Using Diffusion of Innovation theory for the adoption of Health Impact Assessment in Mongolian mining sector

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ABSTRACT

This research looks into the applicability of Diffusion of Innovation (DOI) theory and the implementation of a Health Impact Assessment (HIA) approach, focusing mainly on the resource extraction sector in low-to-middle income countries (LMICs). It begins with a review of DOI theory and discusses how HIA adoption in LMICs context might be understood from the perspective of DOI theory. It then asks whether Knowledge Translation (KT) theories and approaches might be relevant to DOI, and if so, how. DOI framework could yield data on factors influencing adoption or rejection of practice. With the use of its various communication channels and attributes of DOI we were able to see some indication of early success in our work of introducing HIA concept in the Mongolian mining sector. Based on the findings of the literature review and practical applications of DOI theory in HIA implementation, I conclude by arguing that DOI is useful as an overarching theoretical framework to plan and implement adoption strategies and activities, to identify potential challenges, and, in this case, illuminate the HIA adoption patterns in the Mongolian mining sector.

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INTRODUCTION

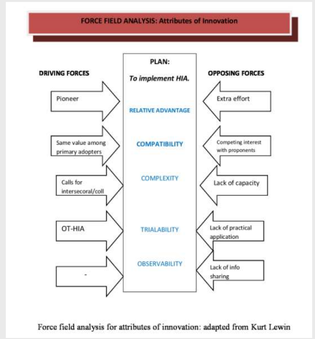
The emerging **mining industry in Mongolia** promises growth in the economy and but also poses risks to human health. Revenues from mining saw the Mongolian economy grow by a record 17.3% in 2011. This rapid growth of the mining industry has led to a need for the application of **Health Impact Assessment** (HIA) in the sector. Although HIA is a still fairly new and a developing approach in Mongolia, there is evidence of variable but steadily increasing activity at both the regional and local levels. HIA has arisen as an especially promising way to factor health considerations into the decision-making process. It is essentially a structured process that uses scientific data, professional expertise, and stakeholder input to identify and evaluate the public-health consequences of proposals and suggests actions that could be taken to minimize adverse health effects and optimize beneficial ones.
Developing countries have seen their efforts to adopt HIA fail for various reasons. Lack of the use of theory in planning and adoption is one such reason.
Diffusion of Innovation (DOI) theory has been used as a way to understand the uptake or implementation of innovations in different contexts. It is useful lens through which to examine how HIA, an already proven innovation, is adopted. Such an approach would identify particular gaps or problems in implementation and ideally point to more effective diffusion strategies. DOI theory seeks to explain the spread of new ideas, opinions, attitudes, and behaviors throughout a community.

METHODS

This literature review sought articles between 1995 and 2012 from the following databases: Elsevier, Science Direct, Scopus, EBSCO and Google Scholar. The search words used included: diffusion of innovation, public health innovation, health innovation, innovation diffusion and DOI. Search results from five databases yielded over 125 academic papers. These were examined in two stages to reduce the number of closely relevant papers to 63. The references from each selected article were also scanned in order to make sure that no noteworthy reference was excluded. In addition, three peer-reviewed books were also examined. This article summarizes general knowledge of DOI with a particular focus on its relationship to knowledge translation in the health sector, and the diffusion of health innovations.

