THE IMPORTANCE OF ACCUMULATING GEOLOGICAL DATA FOR FINLAND

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GEOSCIENCE INFORMATION – HISTORY

• Since the beginning of the industrial revolution in the 18th century, and in isolated examples going back to pre-historic times, there has been a widely accepted association between geological knowledge and economic growth.

• The first known geological map was drawn on a papyrus to represent the Fawakhir gold mine in Egypt. The map was drawn about 1160 BC by the Scribe-of-the-Tomb Amennakhte, son of Ipuy. It was prepared for Ramesses IV's quarrying expedition to the Wadi Hammamat in the Eastern Desert. The purpose of the expedition was to obtain blocks of bekhen-stone to be used for statues of the king.
GEOSCIENCE INFORMATION – HISTORY IN FINLAND

• The first “Vuorimestari” and ”Vuorimestaripiiri” was established in Finland 1638 – acting under the “Vuorikollegio” of Sweden

• “Geologinen toimisto” was established 1877 to manage geological surveys related to mineral exploration > “Geologinen komissioni”

• 20th century: Geologinen tutkimuslaitos > Geologian tutkimuslaitos > Geologian tutkimuskeskus

• Mining companies since 1914: Outokumpu Oy, Rautaruukki Oy, Suomen Malmi Oy etc.

• GTK started the digitalisation project of geodata in late 1980’s

• Outokumpu’s and Rautaruukki’s digitalised geodata was integrated with GTK’s geodata in mid 2000’s – more than doubling the amount of digitalised geodata of Finland > base of the existing national geoscience information

• Huge development of digital technologies and tools during the last couple of decades
NATIONAL GEOSCIENCE INFORMATION IN FINLAND

• Historically, government (GTK) and state-owned mining companies have been in the role of main producers of national geoscience information

• Different nation wide geological, geophysical and geochemical datasets

• Should be living datasets, continually being added to and improved through new data acquisition and available at no cost from government’s (GTK) website

• Today, private mining -, exploration - and other companies (and GTK) are the main producers of national geoscience information

• Government’s role has changed more to direction to provide a big-picture geological framework view of the country, to acquire and combine companies’ data to the existing data, and develop new concepts to utilize the national geoscience knowledge base
DISCOVERIES IN FINLAND

• In Finland, the number of discoveries of larger ore deposits has decreased over the last decades
• Within some instances this has led to a misconception that Finland is mature in relation to mineral exploration and discovery
  
  • Talvivaara – Discovered by Suomen Malmi Oy early 60’s / Mine opened 2008
  • Kevitsa – Discovered by GTK 1985 / Mine opened 2012
  • Suurikuusikko – Discovered by GTK 1986 / Mine opened 2008
  • Sakatti – Discovered by Anglo American 2009 (based on the old Outokumpu Oy and GTK data) / Permitting Phase ongoing
NEW CHALLENGES

• Technical challenges associated with exploration
  – Often related to the greater depths that may be necessary to explore in order to make the discoveries

• New needs for data producing, survey technology and interpretation
  – FIRE and HIRE Projects
  – Exploration Lapland 3D and XL3D - Projects etc.
  – Carried out by GTK and mining companies

• Every reason to believe that there is still great potential to find new economic mineral deposits in Finland
The usefulness of geoscience data and information is significantly enhanced when it is properly managed and readily discoverable and accessible.

Role of government is that of data custodian.

This data stewardship role led in Finland by GTK facilitates the capture of exploration data in open file reports.

- Ensures the proper management, security and reliability of the data
- Allows for centralized data warehousing and accessibility
- Facilitates company engagement in data collection
- Supports the use of industry-accepted data standards
VALUE OF GEOSCIENCE INFORMATION IN THE MINING INDUSTRY

• Countries for which the primary industries of mining and quarrying form a significant part of their national product, are heavily reliant on geological infrastructure. This is clearly recognised for example by Australia and Canada (what about Finland?)

• There is a global competition for international inward investments. Countries that have poor quality, old (non-digital) or unreliable geoscience information will not be attractive to investors

• Such investors are also looking for political stability, a fair-but-firm mining code, reasonable infrastructure, absence of corruption and an available, educated and healthy work force

• Finland displaced Saskatchewan from the top spot this year with the highest PPI score of 100 (Fraser Institute Annual Survey of Mining Companies 2019)
COMPETITIVENESS AND PRODUCTIVITY OF THE FINNISH MINERAL CLUSTER

• The mineral cluster consists of the industrial sectors of mining and quarrying, manufacture of basic metals and manufacture of machinery for mining, quarrying and construction

• The total output of the Finnish mineral cluster multiplier impacts included is approximately 22.1 billion euros, of which the share of the direct impacts is approximately 12.2 billion euros. The mineral cluster employs 87,000 person years multiplier impacts included, the direct employment being approximately 24,000 person years

• The regional impacts are significant in the regions of Lapland, Kainuu and Satakunta. In these regions the total output of the mineral cluster ranges between 21-60 % of the regional total and the employment between 11-33 % of the regional total
GEOSCIENCE INFORMATION – BENEFITS FOR THE WHOLE SOCIETY

It is important to remember that, a national geoscience information is also a powerful platform for providing strategic advice and information on a range of other nationally important matters such as:

- Sustainable building
- Circular economy
- Water resources
- Low carbon energy solutions
- Changing environment
- Information solutions – Etc.
SUMMARY

• Cumulating the Finnish geoscience information started in mid 17th century
• Integration of government and mining companies’ data – base of the national geoscience database
• Governments role is more to manage, acquire and combine companies’ data to the existing data and develop new concepts to utilize the national geoscience information
• Private mining companies (and GTK) are the main producers of geoscience information
• Common scientific research projects by government and industry – increasing national geoinformation
• Global competition for international inward mining and exploration investments. Countries that have good quality, digital geoscience information are attractive to investors
• Nation wide good quality digital geoscience information benefits the whole society
THANK YOU