



Mankala Chronicles: Nuclear Energy Financing and Cooperative Corporate Form in Finland

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Abstract — Drawing on 32 months of interview-based ethnographic fieldwork, this paper examines Finland’s “mankala” nuclear energy companies through the lens of anthropological theories of corporate form. Mankalas are limited liability companies run like zero-profit cooperatives that bring together consortia of Finnish corporations and municipal energy providers to purchase, finance, and share the output of jointly owned energy-generation facilities. They have long been associated with “uniquely Finnish” modes of trust, cooperation, societal cohesion, and transparency. In recent years, however, political-economic uncertainties have destabilized Finland’s mankala circuit, impacting how, whether, and when mankalas Teollisuuden Voima Oyj and Fennovoima have pursued new reactor projects. This has impacted reactor technology suppliers abroad, including France’s Areva, Germany’s E.On, and Russia’s Rosatom. With that in view, this paper explores whether anthropological analysis of Finland’s mankala corporate form can inspire new strategies for institutional innovation and reactor project financing for nuclear energy organizations. To chart out avenues for collaboration between anthropologists and nuclear energy practitioners, it concludes by proposing three pathways through which anthropological sensibilities could inform institutional decision making. I term these pathways holism, tracking and translation.

Keywords — Nuclear energy financing, corporate form, institutional innovation, organizational anthropology, Finland.

I. INTRODUCTION

Finland’s nuclear energy companies Teollisuuden Voima Oyj (TVO) and Fennovoima are backed by a little-known corporate ownership model called “mankala.” With origins in Finland’s early twentieth-century hydropower projects, mankalas are limited liability companies run like zero-profit cooperatives in which power plants are owned by multiple partners through equity. Today, mankala syndicates convene consortia of Finnish industrial companies, wholesalers, distributors, retailers, and municipal energy providers to cooperatively purchase, finance, and share the output of jointly owned nuclear energy generation facilities.¹ They remain poorly understood outside of the country’s small communities of banking professionals and energy

financiers. From 2012 to 2014, I conducted 32 months of interview-based ethnographic fieldwork among Finland’s nuclear professionals. As an anthropologist, I became interested in how and why political-economic uncertainties had destabilized TVO and Fennovoima repeatedly over the past two decades, and how these destabilizations ultimately influenced Finland’s decisions to build or not build new reactors.

To solve this puzzle, I began exploring the subtleties of the mankala corporate form.^{2–4} By corporate form, I mean the culturally variable ways in which collective organizations are structured, owned, operated, and perceived across diverse locales, belief systems, and contexts. Social studies of nuclear energy have explored reactor technologies’ potential environmental, geopolitical, and health risks.^{5–7} They have scrutinized the networks of regulators, bureaucracies, international organizations, multilateral agreements,

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norms, and watchdogs that oversee nuclear energy projects.^{6,8,9} They have examined issues of public acceptance,¹⁰ intergenerational equity,¹¹ expert knowledge management,¹² and technological and political decision making,^{13,14} plus the cultural imaginaries¹⁵ and discourse strategies¹⁶ that frame perceptions of nuclear technologies. Yet few have analyzed how nuclear energy financing interacts with national or regional twists on more conventional models of corporate form. Filling this gap meant developing an ethnographic analysis that seeks to “pluralize, relativize, and contextualize corporate forms geographically and historically.”¹⁷

Conducting fieldwork showed me how many Finnish nuclear industry insiders associated the *mankala* corporate form’s effectiveness with “uniquely Finnish” virtues of trust, cooperativeness, and societal cohesion. It revealed how the *mankala* corporate form’s idiosyncrasies impacted reactor technology providers abroad, including France’s Areva, Germany’s E.ON, and Russia’s Rosatom. With that in view, this paper explores how an anthropological study of a novel corporate form can inspire fresh approaches to nuclear institutional innovation and reactor project financing. Its goal is to scale up my Finland-based case study to chart out avenues for more productive future collaborations between ethnographic researchers and nuclear energy practitioners. By practitioners, I mean regulators, managers, policy experts, quality control specialists, financial analysts, safety culture consultants, and other professionals, technicians, or operators who engage with matters of nuclear institutional organization.

II. METHODS

I began conducting interviews among Finland’s nuclear industry professionals, bankers, managers, lawyers, academics, activists, regulators, media, politicians, and ministry technocrats in January 2012. By August 2014, I had recorded 121 unstructured, open-ended dialogues.^a These conversations took place at my

^a I reached out to prospective informants via email. Participation was voluntary. Interviews ranged from 30 minutes to 4 hours. I met with some informants once; others several times. I also took Finnish language courses and wrote notes on friends’ and acquaintances’ experiences of life in Finland. I collected technical documents, policy reports, and other artifacts. Sometimes I engaged with informants’ personal lives. In summer 2013, I spent 2 days at a nuclear waste expert’s family’s *kesämökki* (a Finnish summer cottage, similar to a Russian *dacha*), where we barbecued hot dogs, enjoyed the sauna, and visited a nearby limestone mine.

informants’ offices, homes, or more often, at local pubs, restaurants, and cafés. I asked not only about their areas of expertise, but also broader questions about how they saw Finland’s political trends, cultural tendencies, historical circumstances, and economic imperatives impacting twenty-first-century nuclear initiatives. My goal was not to conduct a uniform survey composed of standardized questions, to develop a statistical analysis, nor to assemble a quantifiable opinion survey representative of Finland’s entire nuclear sector. Rather, as an anthropologist, I sought to develop an interpretive “ant’s eye view”¹⁸ of everyday life among key Finland-based nuclear professionals, exploring their “native’s point of view”¹⁹ through in-person interaction and cultural immersion.

Fieldwork involved cultivating trust, information-sharing relationships, and ongoing dialogue with whichever nuclear insiders appeared most open to volunteering their personal anecdotes, opinions, and knowledge. Some were employed by Finland’s power companies Fennovoima, TVO, or Fortum Power & Heat. Others worked at financial services companies, law firms, or banks involved with nuclear financing projects. Some worked at the country’s nuclear regulatory agency Säteilyturvakeskus (STUK), the Technical Research Center of Finland, or at Aalto University (formerly the Helsinki University of Technology). Others were employed by industry lobbying associations like Finnish Energy Industries or the Confederation of Finnish Industries. Some were members of Eduskunta (Finland’s Parliament) or the European Parliament. Others were environmentalists working at Greenpeace or Friends of the Earth. I was, at the time, developing an ethnographic study of Finland’s spent nuclear fuel repository project at Olkiluoto.²⁰ Many worked for the nuclear waste management company Posiva Oy (owned by TVO and Fortum), the Geological Survey of Finland, or engineering consultancies like Saanio & Riekkola Oy. All views expressed in this paper belong to my informants as individuals and do not represent those of their employers.

Like other anthropological studies, this paper approaches Finland’s nuclear professional communities as polyvocal²¹: as an ever-shifting diversity of sometimes harmonious, other times discordant voices. A different ethnographer with different interests immersed in Finland at a different moment would inevitably emerge with a different ethnographic depiction.²² Yet in-depth fieldwork remains the best way to garner historically situated, culturally contextualized, empirical accounts of nuclear energy financing dynamics that, to date, have been approached primarily through the lens of

quantitative economic analysis. My goal is not to denigrate quantitative analysis, but to complement it with a qualitative case study of how nuclear energy financing was operationalized in a particular place and time. My hope is that my interpretive, insider-informed ethnographic portrayals, as partial perspectives situated within a specific social and historical context,²³ can help lay ground for more robust collaborations between academic anthropologists and nuclear professionals.

