

Twist and Tango – Mines moving cities in Arctic Sweden

An assessment of national-level adoption of international standards on expropriation, compensation and resettlement in the context of mining operations

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Key words: Urban Resettlement, Mining, Expropriation, Compulsory Acquisition of Land, Valuation of Property, Compensation, Sweden.

SUMMARY

The two cities Kiruna and Malmberget was formed in northern Sweden in the late 19th century, as a result of the establishment of iron ore mines in the same locations. Today the Kirunavaara and Malmberget mines have turned into the worlds two largest underground iron ore mines, proceeding deeper under the urban areas above and making the very ground that the cities stand on collapse.

The mines and the cities are mutually dependent, remotely located in a desolate arctic landscape, and they cannot resonably function without each other. For this reason, the mining company LKAB and the municipalities of Kiruna and Gällivare (where Malmberget is located) have had to form partnerships in order to relocate the affected urban areas, including i.e. residential properties, infrastructure and – in the case of Kiruna – the very commercial centre of the city. The result of the resettlement is that the urban areas transforms into new shapes, avoiding other areas of interest for mining purposes, indiginous land and other areas of national interest, while building sustainable living environments. This is a delicate dance of balancing different land use claims and other interests.

The work being undertaken rasies questions regarding urban and infrastructure planning, social, economical and environmental sustainability and, not least, issues regarding voluntary and compulsory aquisition of property with related compensatory challenges.

The *first objective* of this paper is to briefly describe the proceedings regarding the city of Kiruna – as a case study – and the legal framwork applicable in the relocating process. A *second objective* is to apply the method of *Tagliarino* to assess whether national laws of compulsory aquisition for mining operations comply with international standards on expropriation, compensation and resettlement (the VGGTs).

The assessment indicates that the applicable legal framework was not necessarily designed with the current situation in mind. In the light of the economic interests concerned and the number of actors involved, additional reform in the domain of compulsory aquisition might be appropriate.

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1. INTRODUCTION

The first objective of this paper is to briefly describe the proceedings of the relocation of the town of Kiruna in Northern Sweden (see Section 2 of this paper) and the most important parts of the legal framework applicable in the relocating process (Section 3).

As second objective is to assess the legal framework of compulsory land acquisition in the context of mining operations, against international standards on expropriation, compensation, and resettlement according to the approach of Tagliarino (2019). This is done in Section 4 of the paper.

Lastly, some concluding remarks are made in Section 5.

2. THE RELOCATION OF THE CITY OF KIRUNA

2.1 The founding of Kiruna and the mining company LKAB

The Arctic landscape of Northern Sweden includes an area known as the Ore Fields (“Malmfälten”). Two of the world’s largest underground iron ore mines are located here, right next to the towns of Kiruna and Malmberget/Gällivare, respectively.

The mines were established at the end of the 19th century. Adjacent to the mines, small communities were soon established. In Malmberget, a shantytown-like settlement grew up, with miserable living conditions. When Kiruna was established shortly afterwards, the mining company LKAB (founded in 1890) took measures to create a community with better living conditions than what was the case in Malmberget. The most renowned architects of the time were hired to create city plans and design high-quality buildings. The mining company also took responsibility for community services. The first school in Kiruna was built in 1901 and the company paid the teachers' salaries. Kiruna thus developed as a model city, or with the idea of becoming a kind of ideal society.

Since then, the city of Kiruna and the Kirunavaara mine have lived in symbiosis. When iron ore prices have been high, the company and the city have fared well. When there has been a recession, it has hit the isolated working-class town hard.

During the 20th century, the mining company was gradually nationalized, with the Swedish state acquiring shares in the company. The last shares were acquired by the Swedish state in 1976, and since then LKAB has been a wholly state-owned limited company. In 1952, the company also turned to underground mining, where extraction follows the ore body down under the town center of Kiruna.

2.2 The town of Kiruna in the 21st Century and the start of the resettlement process

By the beginning of the 21st century, the town of Kiruna had grown to a population of around 19,000 (lower than in 1975 when the city was at its largest and had just over 25,000 inhabitants). Demand for iron ore was rising on the world market. LKAB had developed a high-technological way to process the Kirunavaara ore and the expansion of the mine continued ever deeper below the city.

The underground mining methods cause deformations on the ground surface. The mining of ore now takes place at a main level that is located 1365 meters below the ground. The location of the ore body under the city makes the deformations on the ground move closer and closer to the urban areas, approaching the very city center. With this came the realization that the town had to be relocated if mining was to continue. The relationship between the location of the mine, the ore body and the city is shown schematically in Figure 1 below.

