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Mining Towns in Transition

Arctic Legacies

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Towns built around mining operations in the Arctic tend to be vulnerable during de-industrialization as most jobs are in a single industry. This one-sided labor market, along with substantial distances to other employers or business opportunities entails very limited access to alternative sources of income. Therefore, when a crisis hits, the challenges of sustaining former mining towns are particularly severe. Another challenge is the legacy of the mining past that the companies leave behind.

In this chapter, we use a broad definition of the concept of legacies: It will signify anything handed down from the past, material and immaterial. To define what mining legacies may consist of, we will apply a socio-technical systems perspective, incorporating all social and physical components needed for mining (Hansson, 1998; Avango et al., 2019). Thus, material legacies of mining are artefacts and structures constructed and used in mining systems, such as mines and processing plants, infrastructure for transport and energy, waste and morphologically transformed landscapes, as well as built environments for housing, services, and sociocultural activities such as sports, entertainment, culture, and religious practice. Immaterial legacies of mining can be entities such as skills, identities, and memories.

Research on the role of such legacies in post-industrial transitions has shown that they can be used for supporting the sustainability of industrial settlements beyond the end of the industries supporting them (Isacson, 2013; Orre, 2016; Kempinsky, 2017). This can take different forms. One is by *re-using* and *re-purposing* material legacies, for example, running a workshop in a former generator building or using a mining road as a tourist trail. Another is by *heritagization*, which we here define as a process in which actors define and ascribe particular and exclusive historical values to selected legacies and protect them for posterity (Harrison, 2013). Heritagization can generate new economic values but also other values, such as quality of living. Can legacies from the past also help Arctic mining towns in transition to survive?

https://doi.org/10.1017/9781009110044.017 Published online by Cambridge University Press

Under what circumstances can legacies of a mining past contribute to the long-term sustainability of Arctic mining towns subject to economic crisis and de-industrialization? To answer this question, this chapter explores different ways in which actors who own, live in, manage, and govern mining towns have dealt with such challenges. In particular, we will explore the roles that legacies of the mining past may have played.

The chapter draws on cases from two mining towns in the Arctic that are economically dependent on large socio-technical systems (Avango et al., 2019) for iron ore extraction and steelmaking – Kiruna in Sweden and Schefferville in Canada (Figures 2.2 and 2.3). Both towns were hit heavily by the economic recession in the western world from the middle of the 1970s. As the economic crisis for the industry deepened in the early 1980s, the history of large-scale mining in the iron ore deposits of the Swedish and Canadian north appeared to have come to an end. The chapter explores how different actors in those mining towns envisioned a future beyond mining, how they eventually dealt with the crisis, with what outcomes and why.

Steel and Mining Crises Hit the Arctic

The postwar decades were a golden age for industrial growth. Between 1950 and 1974, the global demand for steel products increased by an average of nearly 5 percent per year (Warren, 1985; Magnusson, 1996; Cameron et al., 2006). Settlements based on iron ore mining were established in different parts of the world while already existing ones expanded their production capacity. The economies of these settlements were predominantly related to mining, with a one-sided industrial base and labor market, and when the oil crisis of 1973 hit, the vulnerability of these became evident. Substantial parts of the energy that the companies used to power processing plants, transports, and mining came from oil. As energy prices rose, the demand for steel in turn stagnated, which eventually resulted in a steel crisis, first and foremost affecting the western world. At the same time, western steel production was further challenged when Asia became the main steel producer on the world market. Asia had both an internal market for steel and could in addition export steel products to the western world at a significantly lower price. Western iron ore export and steel production also faced competition from, for example, Africa and South America. To handle the competition, western governments and companies designed and implemented large rationalization schemes for the steel- and mining sector, often resulting in shutdowns (Warren, 1985; Eriksson, 1991; Larsson, 1993; Magnusson, 1996; Cameron et al., 2006).

For Sweden, the general economic crisis in the iron ore mining and steel sector resulted in extensive redundancies. In an attempt to save some mining and steel industries, state and corporate actors concentrated the steel production to a few places in Sweden, a pattern similar to other steel-producing countries in the western world. To save the Swedish steel industry, a comprehensive restructuring

of the steel and mining industry was implemented, with, for example, the merger of several large steel producers (Eriksson, 1991; Magnusson, 1996). The Swedish steel industry was reduced by over 30 percent, and the crisis also led to a sharp decline in demand for iron ore.