This paper explores several anonymized informants' viewpoints, while also highlighting those of a few key informants I have pseudonymized as "Alaknam," "Oona," and "Marita." I gave these individuals a special platform because their views appeared loosely emblematic (but never fully representative) of some (but never all) of the perspectives prominent in Finland's nuclear discourse at the time. By studying these informants as influential exemplar figures²⁴ rather than perfectly representative samples,²⁵ I have sought descriptive validity in articulating their individual worldviews rather than polling-style generalizability in mapping the entire nuclear sector's field of opinions.²⁶ ^b Supplementing my findings with other studies guided by different methodologies—positing them as parallel lines of reasoning filling one another's epistemic gaps (Ref. 29, p. 54)—can cultivate even more holistic understandings of nuclear energy financing.^b

I am not the first to conduct this kind of ethnographic research among nuclear professionals.³⁰ Anthropologists have made valuable contributions to nuclear policy debates and public discourse throughout the years.³¹ Gusterson has studied nuclear weapons scientists at Lawrence Livermore National Laboratory, examining their beliefs, values, hopes, and political anxieties.³² Masco has explored how Los Alamos National Laboratory scientists, Pueblo indigenous groups, antinuclear activists, Nuevomexicanos, and other communities in the Southwestern United States have interacted with the Atomic Age's "new cognitive orientation toward everyday life."³³ Polleri, in conversation with technocrats at Japan's Ministry of Economy, Trade & Industry, has scrutinized the strategies of depoliticization that emerged after 2011's Fukushima disaster.³⁴ Weichselbraun has examined the semiotic implications of how International Atomic Energy Agency safeguards inspectors attach tamper-evident

seals to nuclear facilities to verify state compliance with weapons nonproliferation treaties.³⁵

This paper contributes to this body of scholarship a more thorough reflection on the financial dimensions of corporate form^{17,36} as it pertains to nuclear energy governance. It does so by "unwrapping the bundle" or "tracing the nexus" of TVO's and Fennovoima's *mankala* "structuring agencies."³⁷ There exist some precedents for research at this nexus. Riles has conducted fieldwork on how Japanese financial regulators and risk experts intensified their data collection efforts amid Japan's post-Fukushima regulatory crises.³⁸ Miyazaki has explored how Tokyo's debt and credit market specialists redeployed their precrisis financial techniques under new conditions of post-Fukushima uncertainty.²⁸ This paper contributes to that scholarship by refocusing analysis not on contexts of post-accident financial crisis, but on financial exigencies that arose in more mundane, business-as-usual situations before a reactor was put into operation.

My route into this problem draws on legal and social scientific scholarship on corporate form—on how singular concepts of legal personhood get projected onto collective organizations.^{39–41} Anthropologists have made rich contributions to these debates by approaching corporations as more than just legal-economic constructs. They have studied both the (external) effects of corporations upon workers, consumers, ecosystems, and local communities and the (internal) workings of corporations' organizational values, practices, norms, motivations, rituals, worldviews, and beliefs (Ref. 36, p. 140). Some anthropologists have explored which dimensions of personhood are singular versus multiple,⁴² questioned the boundary between selfhood and personhood,⁴³ and showed how legal frameworks and exchange relationships can shape the individuality of persons and things.⁴⁴ Others have brought these theories to bear on contemporary issues, such as financial institutions deemed "too big to fail"³ or the "corporate oxymorons" of corporate social responsibility public relations campaigns.³⁷ This paper draws that tradition of scholarship closer to emerging literatures on nuclear professional culture by synthesizing it with an empirical case study of Finnish nuclear energy financing.

This paper is structured as follows. First, it introduces the *mankala* concept from the perspective of three key informants—a financial services professional (Alaknam), an environmental activist (Oona), and an industry lobbyist (Marita)—to explore how the corporate form entangled with popular imageries of exclusionary elitism, Finnish nationhood, and cross-sector business collaboration. Second, it draws from anthropological

^b Anonymizing informants' identities is a common practice among anthropologists working with sensitive or personal situations. For examples of papers that similarly highlight the voices of pseudonymized, emblematic, key ethnographic informants see Refs. 27 or 28

theories of corporate form to trace how *mankala* ownership relations extended across Finnish society. Third, it examines how, in 2012, nuclear industry informants were eager to compare *mankalas* to other cooperative endeavors: agrarian Finns' joint purchasing of farm equipment, traditional task-oriented neighborhood gatherings, Danish wind cooperatives, and Japanese "corporatist" governance models, to name a few. Fourth, it shows how the optimism that upheld their ambitious comparisons in 2012 deflated over time, as Finland's *mankala* circuit increasingly saw owner divestments, financial instability, and public criticism in 2013, 2014, and beyond. Taking a step back to reflect on how fieldwork helped me engage with *mankalas* from several important angles, this paper concludes with three pathways through which ethnographic analysis of novel organizational forms can inform nuclear investment decision making and provide practitioners with insightful critique. I term these three paths forward holism, tracking, and translation.

III. MANKALA 101: NOBLE NORDICS AND NUCLEAR POWER

I was first introduced to the *mankala* corporate form in 2012 while sitting outside at Helsinki's Siltanen restaurant with Alaknam, a banking industry professional who moved from elsewhere in Europe to Finland a decade or so before. Alaknam worked closely with *mankala* companies. Like most legal and financial experts, he described the model as follows. An entity owning about X% of a *mankala* company would pay about X% of the total costs to build, maintain, and manage the *mankala*'s cooperatively owned nuclear reactor. It would, in turn, receive about X% of its energy output in return. This diversity of ownership was intended to pool capital from many different sources. It was to disperse risk and liability across several partners so none had to "bet their entire company" on owning a single reactor. If one owner were to seek more energy at some point in the future, it could negotiate with other owners to buy more shares of the *mankala* reactor and hence pay more of its operating and maintenance costs. If it were to want less energy, it could sell its shares, assuming there would be someone willing to buy them, and pay commensurately less of the costs. If an owner would defect from the *mankala* or dissolve into bankruptcy, the remaining owners, it was hoped, would have incentive to either (a) invite new potential owners to enter the *mankala* to replace the exiting owner or (b) buy the exiting owner's shares simply to keep the *mankala* from which they derive

energy afloat. Owners also had the option of selling their portion of energy to the grid via the transnational Nord Pool energy exchange market, which at the time operated throughout Norway, Sweden, Denmark, Estonia, Finland, Lithuania, and parts of Germany.

Mankala cooperation was not dictated by government legislation, but through private contracts called Articles of Association. The approach's legality originated in two 1960s Finnish Supreme Administrative Court decisions. These rulings approved the continued operation of Finland's cooperative-style hydropower company *Mankala AB Oy*, which was established in 1936. *Mankala* companies were governed by Finland's Companies Act. Unlike standard limited liability companies, however, a *mankala* did not generate profit, but instead, aimed to ensure the stability and ready accessibility of its cooperative owners' energy supply. These owners did not receive payments on dividends. Company shares were not listed on any stock market. Rather, *mankala* owners were obligated to buy their share of energy from the private, jointly owned reactor even if its costs exceeded Nord Pool's current market price, which they often did.