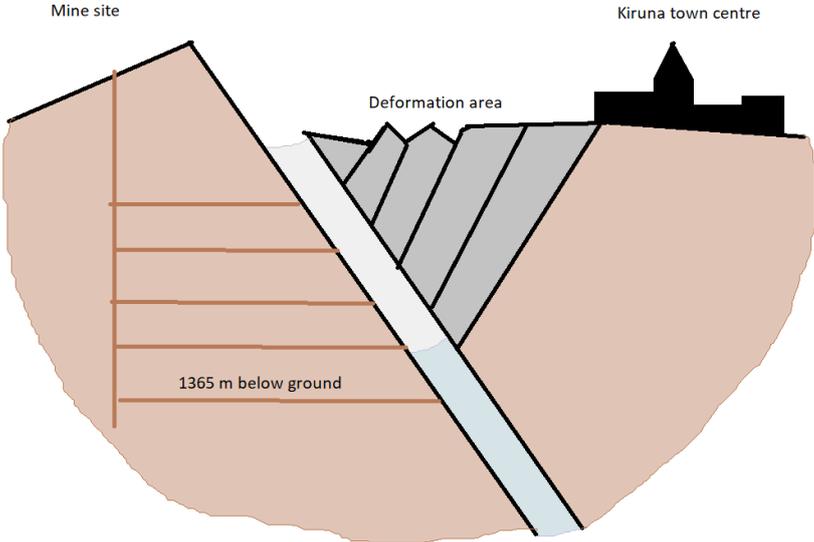


Figure 1. The ore body of the Kirunavaara mine, reaching in under the town, causing deformation of the ground above.

The municipality of Kiruna announced in 2004 that the town would be relocated to enable continued ore mining in the mine. The areas that will be affected by the relocation in the

foreseeable future are the main part of the commercial center, the railway area, and parts of the city center with mixed buildings and infrastructure.

After very strong political discussions, the city decided that the new center would be built northeast of the former Kiruna. The city formed a partnership with the mining company to plan for the implementation. The partnership included decisions in principle on the division of responsibilities for dismantling, expansion, and financing, etc.

The location of the new center has not been obvious. Although Kiruna is located in an area that can be perceived as isolated, there are many strong land use interests in the area. It is indigenous land used by the Sami people for reindeer herding. Mineral resources are found in many places that may be subject to mining in the future. Kiruna also has space operations with a launch area, etc. The strong competing interests have made it a delicate task to locate the new Kiruna in a suitable location.

In short, the implementation involves the municipality planning and deciding on permitted land use. Both in new areas and in areas that are to be dismantled. LKAB acquires the properties located within the deformation zones and dismantles buildings as the areas are no longer suitable for current use. During a transition period when the buildings have been demolished, but the areas do not yet need to be fenced off due to risk of landslides, so-called mining city parks are established with the aim of giving value back to the population that is forced to move. Responsibility for the establishment of the new town center is shared between the municipality and the company, and the company must pay for a substantial part of the reconstruction. There are divided opinions on whether the financing has been sufficient and fair.

The areas that are being dismantled contained not only housing and commercial property, but also many landmark buildings and important infrastructure, such as schools, a fire station, the church, etc. Due to the ambitions that were the basis for Kiruna's founding, many of these buildings have also been built with a very high architectural quality. Kiruna's center was designated as a national interest for the cultural environment. Because of this, several buildings have also been moved to the new center, in order to create continuity in the city's history and identity and to preserve great cultural values. A very important building that is being moved is Kiruna Church, which has been named Sweden's most beautiful building, see Figure 2.



Figure 2. The Church of Kiruna, planned for relocation to the new city center.

The relocation of Kiruna has had major consequences for the local community and many stakeholders have been faced with a *fait accompli* when the city is required to move. Many private landowners have reached voluntary agreements with the mining company, but not everyone. Given the relatively weak local property market, it is also not obvious that the compensation offered to a property owner is sufficient for that actor to be able to acquire a newly produced building with a corresponding purpose in the new part of town. In addition, there is a great housing shortage when many existing buildings are being demolished.

2.3 Current status of the relocation process in Kiruna

In the beginning of 2025, Kiruna's new city center has been in place for a few years. The city's administration and commercial center have moved from the old town center to the new one. Business travelers and tourists have found their way to the new, large hotel next to the new town square. Many landmark buildings in the old city center were demolished during the period 2020–2025.

Mining city parks have been created in the area between the mine and the remaining city.

LKAB has managed to acquire most of the properties in the former city center on a voluntary basis. Through property formation procedures according to the Property Formation Act, the land has been transferred to LKAB's properties.

In a final step, land access was completed in July 2022 when a decision from the authority Bergmästaren was announced, regarding so-called land allocation of a large part of the former city center. The decision means that LKAB, as the holder of a concession for mineral mining, may use the area for mining purposes. In areas where voluntary agreements are lacking, the

land allocation constitutes a compulsory acquisition. Two property owners opposed the measure and one of them also appealed the decision. However, that property owner later withdrew his appeal in the Land and Environmental Court.

