Social Impact Assessment of uranium mining in Niger

Anne Abbing - s2035480

Supervisors: Philippe Hanna and Martin Boisen

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Abstract

The French multinational AREVA (Adoption Resource Exchange of Virginia) operates three uranium mines in Niger; the current COMINAK (Compagnie minière d'Akokan) and SOMAIR (Société des Mines de l'Air) mines and the new Imouraren mine that is meant to start production in 2015. This paper analyses the social impact of AREVA's mining activities in Niger, the application of the Social Impact Assessment (SIA) in Niger by AREVA and whether or not SIA should be applied in the case of uranium mining in Niger by AREVA.

Several organizations like Greenpeace and NGO's as well as scientists and journalists have indicated that the uranium mines operated by AREVA in Niger have significant negative social impacts for local communities. Kidnappings and conflicts are consequences of these social impacts. These negative social effects could be reduced with an effective SIA. In order to minimize the social impacts, together with maximizing the positive social effects, communities have to be engaged in the decision making process of the company across the whole project lifecycle (from the exploring to the closure phase). The result of SIA is a Social Licence to Operate (SLO) - an ongoing approval or acceptance within the local community for the operation of a project. However, SIA could have a vice versa effect on the SLO when all negative impacts of uranium mining are communicated to the local community (this Information Principle is part of SIA) without applying a Social Impact Management Plan (SIMP) to reduce the social impacts. If the SIA and its provisions are not properly implemented, rumours about the social impact of uranium mining will be spread within the community, causing tensions to increase between AREVA and the community stakeholders.

Keywords

Social Impact Assessment; Free -, Prior -, Informed - and Consent principle; Social Licence to Operate; Social Impact Management Plan; uranium mining

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1. Introduction

One of the areas in the world where uranium is mined is northern Niger; one of the poorest countries in the world situated in the Sahel zone of western Africa (UNDP, 2013; CIA, 2013). Uranium mining is the process of extraction of ore from the ground. Only a small fraction (often between 0,1% and 0,2%) of the ore contains the uranium (WISE, 2011). For that reason the first processing of uranium ore takes place adjacent to the mines (Greenpeace, 2010). Uranium is a very heavy metal that is used as a fuel in nuclear reactors (World Nuclear Association, 2012). According to International Atomic Energy Agency (2013) nuclear reactors provide about 13,5 per cent of the world's total supply of electricity.

The French multinational AREVA started its uranium mining operations close to the twin towns Akokan and Arlit in 1971 as shown in Figure 1. Today, Arlit and Akokan make up an urban area of approximately 80,000 inhabitants (Idrissa & Decalo, 2012).

Fig. 1: Uranium mines and uranium mining cities in northern Niger run by AREVA (AREVAb, 2013)

France relocated its uranium mining activities from France to Niger due to public awareness of the dangers and the environmental and health effects of uranium mining, in combination with rising costs and decreasing resources (Greenpeace, 2010). Currently, AREVA operates at the SOMAIR and COMINAK mine in Niger (Fig. 1). Because of the high production of the SOMAIR and COMINAK mine, Niger ranked as number four amongst uranium producing countries in 2011 (OECD & IAEA, 2012). The

Imouraren mine will start production in 2015 (Figure 1). Once this mine is in operation, it will double Niger's production and make the country the world's largest uranium producer (AREVA, 2013d).

The uranium mining area in Niger was historically home of the Tuareg who have a nomadic lifestyle. The homeland area of the Tuareg in Niger is shown in Figure 2. The Tuareg engage in pastoralism in addition to other socio-economic activities as a living (Graham, 2011). In the 1970s, employees of the SOMAIR and COMINAK mine settled down in the homeland of the Tuareg. These newcomers were French expats and internal migrants who established Arlit and Akokan out of nothing (Geels, 2006). Since then, tensions started to increase between the newcomers and the Tuareg due to economic issues (Barra, 2006; Jensen & Rose, 2009), environmental issues (Keenan, 2008) and the marginalization of the Tuareg (UCDP, 2013). Between 1990 and 1995 and between 2007 and 2009 these tensions resulted in armed conflicts (Koos & Basedau, 2012). In 2009, the Niger government and the Tuareg rebels have concluded a peace plan, however, terroristic attacks still appear today (Fortin, 2013).

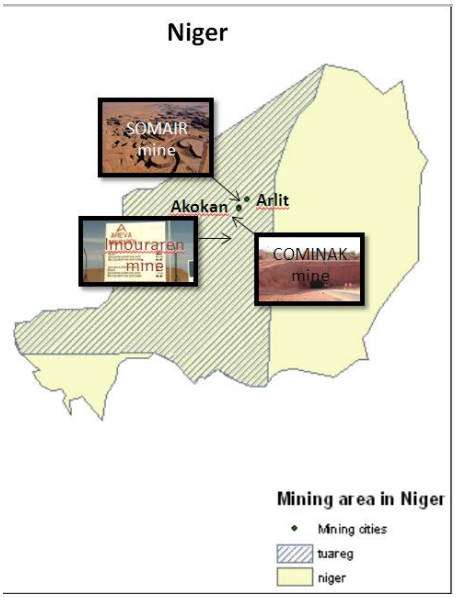

Fig. 2 The homeland area of the Tuareg in Niger (adapted from GlobalSecurity, 2012)

Research by Koos and Basedau (2012) provides evidence that uranium mining causes significant or severe social impacts on local communities and are usually a source of social conflicts in Africa. In the context of this severe social impact of uranium mining it is important and interesting to know how SIA has been applied by AREVA in Niger and

whether it would be possible to apply a more effective SIA in order to reduce the social impacts. The main research question is therefore:

"*To what extent have the measures following former social impact assessments of uranium mining in Niger by AREVA been effective and are there reasons to improve the Social Impact Assessment?*"

The following sub-questions are answered in order to give an accurate answer on the main research question:

- What are the social impacts of uranium mining in Niger by AREVA?
- How is SIA implemented in Niger by AREVA?
- Should SIA be applied in the case of uranium mining in Niger?

2. Methodology

For this research primary and secondary data is collected. E-mail correspondence with Greenpeace International, EPZ (Elektriciteits-Productiemaatschappij Zuid-Nederland) and AREVA (Appendix 1 to 3) provided the primary data. These companies or organizations deal with uranium mining from different perspectives. EPZ has mainly referred to other sources of information and was not able to provide relevant information for this research (Appendix 3). SOPAMIN (Société du Patrimoine des Mines du Niger), a big shareholder in the COMINAK and SOMAIR mine, is also approached by e-mail (Appendix 4). However, this company has not responded on the e-mail. The secondary data consists of research papers, news articles and reports found on the internet. With this set of primary and secondary information, a lot of information can be obtained about the social impacts and the SIA of uranium mining in Niger by AREVA. It has to be noted that data like AREVA and Greenpeace is more subjective than the data from scientists since the company and respectively the organization represent different interests.