RESULTS

➢ Detailed objectives: to accumulate background knowledge of DOI theory including conceptual framework, main elements and attributes, to identify key sources of information, and to contribute to the academic knowledge of practical applications DOI in the discipline of health.
➢Due to the recent discovery of several giant mine sites, mining in Mongolia poses both a great deal of economic development and potential threats to human health. This unprecedented intensification of mining has led to a need for the application of HIA in the mining sector.
➢ The ongoing effort to introduce an HIA approach was initiated by SFU team, who introduced the concept, developed HIA methodology, urged government to focus on mining sector, and have been implementing continuous diffusion activities.
➢ DOI provides an opportunity to analyze and evaluate HIA adoption rates. Rogers explains that the key elements for successful DOI include an idea (innovation),com/ channels, social system and a time.
➢ DOI occurs through a five–step decision-making process that is: knowledge, persuasion, decision, implementation, and confirmation.
➢ Five attributes: its relative advantage over other options, compatibility, complexity, trialbility and observability. An individual's perception of these attributes determines the rate of adoption.
➢ In addition to DOI, other applicable analytical tools such as **Berry & Berry model**, **Stakeholder analysis** and **Force Field analysis** were used to discuss how the DOI model has been applied to introduction and evaluation of HIA in the Mongolian mining sector.
➢Potentially triggering factors for HIA diffusion analysis through Berry[2] model. There seemed to have more than one reason behind this adoption (learning from others' best experiences, conforming to 'normative pressures' and addressing public pressures)



Force field analysis for attributes of innovation: adapted from Kurt Lewin

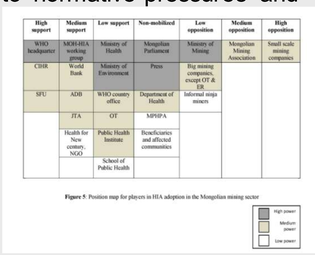


Figure 5: Position map for players in HIA adoption in the Mongolian mining sector

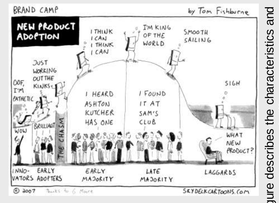


Figure describes the characteristics and motivations of different adopters.

DISCUSSION

➢Although, HIA is being added to the recent EIA law amendment as a hopeful mandatory step prior to seeking the formal operation's approval, yet, HIA in Mongolia seems to be far removed from being the regularly-used informed decision making instrument.
➢A communication channel is the means by which messages get from one individual to another (interpersonal and mass media).
➢Marketing techniques are bridging mechanisms between the simple possession of knowledge and the socially useful implementation of what knowledge allows.
➢In the United States, the terms dissemination, **diffusion**, research use, knowledge transfer, and uptake are often used. The terms knowledge transfer and exchange and **knowledge translation** are commonly used in Canada. They could simply mean knowledge-into action.
➢Factors promoting success of HIA include: partnership working; baseline data for population profiling; a well-developed community; overall strategy with shared aims; and capacity (both time and resources)

CONCLUSIONS

DOI theory appears applicable to understanding the HIA approach. By using the conceptual framework, elements, and attributes of DOI theory, HIA innovators should be able to advance adoption success and rate to any context including LMICs and Mongolia. DOI could be particularly useful in identifying factors that affect adoption rates through the extensive force field analysis on diffusion attributes. Application of force field analysis reveals that it can be concluded that the rate of Mongolian HIA adoption has been steady but progressive. However, the adoption rate could be slowing down due to factors such as the nature of HIA (being the slow-affecting preventive innovation), lack of prior body of knowledge, experience and regulation in the country.

REFERENCES

1. Rogers M. Everett (2003) Diffusion of Innovations, fifth edition, New York, NY: Simon and Schuster, Inc.
2. Greenhalgh, Trisha; Glenn Robert, Fraser Macfarlane, Paul Bate, Olivia Kyriakidou, (2004) Diffusion of Innovations in Service Organizations: Systematic Review and Recommendations, the Milbank Quarterly, Vol. 82, No. 4, 2004 (pp. 581–629)
3. Winkler, M. S., Gary R Krieger, Mark J Divall, Guéladio Cissé, Mark Wielga, Burton H Singer, Marcel Tanner & Jürg Utzinger, Untapped potential of health impact assessment, Bulletin of the World Health Organization *2013, p 1-16.* ID: BLT.12.112318
4. Estabrooks A. Carole, David S. Thompson, J. Jacque E. Lovely, Anne Hofmeyer, (2006) A guide to knowledge translation theory Journal of Continuing Education in the Health Professions, Volume 2