Consequently, the mining industry too went through an extensive structural transformation. Most iron ore mines in Sweden were shut down. The mine in Kiruna was also hit hard by the crisis. In 1981, the state-owned mining company Luossavaara-Kiirunavaara AB (LKAB) was very close to bankruptcy, large parts of the employees in the Kiruna mine were laid off, and the Swedish government started to prepare a decommissioning of LKAB's mining operations there. However, the crisis averted shortly thereafter and the Kiruna mine survived (Eriksson, 1991; Myhr Jansson, 2015). The economic crisis also hit Canada, where the Schefferville mine was closed in 1983. Only the mines of the Fermont/Labrador City region maintained production (Bradbury, 1982; Thistle & Langston, 2016).

Kiruna

Kiruna, located in Norrbotten county in northernmost Sweden, is the most significant mining town in the European Arctic, with the largest underground mine for iron ore in the world – a mine that together with nearby iron ore mines produces approximately 80 percent of the iron ore in the European Union (LKAB, 2019).

The iron ore bodies in Kiruna that were found in the seventeenth century were prospected and test-mined in the eighteenth century. At this time, the Indigenous Sámi and Tornedalians[1] inhabited the area. They were mainly using the land for hunting, fishing, cattle-based agriculture, and reindeer herding. LKAB started the first permanent mining operations in Kiruna at the turn of the twentieth century, establishing the mine and the mining town. The Swedish state established a railway to facilitate transport of ore, goods, and people, connecting the mines with shipping harbors in Luleå at the Gulf of Bothnia and Narvik on the Norwegian north Atlantic coast. The mine and the railway, which were both in operation from the early years of the twentieth century, created difficulties for Kiruna's Sámi population who were using the lands for, for example, reindeer herding. The railway was drawn directly over reindeer migration routes, and the mining facilities and the town of Kiruna were built within essential reindeer migration and grazing lands (Persson, 2013; Österlin et al., 2023, see Chapter 5).

Throughout the twentieth century, LKAB expanded their mining activities in Kiruna, in particular during the decades following the Second World War. Growing infrastructure such as new roads, the expansion of residential areas, and associated increased pressure from other types of land use hampered the Sámi reindeer herders' ability to conduct traditional reindeer husbandry, as well as the Tornedalians' ability

to fish, hunt, and use bogs to harvest hay, infringing on their traditional livelihoods (Persson, 2018). In the first two decades of mining in Kiruna, in the early twentieth century, the LKAB did not employ either Sámi or Tornedalians. It was not until after the First World War that the mining company employed the first Tornedalian workers to carry out traditional mining work (Persson, 2015), and the company did not employ Sámi until after the Second World War (Persson, 2013).

Coping with Crisis: Using the Built Past in Kiruna

The steel crisis in the late 1970s had severe consequences for Kiruna. During the period 1976–1980, the town's population decreased by nearly 5 percent, and in the period between 1980–1987, the population decrease exceeded 10 percent. It was primarily young adults who left the city due to lack of jobs, as the labor market was largely concentrated on the downscaling mining and associated businesses. Another effect of the population decline was that Kiruna now developed a large housing surplus. This brought costs for the Kiruna municipality,[2] since all empty buildings had to be kept warm in order to avoid rapid decline, which in turn led to general cuts in municipal services. The decrease in population naturally led to a decrease in tax revenues, and municipal services were further weakened. Poor services, in turn, meant that even more people left the town at the same time as the inflow of new citizens was insignificant (Eriksson, 1991; Doc. 1; Doc. 2.). Under the imminent threat that the mine in central Kiruna might have to be shut down, LKAB decided to close its mining operations in Tuolluvaara, located about 4 kilometers east of central Kiruna. Accordingly, many jobs either ceased or ran the risk of ceasing in the near future (Eriksson, 1991; Törmä, 1996). This gave rise to a diminished belief in Kiruna as a place with a prosperous future (Doc. 2).

To curb the decline in population, the municipal government worked with a variety of initiatives to create alternative employment opportunities in other industries. At the same time, the municipal government decided to reduce the housing stock to better match the decreased population. This decision was further substantiated by a measure initiated by the Swedish government, which provided financial compensation to municipalities that demolished unused housing to attain a balanced economy. Accordingly, the municipality of Kiruna formed a demolition committee led by the municipal council. The target in their plan for demolition was primarily older housing stock (Doc. 2; Hedborg, 2021).