3. Theoretical framework

3.1 Description of SIA

According to Vanclay (2003, p.5), Social Impact Assessment (SIA) means "the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions and any social change processes invoked by those interventions. [..] Its primary purpose is to bring about a more ecologically, socio-culturally and economically sustainable and equitable environment. SIA therefore promotes community development and empowerment, builds capacity, and develops social capital (social networks and trust)." According to Vanclay (2003), the cooperation between communities, regulatory agencies, financial institutions and the private sector as incorporated in SIA maximizes benefits and reduces local resistance to projects. Democratic decision-making for new projects usually provides these stakeholders a Social License to Operate (SLO), i.e. an ongoing approval or acceptance within the local community for the operation of a project (Langbroek & Vanclay, 2012; Boutilier, 2012). Thus, SIA reduces disruption, increases project success and prevents major planning disasters and associated costs (Burdge & Vanclay, 1996).

3.2 Implementation of SIA

SIA is implemented through the whole lifecycle of a project (from the exploring to the closure phase). In the feasibility phase of a project (Fig. 3) potential social impacts from planned and alternative options are analysed by the company and this information is shared with the community. The community is involved in the decision on which proposed project alternative is the best to achieve the objectives of the project while still enhancing social outcomes and avoiding negative impacts (Franks, 2011). In the construction -, operation - and closure phase of a project (Fig. 3), the actual social impacts are monitored by the company and reported to the community in order to facilitate an informed dialogue around these issues (Franks, 2011).

The negotiations between the local stakeholders and the company in the feasibility -, construction - and operation phase should comply with the FPIC (Free, Prior, Informed and Consent) principle (Fig. 3). This principle is an obligation to treat communities with respect;

allows them to consider development proposals without duress (Free); allows them sufficient time to consider the proposal and its implications for them (Prior); ensures that they have adequate information about the project and that they are in a position to understand the implications it will have for them (Informed); and gives them the power to say yes or no (Consent) (Burdge & Vanclay, 1996).

The outcome of the negotiations is not a universal understanding of the best option (Flyvbjerg, 2012). Instead, all parties both bureaucratic, private and citizens have their own objectives. Although these parties do often meet, they do not sit on each other's laps. In some cases, the consensus building may fail to produce any agreements or only produce low-quality ones (Innes & Booher, 2007). If the local stakeholders do not agree with (proposed) decisions taken by the company even after amendments are made, the project will not have a SLO, meaning that the project is rejected by the local stakeholders. In accordance to the principles of SIA, the company should terminate the project in order to avoid (further) conflicts as shown in Figure 3 (Kapelus, 2002; Fruggle, 1990).

Usually, a SLO can be achieved when SIA is used for spatial interventions, although this is not achieved by negotiations alone. A Social Impact Management Plan (SIMP) also has to be formulated in the planning phase (Fig. 3). This management tool is developed with the participation of the impacted parties in order to avoid negative social impacts and enhance positive impacts and to win community support in every phase of the lifecycle of a project (Franks & Vanclay, 2013; Franks, 2011). The results of the predicted assessment must be embedded across all aspects of business (Franks, 2011). The outcome of SIA in combination with SIMP is a cooperation between the community and the company (Franks & Vanclay, 2013).

At the end of the SIA process the project is evaluated and reviewed. The predicted social impacts are compared with the actual social impacts in order to refine and improve future approaches (Franks, 2011). The output of SIA is used as the input for a comparable activity (Langbroek & Vanclay, 2012; Fig. 3).

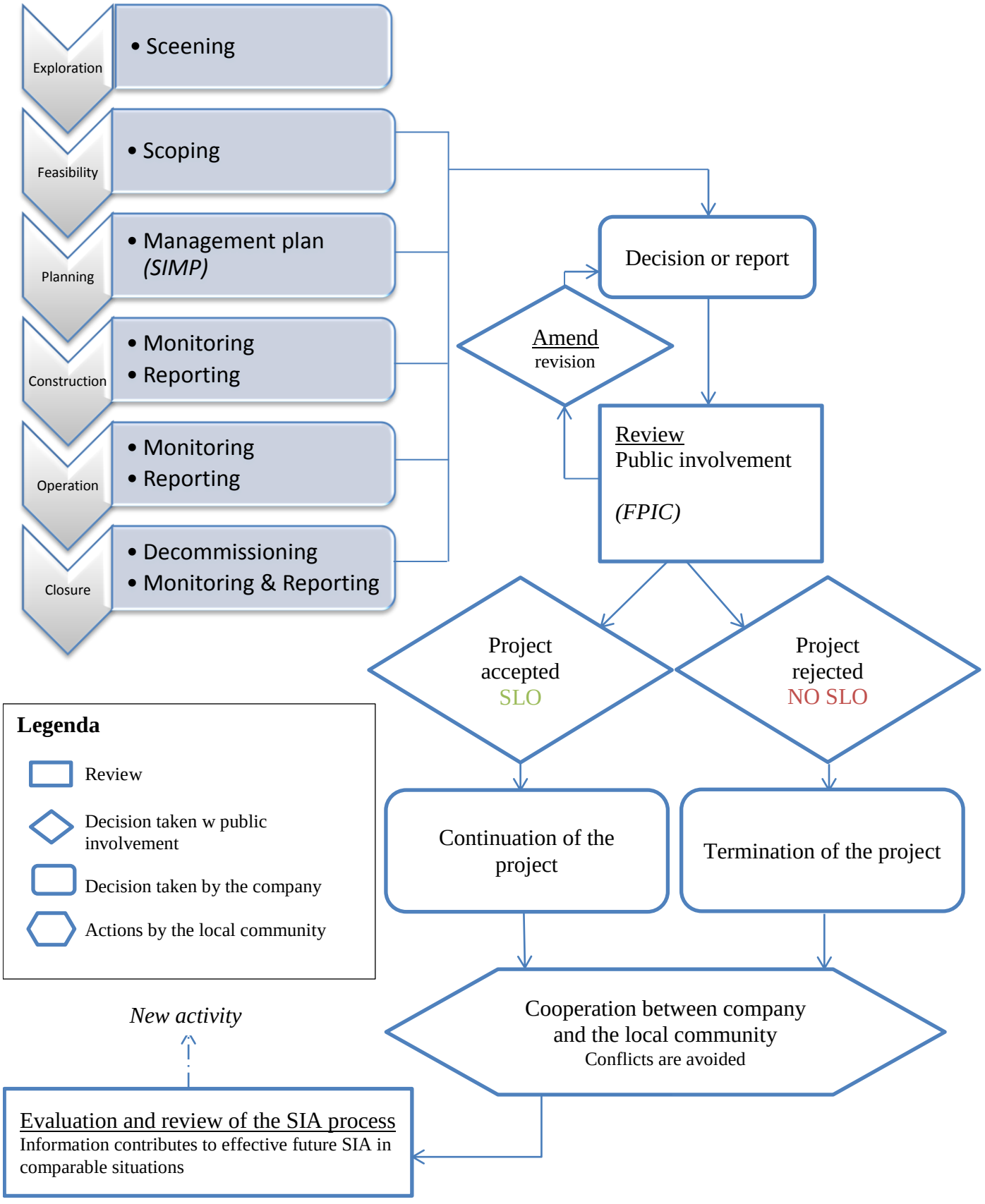

Figure 3: Application of Social Impact Assessment (including the FPIC principle and SIMP)

4. Results

4.1 The social impacts of uranium mining in Niger by AREVA

Based on different sources it has turned out that the stakeholders AREVA, the government, Tuareg rebels, (ex-)mineworkers, inhabitants of Akokan and Arlit and Al Qaeda (as an outsider) have significantly different views on the positive and negative social impacts of uranium mining for the current SOMAIR and COMINAK mine. Subsection 4.1.1 elaborates on the social impacts of current mines for each stakeholder of AREVA. These impacts are summarized in Table 1. Less is known about the social impacts of the Imouraren mine which is currently under construction. The (potential) social impacts of the Imouraren mine are explained in subsection 4.1.2.