Although a large part of the main resettlement process is pretty much completed, the process will continue for a long time to come, as the deformation zones eat into the remaining buildings of the older part of the town. Also several difficult questions remain. The finances of the municipality are very strained, because of the large investments that have been necessary for relocation. Kiruna is also the location of a regional hospital, which will also need to be replaced with a new one, in a new location.

The new Kiruna has been built with high ambitions – just like when the community was established just over 100 years ago. However, the transformation has come at a cost, for the local economy and for the social cohesion in the city. There have been legal tools to handle issues of urban planning, property formation and access to land. The following section provides a brief overview of the legal framework applicable.

3. LEGAL FRAMEWORK OF THE RESETTLEMENT PROCESS

In this section the Swedish legal framework of compulsory land acquisition in the context of mining operations is very briefly described. The description of applicable laws is far from exhaustive but contains some of the most important legal rules that have been applied in the process of moving Kiruna to enable continued underground mining in the Kirrunavaara mine.

3.1 The Expropriation Act (law no. SFS 1972:719)

The Expropriation Act contains rules on compulsory acquisition of land and compensation. Swedish law allows compulsory acquisition according to a number of special laws that regulate special situations. These special laws then have precedence in the application of the law. However, the compensation rules of the Expropriation Act are generally applied in these situations as well.

As a basic rule, anyone who gives up land against their will shall receive compensation corresponding to the market value of the property, with a surcharge of 25%. If other damage also occurs as a result of the expropriation, this shall also be compensated (but without a surcharge).

3.2 The Planning and Building Act (law no. SFS 2010:900)

The Swedish Planning and Building Act gives Swedish municipalities a decisive influence in urban planning and the design of the physical environment within the municipality.

Municipalities can decide on both indicative and legally binding plans for how land may be used and developed. Land use that conflicts with the legally binding so-called detailed development plans is not permitted. The municipalities also have tools to prevent such use. In addition, other authorities are not allowed to make decisions that conflict with the municipal plans.

3.3 The Minerals Act (law no. SFS 1991:45)

The Minerals Act regulates how, and by whom, certain minerals may be searched for and extracted by prospectors. Through a concession, a prospector can acquire exclusive rights in relation to other prospectors to an area for mining activity, if certain conditions are met.

A concession holder can also initiate a process to forcibly obtain the right in relation to the landowner to claim an area for mining. This is done through a measure called land allocation. In this process, land needed for mining must be allocated. Damage that occurs must be compensated by the applicant. In all essentials, the compensation rules in the Expropriation Act then apply.

3.4 The Minerals Decree (SFS 1992:285)

The decree contains supplementary rules to the Minerals Act on how, among other things, the procedure should be carried out in various types of examinations and in decision-making by the relevant authority.

3.5 The Environmental Code (law no. SFS 1998:808)

The Environmental Code contains a number of regulations concerning both land use and environmentally hazardous activities, etc. Chapters 2 and 3-4 of the Act state provisions such as resource management and areas of national interest. These are important when considering a concession under the Minerals Act, since a concession may not be granted in violation of these rules.

The Environmental Code also contains the rules on environmental impact assessments (EIA).

To conduct certain types of environmentally hazardous activities, a permit is required. A mine is one such example. However, it is not necessary for the permit to be in place before, for example, a land allocation under the Minerals Act is decided. In this part, there is no relationship between the Environmental Code and the Minerals Act.

4. ASSESSMENT OF THE LEGAL FRAMEWORK OF COMPULSORY ACQUISITION IN THE CONTEXT OF MINING OPERATIONS

Tagliarino (2019) have developed a method to assess whether national laws comply with international standards on expropriation, compensation, and resettlement as established in Section 16 of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries, and Forests in the Context of National Food Security (the “VGGTs”). The VGGTs was endorsed by the United Nations Committee on World Food Security in 2012.

Below the Swedish legal framework of compulsory land acquisition in the context of mining operations is assessed against the indicators used by Tagliarino. Each table is followed by some remarks.

List of Expropriation Indicators (Table 6 in Tagliarino)	
1. Do the national laws provide a clear conceptualization of public purpose to allow for judicial review?	Partial
2. Do the national laws require the government to minimize the amount of land acquired to the amount necessary to achieve a public purpose?	Partial
3. Do the national laws require the government to conduct a proportionality test prior to expropriation?	No
4. Do the national laws require the government to conduct a feasibility study prior to expropriation?	Partial
5. Do the national laws require an environmental impact assessment (EIA) prior to expropriation?	Partial
6. Do the national laws require a social impact assessment (SIA) prior to expropriation?	Partial
7. Do the national laws establish special protections from expropriation for areas held by poor and vulnerable groups?	No
8. Do the national laws grant affected landholders the right to reacquire the land in the event that the land is unutilized or no longer needed for the project?	-
9. Do the national laws obligate the government to identify all affected landholders prior to expropriating land?	Yes
10. Do the national laws require the government to provide information to affected landholders about the reasons for expropriation?	Yes
11. Do the national laws require the government to consult affected populations prior to expropriating land?	Yes

Land allocation according to the Minerals Act give the prospector a right to use land for a finite amount of time. The answer 'Partial' above should be considered a yes within a concession area, but the land allocation is not strictly limited to such land.

