all of the **dams blew out** from the force of the water flow, as they had been built at the bottom of the mountain. As one formal report read, the dams had been "constructed in improper locations, carelessly miscalculated" (SF report, 2006). Yet instead of this ending the project, the village applied a Thai Constructionist method of reflection and iteration, something they had been practicing for years with other intraventions. They successfully sought knowledge and funds. Knowledge first came in the form of satellite maps provided by a government agency. When carefully combined with a villager-led forest survey, the village identified water flows and planned for better dam placement. Funds supported the men's time away from work in addition to tools and supplies. By the end of 2546/2003, **33 dams** were built: the men built dams "from top of the mountain downward" while children and women "started from the bottom upwards" (BSK book p. 60). Water management and fire prevention efforts grew from this point onward.

Over the next year (2547/2004), with support and encouragement from SF and other organizations, the village significantly expanded the quantity and quality of the check dams. The village provided the vast majority of the largely volunteer labor and materials (leaves, trees, rocks) came from the forest. Meanwhile they applied for and received a **400,000 baht** (approximately USD $25,000 if adjusted for PPP in 2004, roughly USD 39,000 also adjusted for inflation) **grant** from a local industry group. Cement, tools (e.g., chain saws) and volunteers from local industries assisted efforts (see Figure 6 for two types of check dams). By December 2547/2004, a total of **487 check dams** had been completed: 300+ by women and children, and 100+ by men. Further, the village, especially the children, received training on the Hydro and Agro Informatics Institution **(HAII) field server** to keep track of agricultural weather (e.g., daily humidity and temperature), generating diagrams and monthly data reports as well as learning to maintain the technology. A team of youth, adults, the nonformal educator, and a HAII team collaborated to develop a **GPS-enabled system** to keep a record of precise locations of check dams (see Figures 7-8).

Figure 7. Ban Samkha villager using a GPS receiver to note check dam locations with her daughter (2004, photo credit: Arnan Sipitakiat).

Figure 8. Ban Samkha villager with the hand drawn map of check dams, each labeled with width, height, and GPS coordinates (2004, photo credit: Arnan Sipitakiat).

The villagers also developed a more formal, infrastructural (Penuel, 2019), and technology-supported **fire prevention system**, and associated set of policies. Villagers would hear of a wildfire, pinpoint it on GPS, and use cellphones to coordinate with each other. The youths or adults would broadcast on the community radio (see Figure 5), allowing villagers to rapidly respond. In addition, the village decided on a **fine of 10,000 baht** for starting a fire, a policy-level reinforcement.

Over time, as check dams grew from hundreds to thousands to tens of thousands, evidence of the utility of the water and fire management program grew. Foraging became plentiful. **Year-round water** appeared in the river (see Figure 9), resulting in the **appearance of fish** (a valuable food source). As evidence grew, so did willing participation from villagers. To paraphrase one villager, '10% of the village are early leaders, 20% follow us because our explanations are good, but 20% only follow if there is evidence of success... 10% always disagree no matter what,' (interview 2020, paraphrase). Village policies were necessary both for those who wanted further evidence and for those who disagreed with intraventions no matter the evidence to the contrary.

Figure 9. Children playing in the year-round water during the dry season. Multiple check dams made of logs and rocks visible in the image (photo credit: Arnan Sipitakiat).

The intraventions on water and fire management continued as of this writing. Fire management policies had to be negotiated with bordering villages (Tiyapairat & Sajor, 2012), though many in the other villages did not see the value of it. Young people were put in charge of check dam maintenance and fire prevention, roles now institutionalized more than 15 years later by a **young adult branch of the village council** (with the same individuals, now no longer children). A small **water treatment plant** now provides clean drinking water in the extended area (sold below costs). An **additional reservoir** was built. The village applied for and received so many **awards** (often with funding for further work) that they have stopped applying for them so that other villages can win (see Figure 10). Within Thailand, the village is renowned for its water and fire management programs. Where the village initially visited others to study their methods, now the village receives many visitors who seek to learn from them.