4.1.1 The social impacts of the COMINAK and SOMAIR mines

The positive social and economic impacts of uranium mining in Niger by AREVA are: significant profits mainly for AREVA, a free access to education and healthcare in Akokan and Arlit for the local community provided by AREVA, direct employment for 5,300 employees in the mines from which 98% of the workforce are Nigerien plus indirect employment for thousands of others (AREVA, 2011).

For several stakeholder groups the positive social impacts (including economic impacts) of uranium mining are countered or even outbalanced by the negative social impacts. This is especially the case of the ex-mineworkers and inhabitants of Arlit and Akokan who are facing serious health issues, and the Tuareg nomads who are affected by environmental -, political – and economic impacts.

The health issues are caused by high radiation levels in the uranium mines themselves, radiation due to waste material piles (this remaining ore contains too-low uranium concentration to be worth processing and are uncovered with protected layers of clean sand), scrap metals from the uranium mines sold on local markets in Arlit and Akokan, contamination of the water from the wells (the radioactive gas radon) and in asphalted roads for which waste materials from the mines are used (Mark, 2011; Greenpeace, 2009;

Greenpeace 2010). The stakeholders affected with these health issues are (ex-) mineworkers and inhabitants of Akokan and Arlit. Consequences of the high radiation levels as measured by Rianne Teule from Greenpeace (2010) are genetic mutations, birth defects, cancer, leukemia and disorders of the reproductive, immune and cardiovascular systems (Au et al., 1995).

The environmental issues are linked to the extensive use of groundwater for uranium mining activities. The decreasing water supply can be observed in the deteriorating flora in the area. Amoustapha Alhacen of the NGO Aghir in' Man observed that "the wildlife has disappeared in the last decades. The plant life around the village is gone too. This may indeed be a desert country but even the desert has some trees. So the legacy for us is enduring pollution." (Greenpeace 2009, p.2). The extensive use of groundwater threatens the pastoral life of the Tuareg, both for the people and the livestock (Greenpeace, 2010). The depletion of water resources is one of the reasons for the emergence and intensity of resistance to uranium mining by Tuareg nomads (Keenan, 2008).

As far as the political issues of the Tuareg nomads are concerned, the Tuareg people remain diplomatically and economically marginalized up to now and are not being represented in Niger's central government and are perhaps not represented in the decision-making process of AREVA as well (Elischer, 2013). Based on the criteria of the Indigenous and Tribal Peoples Convention, 1989 (No. 169), the Tuareg should be considered as Tribal people. This implies that they have the right "to own, use, develop and control the lands, territories and resources they possesses " (UNDRIP 2007, p.10) and that they have the right to "conservation and protection of the environment and the productive capacity of their lands and resources" (UNDRIP 2007, p.10) according to Article 26:2 and Article 29:1 of the United Nation Declaration on the Rights of Indigenous Peoples. It seems that up to now this declaration has not been materialized considering the demands for greater autonomy of their homeland including their uranium resources. The lack of power of the Tuareg escalated in diverse conflicts against the Central government and AREVA (Krings, 1995; Komlavi-Hahonou, 2009).

The economic issues are related to the unequal distribution of the revenues between the Tuareg and the government plus AREVA according to the Tuareg nomads and by the unequal distribution of revenues between the government and AREVA according to

president Mahamadou Issoufou of Niger. The Tuareg nomads continue to struggle for a larger share of uranium revenues for the local population (BBC, 2013a). According to Article 18 of the peace agreement, signed by the central government and the Tuareg in the 1995, the central government must transfer a share of national resources generated by industrial mining to local governments (UNESCO, 1995). Moktar Roman, spokesman of the Tuareg rebels, believes that most of the money goes to the government and foreign countries while the north is still being drained of resources (IRIN, 2007). This perception is shared with other Tuareg rebels. For this reason and environmental – and political reasons they repeatedly declared that northern Niger is 'a war zone' and attacked the SOMAIR and COMINAK mines (Keenan, 2008; World Nuclear News, 2013).
The government of Niger is also complaining frequently that they want a fairer deal for the poor African country. President Mahamadou Issoufou of Niger said “It's not acceptable, I have asked to re-equilibrate the terms of the deal between AREVA and Niger.” (Fortin, 2013). Nigerien officials hope to increase Niamey’s share of uranium profits so that they make up at least 20 percent instead of the current 5 percent of the annual national budget (Fortin, 2013). In this way, the Niger government able to provide a larger share of the revenues to the Tuareg (IRIN, 2007).

In recent years, the reputation of AREVA has worsened and an exodus of expats and many others has taken place, not only because of conflicts with Tuareg rebels (due to economic -, environmental – and political issues) but also because of kidnappings in 2010 and a suicide attack in 2013 claimed by Al-Qaeda in the Land of the Islamic Maghreb (AQIM), fighting against foreign interference (WikiLeaks, 2013; BBC, 2010; BBC, 2013b). The AQIM have been known to work with Tuareg rebel groups in the Sahel to trade and/or sell high-value Western hostages to them (WikiLeaks, 2013). The resulting safety issues for the AREVA mineworkers are the main reason for the delay of the start-up of production at the Imouraren mine for at least three years (Massalatchi, 2013).

Currently, the resistance against AREVA’s mining activities in Niger is increasing due to the growing realization by the local communities that uranium mining is causing serious ecological and health problems (IRIN, 2007). AREVA is also facing resistance from their mine workers; in 2012 and 2013 the mine workers of the COMINAK and SOMAIR mines have demonstrated and organized strikes against AREVA for a bonus, while referring to the high profits of AREVA (Reuters, 2013).

	Positive	Negative
AREVA	Revenues	Kidnappings and conflicts: bad influence on reputation
Mineworkers	Direct employment Access to education and healthcare	Low salary → strikes Health issues (exposed to high radiation levels) Safety issues (for Western employees)
Ex-mineworkers		Health issues (illness and deaths)
Inhabitants of Akokan and Arlit	Provide (in)direct employment Access to education and healthcare	Contaminated water Environmental issues (depletion of water resources) Health issues (exposed to high radiation levels)
Central government of Niger	Earns a small percentage of AREVA's revenues	No fair deal of distribution revenues between AREVA and government → negotiations with AREVA
Tuareg nomads (including Tuareg rebels)	Possibly high value Western hostages (AREVA employees)	Economic issues: almost no revenues to their mining region → conflicts with government and AREVA Political issues: no autonomy and marginalization → conflicts Decreasing water supply → deteriorating flora → threatens pastoral life → conflicts
Al-Qaeda	High value Western hostages (AREVA employees)	Against foreign influences → kidnappings

Table 1: Positive and negative social impacts of AREVA's mining activities at the current mines

4.1.2 The (potential) social impacts of the Imouraren mine

The positive and negative social impacts of AREVA's mining activities for the new Imouraren mine are probably the same or worse than the social impacts for the current mines. Safety issues already exist for the Imouraren mine (Massalatchi, 2013) and the environment will even be more degraded once the Imouraren mine starts its operations according to WISE (World Information Service on Energy, 2012). "The Imouraren mine will, without mitigations, lead to exhaustion and contamination of water resources and the disappearance of pasture in an area covering hundreds of square kilometres" (WISE 2012, p.8), which will make a pastoral life for the Tuareg nomads in the surrounding area of the Imouraren mine impossible. Moreover, dust and seepage from the piles of waste rock will have impacts on the health of the residents as well (WISE, 2012). There are no indications that the economic - and political issues will be lessened once the new uranium mine is in operation.