In connection with the extensive steel crisis, the state, as owner of LKAB, worked toward cutting costs within the company. As mentioned previously, voices within the Swedish government argued in favor of completely shutting down the company's mining operations for good. The Swedish government set aside hundreds of millions of Swedish kronor (1 Euro is approx. 10 Swedish kronor) in

anticipation of such a decision. Another cost-cutting measure was to demolish most of LKAB's housing stock. Money for a project that would, among other things, be used for demolition and remediation activities was also set aside from the Swedish government (Doc. 3).

However, LKAB's and the municipality's plans for demolishing older housing units were formed at a time when a new interest in historic buildings in the mining town grew. The interest was part of a larger ideological trend in Sweden, favoring the preservation of historic built environments. This trend was a reaction to a large-scale re-development of Swedish town centers from the 1950s through the 1970s, in which municipalities demolished over 40 percent of the oldest housing stock to make way for new, more functional housing, shopping centers, and parking garages. In the prevailing future-optimistic spirit of the times, no buildings were safe. Everything from workers' quarters, decorated wooden houses, and city center nobility palaces were inexorably demolished. This version of urban transformation began to be criticized, and counter-movements resulted in a new type of cultural policy, favoring protection of cultural heritage. A new awareness grew in broad layers of the Swedish population. The immense demolitions were strongly questioned, and cultural heritage protection was significantly strengthened (Johansson, 1997). A part of this movement was increasingly concerned with the demolition of built environments from industrial society (Isacson, 2013), with the last-minute rescue of the textile industry quarters of the south Swedish town of Norrköping in the late 1970s as an important event, paving the way for later preservation actions (Alzén, 1996).

The growing interest in preserving what remained of older Swedish town centers also reached Kiruna, where it was boosted by local developments in culture and politics. The first signal of the change was a doctoral dissertation in art history focusing on how the founders of Kiruna designed the town and its architecture (Brunnström, 1980). The dissertation, which featured a generous selection of photographs of Kiruna's historic built environments, received much attention and was printed in a popular science version, which became widespread (Brunnström, 1981). It contributed to a growing awareness among Kiruna's residents about the history of their own mining town, its buildings and landscapes, and the appreciation of it as a cultural heritage. The second development was a project led by the County Administrative Board of Norrbotten. The project aimed to preserve the oldest buildings in an area of Kiruna known as the company area (Bolagsområdet in Swedish) – buildings that LKAB had planned to demolish. The county and Kiruna municipality implemented a conservation plan for the area, and in 1986 set up a trust with the task of conducting conservation there (Kiruna municipality, 1986; Hedborg, 2021).

Another factor that worked in favor of preserving instead of demolishing was an enduring idea about Kiruna as a site of cultural significance. The founders of Kiruna supported public education, art, and other forms of culture, and as a result,

early Kiruna had high-quality art exhibitions, open to the public. The mining company invited the best-known Swedish artists of the time to perform their art and purchased substantial quantities of artworks that are still present in public and LKAB buildings (Andrén, 1989). Together with elaborate architecture and planning, this contributed to the idea that the town itself embedded cultural values. The municipality's decision to enroll famous architect Ralph Erskine in the re-design of central Kiruna in the 1960s can be considered a continuation of this self-understanding (Egelius, 1990; Sörlin, 1993).

Triggered by this growing interest in preserving older buildings in Kiruna, local politicians formed a conservation committee, which created a plan for conservation of the oldest housing areas. There were now two different committees in the municipal administration, which worked with two opposite objectives – one for demolishing redundant housing, one for preserving built cultural heritage. The municipality bridged this contradiction by deciding to demolish the newest housing stock instead of the oldest, while providing LKAB with financial support to renovate the company's old housing stock. Funds that were meant to function as means to pay the redundant LKAB-workers during the crisis instead went to preservation work (Eriksson, 1991; Hedborg, 2021). The investments in preserving and renovating historic buildings became a successful contribution to the efforts of sustaining Kiruna through the crisis. Once renovated, the apartments became immensely popular. Kiruna residents queued for these apartments, which is a situation that prevails today. Art and cultural heritage together with a broad popular participation in social organizations became cornerstones of a humanistic way of sustaining the town of Kiruna (Hedborg, 2021).

