PUBLIC RISK PERCEPTION OF SHALE GAS EXPLOITATION: A COMPREHENSIVE REVIEW

Huimin Tan, Southwestern University of Finance and Economics, E-mail: tanhuimin@swufe.edu.cn

Jianhua Xu, Peking University, E-mail: jianhua.xu@pku.edu.cn

Shumin Zhang, Renmin University, E-mail:shelleyzhang1@foxmail.com

Overview

Shale gas, an emerging unconventional energy, is being actively developed around the world. Whereas shale gas is considered to be able to promote energy upgrading, the risks associated with its development and production process have given rise to quite many concerns. This paper has reviewed recent studies on public risk perception of shale gas development and hydraulic fracturing technologies by summarizing research priorities and uncovering factors that affect public perception (86 articles were identified). The most concerned risks among the public toward shale gas development were revealed, and the differences of public risk perceptions were further analyzed from a perspective of cross-country comparisons. Our review suggests that knowledge, trust, personal experience, and individual social-demographic characteristics can influence public risk perception toward shale gas exploitation across countries. Additionally, contextual factors including shale gas development level and proximity to shale mining area are found also related to public's assessment of risk. This paper can potentially shed light for policy-makers on how to promote public support for the shale gas development.

Methods

The aim of the review is to reveal public risk perception of shale gas development among nations and countries, and to discover the underlying factors that affect public risk perceptions by searching and reviewing the existing literature in “web of science Core Collection” database. We used the different combinations of the keywords “perception*”, “attitude*” with the keywords “shale gas”, “fracking”, “unconventional gas” and “hydraulic fracturing”, and searched in the “Web of Science Core Collection” database for all existing literature in October 2017. In the end, 86 articles were chosen upon which this review study is based, most of which were empirical studies with first-hand data, for instance, surveys among residents, stakeholders and national public.

Results

The review has identified three major kinds of public risk perception toward shale gas development: perceived environmental impacts (Borick et al., 2014; Ferrar 2016), perceived health impact (Ferrar, 2013; Willems et al., 2016), and perceived social and economic impacts associated with shale gas development (Crowe, 2015; Schafft, 2014). Overall, water pollution and air contamination caused by hydraulic fracturing have been widely examined under the context of varying countries, which are often been considered as the major risks. Health issues are more conspicuous in South Africa than in other regions.

Both the research themes and methodologies differ significantly among the reviewed studies. For instance, the research focuses vary from exploring influential factors of public risk perception (Brasier 2011, Schafft 2013, Gunzburger 2016, Alcorn 2017, Evensen 2017), to characterizing risk perception by categories (Theodori 2009, Brasier 2011, Stedman 2012, Ladd 2013, Ferrar 2013, Perry 2013, Schafft 2014, Theodori 2014, Sher 2016, Olawoyin 2016, Willems 2016, Mchenry-Sorber 2016, Willits 2016), to a cross-country comparison (Lachapelle 2014, Partridge 2016). Besides, the studied stakeholders vary from community leaders (Anderson 2009, Schafft 2013, Crowe 2015), to local educator and experts (Schafft 2014, Schafft 2014, Gunzburger 2016), and to land owners (Perry 2013). Furthermore, the survey sample varies widely from state level (Theodori 2014, Zilliox 2017) to country level (O’Hara 2013, Boudet 2014, Whitmarsh 2015, Boudet 2016, Gunzburger 2016, Olawoyin 2016), and from local IAPs (interested and affected parties) (Anderson 2009, Ladd 2013, Ferrar 2013, Crowe 2015) to a more representative national public (O’Hara 2013).

Conclusions

Shale gas is important for the development of global energy transformation. In order to promote the development of shale gas industry, the potential risks that concern the public the most should be addressed. This study represents the first comprehensive reivew of public risk perception toward shale gas development. Researchers and policy makers can design policies and mechanisms to take preventive measures in order to maintain the balance between energy development and environmental protection. In addition, governors should

enhance the participation of local communities and residents, and adjust the distribution of benefits at the same time.

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