4.1.3 Analysis of the social impacts of AREVA's mining operations in Niger

Although uranium mining has positive economic impacts on AREVA and its mineworkers in Niger, the perceived negative social impacts due to uranium mining dominate the positive impacts for most of the stakeholders as a consequence of desertification, environmental pollution, health problems and safety problems that are caused by uranium mining activities. It is not sure whether the negative social impacts for the current mines are worse than the perceived negative social impacts for the new Imouraren mine. This is because there is insufficient data and knowledge about the perceived social impacts of uranium mining in Niger by AREVA for each stakeholder group and even within a stakeholder group perceptions about uranium mining differ (Flyvbjerg, 2012). Especially in the stakeholder group 'Inhabitants of Arlit and Akokan' these perceptions probably differ, since the inhabitants consist of inland migrants, expats and Tuareg people with different interests in uranium mining (Geels, 2006).
In the future, AREVA is going to face more and more resistance according to the French researcher Nadia Belamat, since there has been a growing realization by the local communities that uranium mining is causing serious ecological and health problems (IRIN,

2007). Thus, resistance against uranium mining will probably increase when no measures are taken by AREVA to reduce the social impact.

4.2 Application of the SIA in Niger by AREVA

AREVA applies elements of SIA for the current SOMAIR, COMINAK mines (AREVA, 2013a; AREVA, 2013b; AREVA, 2013c) and the new Imouraren mine since a couple of years (AREVA, 2013a; AREVA, 2013d). AREVA seriously considers improvements regarding social responsibility, including stakeholders engagement which can be regarded as part of SIA (Appendix 1). According to Rianne Teule from Greenpeace International these measures have been started very late. AREVA was only willing to start after new scandals regarding radioactivity and the lack of security were revealed in the public domain (Appendix 1).

The analysis of the elements of the SIA (including FPIC principle and SIMP) applied by AREVA for the current mines and the new mine in Niger is based on secondary data. It is not possible to achieve primary data from AREVA since AREVA "can not communicate on this" by e-mail (Appendix 2). By addressing during a phone call with an employee of AREVA that it is not coherent with their open and transparent policy of AREVA (AREVA, 2013a) to withhold important information, made the company reconsider to take a second look at the questions that were sent to AREVA by e-mail. Despite of this, AREVA has not replied on the e-mail so far.

In subsection 4.2.1 data about the application of SIA for the current COMINAK and SOMAIR mine is gathered. Subsection 4.2.2 contains the data about the application of SIA for the new Imouraren mine. In subsection 4.2.3 these data is compared with the requirements of a fully implemented SIA for which the theoretical framework is used as reference point. This analysis is exemplified with Table 2.

4.2.1 Application of the SIA for the current COMINAK and SOMAIR mine

Since a couple of years AREVA holds regular sessions in Arlit and Akokan regarding the social impact of the COMINAK and SOMAIR mines (AREVA, 2013e). These sessions are held with department representatives, city representatives, departmental engineers, technicians and other representatives of the civil society. AREVA tries to maintain this ongoing dialog to share information and to respond to stakeholders' questions and concerns (AREVA, 2013e).

These sessions are part of the operational phase of the project lifecycle. The first four phases of the project lifecycle in which the potential social impacts and the alternative uranium mining options should be discussed with local stakeholders and in which the SIMP is developed, are not implemented by AREVA (AREVA, 2013a; AREVA, 2013b; AREVA, 2013c; Franks, 2011; Franks & Vanclay, 2013).

AREVA has not complied with the FPIC principle for the current COMINAK and SOMAIR mine. The Free principle has not been applied from the perspective of the Tuareg. They were forced to accept the mining activities in their homeland including environmental impacts and the loss of local resources for their pastoral life (Barra, 2006; Jensen & Rose, 2009; UCDP, 2013). Furthermore, the Prior principle has probably not been applied since the Tuareg were most likely not involved in the decision making process during the start-up phase of these mines considering the ongoing tensions between the Tuareg and AREVA (AREVA, 2013a). AREVA has also not complied with the Information principle. According to Meyer (2010), the serious environmental - and health impacts of uranium mining became apparent decades after the start-up or have not come to the light yet, due to incomplete information and the distortion of the truth by AREVA. Two examples show this distortion of the truth by AREVA; first, (ex-)mineworkers are given the wrong diagnoses if they have cancer in the SOMAIR hospital founded by AREVA (Meyer, 2012), secondly, the wrong information about the radioactive contaminations in water and on several locations in Arlit and Akokan is provided to Greenpeace and CRIIRAD (Commission de Recherche et d' Information Indépendantes sur la RADioactivité) and to the local community as well (Greenpeace, 2009; CRIIRAD, 2010). It is not clear whether the Consent principle is applied.

4.2.2 Application of the SIA for the new Imouraren mine

For the new Imouraren mine, elements of SIA are implemented in the construction phase. AREVA has initiated a validation workshop in this phase, attended by experts from AREVA and the Nigerien State, members of civil society and representatives of various administrations (AREVA, 2011). Perhaps SIA is applied in the planning phase as well. There are indications that SIMP is used in the planning phase since AREVA has ensured that the project's impact is as low as possible (AREVA, 2011), although AREVA does not elaborate on the website on how they want to achieve a minimization of the social impact. There is no data whether elements of SIA are applied in the feasibility phase of the Imouraren mine.

The application of the FPIC principle for the Imouraren mine differs from the current mines. The construction of the Imouraren mine was not on a Free basis, considering the attack on this mine in 2007 by Tuareg rebels and the delay of the start-up of this mine due to safety reasons (Massalatchi, 2013). Insufficient data is available about the application of the Prior principle for the new mine. The Information principle has probably not been applied for the new mine, since AREVA is not transparent about the social impact of its uranium mining activities (Meyer, 2010; Greenpeace, 2009; Greenpeace, 2010; CRIIRAD, 2010). Perhaps AREVA has complied with the Consent principle for the new mine, since stakeholders must validate the impact studies (AREVA, 2011). However, it is not sure whether the Consent principle is applied for all interested and affected parties and whether there is a reasonable balance of power between these stakeholder groups and AREVA (Flyvbjerg, 2012).