Alaknam described his curiosity about how *mankala* cooperation came to be seen as a "distinctly Finnish" approach to nuclear reactor financing. Cast as "a unique Finnish practice,"⁴⁵ *mankala* cooperation befuddled international investors who "found *Mankala* companies challenging to analyze" because they followed a "Finnish practice without good international benchmarks or comparables."⁴⁶ As anthropologists have long emphasized, variations in corporate form often evolve alongside variations in regional, national, and/or global cultural tendencies (Ref. 36, p. 149). Different corporate forms emerge from different contexts' unique constellations of laws, norms, and expectations regarding organizational behavior (Ref. 17, p. S9). *Mankala* cooperation was, in this sense, a locus at which understandings of Finnish national identity, nuclear energy financing, and corporate form converged into a set of sociotechnical imaginaries: "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific scientific and/or technological projects" (Ref. 15, p. 120).

As many industry informants saw it, *mankalas* were enabled by Finns' "unique" propensities for societal cohesion, interpersonal trust, and multiparty cooperation.^{47,48} This evoked shared imaginaries of Finnish nationhood. Finland has been cast as having a "high level of trust among citizens, a cooperative attitude in society and a sense of solidarity."⁴⁹ Like its

Nordic neighbors, Finland has been said to harbor a “unique culture with a strong work ethic” with “high levels of trust and social cohesion” (Ref. 50, p. 39). As Finnish President Sauli Niinistö told CNN’s Richard Quest during the 2012 World Economic Forum at Davos: “[O]ne of the elements of why we feel that Finland is a good country” is “because we have social cohesion still very strong.” As a Helsinki-based Russian expat recalled a drunk Finn once telling him: The “most important thing about living here is *luottamusperiaate* (the principle of trust) . . . in Finland we trust each other. We trust officials, police, and people.”⁵¹

These depictions of Finnish cooperativeness help comprise a popular, globally circulating stock character I call the Noble Nordic: imaginaries of the modest, educated, practical Northern European who politely cooperates with others, neutrally places faith in rationality, and is broadly supportive of transparency, human rights, social democracy, and scientific inquiry. For decades, there has been a robust international press market that idealizes Finland as a small, egalitarian, stoic, unassuming, peaceful, cohesive country in Europe’s far north in which trust abounds, cooperation works, and quality of life is miraculously high. Examples have included Newsweek describing Finland as “The World’s Best Country” or The Atlantic’s 2013 article, “The Secret to Finland’s Success with Schools, Moms, Kids—and Everything.”⁵² Finland’s domestic media imaginaries have heralded Finns’ “Lutheran Work Ethic,”⁵³ suggesting that Finnish business professionals value humility, modesty, and leisure time over profits. They have described how Finland’s “low-profile rich” tend to “hide” their wealth and “shun publicity” in an egalitarian culture in which “flamboyance is seen to be uncouth” and “there is almost a feeling that wealth is something to be ashamed of.”⁵⁴

Some of my informants, however, rejected these imaginaries as idealistic. To them, sentiments of trust and belonging were not distributed evenly across Finland’s class, gender, age, political, and ethnic divides. Finnish social scientists explained to me how the social bonds underlying Finnish national solidarity are of a very different kind than those underlying *mankala* cooperation. They associated the latter with the exclusionary, undemocratic mentalities of Finland’s “old cohesive energy elite.”⁵⁵ Studying these perspectives can inform strategies to design participatory nuclear decision-making arrangements more inclusive of marginalized voices.⁵⁶ Such arrangements too often fail to acknowledge the tacit power relations⁵⁷ and unequal distributions of control over knowledge production that underpin them.⁵⁸

Fieldwork on *mankalas*, and their myriad associations with cooperation, nationalism, and elitism, can help evaluate regional successes and failures in achieving distributional inequity among stakeholders.⁵⁹ This, however, first requires an on-the-ground look at how *mankalas* interacted with democratic ideals of equality, inclusion, and consensus.

This is where the perspective of Oona, an environmentalist who worked at a nongovernmental organization (NGO), becomes especially valuable. Oona criticized the exclusionary ways that Finnish trust, cooperativeness, and cohesion have manifested among in-groups of domestic technocrats, politicians, and industry elites. She criticized politicians in Finland’s mainstream conservative National Coalition Party *Kokoomus* for routinely taking “advantage of Finland’s historical efforts to nurture the spirit of the Winter War,” the Finnish “ideal of consensus,” and the Finnish public’s feeling that “a small nation has to be united and cooperative.” Their aim, she argued, has been to limit public dissent and justify their economic policies by publicly evoking nationalistic imaginaries. Oona then began sketching out Finland’s “locus of power,” which spanned the Finnish industry lobbying association Confederation for Finnish Industries, old heavy industries, established political parties like *Kokoomus*, and Finland’s Ministry of Employment and the Economy (MEE). She expressed discomfort with how Finland’s MEE, not a dedicated environmental or energy ministry, remains the primary government agency overseeing Finland’s nuclear energy sector.

When Oona critiqued the uneven distribution of nuclear decision-making power across Finnish society, she evoked longstanding debates about Finland’s *hyväveliverkosto* (“dear brother network”): communities of Finnish elites who, behind a veil of secrecy and mutual trust, used their connections to rise to positions of influence and to circumvent formal decision-making procedures. *Hyväveliverkosto* conjured up imageries of handshaking behind closed doors, of decisions made informally during hunting or skiing trips, of drunken sauna nights in which huge political deals were hashed out, and of the ongoing favor-for-a-favor camaraderie of powerful Finnish men’s *lehmänkauppa* (“cow trade”). Oona saw this gendered form of collusion as reaching its apex at the Confederation for Finnish Industries’ headquarters in Helsinki. She noted how its address, Eteläranta 10, had become as much a “cultural concept” as an “actual place” due to its stereotype as the spot “where the big boys work, the big boys play, and the big boys go to sauna.” Her views ought to be taken

seriously. They parallel social scientific findings about how nuclear practitioners can benefit from supporting more inclusive public dialogs⁶⁰ and breaking down historical barriers to transparency.⁶¹

My industry-based informants tended to speak more positively about how Finland's cooperative bonds of solidarity fostered a sense of cohesion within *mankala* governance and business communities. Marita, a lobbyist at the Confederation of Finnish Industries, defended Finland's nuclear decision-making institutions. She saw *hyväveliverkosto* ("dear brother network") nepotism as confined to Finland's "olden days." Marita insisted that there are realistically "not many of these 'sauna nights' anymore," and that gender parity had improved. Next, she spoke warmly of the strong interpersonal trust sustaining Finland's governance and business communities, emphasizing how it has provided the "small country" with competitive advantages. Finland's through-the-grapevine communications, she noted, move swiftly through *puskaradio* ("bush radio") or *viidakkorumpu* ("jungle drum"): rumors, gossip, and informal exchanges in small, inward-looking networks. These communicative efficiencies, in her eyes, fostered decision making more adaptive to changing political, economic, and epistemic circumstances.⁶² For Marita, then, Oona was being disingenuous when she derided *mankala* cooperation's internal bonds of social trust by referencing misleading cultural stereotypes about elite collusion in a country ranked among the most transparent in the world.

