

Missed opportunities as a responsible geologist

Mike Katz*

Former Director of Key Centre for Mines International, University of New South Wales, Sydney Australia

Article history: received received October 17, 2024; accepted December 28, 2024; published January 22, 2025

Abstract

Reflection upon missed opportunities as a geologist working in many countries revealed the importance of being socially responsible in many cases, especially given that geologists are often the first point of contact with communities in our professional work. Concern for social responsibility should be introduced in undergraduate geological education as an important complement with technical subjects. A review of personal experiences under various conditions working with industry and government on various national and overseas projects shows that this social aptitude would have been of great benefit to positive and sustainable work outcomes had it been applied at the time(s). Based on these experiences, I assert the need to introduce social responsibility content in undergraduate geoscience courses. This training on social responsibility is now especially relevant in the extractives sector notably in the exploration of critical minerals. Mineral exploration often involves important mutually beneficial social engagement with many communities including small scale miners and Indigenous People in developing countries. Undergraduate-level discussions about social responsibility can equip future geologists with essential tools to practice ethically and prevent missed opportunities in their careers

Keywords: Social responsibility; Communities; Education; Opportunities; Engagement



1. Introduction

Social responsibility is the idea that individuals and organizations should act in a way that benefits society and the environment. It involves balancing economic growth with the welfare of people and the environment. As geologists this means that we undertake our engagement with communities in our work and research in a responsible and understanding manner.

My background may provide a helpful context for the observations and recommendations in this article. I have over 60 years of geological experience, beginning in Canada with mineral exploration in Manitoba and for the Quebec Government (1960–1967). Between 1967 and 1970, on an overseas assignment for the Canadian Government, I helped to develop the first Department of Geology at the University of Ceylon (Sri Lanka). I began learning about the need for geologists to be mindful of social responsibility issues in engaging communities, Indigenous People, and small-scale miners.

My understanding of the importance of social responsibility continued to develop throughout my academic work at the University of New South Wales (UNSW) in Sydney, Australia (1971–1988), researching the Broken Hill mines area, and as a Counselor for the Association of Geoscientists for International Development (1976–1984). Later, as the International Director and Manager of the Key Centre for Mines, UNSW (1988–2010), I organized and managed short-term professional development geological and mining training projects, working with the Australian Agency for International Development, United Nations Development Program, Asian Development Bank, and other funding agencies. This involved over 70 projects in 25 countries, mainly in Asia. I also engaged in major study-tour projects for Tata Steel in India. As an international consultant, I worked with the UNDP, the Asia Pacific Economic Commission, the International Mining for Development Centre, and the Australia Awards Africa in the extractive sector (2010–2023). Educators and researchers have highlighted the need for geologists to develop social responsibility skills [Katz, 2020a; 2020b] and adhere to ethical standards [Peppoloni and Di Capua, 2015]. This need to incorporate content about social responsibility in undergraduate geoscience courses was developed and discussed through workshops and presentations in Australia, Chile, India, South Africa, Morocco and Canada [Katz, 2020a; 2022a]. Despite recognizing its importance, social responsibility was not considered as a core competency in an undergraduate geoscience course.

Mike Katz

2. Some personal examples

If geologists had received instruction about social responsibility during their undergraduate studies, would it have benefitted them in their professional work? This article presents examples of missed opportunity experiences I have had over the years in my professional work for industry, government, academia, non-government organisations, and as an international consultant for mineral development projects. These cases outline the importance of this social capability, especially regarding Indigenous People and small-scale miners, many of whom are located in developing countries.

2.1 Canada: Mineral Exploration

As a Hudson Bay Mining company exploration geologist working in Northern Manitoba and Saskatchewan in 1960/61 on Indigenous First Nation areas, little attention was paid to local people. At that time, there were no corporate social responsibility (CSR) requirements. The company's policy was to not engage with the Indigenous People. This was the norm in the industry, even though it was apparent that our company's camps, survey lines, exploration work and drilling traversed their lands and communities and interfered with their trapping, hunting and fishing livelihoods. Informal community engagement was attempted by offering food and supplies left over after the camp breakup, but this opportunity was not successful due to a lack of mutual trust.

2.2 Canada: Quebec Government Geologist Survey in a National Park

Mapping in Mont Tremblant National Park, Quebec from 1963 to 1965 there was no directive to engage the park authorities and the small communities around the park to inform them of our work. It would have been a great advantage to have the cooperation and assistance of the park rangers and the local people for their knowledge and experience. With little encouragement, prospectors sometimes approached the team to investigate their small mineral deposits. This was a missed opportunity for essential, mutually beneficial communication.