4.2.3 Analysis of the application of SIA by AREVA

In Table 1 data of a fully implemented SIA is compared with the SIAs as applied in Niger by AREVA. For the Imouraren mine, AREVA implemented SIA in an earlier phase of the project lifecycle compared to the application of SIA for the current mines. This earlier start of the implementation of SIA is an advantage since the worries of the community about the operation of the Imouraren mine can be heard, addressed and potentially accommodated by AREVA before this company starts to operate which has not been done during the start-up of the current mines (Langbroek & Vanclay, 2012). However, the Imouraren mine can still be a major planning disaster since the FPIC principle is not properly applied (Franks & Vanclay, 2013). For the existing mines the Tuareg (rebels) are not only forced to accept the mining activities of AREVA (the Free principle), they and other stakeholders of AREVA's mining operations in Niger are also wrongly and inadequately informed about the environmental - and health consequences of the uranium mining activities (the Informed principle). The Free principle is not applied and Informed principle is probably not applied for the new Imouraren mine either. Moreover, SIMP is not applied for the current mines and perhaps not used for the new mine to manage the social impacts of AREVA's operations.

Furthermore, it is not sure whether all affected parties (including Tuareg rebels) are involved in the decision-making process of AREVA. Another point that has to be addressed in relation to the application of SIA is that it is unclear whether there is a reasonable balance of power between these stakeholder groups and AREVA (Flyvbjerg, 2012).

It can be concluded that for both the current mines and the new mine only a few elements of SIA have been implemented by AREVA.

	Fully implemented SIA	**Current mines (SOMAIR and COMINAK mine)**	**New mine (Imouraren mine)**
Phases of the lifecycle in which SIA is applied	From exploration to closure	Operation	Construction Planning: probably Feasibility: no data
Application of FPIC principle	FPIC is fully applied	F and I: not applied P: probably not C: no data	F and I: probably not applied P: no data C: perhaps applied
Application of SIMP	Applied	Not applied	Perhaps applied

Table 2: Application of SIA for the current mines and the new mine in Niger operated by AREVA compared the application of a fully implemented SIA

4.3 Should SIA be applied in the case of uranium mining in Niger by AREVA?

Currently, the SOMAIR and COMINAK mines as well as the new Imouraren mine do apparently not have SLO's. First of all, the SIA's (including FPIC and SIMP) are badly implemented by AREVA. The conflicts and kidnappings at AREVA's mining sites in Niger are probably consequences of the absence of SLO's as shown in Figure 4. Due to these safety issues AREVA decided to delay the start-up of the Imouraren mine and to protect the current SOMAIR and COMINAK mines with French special forces in order to continue its operations (BBC, 2013c; Massalatchi, 2013).

In order to achieve a SLO, the SIA should be fully implemented by AREVA according to Vancaly (2013). However, when AREVA would address the actual social and environmental impacts to all stakeholders in accordance with the Information principle and would respect

the indigenous rights of the Tuareg in accordance with the Free principle, a SLO for its uranium mining projects is not guaranteed. For example, in the Navajo Nation (a semi-autonomous Native American-governed territory) uranium mining activities were proposed and there has been complied with the Information – and Free principles. Even though, president Joe Shirley, Jr. of the Navajo people signed the tribal law in 2005, banning uranium mining and milling after resistance against these activities from within the local community. According to the president, "certain substances in the Earth that are harmful to the people should not be disturbed. People now know that uranium is one such substance, and it is therefore that its extraction should be avoided as traditional practice and prohibited by Navajo law." (SRIC, 2013).

This example shows that even with the application of the Free – and Informed principle an uranium mining project to be rejected . Therefore, it could be questioned whether SIA will sufficiently reduce the negative social impacts of uranium mining to achieve local cooperation. However, this example cannot be compared to AREVA's mining operations in Niger because of the different contexts (such as the economic -, social -, political - and physical circumstances) and different experiences with uranium mining activities in the past (Alberta government, 2008; Flyvbjerg, 2012).

Although uranium mining damages the environment and has an impact on human health, it is possible to obtain a SLO. For the Olympic Dam and Radium Hill (uranium mines in South Australia) community trust is achieved by a full implementation of SIA (Baldry, 2008). If the economic -, political -, environmental – and health issues of the local stakeholders are heard, AREVA could take these community aspirations into considerations and give the community the ability to influence the outcome of a decision-making (O'Faircheallaigh, 2010). Possible measures to avoid or mitigate these impacts could be: the removal or coverage of the radioactive material in Akokan and Arlit (on health – and environmental issues); a reasonable agreement about the distribution of revenues between AREVA, the Niger government and the Tuareg nomads, with a better balance of power between AREVA, the government and Tuareg nomads (on economic and political issues); and a reduction of the water use from the aquifer by using water from the Niger river instead and using the latest techniques of cleaner uranium mining (on environmental issues).

Stewart and Sinclair (2007, p.162) demonstrate a wider range of benefits of the implementation of SIA, including "access to local knowledge; broadening the range of solutions considered; strengthening the democratic fabric of society; acting as a vehicle for individual and community empowerment; and promoting broadly-based individual and social learning." So, with a good implementation of SIA (compliance with the FPIC principle and SIMP) a transition can be possible for AREVA from a fragile safety situation to sustainability and from a conflict situation to cooperation between AREVA and its stakeholders (Figure 4).

Based on the analysis in this paragraph it can be concluded that the answer to the subquestion 'Should SIA be applied in the case of uranium mining in Niger by AREVA?' is: Yes, because there is no SLO now and the social impacts will probably increase in the future when no measures are taken. With the absence of a good SIA, AREVA is exposed to the risk of forced closure of their uranium mines in Niger in the future due to increasing resistance and conflicts. If AREVA would shift to a fully implemented SIA, AREVA might achieve a cooperation with local stakeholders (Figure 4).

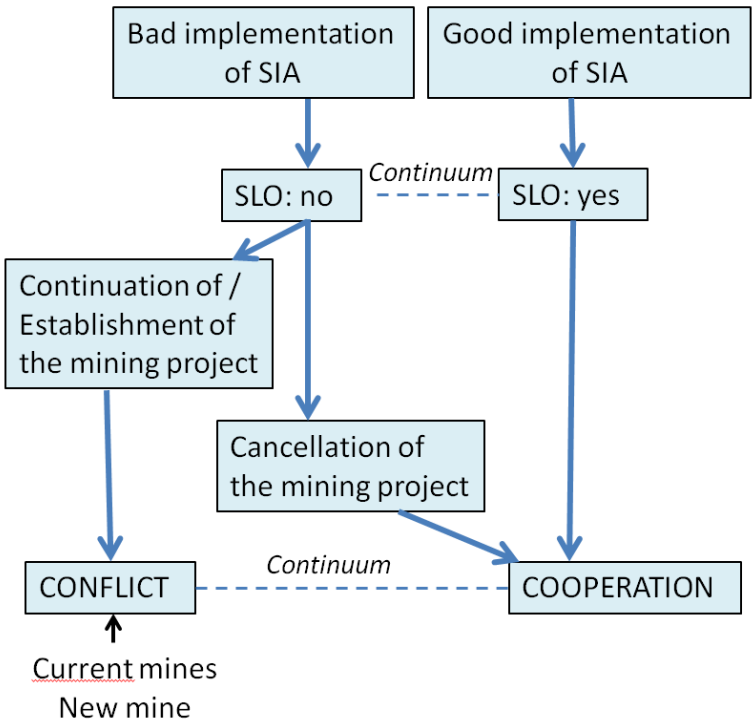

Figure 4: Implementation of SIA and SLO for mining projects: the difference between conflict and cooperation with local communities

Conclusion

Social Impact Assessment are the processes of analyzing, monitoring and managing the social consequences of spatial interventions (Vanclay, 2003). SIA is focused on identifying, avoiding, mitigating and enhancing outcomes of projects for communities by involving and empowering communities in de decision-making process (Franks, 2011; Langbroek & Vanclay, 2012). For an effective SIA, SIA have to be implemented from the exploring to closure phase, and the FPIC (Free, Prior, Informed and Consent) principle and SIMP (Social Impact Management Plan) have to applied (Franks, 2011; Burdge & Vanclay, 1996). An effective SIA provides stakeholders of projects a Social License to Operate (Langbroek & Vanclay, 2012), i.e. the ongoing approval within the local community for the operation of a project (Boutilier, 2012).