Post-extraction Future Visions during the Mining Boom

In the early 2000s, prices for metals on global markets started to rise dramatically, driven by demand in growing economies in the global South and East Asia, China in particular. Consequently, companies launched prospecting campaigns, opened new mines, re-opened old mines, and expanded production in existing mines. This mining boom was global, but in Europe and North America it had a northern direction. The largest untapped mineralizations were located in the Arctic, and prices were high enough to guarantee profits despite high investment and operational costs (Bay-Larsen, Skorstad, & Dale, 2018).

In Kiruna, LKAB responded by deciding to open a new level in the ore body. Unlike previous decisions to open new levels, this meant that the company would have to perform the immense project of relocating the entire town because of land deformations that the underground mining operations would now cause. The expanding mining operations and the construction work in the town contributed to a diversification of the local economy, as well as a growing optimism in the town.

Lately, this optimism has grown even further, in the wake of LKAB plans to invest in steelmaking processes emitting less greenhouse gas (Myhr Jansson, 2015; LKAB, 2020). In this way, Swedish iron would become even more attractive on the international market and thus pave the way for expanded mining, new job opportunities, and regional economic growth. Expectations of increasing demand for copper and rare earth minerals, along with efforts to increase energy production from wind power, are at the same time increasing the competition for land. As a result, conflicts over what could be considered a sustainable local future are escalating, particularly in relation to reindeer herding but also regarding the consequences of the large-scale transformation of the town because of land deformations (Österlin et al., 2023, see Chapter 5; Rosqvist et al., 2023, see Chapter 6).

The mining boom and the future visions about green steel have not entirely taken planning for a post-mining Kiruna off the agenda. Substantial price falls of iron ore in 2014 and 2015 resulted in economic losses. As prices rose again, other challenges appeared. In 2018, when planning for opening yet another level in the mine, LKAB discovered that the ore body was substantially smaller at greater depths, making mining unprofitable. Therefore, the company launched new intensive prospecting campaigns in the vicinity and eventually identified new ore bodies to extract. These events were a reminder that no ore body and no mining boom lasts forever. Clearly, LKAB is also considering this, as demonstrated by the company's recent investment plan for the environmental remediation of its mining area at Kiirunavaara (LKAB & Ecogain AB, 2019).

At a workshop in Kiruna in 2019, possible future scenarios in connection with the mine's eventual closure were discussed, which resulted in five key themes: demography, jobs, heritage, diversity, and political influence (Nilsson, 2020; Nilsson & Sarkki, 2023, see Chapter 4).

The demographic challenges concerned outmigration that would lead to an aging population and a town lacking necessary commercial and social services, where buildings would be torn down and that the new town center that is currently under construction would never develop to its potential. Making the town's economy more diverse with a focus on other businesses than those related to mining could be a possible antidote to this, according to workshop participants, and ideas of alternative jobs, where the legacies of Kiruna's mining past would be of central value, were formulated. Legacies such as skills and knowledge from mining and mining-related professions that could be used elsewhere, perhaps to remotely operate mines elsewhere in the world, or in a tourism sector that uses mining history and the built environments and landscapes it has left as a resource. Other post-extraction businesses envisioned were a continued expansion of Kiruna's space sector, mining for other resources, and automation research.

To ensure sustainable local development, Kiruna must remain an attractive place in which to live and work, and heritage could clearly contribute to this. Kiruna

Figure 11.1 Kiruna town with its miscellaneous buildings. Photo by Curt Persson

could also become a model for sustainability, in terms of efforts to better manage the mine's impact on the environment. Workshop participants also mentioned areas in which local perspectives could be better integrated into the decision-making process.

In other words, actors in Kiruna still view the legacies from 120 years of mining operations as a resource for building a future beyond the end of extraction. The values of these legacies are multifaceted, and heritage values are only part of it. They have economic value because entrepreneurs can use them for new businesses, material legacies as well as immaterial in the form of knowledge, while municipalities can use them to create attractive settlements (Figures 11.1 and 11.2).