2.3 Sri Lanka: Assignment to establish the first Department of Geology

In service as a Canadian Government overseas expert from 1967 to 1970 tasked with assisting in the development of the first university geology department in Ceylon (Sri Lanka), opportunities for staff and students to engage communities especially during field studies were not realized. Local workers gathered around and were curious about our presence at the village stone quarries but they were ignored and often viewed as sources of unwanted interference. Had we not ignored them, these local workers might have become sources of technical and social advice. Even visits to small-scale gem mining pits involved observation, sampling, mineral identification, and little social interaction [Katz, 2022b].

2.4 Australia: Student fieldwork in the Broken Hill Mining Area

Although there was a lack of social responsibility content in the coursework at the School of Applied Geology at UNSW, the supervision of students in the field did involve some very minor community interaction. At Broken Hill, a classic mining district, rare discussions were held with landowners for access to conduct geological exercises and examine small – scale mining workings. In all cases the students were not encouraged to interact with any people they encountered in the field; instead, they were advised to stay clear of any local people. Respectful interactions could have built a foundation for later mutually beneficial engagement.

2.5 Association of Geoscientists for International Development (AGID)

This grassroots Non-Governmental Organization (NGO) had aimed to encourage communication among individuals, societies, agencies and corporations interested in applying geosciences to international development. However, the social component of AGID was lacking due to the narrow focus of the technical training conference approach requested by the various university and governmental partners. This NGO missed the opportunity to initiate and develop awareness of social responsibility which would have been an important component of the programs.

Mike Katz

2.6 Key Centre for Mines, UNSW, International Professional Development

The Australian Government and other organizations' projects from 1988 to 2010 lacked social responsibility content [Katz, 2023]. This topic is important particularly for groups from developing countries mainly in South and Southeast Asia, and should have been included in the professional development training, but the projects were more focused on technical subjects. An example is the United Nations Development Programme (UNDP) program for staff capacity building in the Laos Department of Geology and Mineral Resources [Katz, 2008]. In this case, technical skill transfer was not complemented by the important social input in a country where nascent mining development could involve adverse local community impact.

2.7 India: TATA Steel

TATA Steel senior staff managers' study tours in Australia from 2002 to 2011 showcased best practices in mining and environmental techniques with some attention to social impact [Katz, 2022c]. However, the important visits to coal and iron ore mining company sites should have included discussions of their Corporate Social Responsibility (CSR), social license, and, in the case of the iron mines on Indigenous Lands in West Australia, their Free, Prior, and Informed Consent (FPIC) policies. Discussions would have likely exposed major flaws in the assumptions of FPIC. Do they really exercise FPIC, and if so, how? If they do, and do not share it and/or take the opportunity to spread or repeat it, it is a huge, missed opportunity.

2.8 World Mines Ministry Forum (WMMF)

I was invited to make a plenary address on "The Australian Experience" to the "Minerals Sector Education for Indigenous Peoples" session of the WMMF during the Prospectors and Developers Annual Conference (PDAC) in Toronto, Canada, in 2004. This followed the 7th Indigenous Australian Engineering Summer School hosted by the UNSW Faculty of Engineering. The aim of this presentation was to initiate an engineering education program for Indigenous people in Australia supported by the government and industry. However, this initiative mainly focused on technical knowledge and skills. The lack of social input was a missed opportunity for inclusion.

2.9 East Timor Mining Law Workshop

In 2008, I facilitated a workshop in East Timor on the development of a modern mining law, with the participation of local and international experts. The focus was mainly to attract investment in the mineral sector to balance the already developed oil and gas industry. However, little regard was given to the social impact in a developing country that needed to consider social responsibility in its mining law.

2.10 UNDP Cambodia extractive industry human resource development

A UNDP consultancy in 2010 reported on the capacity of technical colleges and universities to provide the necessary geologists and engineers for the country's emerging mining sector. The proposed geology course plan mainly covered technical and environmental education needs. However, the plan did not consider social responsibility, especially regarding the small-scale mining sector. Some local social needs in the community were evident, and social impacts should have been included in the planning document.

2.11 Independent assessment of the Asia-Pacific Economic Cooperation (APEC) Mining Task Force (MTF)

The independent assessment of the APEC MTF [Katz, 2011] mainly focused on mineral economics; however, sustainable development and Corporate Social Responsibility (CSR) issues were also considered in the records of MTF activities. There was a recommendation (MTF 16) to promote CSR awareness and capabilities in the APEC region and future work that will encourage dialogue among all relevant stakeholders, including NGOs, civil society, small-scale miners and Indigenous Peoples. This should be an ongoing development.