As turned out from the results, uranium mining in Niger by AREVA has severe negative social impacts due to desertification, environmental pollution, health problems and safety problems (conflicts and kidnappings) that are caused by uranium mining activities. The SIA has not effectively been applied since only elements of SIA are used for both the current mines and the new Imouraren mine. In order to reduce these social impacts that differ for each stakeholder, a fully implemented SIA should be applied by AREVA. In this way, a transition can be possible from a fragile safety situation to sustainability and respectively from a conflict situation to a cooperation between AREVA and its stakeholders. Thus, there are reasons to apply SIA because there is no SLO now and the social impacts will probably increase in the future when no measures are taken due to the growing realization of the actual impacts of uranium mining for its environment and the health of people amongst local stakeholders (IRIN, 2007).

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Appendix

Appendix 1:
E-mail correspondence with Rianne Teule (Greenpeace International).
Rianne Teule went to the SOMAIR, COMINAK and Imouraren mine in 2009. She also measured the radiation levels in Akokan.

Beste Anne,
Mijn antwoorden hieronder tussen je vragen.

On 29/05/2013 11:50, A.Abbing wrote:
Hallo Rianne,

Ik had het rapport al op internet gevonden en ik heb veel nuttige informatie uit het rapport toegevoegd aan mijn thesis. Ondanks dat ik op de hoogte was van de (mogelijke) gevolgen van uranium mijnbouw en milling voor de mens, schrok ik van de quotes die in het rapport stonden. Goed dat jullie de sociale impact van uranium mijnbouw en de consequenties voor het milieu in kaart hebt gebracht! Toch heb ik naar aanleiding van het rapport nog enkele vragen waarvan ik hoop dat je deze zou kunnen beantwoorden.

1. Voor mij is het onduidelijk hoe er door de lokale bewoners van Akokan en Arlit tegen uranium mijnbouw wordt aangekeken. Enerzijds zou ik zeggen dat ze blij zijn met de werkgelegenheid die de uranium sector voor hen biedt, anderzijds heeft uranium mijnbouw behoorlijke consequenties voor het milieu, de gezondheid en voor de politieke stabiliteit van Niger. In hoeverre zijn de bewoners in Niger op de hoogte van de negatieve gevolgen die uranium mijnbouw en milling met zich meebrengen? (In het Greenpeace rapport las ik dat sommige inwoners van Akokan aangaven dat er nieuwe ziektes in Akokan voorkomen en dat het een open secret is dat mensen overlijden als gevolg van radioactieve straling. Amoustapha Alcahen van de NGO Aghir in' Man geeft in het filmpje dat op de Greenpeace site geplaatst echter aan dat de bewoners van Arlit niet bang zijn voor radioactiviteit omdat ze niet weten wat radioactiviteit is.)
Je moet je voorstellen dat het een extreem arm gebied is midden in de woestijn. Veel mensen hebben geen opleiding en leven (leefden) van de woestijn. Sinds de mijnen openden zijn de dorpen Akokan en Arlit daar gegroeid om de mijnwerkers te herbergen. Er is dus enkel werk in de mijnen en in de lokale economie. Mensen hebben weinig, verdienen weinig en er is niet veel bewustzijn van risico's van mijnen of radioactiviteit. Sommige mensen maken zich zorgen, anderen zijn gewoon blij dat ze werk hebben en te eten. Ze hebben geen keus! Lokale NGOs proberen wel t bewustzijn van mensen over de risico's te vergroten, maar leg maar eens aan iemand zonder opleiding uit wat radioactiviteit is.. het zegt ze niks, je kunt het niet zien..

2. Ik kan nergens op de AREVA site terugvinden wat het inkomen van een werknemer in de uraniummijn is. Weet jij misschien of dit inkomen genoeg is om er als huishouden van 8 personen mee rond te kunnen komen? Is dit inkomen (veel) hoger, gemiddeld of lager dan het gemiddelde inkomen van een Niger? Zorgt het inkomen en/of de werkloosheid in de rest van Niger door de desertificatie voor een trek naar Arlit en Akokan?
Ai, dat weet ik niet.. inkomens zijn erg laag, maar de levensstandaard is ook erg laag - Niger is een van de armste landen ter wereld.
Ik weet ook niet of er (te)veel mensen naar A&A trekken op zoek naar werk.

3. Welke andere vormen van werkgelegenheid zag je naast de mijnbouw sector in Akokan en Arlit? Was het nog mogelijk om in 2009 een pastoraal bestaan in de omgeving van Akokan en Arlit te leiden? Weet je ook of er actie wordt ondernomen om het grondwaterpijl te verhogen, dan wel om niet uit de Tarat Aquifer maar van elders water aan te voeren?
Andere vormen van werkgelegenheid zijn diensten, zoals ziekenhuis, winkels, markt, ambachten, kleinschalige verbouwen van groente. Ik weet niet wat je bedoelt met 'een pastoraal bestaan'. En er zijn naar mijn weten geen speciale maatregelen met betrekking tot het grondwaterpijl of aanvoer van water. Er wordt wel gemonitord in hoeverre de mijnen het grondwater vervuilen, en AREVA heeft berekeningen gedaan over hoe veel water ze verbruiken ten opzichte van de totale hoeveelheid water in de aquifer.

4. Aangezien mijn scriptie over Social Impact Assessment gaat, vroeg ik me af of er bij de SOMAIR en COMINAK mijn sprake was van Social Impact Assessment (dus of er voor het uitvoeren van nieuwe handelingen een afstemming tussen verschillende actoren (waaronder die van de lokale bevolking en de Tuareg) wordt gemaakt, zodat er een consensus ontstaat). Op de site van AREVA las ik het volgende (zie hieronder), maar heb je dit in de praktijk ook teruggezien?
Local Stakeholder Engagement
For nearly a decade, AREVA has globally deployed a local stakeholder mapping methodology to guide engagement with the local communities around our major locations. This approach involves identifying the main economic, environmental, social and societal issues for AREVA sites and those in the community.
Dit is inderdaad iets waar AREVA over praat sinds een aantal jaren - rijkelijk laat in aanmerking genomen wanneer de mijnen in bedrijf zijn genomen. Dit is ook begonnen in de tijd dat de eerste onthullingen van schandalen rond de mijnen uitkwamen, over verspreiding van radioactieve materialen en laksheid in veiligheidsmaatregelen. AREVA is toen gaan kijken wat ze konden verbeteren in het kader van CSR, en daar valt de stakeholder engagement onder. Het is een feit dat ze meer in gesprek zijn met NGOs, hoewel dat toen wij er waren in 2009 nog maar net begonnen was. In hoeverre het daadwerkelijk positieve effecten heeft weet ik niet.