When I broached Alaknam's, Oona's, Marita's divergent views on Finnish national solidarity with a manager from Fennovoima, he emphasized how there was a tacit industry-wide commitment to ensuring that, for the good of Finland, the *mankala* principle would never collapse by being ruled illegal or by losing the country's political establishment's approval (Ref. 63, p. 5). This commitment had been reinforced by public perceptions that associated Finland's *mankala* syndicate's cohesiveness with Finland's population's cohesiveness. When the legality of *mankala* cooperation was challenged at the European Union level in 2010 by Finnish Greens Satu Hassi and Heidi Hautala, the Finnish Energy Industries lobbying association launched a "massive defence" of its legitimacy.⁶⁴ Hassi's and Hautala's European Parliament inquiry asked whether *mankala* cooperation illegally provided hidden dividends to owners by attempting to sell them energy at a special rate below market price, without the savings being taxed as income. The European Commission launched an investigation, and in 2012 decided to allow the *mankala* approach to persist.

When I met with Alaknam at Siltanen months later, he told me how, in his experience, Finnish business cultures place a uniquely strong emphasis on "personal relationships" and the "churchtower principle": the "idea that it is safest to cooperate with people inside your closer circles." He noted that only "vetted" companies—those viewed as amply established, trustworthy, reliable, or favored in the eyes of *mankala* organizers—could be invited to join the private *mankala* energy-sharing "clubs." When Alaknam first moved to Finland, industry leaders would invite him to barbecue at their *kesämökki* ("summer cottage") to assess his character before making a decision about a deal. To Alaknam, *mankalas* resembled selective "brotherhoods." At the same time, tight-knit relationships like these were precisely what gave *mankalas* their exclusionary, elitist, or collusive flair among critical activists. Feeling ambivalent about *mankala* cooperation's "clubbiness," Alaknam put it this way:

A *mankala* is still a club. You don't enter the club just like that . . . and existing shareholders have the preemptive right to buy from those selling. Look at one of the reasons Fennovoima was created: it was created by people who were disappointed not to be allowed into the club of TVO. So, they left and created their own club. So *mankala* is still a club. It is flexible, but only between the club owners. They don't accept just anyone in, just because. If someone gets into difficulties, the others have to buy or to clear them out. So, you don't want to be partners with a weak partner or untrustworthy parties.

Alaknam saw TVO's and Fennovoima's public disagreements about whether the latter would be allowed to bury its spent nuclear fuel in Posiva's Olkiluoto geologic repository (which was partly owned by TVO) as a "fight between brother and sister." As he saw it, it was in the self-interest of all cooperators, averse to losing face in Finland's business communities, to maintain their bonds of solidarity:

It's difficult to convince international banks to lend [to *mankalas*] because international banks would only look at the document, at the law, at the precedent. In Finland, we would also look at all these cultural aspects: who is behind it? We would trust that no one would take the risk of putting a *mankala* company in bankruptcy because they would lose their fame, their face, and so on. They would ruin the entire *mankala* concept, and everyone would suffer because one would screw up. In Finland, that would be very harsh for those who hear that. It is a soft

regulation. It cannot be written, it cannot be agreed.
But it is very important.

Alaknam described how solidarities among *mankala* cooperators were stronger decades ago. Back in the 1970s, their cooperative agreements did not need to be codified as extensively in written laws and contracts. They were sustained more by handshakes and “gentlemen’s agreements” in a context in which cooperators could assume greater mutual trust in one another. To him, this trust seemed like an inexhaustible resource. An extension of trust could be reciprocated with a counterextension, which could be reciprocated with another counterextension, and so on, indefinitely. Trust seemed to have no upper limit—no maximum at which it had to be capped. This sort of trust involves holding aspects of one’s personal agency in “abeyance” so “uncertainty, unknowability, and helplessness were deferred and hence obviated again and again” (Ref. 65, p. 185). *Mankala* participants had long relied on these stable plateaus of solidarity, senses of mutual duty, and fruitful back-and-forth gestures to tighten their cooperative ties.

Engaging with Alaknam’s, Oona’s, and Marita’s perspectives on *mankala* cooperation taught me how to approach the unique corporate form as more than just a bucket of wealth, a web of contracts, or a collection of legal technicalities. TVO and Fennovoima were crucial sites at which concerns about elite clubbishness, societal hierarchy, economic dominance, public transparency, and exclusivity were hashed out. Fieldwork revealed *mankalas* to be ever-shifting, polyvocal entanglements of relations between corporations, individuals, municipalities, laws, technologies, geopolitical events, price fluctuations, government agencies, partners abroad, and more. This, as Secs. IV and V will show, underscored how corporate form “shapes and is shaped by daily life” in ways that cannot be reduced to “default conceptualizations of corporations as solid, unified, self-knowing, and self-present actors that relentlessly maximize profit and externalize harm.”¹⁷ From this perspective—and with Alaknam’s, Oona’s, and Marita’s reflections on Finnish business culture in view—I will now explore the complex ownership relations that comprised TVO and Fennovoima from 2012 to 2014.

IV. MANKALAS MULTIPLE

The *mankala* corporate form entangled companies-inside-companies-inside-companies-inside-companies or owners-of-owners-of-owners-of-owners. These

entanglements could resemble, to borrow an informant’s analogy, Russian dolls inside Russian dolls inside Russian dolls. TVO, founded in 1969, owned two nuclear reactors in Olkiluoto and was building a third. As a *mankala* company, it had multiple owners. Many of TVO’s owners were energy companies. The largest owner of TVO was Pohjolan Voima Oy (PVO), which was itself a *mankala* company cooperatively owned by multiple Finnish companies. PVO owned hydropower and thermal plants in Finland. Owners of the PVO *mankala* included the Finnish paper and pulp manufacturers Stora Enso Oyj and United Paper Mills Oyj. Among the 15 other owners of PVO, which remember, itself owned a part of TVO, were the energy company EPV Energia Oy, the City of Helsinki, Ilmarinen Mutual Pension Insurance Company, the City of Pori, and Finland’s chemicals industry group Kemira Oyj. Another owner of TVO was Fortum, which was not a *mankala* company. Fortum owned two nuclear reactors, both operating in the municipality of Loviisa. The Finnish State owned 61.9% of Fortum, and because of that, had an indirect stake in TVO. Other owners of the TVO *mankala* included Finnish energy companies EPV Energia Oy, Karhu Voima Oy, Mankala Ab, and Kemira Oyj.

As Riles has said of the Japanese electric utility holding company TEPCO’s far-reaching ownership structure, TVO and Fortum took form as odd hybrids: They were based on “neither private ownership nor collective ownership but, rather, an intractable web of mutual obligations” (Ref. 38, p. 558). While TEPCO was not run like a cooperative, many of Japan’s top pension funds, private investors, corporations, and megabanks held TEPCO bonds and shares in their portfolios. TEPCO’s ownership and financial base was distributed widely across Japan’s national economy (Ref. 28, p. 129). This reinforced perceptions that TEPCO was more than just a normal company—that it was endowed with a special national purpose. The same could be said of Finland’s *mankala* companies’ distributed ownership and the “uniquely Finnish” cooperation that sustained it. Many in Finland viewed nuclear power as having a special national purpose: to domestically produce emissions-free energy, while also enabling the training of generations of Finnish engineers, scientists, and technicians. One Finn told me he saw nuclear energy as the “battery powering Finland’s welfare state.”