List of Compensation Eligibility Indicators (Table 8 in Tagliarino)	
1. Is compensation provided for formally recognized IPLC tenure rights?	Yes
2. Is compensation provided for unregistered IPLC tenure rights?	Partial
3. Is compensation provided for formally recognized IPLC tenure rights regardless of whether the IPLCs developed or made improvements on the land?	Yes

The reindeer herding of Sami people is recognized as a right that should be compensated in a land allocation procedure.

Compensation Valuation Indicators (Table 9 in Tagliarino)	
1. Does the law allow for assessors to follow an alternative approach (e.g., ‘replacement cost’ approach) instead of a “‘air market value approach’ to calculating compensation in cases where land markets are weak or non-existent?	Yes
2. Does the law provide compensation for unregistered customary tenure rights held by Indigenous Peoples and local communities?	Yes
3. Does the law establish special protections for women landholders regarding compensation entitlements?	No
4. Does the law require assessors to take into account the loss of business and other economic activities?	Yes
5. Does the law require assessors to take into account the improvements (i.e., attached and unattached assets on the land (e.g., crops, buildings) made on the land?	Yes
6. Does the law require assessors to take into account intangible land values (e.g., cultural, social, and historical land values)?	No
7. Does the law provide affected populations with the right to opt for alternative land instead of compensation in cash?	No
8. Does the law provide affected populations with the right to negotiate the amount of compensation?	No
9. Does the law require that compensation must be paid prior to the taking of possession of the land or within a specified timeframe thereafter?	Partial
10. Are affected populations granted the right to appeal decisions on the amount of compensation in court or before a tribunal?	Yes

Compensation can only be given in cash. As a comment to no. 9, the compensation can be deposited by the acquiring actor to allow prior access to the land – but the landowners and other actors affected cannot receive this compensation until the land allocation procedure is completely settled and in legal effect.

Resettlement and Rehabilitation Indicators (Table 10 in Tagliarino)	
1. Is there a national-level resettlement policy that is legally binding on all projects involving the expropriation of land?	No
2. Do the national laws provide displaced populations with relocation allowance?	Partial
3. Do the national laws provide displaced populations with alternative land, housing, or resettlement?	No
4. Do the national laws provide displaced populations with productive or suitable alternative land?	No
5. Do the national laws require that displaced populations be consulted during the resettlement process?	Yes
6. Do the national laws require the government or acquiring bodies to minimize or avoid involuntary resettlement?	No
7. Do the national laws require the government or acquiring bodies to provide sufficient funding to implement resettlement programs?	Partial

The legal framework does not at all cover issues of resettlement. Cash is the only form of compensation for landowners and other actors affected.

5. CONCLUDING REMARKS

It is the author's opinion that the Expropriation Act is fundamentally robust and to a greater extent than the Minerals Act meets the indicators in section 4. The same applies to several of the other special laws that enable compulsory land acquisition in Sweden.

The legislator has chosen to give the applicant a very strong position when applying for land allocation for mining purposes, since the mining industry has been considered to be a strong national public interest.

Some issues that emerge in the evaluation in section 4, where the Minerals Act differs from other similar regulations, are partly the issue of (lack of) proportionality testing, and partly the issue of the affected actors' opportunity to receive compensation, or at least an advance on compensation, in order to be able to assert their rights in court in case of an appeal. In the case of Kiruna the mine is also situated directly in the site of an urban area, which might not have been predicted when the legal framework came into effect.

These questions deserve a closer examination, and possible also reform, if one wants the legal framework of compulsory acquisition to comply with international standards.

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SFS 1992:285, *Mineralförordningen* (the Minerals Decree)

SFS 1998:808, *Miljöbalk* (the Environmental Code)

SFS 2010:900, *Plan- och bygglagen* (the Planning and Building Act)

BIOGRAPHICAL NOTES

Mr. Daniel Janonius Löwgren is a technical judge in the Land and Environment Court in Umeå, Sweden, since 2017. He graduated with a master's degree in land administration from The Royal Institute of Technology (KTH) in Stockholm, Sweden, in 2010. Between 2010 and 2017 he worked with property formation procedures, urban planning, real estate valuation and as a manager, most of the time at the Swedish mapping, cadastral and land registration authority (Lantmäteriet).

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