Schefferville

The Establishment of Schefferville The Creation of Schefferville

The iron ore deposits in the Schefferville region have been known since 1870. However, the need for steel to reconstruct Europe after the Second World War provided the incentive to, in 1949, create the Iron Ore Company of Canada (IOC), an US company created by the steel industry to open a mine in the region.

https://doi.org/10.1017/9781009110044.017 Published online by Cambridge University Press

Figure 11.2 Kirunavaara – the mountain where LKAB has been mining for over 120 years, designated as a national interest for cultural heritage preservation by the Swedish National Heritage Board, and an example of the heritage values that the mining operations have generated. Photo by Dag Avango

Before this, there was no permanent settlement in the region. In order to exploit the iron ore deposit, a railway had to be built to bring supplies for the construction of a new town and to bring the ore to the Sept-Îles port for shipping to the Midwest steel industry. The 578-kilometer railway through sparsely populated forest lands was completed in 1954, and the town of Schefferville was established the same year. A hydroelectric power station was also built to supply the town and mine. At its peak in 1976, Schefferville had more than 3,400 inhabitants (Rodon, Keeling, & Boutet, 2021).

However, the region was inhabited by two Indigenous nations, the Innu and the Naskapi, who lived in the area well before the establishment of the mine. With the opening of the mine and the establishment of Schefferville, the Innu were settled in two reserves on a piece of land surrounded by Schefferville: Lac-John established in 1960 and Matimekush established in 1968. The Innu worked at the mine, but they continued to hunt, fish, and gather on their territories since they were only employed for seasonal and unskilled jobs (Boutet, 2015).

The situation was even more complicated for the Naskapi since they were convinced in the early 1950s by federal government representatives to move from Fort Mckenzie, 300 kilometers north, to relocate in Schefferville to participate in the new mining economy. The whole Naskapi community travelled by foot to Schefferville only to find that nobody was expecting them. They had to find lodging among the Innu community until the creation of Kawawachikamach in 1981, a new village located 45 kilometers from Schefferville.[3]

https://doi.org/10.1017/9781009110044.017 Published online by Cambridge University Press

The Closure of Schefferville

In 1982, the IOC suddenly announced that the company would close the mine and the town of Schefferville. This came as a shock for the inhabitants of what had become a thriving town. IOC was planning to destroy the town, and all the inhabitants were advised to relocate to other mining towns in the region. Many workers moved with their families to Labrador City or Fermont, two mining towns located 300 kilometers south of Schefferville (Bradbury & St-Martin, 1983; Wolfe, 1992). The closure was also a shock for the Innu communities situated near Schefferville, who had no intention to leave their ancestral territory. The destruction started despite the protest of the Innu, who lived in overcrowded housing and were hoping to use the abandoned bungalows (Vakil, 1983). The Innu and the Naskapi are still resentful about the destruction of the hospital, the swimming pool, the movie theatre, the bank, restaurants and bars, churches, the bowling alley, the town gymnasium, the ski hill infrastructure, and the asphalted roads and sidewalks.

Only the hockey arena was left because the Innu mothers made a human chain around the equipment to prevent the bulldozer from destroying it (Wolfe, 1992; Boutet, 2015). In addition to the destruction of most of the town, IOC left a pervasive environmental legacy, leaving massive tailing mounts and open pits around the town. The Innu also managed to save the train by buying the equipment and the railway from IOC and now an Innu company, Tshiuetin, is running a passenger train between Sept-Îles and Schefferville. The train stops on demand along the line, allowing the Innu to access their hunting camp and thus practice their ancestral activities. The town that had 3,400 inhabitants in 1976, had only 155 in 2016, of which 40 percent are Innu (Rodon et al., 2021).

Post-extraction Future Visions during the Mining Boom

With the sharp increase of iron ore prices in the early 2000s, Schefferville has witnessed a revival of mining activity. Many new mining projects were announced, although only one mine, owned by Tata Steel, opened in 2012 near the former IOC mine. Tata Steel succeeded in keeping the mine open, despite a drop in iron prices caused by an economic slowdown in China, the same year that the mine opened. In 2016 prices started to rise again.

Due to jurisdictional issues and changes in human resource management, the new mine had minimal positive impacts on Schefferville and many negative ones. First, all the workers at the new mine are on a fly-in fly-out (FIFO) schedule, and during their shifts, they reside in a camp located at the entrance of the mine and not in Schefferville. Second, the new mine is located in Newfoundland and Labrador, while Schefferville is in Québec, even if the mine is only 20 kilometers from the