2.12 2013 UNDP South-East Asia Sub-Regional Meeting on Extractive Industries and Indigenous Peoples' Rights to Land and Natural Resources

An invited keynote address on the role of the mining industry engaging with Indigenous Peoples and small-scale miners in Southeast Asia focused on practical

Mike Katz

and sustainability issues. The technical paper presented on “Small-Scale Mining for Sustainable Indigenous Community Development” lacked a social dimension – a missed opportunity.

2.13 2014 International Mining for Development Centre (IM4DC) Mid Term Review

I was part of a two-person team that reviewed the IM4DC (Universities of Queensland and West Australia) short courses presented to mining professional candidates from many countries to upgrade their best practices and modern qualifications. Many participants were senior members of their academic and government institutions. Interviews with the participants revealed that the issues concerning them most were technical with little attention paid to social matters. This lack of concern about social responsibility issues indicates that these professional geologists and mining engineers are unlikely to drive social change.

3. Review

The examples of missed opportunities show that geologists need to be socially responsible in their work. However, integrating social responsibility with geology will be challenging. The undergraduate geoscience curriculum is a good place to develop the knowledge and skills required for socially responsible geology. The goal should be to prepare novice geologists with an understanding of the ethical and social dimensions of their work so that, upon graduation, they can effectively practice their science in the public interest.

A preliminary survey of curricula in many universities in North America, Australia, and Europe has indicated some attention to this issue, although it is not commonplace [Katz, 2020a]. Several approaches have been suggested to develop knowledge and skills concerning social responsibility. The service-learning approach to geoscience education, which combines learning objectives with community service, provides a pragmatic, progressive educational experience while meeting societal needs [Mileusnić, 2020]. The modular approach to interdisciplinary learning can include information about social responsibility. Educational modules were developed in a range of disciplines, including Earth sciences, for remote asynchronous learning during the covid pandemic [Striolo et al., 2023]. The socio-technical approach to undergraduate education is built around the idea that solutions to many technical problems have social dimensions [Smith et al., 2023].

There is a special need for the idea of social responsibility to be introduced through university-level geoscience education in developing countries. Unfortunately, the social dimension of geoscience is largely ignored in favor of meeting even more basic needs, such as building an understanding of the scope and importance of geology as it relates to national and regional issues of development, resources, and hazard management [e.g., Sapah et al., 2023]. Given a basic understanding, the focus shifts to developing technical knowledge and skills. Missed opportunities of the past and present for integrating social responsibility with geology should be addressed by university courses of the future.

4. Conclusions

A professional geologist must be able to engage communities and act as a social interlocutor for the mutual benefit of all. Without education and awareness of social responsibility, the modern geoscientist would likely miss some or many opportunities that arise in their work and research on the ground, especially in remote areas. This will result in difficulties in making substantial gains toward the UN Sustainable Development Goals in developing countries [Gill, 2017], with small-scale miners [de Haan et al., 2020], and with Indigenous Peoples. Other missed opportunities involve the lack of application of best practices in corporate social responsibility, social license to operate [Marieke et al., 2021] and misunderstandings of free, prior and informed consent for Indigenous Peoples [ICMM, 2024].

Establishing a practical, shared understanding of social responsibility in professional geoscience work would better address the varied and often difficult social problems related to best practices for the mapping, surveying, exploration and exploitation stages of sustainable mineral development. It is especially relevant for newly graduated geologists to have developed knowledge and skills in social engagement, given the present-day rush for the exploration and management of critical minerals frequently found in developing countries which often involves engagement with small scale mining [Laing and Pinto, 2023] and Indigenous People [Owen et al., 2023].

Acknowledgements. For their support over the years my wife Rita, Wally Moorehouse, Marcel Morin, Das Vitanage, Tony Berger, Joe Frankel, Charles Gerrard, David Laurence, David Cohen and in regard to finalising the manuscript two interested and very helpful reviewers one of which is Paul Hubley of Geoscientists Canada.