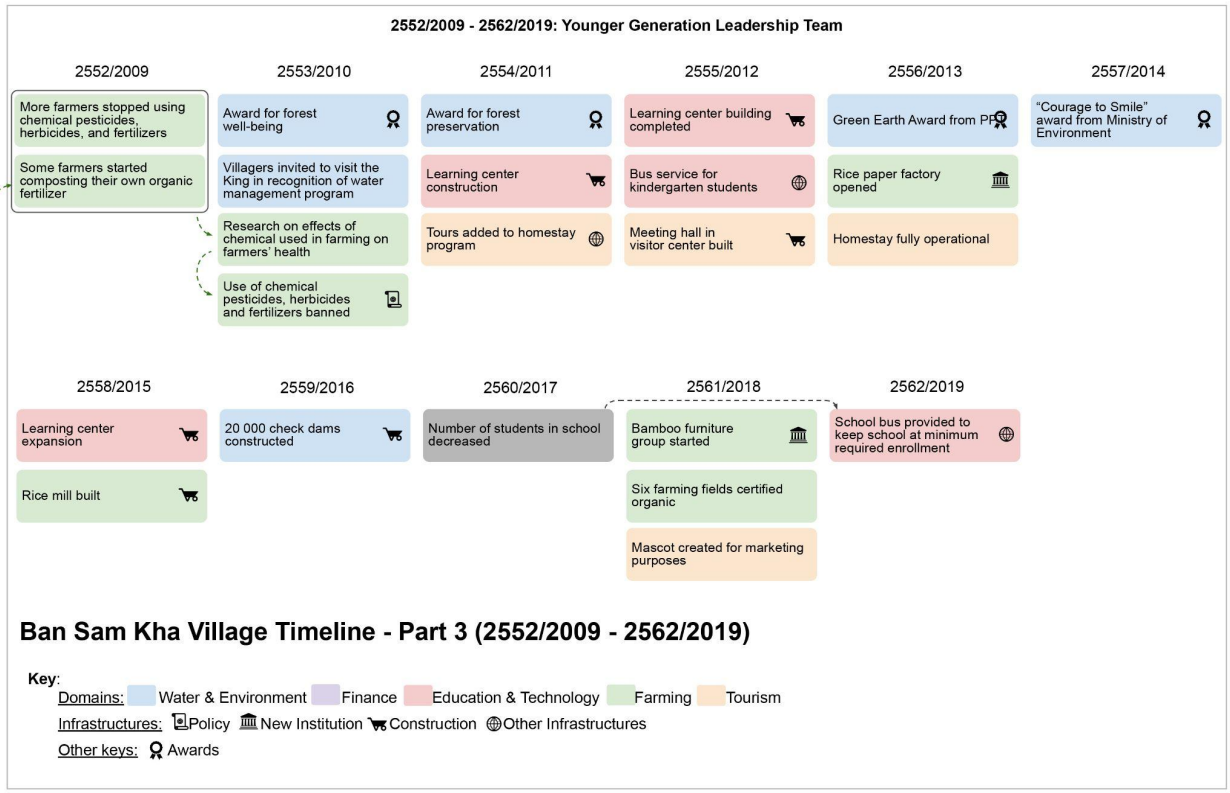

Figure 10. Ban Samkha Timeline:Part 3 (2552/2009-2562/2019).

Interpretation of Water Management Intraventions from 2546/2003 - 2548/2008

At a closer timescale of investigation, the series of intraventions in water management reveal several elements about Ban Samkha's journey to becoming *a village that learns*. First, the villagers were already building on six years of experience in other intraventions. They had used the iterative Thai Constructionist method many times in finance and education, especially with "reflection, reflection, reflection" (interview, 2017) (see Figure 3). Still, applying this method in a new domain was nontrivial, as demonstrated by the iterative efforts required after the dramatic failure of initial check dams. In addition, the children built on a developed sense of teacher-facilitated agency, with access to computers and Internet for research and prior experience researching local herbs. Children also built on leadership roles begun in computer workshops and the Brain Bank. This was not the first time that children led the village into new intraventions. What was perhaps new in the children's roles is that they drew adults into their intravention by disrupting family practice (i.e., staying late after school).

One noteworthy feature of the water management intraventions was the village's broader learning ecology (see Figure 11). The village was immersed in their *physical environment* which directed which water management strategies (i.e., check dams) they could use and eventually shaped an emergent division of labor: men, volunteers, and heavier tools at the mountaintop, and women, children, and lighter tools at the base. The village also drew on *outside organizations*, partly shaped by national research efforts and broader *cultural discourses* about sustainable village agriculture and Thai "New Theory." Other organizations were eager to participate (immersed in these discourses as well, as evidenced by interviews with members), and thus began a network of over 21 organizations (Ban Samkha, 2005) that provided a diverse set of tools (e.g., chain saws, satellite maps, organizational systems), resources (e.g., funds, volunteer labor, cement), and expertise (e.g., check dam expertise, technology use). Further, the village had to network with *neighboring villages* for fire management. Finally, the village was a *diverse unit*, with changing participation from children, moms, and dads; then broader participation after persuasive efforts and evidence; and finally mandated practice with fire management policy. The diversity

in village participation is more clear at this smaller timescale where changes in participation are seen more easily.

