Ecological Economics 105 (2014) 67–77

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Activism mobilising science

Marta Conde *

ICTA, Universidad Autonoma de Barcelona, 08193 Bellaterra, Barcelona, Spain

ARTICLE INFO

Article history:
Received 9 October 2013
Received in revised form 6 May 2014
Accepted 19 May 2014
Available online 14 June 2014

Keywords:
Activism
Knowledge co-production
Political ecology
Uranium mining
Participatory processes
Resistance

ABSTRACT

The article sheds light on a process where unequal power relations are contested through the co-production of scientific and local knowledge. I argue that lay citizens, communities and local grassroots organisations immersed in socio-environmental conflicts are engaging with professional scientists to understand the impacts a polluting project is causing to their environment and themselves. Together with scientists they co-produce new and alternative knowledge that gives the local organisations visibility and legitimacy, information on how to protect themselves from the impacts, and allows them to engage in practical activism, challenging the manufactured uncertainty and other information produced by the state or companies running the projects. This process is what I term Activism Mobilising Science (AMS). It is locally driven by activists who have built related capacities and is generally based on voluntary work. AMS is compared to other participatory processes and gives clues into how grassroots organisations can avoid co-optation. The analysis is based on two uranium mining conflicts in Niger and Namibia where two local organisations are trying to confront the manufactured uncertainty of the nuclear industry through an AMS process.

1. Introduction

> "We had no knowledge that radon could travel, we thought that you had to be in contact with uranium, otherwise radioactivity would not impact you" (A. Alhacen, Pers. Comm., 1 February 2013).

In Niger, Almoustapha Alhacen is the head of Aghir in'man, a local NGO in Arlit, located next to the uranium mines of Areva, the French state nuclear giant. After working for more than 20 years in the uranium mines he saw several of his colleagues getting sick from diseases they did not understand. He wanted to know more; understand why that happened, and take measures to protect himself and others.

In a similar way, Bertchen Kohrs and Hilma Shindondola-Mote, heads of two NGOs in Namibia (Earthlife Namibia and the Labour Resource and Research Institute, LaRRI) had been trying to gain more knowledge about the impacts of radioactivity. In 2008 they carried out an investigation and campaign revealing that an unknown number of mineworkers of Rio Tinto's Rössing uranium mine had been getting sick and some of them dying. The workers believed their diseases were connected to their work in the mine. They had heard about radioactivity but didn't know how it could impact them. By highlighting and exploiting the uncertainty over radiation related occupational health diseases (Hecht, 2012), mining companies have impeded workers from claiming compensation. Moreover, the nuclear industry has also manufactured this uncertainty (Michaels and Monforton, 2005) by for example producing studies denying the impacts of radiation (Hecht, 2012). The manufacture of uncertainty has been used with great success by polluters and manufacturers of dangerous products (best known examples are the tobacco and asbestos industries) by questioning the validity of scientific evidence on which regulation prohibiting those products is based (Michaels and Monforton, 2005). I differentiate between knowledge *produced* by the mining companies that is based on their own measurements or monitoring of impacts and *manufactured* knowledge that aims at covering or increasing uncertainty about an impact. The two Namibian NGOs wanted to challenge this uncertainty by learning more about radiation and its impacts.

As a result, both Aghir in'man from Niger and Earthlife from Namibia contacted CRIIRAD, a French independent laboratory specialising in radiation. CRIIRAD visited the two countries marking the start of an on-going collaboration, allowing these organisations to learn more about radiation and challenge the knowledge created by the mining companies.

These alliances emerge as a result of the increasing pressure for extraction driven by the increasing social metabolism, a decline in the quality of minerals and reserves and an increasing competition among land uses. This is driving the commodity frontier into more ecologically and socially vulnerable areas, with higher environmental impacts

* Tel.: +34 676172708.
E-mail address: mcondep@gmail.com.

http://dx.doi.org/10.1016/j.ecolecon.2014.05.012
0921-8009/

(Moore, 2000). These areas are often inhabited by indigenous people or historically disadvantaged social groups, whose livelihoods are highly dependent on their land (Guha and Martinez-Alier, 1997). These phenomena set the conditions for the emergence of resource extraction conflicts (Martinez-Alier et al., 2010). The expansion of the commodity frontier or the increasing impacts in these areas after many years of extraction is causing local communities to react and confront these operations. This is coupled with an increasing capacity by local organisations to make extra-local contacts (Keck and Sikkink, 1998), in this case with scientists.

In political ecology literature several authors have examined how mining companies have access to and control over resources, land, water, energy, minerals (Bebbington et al., 2010; Bryant and Bailey, 1997; Martinez-Alier, 2003). However, to date the literature does not sufficiently explore how knowledge is co-produced, manufactured and controlled by these companies in order to create discourses and truths. Knowledge production and control does appear in the literature when looking at how historically, knowledge has been appropriated by colonial officials (Bryant, 1996; Neumann, 1996; Peluso, 1993; Robbins, 2004), conservationist NGOs (Bryant, 2002) or institutional narratives (Fairhead and Leach, 1995; Sletto, 2008), imposing their discourses and 'truths' on grassroots organisations. Although examples where grassroots organisations contest these different narratives through relevant science-based knowledge are explored (Bebbington, 1996; Forsyth, 1998; Peet and Watts, 1996), little attention has been placed on the dynamics and processes of how this happens (see for example Peluso, 1995). In this article I explore one such mechanism of resistance, looking at how the interactions and processes of power can be reversed. Knowledge, be it local or scientific or newly co-produced (Jasanoff, 2004), becomes a political tool that can express and exercise power.