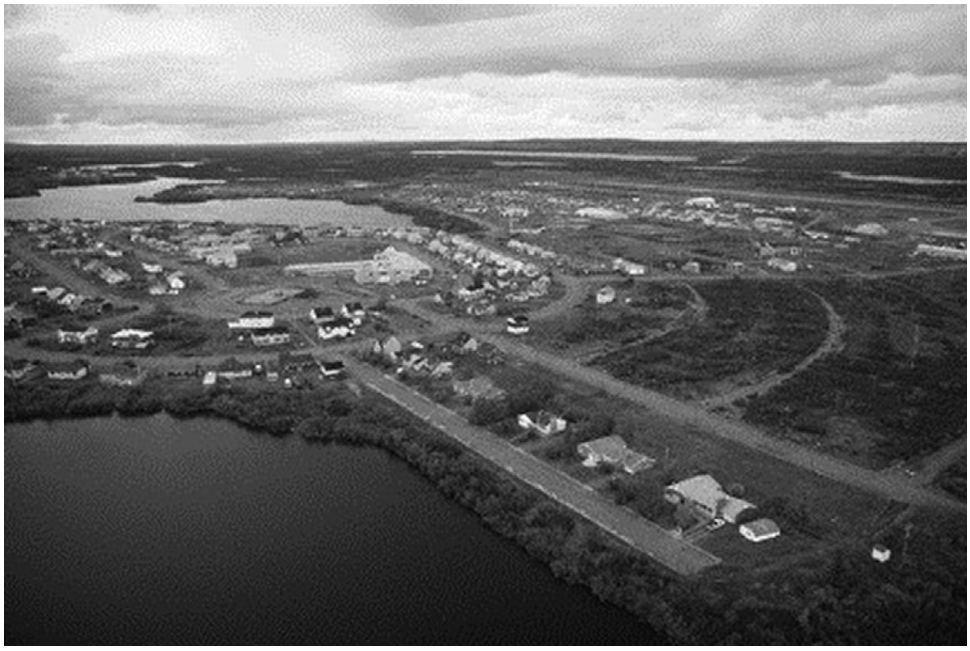

Figure 11.3 Schefferville and Matimekush, Québec: the empty lots to the right are where the houses were destroyed. Photo by Pierre Bouchard — Simon Pilot, Copyrighted free use, https://commons.wikimedia.org/w/index.php?curid=3670850

town. This means that Tata Steel pays taxes to Labrador/Newfoundland, but since the only access to the mine is through Schefferville airport, all the workers transit through it, and since there are very few services in town, they usually drive directly to their compounds. The town has now a ghost town feel, due to the markedly reduced population. Only one restaurant and a general store serve Schefferville and Matimekush, and some sections of the town are derelict. On the other hand, Matimekush is a growing settlement, but there are few services, wide roads, and empty lots separating each house, and very few people in the streets (Figures 11.3 and 11.4). For the Innu, real-life is not in the remains of Schefferville but in the Nutshimit – the forests, lakes, and rivers surrounding the town. By contrast, Kawawachikamach, the Naskapi settlement, 45 kilometers from Schefferville, has lots of new buildings and a large school. The town resembles many other Canadian Indigenous communities. Here, mining is less present in the community space, but it is still in people's minds (Rodon et al., 2021).

Schefferville does not seem to have a thriving future. Even with the opening of the Tata Steel mine in 2011, the town has not been able to benefit much from this development. The population has failed to increase, as the mining is based on FIFO workers who only cross Schefferville on their way from the airport to

Figure 11.4 Tata mine and Iron Ore Company pit left from earlier exploitation. Photo by Thierry Rodon

buildings located near the mine, where Tata Steel provides food and lodging. In fact, with the opening of the mine, Schefferville mainly collects iron-red dust and mud, brought in by mining trucks and workers, which is ubiquitous in town.

The two Indigenous communities of Matimekush and Kawawachikamach that now constitute most of the population in the region have a high rate of fertility, and to them, the region is not about mining but is their home, with multiple lakes and rivers, holding other values than those related to mining. The two Indigenous communities are also better able to benefit from mining since their rights are now recognized by the Canadian court and the government. Those rights might include ancestral title to the land, and this makes it impossible to open a mine without first signing an impact and benefit agreement (IBA) with the Indigenous communities concerned (Southcott et al., 2018; Rodon et al., 2021). These agreements present a form of consent, offering legal protection for the company. IBAs usually provide a share of the mine's benefit, a share of mining contracts for Indigenous contractors, and employment for Indigenous workers. Tata Steel has signed an IBA with both Matimekush and Kawawachikamach.