The water management intraventions were hard fought and took years to see the full fruits of the village's labor. The village had to counter its own inherited norms about forest burning, provide extensive physical labor, learn new systems of mapping, technology and management, create new roles of leadership, and develop divisions of labor both immediate (building dams) and long term (managing dams and fires). Yet these developments set the stage for further expansions of the village's learning.

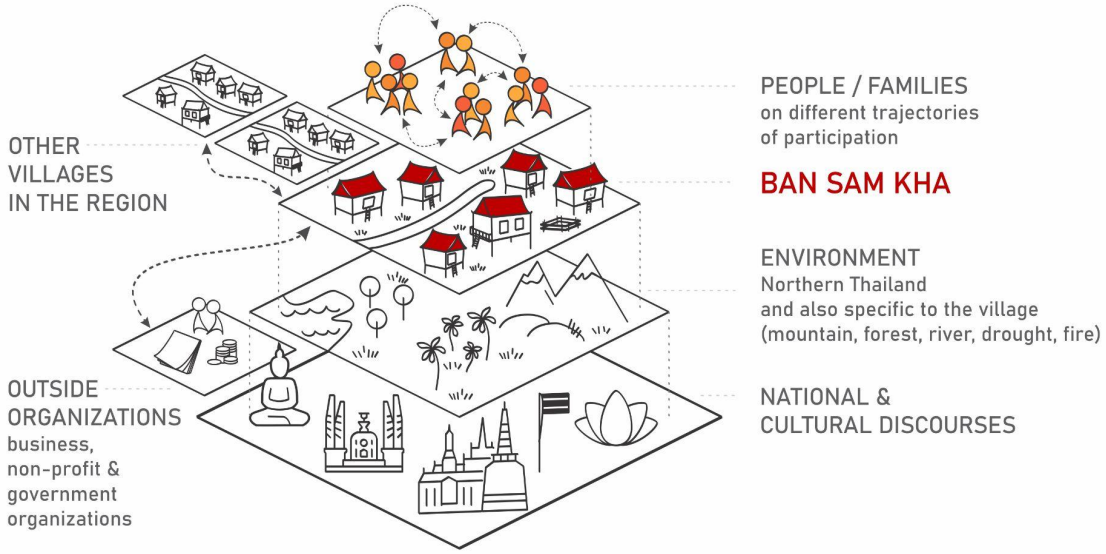

Figure 11. Learning Ecology of Ban Samkha. Image by Alicja Żenczykowska.

From 2552/2010-2563/2020: New and Continued Intraventions

In the past decade, Ban Samkha has continued to learn, both extending earlier domains (finances, education, environment) and working in new domains of agriculture and entrepreneurship. The germ cell, 'keeping it in the village,' grew from money to attending to the environment and then to physical health. In 2010, after evidence of pesticides and herbicides in blood tests, the village debated and created a policy **banning all farming chemicals**. Additionally, first one, then three, and as of 2020 six families transitioned to **organic farming,** seen as protecting both health and income. Many original children who led check dam development have returned from university and careers to develop new industries, including a **rice paper plant**, a dried mushroom factory, and a **local tourism program**. Some now manage the **homestay program** and savings account or have become teachers in addition to serving on the young adult branch of the village council.

Ban Samkha continues to face many challenges. While many members are stronger financially, wealth is not evenly spread (just as participation in intraventions was not evenly spread). Further, the money from selling crops is not enough to meet current needs, and entrepreneurship, especially developing and marketing packaged food goods (e.g., banana honey, rice crackers, cereal drink) seems to be a requirement, not just a bonus for financial survival. The learning methods the village has internalized will surely be put to future tests as they face the next decades of their development as *a village that learns*.