Fennovoima, a newer *mankala* company established in 2007, evoked imaginaries of Finnish nationhood too. Its name translates to “Finnish Power.” Voimaosakeyhtiö SF, the consortium that owned a majority of Fennovoima,

included over 60 members at the time of its founding. These included Finnish municipal energy companies, large formerly state-owned mining and metals companies like Outokumpu and Talvivaara, and Finnish food and grocery cooperatives, as well as the retailing cooperative S-Group. Inside the S-Group cooperative were 22 smaller regional cooperatives working in Finnish markets for groceries, restaurants, hotels, auto sales, service stations, and agricultural supplies. Also inside S-Group was the cooperative bank S-Pankki, plus 13 more local cooperatives. Any Finn who held an S-Pankki “S-Etukortti” credit and debit card was also considered to be a “client-owner” of S-Group.^c Since owning an S-Etukortti made one the owner of a tiny piece of the larger S-Group cooperative, S-Group technically had more than 1.5 million owners. So, anyone who owned an S-Etukortti at the time also owned a piece of S-Group, which owned a piece of Voimaosakeyhtiö, which owned a piece of Fennovoima which, in the future, was to own a nuclear reactor. In other words, anyone who owned an S-Etukortti during Fennovoima’s first few years would have owned a tiny piece of a future nuclear reactor. When I visited Fennovoima’s office to ask about this, I was told a story of how when the company’s financial team tried to calculate who, ultimately, owned the company, they were unable. The chains of owners-of-owners-of-owners kept going. Their conclusion was that most of Finland technically owned a tiny share of Fennovoima’s prospective reactor.

The wide range of Finnish citizens and organizations with stakes in TVO and Fennovoima, from the Finnish State to mining companies to local municipal energy companies to food companies to hotels, reinforced popular imaginaries that associated the wellbeing of Finland’s *mankalas* with the wellbeing of the Finnish nation. However, Fennovoima’s fate was influenced by its powerful foreign owners too. While Finland’s domestic Voimaosakeyhtiö consortium owned 66% of Fennovoima, 34% was owned by the German energy giant E.ON. E.ON was initially selected to act as Fennovoima’s nuclear reactor technology supplier. However, in 2012, facing post-Fukushima financial anxieties, E.ON divested from Fennovoima. This was, in part, a hedge against how Finland’s forecasted energy demand had fallen following the 2007–2008 global financial crisis and Europe’s sovereign debt crisis. After E.ON departed, Rusatom Overseas bought its 34% share and agreed to build Fennovoima’s

new reactor instead. “Rosatom” was a shorthand that informants used to refer to hundreds of interconnected corporations and subsidiaries. The Rosatom subsidiary established to work with Fennovoima was RAOS Voima Oy. Yet much of Rosatom, an informant from Greenpeace Finland repeatedly emphasized, had once been the Ministry for Atomic Energy of the Russian Federation, and before that, the Union of Soviet Socialist Republics’s Ministry of Nuclear Engineering and Industry.⁶⁶

TVO and Fennovoima brought together several entities from several sectors of Finland’s national economy to generate energy. They did so in partnership with large foreign reactor technology corporations. Studying Finland’s nuclear *mankala* ownership relations revealed how a corporate form’s singularity as an autonomous or unitary legal “person” could only emerge out of a “field of relations” (Ref. 37, p. 100) and multiple “scales of corporate action” (Ref. 17, p. S6). It revealed how *mankalas* drew together a seemingly impenetrable jungle of relations-within-relations-within-relations, one that appeared no more amenable to quantitative financial calculation than qualitative ethnographic fieldwork. *Mankala* ownership was, after all, not unambiguously private nor public, nor unambiguously national or international, but rather a unique hybrid object (Ref. 67, p. 7). It relied on an “utter interdependence of fates—of each individual and enterprise, and of the market and state” (Ref. 38, p. 558). This was reinforced by how *mankala* syndicates’ owners and managers maintained closer, more personal relationships than they would in a company in which shareholder ownership is alienated from its management through its commodification in a stock market.

Mankalas held together large clusters of interpersonal relationships, funding flows, political imperatives, sociotechnical imaginaries, and ownership logistics. TVO and Fennovoima could thus be approached either (a) from the outside, in their fictive oneness as singular corporate or legal persons or (b) from the inside, in their organizational multiplicities, bringing together a plurality of owners, aspirations, relations, people, and technologies. *Mankalas* appeared “simple, steady, singular and unchanging” and “marked by a highly rigid division between inside and outside,” while also enfolding multiple overlapping ownership relationships inside them (Ref. 3, p. 39). Shared fates, wills, and interests converged; *mankalas* were bundles of (corporate/legal) persons composed of many other (corporate/legal) persons.⁶⁸

Yet Finland’s societal support for nuclear *mankalas* did not emerge in isolation. Social scientists have shown

^c S-Group paid out bonuses to its client-owners’ S-Pankki accounts whenever they purchased items at S-Group retailers. The money S-Group paid into the client-owners’ S-Pankki bank accounts was not considered a store discount, but rather an owner’s profit.

how Finland's MEE collaborated with powerful actors in industry, domestic media, and Parliament to generate a "pro-nuclear network" and a "hegemonic political discourse" that "stigmatized" opposition to nuclear power, such that it became "not fashionable to write critical reports about nuclear power" (Ref. 10, p. 201 and Ref. 69, p. 44). Finnish politicians evoked imaginaries of societal "faith" and "solidarity" to present "utopian visions related to the development of nuclear power: a broad trust in technology and its ability to produce welfare; a Finnish political culture consisting of legalist tradition; corporatism; the strong position of administrative bodies; and the involvement of academic intellectuals in the creation of the national ideology" (Ref. 9, p. 235). TVO and Fennovoima developed public communication strategies with these imaginaries in mind. A Fennovoima manager told me how his company's biggest competitor TVO, short for Teollisuuden Voima or "Industrial Power," had a different ownership composition than Fennovoima. The latter, founded with many local municipal energy utilities as its owners, should, he said, be branded not as an "Industrial Power" provider, but rather as "The People's Power Company."

Several informants rejected this assessment. A Finnish Green politician saw both TVO and Fennovoima as little more than anticompetitive "elite clubs" that violated principles of tax justice. A Finnish academic colleague compared the *mankalas* to the cartels that operated in Finland prior to its 1995 European Union accession. Another dismissed them as "living fossils" left behind by Finland's bygone national-capitalist past.⁷⁰ Still others gestured to Fennovoima's "very scattered ownership by Finnish industrial, trade and municipal companies."⁴⁵ I decided to meet up with Alaknam again to discuss the Fennovoima manager's distinctions between elite/industrial energy production versus populist/municipal energy production.