I argue that with a process which I hereby call 'Activism Mobilising Science' (AMS), lay citizens, communities, and local grassroots organisations are engaging with professional scientists to learn from them the tools and the scientific language they need to produce a new and alternative knowledge with which they can challenge dominant discourses and engage in practical activism.

Through AMS, activists become visible actors in the governance of extractive industries and environmental health, engaging politically and influencing environmental actions and outcomes together with the state and the companies (Lemos and Agrawal, 2006). For instance, urban neighbourhood organisations might call for expertise from environmental chemists who can teach them how to measure dioxins when confronting a new incinerator (GAIA, 2003), or peasant groups might ask a sympathetic hydro-geologist to instruct them on how to take water quality measurements when trying to challenge an open cast gold mine (FPIF, 2012).

The aim of this article is to build the definition of AMS by understanding *how* and *why* is activism mobilising, using and co-producing, science. The next section introduces the case studies' context; the manufactured uncertainty and opacity the nuclear industry often uses, which the AMS processes presented are challenging. The theoretical background and methods are explained in Sections 3 and 4. Section 5 explains how and why two grassroots organisations engage in an AMS process to confront uranium mining whilst Section 6 gives clues into how these organisations have avoided co-optation. Section 7 situates and compares AMS in the literature on participatory processes and Section 8 draws some conclusions.

2. Uranium Mining and the Manufacture of Uncertainty

The cases presented in this article deal with Low Level Radiation, radiation under 100 mSv, caused by uranium mining and affecting workers' health and communities living nearby. Despite half a century of intensive research in the field of radiation and human health, uncertainty is still prevalent as science has yet to find a way to clearly connect an individual's exposure to low doses of radiation to subsequent health problems or fatal diseases. Only with large groups such as the Wismut and Navajo cases[1] have large epidemiological studies with lifetime follow-up been able to detect a significant increase in cancer mortality (Brenner et al., 2003; Land, 1980). Science cannot yet prove causation in particular cases (Brenner et al., 2003; Connor, 1997; EEA, 2001; Hecht, 2012). Given the difficulty to carry out these studies, the radiation protection community has been using since the 1970s the linear no-threshold model that assumes that the biological damage caused by ionising radiation is directly proportional to the dose (Kathren, 1996). In other words, there is no safe radiation dose. However, responding to pressures by the industry, the International Commission for Radiological Protection (ICRP), which sets the radiological limits adopted by the International Atomic Energy Agency, proposed the ALARA principle in 1977 (ICRP, 1977) by which all exposures should be kept As Low As Reasonably Achievable. According to Hecht (2012), this move tried to remove the exceptionalism of nuclear risk by comparing it to other industrial risks. It set a permissible threshold below which a reduction in exposure is not worth the investment. This caused a major debate in the nuclear industry, with the ICRP modifying the threshold downwards twice since then. With people impacted by Low Level Radiation claiming causal links that are still not scientifically proved and safe limits being modified as new research appears, it is safe to say that the impacts of Low Level Radiation are shrouded with uncertainty (Hecht, 2012; Kuletz, 1998).

The industry didn't only exploit this uncertainty but in many occasions manufactured it. Hecht (2012) points in her book to numerous accounts where mining officials contested the findings of the ICRP in order to defer regulation. She dubs the scientists behind this manufacturing as the "merchants of doubt" (Hecht, 2012:209). As with tobacco or asbestos cases, it has been argued that "the cause-and-effect relationships have not been established in any way; that statistical data do not provide answers; and that much more research is needed" (extracted from Michaels and Monforton, 2005). The established radiation limits (under 20 mSv per year for workers) and the ALARA principle, allows the uranium mining companies to comply with the regulations, thus liberating them from any responsibility over sick workers. As with the lead industry case, the blame was shifted "from the lead itself and the manufacturing process, and claimed that the workers had sloppy habits and were careless" (extracted from Michaels and Monforton, 2005). In Niger's and Namibia's uranium mines the responses are similar, "the diseases are caused by the eating and social habits of the workers, who don't exercise (…) and in many cases smoke" (Rössing Manager, Pers. Comm., 21 June 2009).

As a result, the burden of proof of the impacts of Low Level Radiation is left to the communities. They however lack the technical expertise required by orthodox science to claim that they are being impacted. The State and the companies value the formal and quantitative information that the communities lack. They privilege evidence produced by experts trained in scientific disciplines. On top of this, communities face also the opacity of the uranium industry that made "invisible" black African miners (Hecht, 2012), Indian Nations in the US (Kuletz, 1998) and communities in Jharkhand, India (Ramana, 2012), bypassing for decades radiological safety regulations and not informing miners of the deadly hazards they were exposed to. To bridge this gap, it has been argued that these problems can no longer be viewed as purely technical and left exclusively to professionals. Due to high uncertainty, the urgency to solve this issue by those workers who are still alive and sick and the high stakes involved, the study and evaluation of Low Level Radiation in the nuclear industry could be considered a case of Post Normal

[1] After WWII uranium mining expanded in the Wismut province in East Germany and in several states of the South West of the US, drawing (in the second) Navajo People to work in their mines. Numerous epidemiological studies have proven occupational related cancers (see among others, Kreuzer et al., 2010 for Germany and Gilliland et al., 2000 for the US). In the US this led to the passage of the Radiation Exposure Compensation Act.