Discussion

What does it mean to become *a village that learns*? In this paper we documented how Ban Samkha underwent substantial and durable change over 24 years, becoming a community that identified, tackled, and iterated on problems, altering their everyday practices and lives. There are many possible

takeaways from this research, all of which point to the village as a learning entity. Our analysis revealed material changes across several domains that were inter-related in the village's learning: finance, education and technology, environmental sustainability, agriculture, and entrepreneurship. The series of intraventions in each domain could fill an entire paper or more, as the village built on one intravention to the next. Indeed, in a different paper we focused entirely on changes in finances, exploring the evolution of the germ cell "keeping it in the village" as the village moved from a savings program to personal accounting to a community-run savings and loans bank (see Morales-Navarro et al., 2022). Further, the long timescale available in this study reveals at least two important trends. First, the focus on *learner interest and agency* allowed the village to choose problems of collective importance and slowly move through different ideas that bore fruit (e.g., pursuing water management only after six years of investment and research in their finances). Second, the village acted within *parallel series of intersecting intraventions*, where learning built both within and across domains. As a field, we need models that consider longer and broader trends to capture learning in communities. As Engeström and Sannino (2021) argue for a shift "from an emphasis on space to an emphasis on time"; we similarly argue for a shift from an emphasis on a single domain to *multiple domains across time*. This shift to encompass multiple domains across time is possible with the unifying element of a community or organization (like a village) as the learner.

Key in their ability to learn and face challenges across domains and over time was the role of the village's learning ecology. The physical environment, neighboring villages, and knowledge from other organizations in Thailand shaped how the village approached tasks like water management, finances, and tourism. Yet the village not only worked within but further *developed and transformed their learning ecology*. Environmental and agricultural intraventions literally changed the physical environment, which afforded further learning, from sustainable agriculture to entrepreneurship and tourism. Networks built with neighboring villages for fire prevention were later tapped to sustain the local school, bussing in primary school children to meet minimum attendance. Further, the village now has longstanding relationships with various nonprofits and industry partners that shape their continued learning. All of these changes point to the importance of infrastructural intraventions (Penuel, 2019) not just as an accomplishment in their own right but as setting the stage for further innovations. Thus we see a shift from observing and acknowledging learning ecologies (Barron, 2006) to leveraging (Pinkard, 2019) to transforming them.

Important to the village's learning ecology were national expertise and cultural narratives of sufficiency economy and sustainable villages. While it is beyond the scope of this paper to analyze the nuanced sociohistorical and power relationships behind these institutions and cultural narratives (Gutierrez & Jurow, 2016), we do note inside critiques, such as the romanticization of village life in support of populist nationalism (Schaffar, 2018; Hewison, 2000) and the celebration of political discourse without public policies to support and fund village and rural development (Jungck & Kajornsin, 2003). Of note, the village itself has eagerly credited every agency, volunteer, and mentor who provided grants, funding, labor, and tools—critiques did not arise in our data. Further research could more deeply investigate aspects of power, equity, and inequity, both within and beyond the village learning ecology.

Finally, sustaining the village's learning was its method appropriation (Sannino et al, 2016) of Thai Constructionism, which relates to the core role of learner interest and agency. Elsewhere we have described the deep internalization and transformation of the foreign learning philosophy of constructionism (Papert, 1980) by the Thai movement, spearheaded by the Suksapattana Foundation (Fields & Blikstein, under review). Both intentional (top-down) and emergent (bottom-up) work reshaped the philosophy into a method that resonated locally in places like Ban Samkha. Indeed, Ban Samkha's adoption and adaptation of the method contributed to the larger internalization of constructionism in Thailand, as depicted by the bidirectional arrow between organizations and the village in Figure 11. In other words, while Thai Constructionism played an essential role in the village, the village's use of the method also influenced how Thai Constructionism developed in the country, with members in regular conversation with key figures of SF and with thousands of annual visitors to the village (including volunteers, learners, and tourists).

Conclusion

As Lemke (2000) aptly states, "'It takes a village' to study a village" (p. 288). We owe many of our insights to *research that the village conducted* on itself—histories that they passed down, wrote, and shared—as well as the histories embedded in socio-material artifacts, from village policies to reservoirs. Indeed, the Thai Constructionist method that Ban Samkha adopted and internalized reinforced the need for documentation which supported this research—from the numerous visits from outside mentors and organizations to experiments conducted and policies created. We also benefited from events and perspectives recorded in papers by contemporary Thai authors and institutions such as SF who partnered with the village for over 20 years, as well as research into larger historical and cultural trends in Thailand that played a role in the village's learning. These multiple perspectives, documentation, and literature were key to understanding the village's learning on longer timescales that yielded insights into the cross-domain, ecological system of village learning. This "village" approach may be necessary for others who seek to study institutions, communities, or larger learning entities across timescales and domains.

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