V. COOPERATION AND CLUBBISHNESS

In early 2012, a relatively stable time in Finland's *mankala* circuit, Alaknam appeared relaxed when speculating about the *mankala* corporate form's "distinctly Finnish" character. He spoke of parallels between (a) how interpersonal trust had helped *mankala* companies jointly purchase, own, and share expensive nuclear reactors that no cooperator could afford individually and (b) how interpersonal trust had long helped agrarian Finns jointly purchase, own, and share expensive tractors and crop sprayers that no cooperator could afford

individually. This resonated with anthropologist Abrahams' depiction of Eastern Finland's family farmers' joint purchasing cooperations⁷¹: "Finnish farmers do not enter lightly into such arrangements, and most cases of joint ownership of machinery and other equipment occur between people who have known and come to trust each other over many years" (Ref. 71, p. 152). It also evoked similarities between (a) the "overlaps of membership" underpinning *mankala* ownership relations, in which owner-companies owned shares of other owner-companies that owned shares of still other owner-companies and (b) the "overlaps of membership" underpinning the Finnish farmers' ownership relations. As Abrahams noted:

Ilmari Turunen had a large stock of his own machinery and engaged in an exchange of services with four others, a fertilizer drill with one other, a crop sprayer with four others, a potato harvester with six others, a combine harvester with one other, a slurry tank with one other, a winch with two others, and a ditching disc with one other (Ref. 71, p. 156).

Alaknam then drew on popular imaginaries of Noble Nordic cooperation to make comparisons between *mankalas* and *talkoot*, a cooperative event in which Finnish friends, neighbors, or acquaintances meet at a scheduled time to collectively accomplish a task without being compensated monetarily. For Alaknam, *talkoot* was a curiously informal style of "traditional" economic cooperation. He was intrigued by how an assumption implicit in asking someone to help out with a *talkoot* was that the asker could be trusted to help with others' *talkoot* in the future. He contemplated whether *talkoot* was merely a vestige of a more archaic, traditional Finnish cooperative form. He then told me about his hope that *mankalas*, which he also saw as unique products of Finnish cooperativeness, could someday be adopted as a financing model in "other small countries" like Lithuania, which might wish to purchase a reactor, but do not necessarily have all the capital to do so held in any one place. Alaknam dreamed that, someday, a "little piece of cooperative corporate strategy from Finland" would help other countries pool capital to support reactor projects too.

Alaknam was not the only informant who was making ambitious comparisons in 2012. I also met a Finnish lawyer who compared Finland's *mankala* model to Denmark's wind power cooperatives. Denmark had pioneered decentralized renewable energy projects during OPEC's 1970s oil crisis. Both the Finnish nuclear example and Danish wind example involved familiar corporate forms, a limited liability company and a partnership, respectively, run like zero-profit cooperatives. Just as Denmark mandated

minimum local-community-ownership ratios for its cooperative wind turbines, Finland mandated minimum national-domestic-ownership ratios for its *mankala* reactors. Yet there were also contrasts. While Denmark's more "grassroots" wind cooperatives sought local "democratic" ownership of small-scale energy provision, TVO's *mankala*, now providing one-sixth of Finland's energy, originated as a large-scale industrial power source born out of a tight-knit clubbiness among Finland's large forest products companies. Fennovoima was similarly co-owned by powerful Finnish industrial and commercial interests. Both *mankalas* were subject to the powerful multinational corporations that provided them with nuclear fuel and reactor technologies. These geopolitical dynamics did not loom over Denmark's community wind turbine owners' decisions.

The lawyer then compared the "more traditional" relationships that underpinned Finland's *mankala* efforts with the "more traditional" relationships that underpinned Japan's business and governance communities. He noted similarities between the countries' "corporatist" sociopolitical arrangements. This recalled longstanding anthropological debates (a) about Japan's small- and medium-sized companies in which shareholders see themselves as kin; (b) about whether the Japanese *ie* ("household") should be analyzed more as a kinship unit, more as an economic unit, or more as a corporation; and (c) about how Japanese judges are known to sometimes put the strict letter of corporate law aside when it seems incompatible with proper behavior among kin (Ref. 3, pp. 37–38). In popular imaginaries, Japan was perceived as having credit and debt markets with "highly-domestic, inward-looking and relational" qualities—perceptions which Tokyo's market professionals made a "conscious effort" to maintain after the 2011 Fukushima meltdown threatened TEPCO's cohesion (Ref. 28, p. 133). In a similar vein, industry informants such as Marita were more apt to emphasize Finland's *mankala* circuit's highly domestic, inward-looking, and relational qualities. Activist informants such as Oona, in contrast, tended to compare Finnish nuclear elites' alleged *hyväveliverkosto* ("dear brother network") with Japanese elites' alleged secretive, tight-knit "nuclear village."

A Finnish historian I met compared and contrasted *mankalas* with Finnish cooperative companies like the OP-Pohjola Group, mutual insurance companies like the LähiTapiola Group, the forest owner cooperative Metsäliitto, the egg-producers cooperative Munakunta, and the animal breeding cooperative Faba—members of the Confederation of Finnish Cooperatives, also known as the Pellervo Society.⁷² Two economic historians I met

positioned the *mankala* corporate form within a broader history of Finnish cooperative capitalism, which was itself part of a broader history of cooperative capitalism across Europe.⁷³ There had, for instance, been weaver cooperatives in 1840s England and cooperative stores in 1860s Denmark. The latter became home to dairy cooperatives in the 1880s. In 1933, President Franklin D. Roosevelt sent a task force to study Scandinavian electricity cooperatives as models for U.S. programs to electrify rural areas and reduce unemployment.⁷⁴ U.S. press outlets have idealized popular imaginaries of Noble Nordic cooperation ever since. As a 1937 episode of the U.S. television show *March of Time* explained:

[I]t was through a cooperative system of production and consumption on a nation-wide scale that frugal Finns turned for economic salvation. In great modern plants cooperatively owned by their customers, Finns carry on 25% of all retail trade, 60% of all wholesale business. In Helsinki alone, one cooperative, Elanto, divides the profits from its 314 shops and 15 restaurants, among the shareholders who patronize it.

Fieldwork revealed competing perspectives on whether Finland's *mankala* corporate form was underlain by nationalist solidarity, clubbish elitism, or a peculiar mix of both. Studying this demonstrated how TVO and Fennovoima interacted with Finland's dominant socio-technical imaginaries. Yet it also provided a window into how *mankala* companies operated in practice—into how their ownership relations shifted and reshifted over time. With this in view, I will now chronicle how Finland's *mankala* circuit teetered and realigned, but never fully tipped over or collapsed, amidst the economic uncertainties, political shifts, fluctuations in public perception, and owner divestments that took place in 2013 and 2014.

VI. CHRONICLES OF MANKALA

Finland's *mankalas* began to wobble, fragment, and realign increasingly throughout my fieldwork. Uncertainties shook, sliced up, and reconfigured relationships among cooperators. Fennovoima saw a struggle to retain owners. After a series of divestments since 2012, the Voimaosakeyhtiö consortium's 60 owners fell to about 40 by 2014. This resulted in a struggle to reattain the strong majority of domestic Finnish owner-companies required by Finnish law—a rule established to harmonize Finland's *mankala* syndicates' solidarities

with Finland's national solidarities by limiting participation among non-Finnish interests. By September 2014, however, many worried that the geopolitical crisis following Russia's annexation of Crimea was scaring off Fennovoima's owners. Finnish Environment Minister Ville Niinistö criticized Fennovoima's dealings with Rosatom as reminiscent of Finland's wary, but sometimes (reluctantly) cooperative, Cold War era relations with the Soviet Union.