5. Ken je voorbeelden waar wel of meer sprake is van Social Impact Assessment in de mijnbouw? Zo ja, bij welke mijnen is dit het geval? (misschien is er een onderscheid tussen ontwikkelingslanden en ontwikkelde landen te maken)
Sorry, daar heb ik nooit naar gekeken.
6. Hoe zijn de werkomstandigheden in de mijnen in Niger vergeleken met andere mijnen die je hebt bezocht?
Ik heb geen andere mijnen bezocht, dwz de mijnen in Niger zijn de enige waar ik daadwerkelijk in de mijnen ben geweest. En dat was rondgeleid door AREVA, dus die hebben zeker hun best gedaan dat we geen rare dingen zagen. Het was een erg ge-orchestreerd bezoek ;-)

Alvast een hele fijne vakantie toegewenst en begrijp je reactie van gisteren wel nu je het zo druk hebt. Waar gaat de reis naartoe?
Duiken in Egypte en verder uitrusten in NL :-) Dank je!

Sterkte met je thesis, en mocht je in juli nog meer vragen hebben hoor ik dat graag.
Is het ook mogelijk een kopie van je thesis te ontvangen als het klaar is?
Vriendelijke groeten, Rianne

Appendix 2: AREVA
E-mail correspondence with AREVA
De : Anne Abbing [mailto:abbinganne@gmail.com]
Envoyé : mardi 23 avril 2013 10:38
À : &PAR_AREVA_PRESS
Objet : information for my bachelor thesis about 'Social Impact Assessment of Uranium Mining'

Dear Sir/Madam,

For my bachelor thesis at the University of Groningen (the Netherlands), I'm trying to answer the following question:

"To what extent have the measures following former Social Impact Assessments of uranium mining in Niger been effective and are there reasons to improve the Social Impact Assessment?"(see the description of SIA below)

Social Impact Assessment (SIA) means "the processes of analysing, monitoring and managing the social consequences of planned interventions and any social change processes invoked by those interventions." (Vanclay, 2008) Its primary purpose is to bring about a more ecologically, social-culturally and economically sustainable and equitable environment. Social Impact Assessment promotes community development and empowerment, builds capacity and develops social capital. The cooperation between communities, regulatory agencies, financial institutions and the private sector maximizes benefits and reduces local resistance to projects (Langbroek & Vanclay, 2012).

Since AREVA has mining activities in Niger, I think you can really help me to collect data that is needed to answer my main research question. I put these 10 questions below. I would be pleased if you could answer these questions.

I hope you can give me some advice if you have suggestions for contact persons or websites I can consult to answer these questions.

Thank you in advance for your co-operation,

With kind regards,

Anne Abbing

Third-year human geography student at the University of Groningen

Questions

I don't have a good overview of AREVA's activities in Niger. I hope you could provide information regarding the questions below.

1. **How many uranium mines does AREVA have in Niger?**

2. **How many employees work in these mines?**

3. **Where exactly are these mines (geographical location)?**

4. **What other companies have uranium mining activities in Niger?**

5. **What is the average income of an employee in AREVA's uranium mines?**

6. **In what way does AREVA reduce mining's impact to the health of human communities?**

7. **Does AREVA apply Social Impact Assessment (SIA) for the current mining activities and - if so - what are the most important experiences of AREVA with SIA?**

8. **Are new mining sites in Niger prospected? If so, is Social Impact Assessment undertaken for these new mining sites?**

9. **On the website of AREVA, I read that 4 employees of uranium mines in Niger have been held in hostage. Could you tell me more about the motive of the hostage makers?**

10. **Is it safe to work in uranium mines in Niger at the moment**

Answer by: PAR_AREVA_PRESS <press@areva.com> 23 apr.

Dear Madam,
You can find information here:
http://www.areva.com/finance/liblocal/docs/doc-ref-2012/DDR_AREVA_2012_VUK.pdf
Thank you.

De : Anne Abbing [mailto:abbinganne@gmail.com]
Envoyé : mardi 23 avril 2013 11:27
À : &PAR_AREVA_PRESS
Objet : Re: information for my bachelor thesis about 'Social Impact Assessment of Uranium Mining

Dear sir/madam,
Thank you very much for the link. Unfortunately, the document doesn't give an answer on most of my questions. Do you also have more information about the Imouraren project in Niger? Is Social Impact Assessment applied in this project? Perhaps you can send this e-mail with my questions to the Mining Business Group or to Mr. Luc Oursel. I already made a telephone call this morning with AREVA and the person I talked to gave me your e-mail address. I really need to get more information linked to my subject of research.
I hope you can help me,
Thank you in advance,
With kind regards,
Anne Abbing
The Netherlands

Answer by: PAR_AREVA_PRESS <press@areva.com> 23 apr.

We can not communicate on this. Sorry.

Best regards.

The e-mail below was sent after I had a phone call with AREVA on 30-5-2013:

van:	Anne Abbing <abbinganne@gmail.com>
aan:	press@areva.com
datum:	31 mei 2013 18:01
onderwerp:	SIA of uranium mining in Niger : focus on Akokan and Arlit
verzonden door:	gmail.com

Dear Sir/Madam,

I'm writing this e-mail after I called you this afternoon. You told me that you wanted to know the person I'm corresponding with. Her name is Rianne Teule from Greenpeace International and she measured the radiation levels in Akokan (Niger) in 2009.

Below, I copied the e-mail I sent to you a month ago. I adjusted some questions, since I've already found lots of information on your website.

For my bachelor thesis at the University of Groningen (the Netherlands), I'm trying to answer the following question:

"To what extent have the measures following former Social Impact Assessments of uranium mining in Niger been effective and are there reasons to improve the Social Impact Assessment?"(see the description of SIA below)

Social Impact Assessment (SIA) means "the processes of analysing, monitoring and managing the social consequences of planned interventions and any social change processes invoked by those interventions." (Vanclay, 2008) Its primary purpose is to bring about a more ecologically, social-culturally and economically sustainable and equitable environment. Social Impact Assessment promotes community development and empowerment, builds capacity and develops social capital. The cooperation between communities, regulatory agencies, financial institutions and the private sector maximizes benefits and reduces local resistance to projects (Langbroek & Vanclay, 2012).

Since AREVA has mining activities in Niger, I think you can really help me to collect data that is needed to answer my main research question. I put these 5 questions below. I would be pleased if you could answer these questions.

Thank you in advance for your co-operation,

With kind regards,

Anne Abbing

Third-year human geography student at the University of Groningen

Questions

1. **Where exactly are the SOMAIR, COMINAK and Imouraren mines located (geographical coordinates)?**

2. **What is the average income of an employee in AREVA's uranium mines in Niger? Do you think this income will increase or decrease in the near future? What is/are the cause(s) for this increase or decrease?**

3. **In what way does AREVA reduce mining's impact to the health of human communities?**

4. **Does AREVA apply Social Impact Assessment (SIA) for the current mining activities and if so - in what way is SIA undertaken and what are the most important experiences of AREVA with SIA?**

5. **Is Social Impact Assessment undertaken for the Imouraren site?**

Appendix 3: EPZ
E-mailcorrespondence with Elektriciteits-Productiemaatschappij Zuid-Nederland (EPZ)
(This company operates in nuclear power plants)
Date: 29-04-13 16:30
From: EPZ
Sender: Feijter - Mual F.L. de

Beste Anne,

Hierbij antwoorden op de door jouw gestelde vragen. Het heeft even geduurd voordat wij de juiste persoon hadden gevonden, die hier het best antwoord op kon geven.