This constitutes an interesting turn of fate, where the Indigenous people that were totally ignored during the early mining operation in the 1950s are now the only communities able to benefit from mining. Finally, an Innu entrepreneur has bought the Hotel Royal in Schefferville and plans to fully renovate it to be able to accommodate visitors. Matimekush has also managed to create a future by negotiating a reconciliation agreement with the mining company Rio Tinto, who have purchased IOC. This agreement is in fact an out of court settlement between the Innu communities of Matimekush and Uashat Mak Mani-Utenam that were demanding 9 billion Canadian dollars for past impacts. The agreement aims to compensate for past environmental damage left by IOC by investing in housing, roads, community equipment, and railways, the only terrestrial transport that links Matimekush to Sept-Îles and the rest of Québec. The agreement amounts to a total of 6 billion Canadian dollars (Rodon et al., 2021). The future of Schefferville is clearly in its Indigenous communities that were here before the mine.

Comparing and Concluding Discussion

The fates of Kiruna and Schefferville have differed greatly and so have the roles of legacies from the past during the dramatic transformations these towns underwent when hit by the 1970s economic crisis and the early twenty-first century mining boom.

In Kiruna, a broad societal movement aiming to stop the demolition of older buildings in Swedish towns fed into local campaigns to preserve historic built environments. This is an example of what Rodney Harrison (2013) defines as unofficial heritagization, which in this case led to official heritagization, when state and municipality provided the legal and financial means to save a historic built environment from demolition. This process made it possible to not only preserve and reuse buildings from Kiruna's history as a mining town but also to boost non-mining segments of the local economy, support local identity, and thereby contribute to the sustainability of Kiruna through this time of crisis.

In Schefferville, there was also a social movement growing to preserve the mining town after the company closed its operations. However, this movement gained momentum too late, managing to save only some of the buildings. Moreover, in Schefferville there were no state actors present as in Kiruna, with the financial means and political will to save the built environment from demolition. In other words, no official heritigization took place. Instead, the company was able to realize most of its plan – to empty the town of its workers and demolish houses.

These differences are explained by several factors. First, the most important is the difference of ownership and governance of mining settlements in Sweden and Canada, during the period analyzed in this chapter. In the Canadian Arctic, most mining towns were company towns in which the companies owned the

https://doi.org/10.1017/9781009110044.017 Published online by Cambridge University Press

infrastructure, housing, and all recreational services. The companies could do whatever they liked with their property and generally destroyed towns when closing the mine to avoid liabilities – which happened to, for example, Gagnon in 1985 (Wolfe, 1992), or Nanisivik, which was destroyed despite efforts of the local Inuit population to reclaim the housing (Bowes-Lyon, Richard, & McGee, 2009). This set-up is a result of how mining settlements have been conceived in Canada historically, operated on the assumption that the mine is a temporary operation with temporary workers (recently often as FIFO operations). Even when a town was built, as in Schefferville, the underlying assumption was that it should not survive the economic life of the mine.

In the history of the Swedish Arctic, there have also been several company towns, which companies dismantled after ending their operations. Examples are settlements built for the construction of hydro power stations, such as Messaure and Harsprånget, but also mining towns such as Laver and Nautanen (Hallin, 2003; Sundin, 2003; Avango et al., 2023, see Chapter 10). Kiruna in the context of the 1980s steel crisis, however, was governed in the same way as any town in the country at that time, as integrated parts of the Swedish state and welfare society. Even though LKAB owned – and still owns – substantial parts of the land, infrastructure, and built environments, the company did not own all of it. Just like any municipalities in Sweden, an elected municipality government governs Kiruna. The municipality oversees urban planning, which includes decisions on how to deal with historic built environments. Unlike the IOC and Tata Steel in Schefferville, the politics in Kiruna municipality include planning for the long-term future, and the future beyond mining. Conceptions inherited from the past were also at play in Kiruna at the time when the settlement was founded, here with an idea that Kiruna was there to stay, with a long-term role in large-scale industrialization of the Swedish Arctic and because the company estimated that the ore body would last forever.

The differences in ownership and governance are the most important reasons why Kiruna municipality and the Swedish state tried to develop different alternative economies during the crisis in the 1980s – including preserving historic buildings to create new economic opportunities. They were responsible for doing so. The difference in size should also be considered. Kiruna was roughly ten times the size of Schefferville in terms of population, which worked in favor of making an effort to sustain the town beyond the end of mining. In the case of Schefferville, the IOC did not have any responsibilities to maintain the town beyond the end of their mining operation and no reason to think of long-term sustainability for the town, based on heritagization, re-use of built environments, or any other activity.