When Fortum announced its plans to invest in Fennovoima in December 2014, a Finnish academic publicly dubbed Fennovoima's, Fortum's, and Rosatom's "behind-the-scenes" dealings a "lehmänkauppa" ("cow trade").⁷⁵ He noted Fortum's interest in extending its reach to hydropower projects in Russia, a key market for Fortum, which, remember, had the State of Finland as its primary owner. In 2015, a little-known Croatian company named Migrit Solarna Energija appeared, seemingly out of nowhere, to invest in and rescue Fennovoima's project. Finland's national ownership rules had, at that point, already been deliberately relaxed in response to Fennovoima's difficulties attracting domestic investors. Finnish politicians had redefined "national investor" to include any investor from the European Union, which would include Migrit Solarna Energija. Before long, rumors of the company's ties to Russian government leaders and oligarchs circulated in the media. Finland's government ultimately refused to let Migrit Solarna Energija join Fennovoima.

Some informants blamed Fennovoima's instabilities on how its "scattered ownership" was not as cohesive as the more "traditional" *mankala* that held TVO together. TVO had been composed of owners with more shared interests, more shared histories and fates, and more similar roles in more closely related sectors of Finland's economy. These informants portrayed the sudden divestments from Fennovoima as symptomatic of a dissipating sense of Finnish national cohesion—a deflating enthusiasm for participating in a shared Finnish "national project." Alaknam, however, downplayed Fennovoima's troubles, suggesting its breakdowns were far less consequential than they would have been for, say TVO. Since Fennovoima was not yet responsible for an operational nuclear reactor, abrupt owner divestments would not imply the grave breach of trust it would if the same were to happen at TVO.

TVO and Areva—the France-based nuclear corporation helping build TVO's third reactor, which was still under construction—faced mounting instabilities too. While TVO initially anticipated that Olkiluoto 3 would be operational by 2009, the project experienced extensive

delays. Cost overruns raised its anticipated price tag from €3 billion to over €8.5 billion in 2012. This led TVO and its technology supplier, a joint Areva-Siemens consortium, to sue one another for billions of euros in compensation. In October 2017, TVO planned for Olkiluoto 3 to be operational by May 2019. As I write now in May 2020, the reactor remains a costly work in progress, scheduled to begin operations in November. Insiders, however, suggest the COVID-19 pandemic could push this start date back even further. TVO's plans to build a fourth reactor have also stalled. In May 2014, TVO sent a request to Finland's MEE soliciting a 5-year extension of its initial 5-year go-ahead decision. TVO's request was rejected in September 2014.

When I met with Alaknam for a final time in 2014, he appeared somber. He did not excitedly riff ideas or boldly compare the *mankala* corporate form to Finns' supposed propensities for cooperation, solidarity, or trust. Gone too were his past dreams of exporting Finland's *mankala* corporate form abroad. He felt discouraged by the global nuclear energy industry's uncertain financial futures. A longtime rationale for setting up *mankalas* was that they could reduce overhead costs through private ownership, generating energy closer to production price than to Nord Pool's market price. This, Alaknam now lamented, was no longer the case. In late 2013, a Finnish informant working at a multinational accounting firm explained that the *mankala* model's financials stopped adding up. Cooperators were now paying more for *mankala* nuclear energy than for Nord Pool energy. Meanwhile, Finland's *mankala* syndicates were increasingly criticized in the media.

Alaknam's past generalizations about a "distinctly Finnish" spirit of cooperation fragmented into a series of more qualified specifications about (mis)trust. Alaknam now reflected on (a) *mankala* owners' (mis)trusts in cooperating on new reactor projects, (b) *mankala* owners' (mis)trusts in their own and others' financial futures, (c) Finland's (mis)trusts in cooperating with Russian companies, (d) Finland's public's (mis)trusts in nuclear energy companies' and their financiers' national loyalties, and (e) my own (mis)trusts in the optimistic analyses informants shared with me back in 2012. A profusion of (mis)trusts spawned. Shifting and reshifting political, financial, and technological uncertainties waxed and waned. When trust was down, informants were more restrained in describing the *mankala*'s "uniquely Finnish" cultural essence. They became less likely to speculate about Noble Nordic trust in playful, open-ended, imaginative ways. Some grew nostalgic for TVO's 1970s "golden age" of simpler *mankala* solidarity.

Others worried that, if Fennovoima were to ultimately collapse into insolvency, its dissolution would call the *mankala* corporate form's legitimacy into question in Finnish courts and media. Nevertheless, an industry-wide commitment to upholding the principle of *mankala* cooperation endured. In light of this, some held onto hope for tomorrow: “[T]o finance and build a nuclear reactor, you need to believe in the future,” Alaknam told me.

VII. DISCUSSION: PATHWAYS

This paper's objective is to examine the *mankala* corporate form's practical implications ethnographically and to emerge from fieldwork with a roadmap for more productive collaborations between academic anthropologists and nuclear energy practitioners. To this end, I will now take a step back and reflect on anthropology's capacity to offer more vivid understandings of the promises and perils of novel organizational forms like Finland's *mankala* corporations. My interest is in exploring how and whether this case study can inspire new avenues for institutional innovation and cross-disciplinary interaction. I conclude now with three “pathways” through which ethnographic analysis of novel organizational forms could inform future decision making.

VII.A. (Pathway 1) Holism: Exploring Diversities of Perspective

Studying Finland's *mankala* corporate form ethnographically revealed its multidimensional character: how it got perceived differently by different informants coming from different professional, disciplinary, and ideological backgrounds. *Mankalas* looked more like collaboration from some perspectives (e.g., when Alaknam framed them as a collegial form of joint activity within a tight-knit “club” or “brotherhood”), more like collusion from other perspectives [e.g., when Oona criticized the exclusionary, nontransparent, undemocratic *lehmänkauppa* (“cow trade”)], or more like cooperation from still other perspectives (e.g., when Marita described *mankala* as a banal “small country” technique for efficiently orienting formal business partners toward shared goals). Engaging with these viewpoints revealed how joint endeavors can cohere despite “radically diffracted observations generated by participants” and a “multiplicity of devices or participant observations whose ‘collaborations’ cannot be grasped from any one perspective” (Ref. 76, p. 363). It revealed how, to use anthropologist Strathern's terms, “what may seem like cooperation to one party may appear as exploitation or

intrusion to another” in “interchanges [that] may or may not be marked as collaboration” (Ref. 77, p. 109).

By drawing multiple perspectives into a single frame of analysis, anthropologists can help nuclear energy practitioners discern points of (mis)communication, (mis)interpretation, and (dis)agreement across diverse groups of customers, industry insiders, and public commentators who might not ordinarily interact. What two Green Party members of the European Parliament saw as an “elite club” devised to secure hidden tax advantages was, to a Fennovoima manager, instead a symbol of Finnish trust, solidarity, and nationhood. Scrutiny of these divergences can offer a more holistic, wide-ranging, outsider's perspective on the unexpected, often incommensurable, ways that nuclear energy financing is perceived across contexts. This can serve as a basis for cross-cultural and cross-regional comparison. Whereas a Finnish economic historian compared and contrasted *mankalas* with domestic cooperatives like *Metsäliito* or the *LähiTapiola* Group, a Finland-based lawyer compared and contrasted it with Danish wind cooperatives and Japanese business culture norms. Juxtaposing these associations with existing anthropological studies, such as Riles' ethnographies of Japanese finance professionals or Abrahams' work on Eastern Finland's farm equipment sharing, can aid nuclear practitioners in understanding their financing arrangements' historical, cultural, and political complexities.