Mike Katz

References

- Gill J., (2017). *Geology and the Sustainable Development Goals*. Episodes, 40(1), 70-76
<https://doi.org/10.18814/epiiugs/2017/v40i1/017010>
- de Haan J.K., Dales K., and McQuilken J., (2020). *Mapping Artisanal and Small-Scale Mining to the Sustainable Development Goals*. Newark DE: University of Delaware (Minerals, Materials and Society program in partnership with Pact)
<https://www.researchgate.net/publication/346108249> (accessed 23 December 2024).
- ICMM, (2024). *Indigenous People and Mining: Position Statement*.
<https://www.icmm.com/en-gb/our-principles/position-statements/indigenous-peoples> (accessed 23 December 2024).
- Katz M., (2008). *Professional Education and Training for Sustainable Mineral Resource Development in the Asia Pacific Region*. In Hadjigeorgiou, J. (ed.), *Proceedings of Third International Symposium on Strategic vs Tactical Approaches in Mining* (Quebec City, Canada, pp. 64-74), Laval University.
- Katz M., (2011). *Independent Assessment of the APEC Mining Task Force*.
https://www.apec.org/docs/default-source/Publications/2011/9/Independent-Assessment-of-the-APEC-Mining-Task-Force/2011_sce_APEC-MTF-Assessment.pdf (accessed 23 December 2024).
- Katz M., (2020a). *Social responsibility in geoscience education workshops*. Episodes, 44(2), 185-188. <https://doi.org/10.18814/epiiugs/2020/020062>
- Katz M., (2020b). *The need for socially responsible university educated professionals in the extractive industries*. The Extractive Industries and Society, 7(4), 1351-1353.
<https://doi.org/10.1016/j.exis.2020.10.015>
- Katz M., (2022a). *A Sustainable Extractive Industry Requires Educated Responsible Geoscientists*. Earth Science, Systems and Society, 2.
<https://doi.org/10.3389/esss.2022.10046>
- Katz M., (2022b). *Building field trips to small scale mines into university undergraduate degrees: The case of gemstone extraction in Sri Lanka*. The Extractive Industries and Society, 11. <https://doi.org/10.1016/j.exis.2022.101131>
- Katz M., (2022c). *International Professional Development Cooperation Study Tours for Environmental, Social and Sustainable Development for the Indian Mining Sector*. Journal of International Cooperation and Development 5(2).
<https://doi.org/10.36941/jicd-2022-0006>
- Katz M., (2023). *Retrospective: International Mining Education and Training Best Practice Professional Development Initiative*. AUSIMM Bulletin Spotlight,
<https://www.ausimm.com/bulletin/bulletin-articles/retrospective-the-international-mining-education-and-training-best-practice-professional-development-initiative/> (accessed 23 December 2024).

- Laing T., and Pinto A.N., (2023). *Artisanal and small-scale mining and the low-carbon transition: Challenges and opportunities*. Environmental Science & Policy, 149. <https://doi.org/10.1016/j.envsci.2023.103563>
- Marieke M., Piet W., van Leeuwen J.J., Behagel J.H., and Turnhout E., (2021). *The Social Licence to Operate and the legitimacy of resource extraction*. Current Opinion in Environmental Sustainability, 49, 7-11. <https://doi.org/10.1016/j.cosust.2020.11.002>
- Mileusnić M., (2020). *Service learning in geoscience education*. European Geologist Journal, 50. <http://doi.org/10.5281/zenodo.4311367>
- Owen J.R., Kemp D., Lechner A.M., Harris J., Zhang R. et al., (2023). *Energy transition minerals and their intersection with land-connected peoples*. Nature Sustainability, 6, 203-211. <https://doi.org/10.1038/s41893-022-00994-6>
- Peppoloni S., and Di Capua G., (2015). *Geoethics: The Role and Responsibility of Geoscientists*. Geological Society of London, Special Publication, 419. <https://doi.org/10.1144/SP419.0>
- Sapah M.S., Asiedu D.K. and Lo Y.S.A., (2023). *Geoscience education in Ghana: status and recommendations*. Episodes, 47(1), 1-9. <https://doi.org/10.18814/epiiugs/2023/023012>
- Smith J., McClelland C., and Restrepo O.J., (2023). *Sociotechnical Undergraduate Education for the Future of Natural Resource Production*. Mining, 3(2), 387-398. <https://doi.org/10.3390/mining3020023>
- Striolo A., Jones A., and Styan C., (2023). *The effectiveness of an interdisciplinary postgraduate-taught program in terms of employability*. Education for Chemical Engineers, 45, 1-10. <https://doi.org/10.1016/j.ece.2023.06.006>

*Corresponding author: **Mike Katz**

e-mail: Mikekatz320@gmail.com

© 2025 Istituto Nazionale di Geofisica e Vulcanologia

All rights reserve