Furthermore, the growth of a broad popular engagement for heritage protection in Sweden, including industrial heritage, and the progressively stronger institutionalization of heritage protection did not happen in the same way in

Canada. Canadian legislation for urban planning contained tools for protecting heritage in the 1980s, but these institutions had no influence on company towns such as Schefferville. When the Innu residents of Schefferville wanted to bring an end to the demolition of the town after closure, there was no municipal government that could intervene and provide an alternative. The residents' only tool to protect buildings was to do it with their own bodies.

The differences between Kiruna and Schefferville must also be understood in the broader context of the two different socio-technical systems for mining. The system of which Kiruna and LKAB's mines are part is interconnected by a vast railway system transporting people and ore concentrates. It includes hydro-power stations, military infrastructures, shipping harbors at the North Atlantic, 200 kilometers west of Kiruna in Narvik, and at Luleå, 400 kilometers to the east at the Gulf of Bothnia. In Luleå, a major steel work is located, and there are several towns that, just like Kiruna, cater to the needs of those places. Since state and corporate actors built this system in the early 1900s, it has provided an opportunity for others to begin extracting other ore bodies in its vicinity, and for other economic activities such as forestry, steel manufacturing, wind energy, and tourism. The socio-technical system itself, a product of human efforts over a century, is a legacy that paved the way for diversification and the rise of new economic activities.

The system of which Schefferville was part was also made up of a railway connecting it to Sept-Îles on the Gulf of St. Lawrence. With this, however, the similarities end. The steelmaking process took place far away in the Great Lakes region of the United States, and no one established any new industries or towns along the railway line to Schefferville. Therefore, when IOC shut down their mines in Schefferville, there were no other economic actors using the system. Today, instead of primarily relating to a socio-technical system of mining that no longer provided for them, the Indigenous people who remained on their territory when the company departed returned to a mixed economy with a blend of land-based activities and mostly government transfer payment or some employment to cover the expenses of going on the land (Natcher, 2009). A precondition for such a transition was that the ecosystem was relatively intact, for example, that the mine had left no permanent toxic legacy, but also that the socio-cultural context and the knowledge of living off the land had not eroded.

Conclusions

We have shown in this chapter that the possibilities to sustain Arctic mining towns undergoing crisis, by creating new values out of legacies from the past, is dependent on several factors. First, there must be institutional frameworks providing possibilities for preserving and re-using historic built environments.

Second, there must be a perception that legacies of closed industries can have values, either as cultural heritage or as resources for new economic activities. Third, the socio-technical systems for mining need to gain a momentum of their own.

Finally, we also conclude that both the Kiruna and Schefferville cases show the importance of local initiatives for sustaining the life of Arctic mining towns beyond the end of extraction. In both Kiruna and Schefferville, local actors envisioned ways of re-using legacies of mining for sustaining their towns and in several cases also realized those future visions. In Kiruna this entailed material legacies such as the built environment but also immaterial legacies such as know-how and perceptions of cultural values. In Schefferville, Innu entrepreneurs are re-economizing the railway system, once built for ore trains, for transporting people between coast and inland, and have re-opened the former company hotel, which brings new income, services, and diversification to their community.

Notes

1 A Swedish minority. Their mother tongue is *meänkieli*, which is close to the Finnish language and since 2000 an official national minority language in Sweden.
2 In this chapter we use, from here on, the term *municipality* for the mining town Kiruna. Municipality is a translation to English of the Swedish term *kommun*. The kommun/municipality of Kiruna is a much larger area than the mining town itself, consisting of several other settlements as well as vast sparsely populated forests, bogs, mountains, and rivers. Kiruna town, the other settlements, and these lands are governed by the Kiruna municipal government.
3 The Naskapi have signed a treaty with the Quebec and federal governments; the Northeastern Quebec Agreement (NQEA) in 1978, extinguishing their rights on their ancestral territory in exchange for financial compensation and collective property, exclusive hunting and fishing rights, and some rights on the rest of their ancestral territory. The Innu were not included in the negotiation even if part of their traditional territory is covered by the NQEA, a treaty of which they were not part (Thériault, Bourgeois, & Boiron-Fargues, 2021).

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