- Weet u ook welke buitenlandse bedrijven er opereren in de uranium mijnbouw in Niger?

Uranium is een belangrijke industrie in Niger. Volgens het "Red Book" van de OECD waren er in 2011, het meest recente jaar waarvan een goed overzicht bestaat, maar liefst 160 concessies uitgegeven aan buitenlandse bedrijven.

De belangrijkste ertswinning vindt plaats in Arlit: 36,6% SOPAMIN (Niger) en 63,4% AREVA (Frans).

Verder Akouta (31% SOPAMIN, 34% AREVA, 25% OURD (Japan) en 10% ENUSA (Spanje).

Azelik (37,2% CNUC (China), 33% SOPAMIN, 24,8% ZXJOY (China) en 5% KORES (Korea)

De grootste erts voorraad is in Imouraren (33,35% Niger, 56,65% AREVA (Frankrijk), 10% KEPCO(Korea).

Veiligheid:

Bij uraniummijnbouw wordt rekening gehouden met dezelfde veiligheidsmaatregelen als bij gewone mijnbouw bv. koper of kolenmijnen. Daarnaast is een speciaal extra aandachtspunt dat het moedergesteente van uranium natuurlijke radioactieve stoffen bevat, die miljoenen jaren zijn opgesloten geweest in het erts maar die door het delven en verbrijzelen van gesteente mobiel worden en stralingsbelasting kunnen opleveren voor werknemers en voor de omgeving. Om dat risico te beheersen worden ondergrondse mijnen goed geventileerd en wordt het mijnafval (de zgn. tailings) opgeslagen op een manier die de radioactieve stoffen geen kans geeft te ontsnappen. Tijdens de exploitatie van de mijn wordt het afval meestal onder water bewaard in "tailings ponds" en later wordt het ondergronds opgeslagen of met dikke lagen klei afgedekt. Informatie is onder meer te vinden via de volgende links:

http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Mining-of-Uranium/Environmental-Aspects-of-Uranium-Mining/

http://areva.com/EN/operations-592/a-lasting-partnership-with-niger.html

http://www.iaea.org/newscenter/news/2009/cleanuranium.html

- Op welke manieren kunnen de gevolgen van uranium mijnbouw voor het milieu en voor de gezondheid van de mens worden gereduceerd?

EPZ kan niet in detail uitleg geven over de mijnbouw in Niger, want wij hebben daarmee geen commerciële relatie (momenteel komt ons uranium uit Canada).

Een meer algemene observatie is dat de relatie van de mijnbouwindustrie met de omgeving (meestal) anders wordt beschouwd dan in welvarende landen zoals in Europa. Niger is een bijzonder arm land en voor de regio zijn de uraniummijnen vaak de enige vormen van inkomsten. Ook zijn dat vaak de enige plekken in de wijde omgeving waar scholen, ziekenhuizen en zelfs schoon drinkwater te vinden zijn.

- Hoe kijken inwoners die vlakbij een uraniummijn wonen over het algemeen tegen uraniummijnbouw aan? (zien ze dit als positief of negatief?)
- Wordt er bij nieuwe uraniummijnbouw projecten normaliter aan Social Impact Assessment (zie de beschrijving hieronder) gedaan? Oftewel, wordt de lokale bevolking bij nieuwe projecten betrokken (mogen ze input leveren en worden hun ideeën meegenomen bij het opstellen van een plan) zodat de weerstand vanuit de lokale gemeenschap vermindert?

Wat betreft de sociale aspecten van de mijnbouw in Niger, verwijzen we je naar AREVA's website http://areva.com/EN/operations-592/a-lasting-partnership-with-niger.html#Q1

- Is er bij uranium mijnbouw in Niger sprake van Social Impact Assessment?

Of er in het algemeen in Niger sprake is van Social Impact Assessments, weten we niet. EPZ betrekt haar uranium niet uit Niger, en heeft daarom de bijzonderheden in dat land nooit bestudeerd.

Veel succes met je opleiding.

Met vriendelijke groet, Fransgall de Feijter - Mual
Afdeling In & Externe Communicatie

Appendix 4: SOPAMIN (Société du Patrimoine des Mines du Niger)

SOPAMIN is shareholder in the SOMAIR and COMINAK mine

Translated by: Nienke Hulswit, student French language

Anne Abbing <abbinganne@gmail.com>
23 mei

To: direction SOPAMIN

Chère Madame, cher Monsieur,
Pour mon mémoire de bachelor à l'Université de Groningen (aux Pays-Bas), j'essaie de répondre aux question suivantes :
Est-ce qu'il était question de Social Impact Assessment aux activités de l'exploitation minière d'uranium au Niger ? Si oui - était-il efficace et est-ce que il y a des raisons pour améliorer le Social Impact Assessment?" (Voir en bas de page pour une description détaillée du Social Impact Assessment)

Comme SOPAMIN fait des activités dans le domine d'exploitation minière au Niger, j'espère que vous pourriez m'aider pour réunir des informations qui sont nécessaire pour répondre à la question principale de ma recherche. J'ai mis les questions en bas. J'espère que vous pourriez répondre aux questions.
Merci d'avance pour votre collaboration,
Bien cordialement,
Anne Abbing
Étudiante de la troisième année des études de géographie humaine à l'Université de Groningen
Les questions
Je n'ai pas une bonne vue d'ensemble des activités de AREVA au Niger. J'espère que vous pourriez me procurer des informations concernant les questions suivantes.

1. Comment réduit SOPAMIN l'effet sur la santé des communautés humaines de l'exploitation minière?
2. Est-ce que SOPAMIN applique le Social Impact Assessment (voir en bas pour une description détaillée) pour les activités actuelles d'exploitation minière et – si oui – quelles sont les expériences les plus importantes de SOPAMIN avec SIA ?
3. Est-ce que SOPAMIN participera au projet d'Imouraren ? Si oui, sont le Social Impact Assessment et/ou l'Environmental Impact Assessment faits ? Pour les nouveaux champs de mines ?
4. Est-il hors de danger de travailler dans des mines d'uranium au Niger, en ce moment ?

Social Impact Assessment (SIA) = "les processus d'analyser, de contrôler et de diriger les conséquences sociales des interventions prévues et des processus de changements socials invoqués par ces interventions." (Vanclay, 2008) L'essentiel est de créer un environnement plus écologiquement, socioculturellement et économiquement durable et équitable. Social Impact Assessment promeut les développements et les délégations des pouvoirs communautaires. SIA édifie la capacité et il développe le capital social. La collaboration entre les communautés, les agences réglantes, les institutions financières et le secteur privé maximalise les bénéfices et elle réduit la résistance locale aux projets. (Langbroek & Vanclay, 2012)