When nuclear practitioners engage with diverse viewpoints via detail-driven articles curated by anthropologists, their thinking can extend outside its usual institutional horizons, information silos, and ideological echo chambers. Hiring an embedded anthropologist, as a consultant, perhaps, could foster more adaptive management⁶² by supplying decision makers with ongoing intakes of internal critiques, outside perspectives, and comparisons to analogous initiatives they may not otherwise notice. The anthropologist could interview several actors in a stakeholder network and emerge with a broad-spectrum “jack of all trades, master of none” analysis, always partial and situated in a specific context,²³ of their diverse perspectives. Writing reports, briefs, or articles assessing how nuclear projects are perceived by key insiders, observers, and critics could cultivate more flexible, adaptive, multiperspectival outlooks among practitioners. To achieve their full potential, however, their analyses must be made transparently available for educated publics to read and respond to—not only because their feedback can be a source of understanding, but also to avoid re-entrenching the information

asymmetries that too often hinder participatory decision making.⁵⁸

VII.B. (Pathway 2) Tracking: Examining Institutional Performance

Studying the relational ties that formed within and extended from Finland's *mankala* companies revealed how their nuclear reactor financing initiatives took shape, changed shape, and retained shape at different moments in time. This helped track how Finland's *mankala* circuit's internal composition and public reception shifted as Fennovoima's owners divested, as Germany's E.ON was replaced by Russia's Rosatom, as Finnish politicians redefined the term "national investor," and as Migrit Solarna Energija sought to join Fennovoima. Yet it also underscored how the *mankala* model still endured as a framework for organizing ownership, capital, and energy production even when TVO's and Fennovoima's cooperative interests and financial outlooks destabilized. This not only illuminated the modalities of trust, belief, and reciprocity that held *mankalas* together, it also flagged how they can be vulnerable to unanticipated economic swings (e.g., the global financial crisis and European sovereign debt crisis), geopolitical events (e.g., Russia's annexation of Crimea), shifting public perceptions (e.g., lobbyists' "massive defence" of the *mankala* model), and more.

Embedding a fieldworker in novel reactor financing arrangements (*mankala* or otherwise) can similarly help nuclear energy practitioners assess the performance of alternative or experimental organizational forms. This paper not only provides a play by play of how Finland's novel *mankala* model changed over time, but also how it persisted as a matrix for orienting cooperation and institutional inertia into the future. This revealed both (a) the political-economic drivers that caused TVO and Fennovoima to destabilize and (b) the solidarities, beliefs in the future, and spirits of intra-club cooperation that enabled them to never fully collapse into bankruptcy. It also differentiated between the aspects of *mankalas* construed as culturally specific (e.g., Finnish business culture's "traditional" reliance on "gentlemen's agreements" and the "churchtower principle") versus those seen as adaptable for export elsewhere (e.g., the private Articles of Association contracts Alaknam insisted could be adopted by other "small countries"). Finally, it depicted a series of positive and negative public associations, from exclusionary, gendered *hyväeliverkosto* ("dear brother network") clubbishness to patriotic, cohesive "Finnish trust" imaginaries, that gave *mankalas* their aura of distinctiveness.

In light of this, one could envision an anthropologist employed in something like an auditing or project assessment role, curating empirical accounts to help nuclear energy practitioners qualitatively gauge a novel or experimental organizational form's promises and perils, successes and failures, costs and benefits. The anthropologist—embedded in, say, the early "pilot" phase of the novel arrangement—could remain in sustained interaction with actors both external (e.g., activists, academics, or journalists) and internal (e.g., engineers, project managers, operators, and administrative assistants) to the organization. The resultant polyvocal analysis could help decision makers discern which aspects of the novel approach require reform, which ought to be discarded, and which ought to be expanded. This could integrate greater reflexivity—an openness to self-reflection, self-critique, and adaptive change—into decision making. Nuclear personnel, like anyone else, reflexively go about their lives.⁷⁸ However, the most high-performing ones are often those most open to ongoing, culturally sensitive learning, embracing modes of self-critique that do not paralyze action (Ref. 29, p. 64). Integrating ethnographic feedback into nuclear decision making, then, can not only nurture a professional ethos of self-awareness, but also help decision makers more reflexively assess a novel organizational form's pros and cons.

VII.C. (Pathway Three) Translation: Making Technicalities Accessible

For many industry informants, *mankala* cooperation was Finland's nuclear sector's lifeblood. Yet it remained easy to overlook. Few Finns I met had heard of it. When I met educated Finns who closely followed current events, they seemed to have only a vague grasp of the cooperative relationships behind TVO and Fennovoima. In Finnish media reports on nuclear power, the term *mankala* was mentioned only occasionally, usually as a quick side note, if it was mentioned at all. In 2012, I met a Finnish business professor who studied energy issues. He had barely heard of the term. He laughed when I, an American doctoral student, insisted over drinks that the *mankala* model is an important feature of Finland's nuclear sector. He suggested that, even if *mankalas* were unique, there was simply no serious global debate about the relationship between cooperative ownership and nuclear power. So, why bother studying it? The *mankala* model seemed, to him, obscure.

Collaborations between anthropologists and nuclear energy practitioners can help discern the origins, extents, and implications of common gulfs between academic, media, public, and industry

perceptions of nuclear energy financing. Among outsiders, the *mankala* model appeared only as a bundle of arcane legal and financial minutia found in policy briefs, industry reports, and regulatory documents. The concept's sheer mundanity and complexity tended to deflect journalists' and academics' attentions away from it, keeping *mankalas* off their and their colleagues' radars. Yet, by conducting fieldwork among actors who interacted regularly with *mankalas*, I encountered several more compelling and timely ways of conceptualizing, analyzing, and articulating *mankala* cooperation. Conducting fieldwork helped me draw out the broader significances of what, at first blush, seemed only like tedious, legalistic, jargon-laden technicalities. In this paper, it helped me reposition a deceptively esoteric corporate form within hot-button debates about global power politics, economic recession, Finnish national cohesion, and elite in-group favoritism.

This underscored anthropology's capacity to digest crucial nuclear energy legal-financing technicalities and translate them into lines of thinking more accessible, and therefore more actionable, among wider networks of stakeholders who may be situated in very different niches of society. This can not only help make the technicalities more amenable to press coverage and societal debate, but also more legible among NGOs, interest groups, local communities, think tanks, marginalized groups, activists, social scientists, and others who ought to be more meaningfully included in reactor investment decisions. Papers like this could thus be repurposed as conversation pieces at, say, stakeholder focus groups, conference events, or public hearings. Or they could be addressed in participatory "boot camp" workshops that challenge nuclear energy practitioners to reconsider their work from several different standpoints (Ref. 29, pp. 216–218). These are but a few ways that holistic, empirical, anthropological inquiry can provide a more inclusive starting point for communication across the divides that now separate academic/industry, expert/lay, and social/physical scientific communities.

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