

Roles of Health Impact Assessment and Potash Mining Project, Thailand

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1. Abstract

Thai people and the environment have been suffering due to development projects for a long time. "Health Impact Assessment" is one of social innovations that can prevent and mitigate such problems.

The Potash Mining Project in Udon Thani Province: High quality potash deposits have been discovered in Udon Thani since 1981. The Asia Pacific Potash Corporation (APPC) has planned to invest around \$US 645 millions on the mine. A 170-hectare plot of land has been purchased for the buildings of the plant. Expectedly, 5 millions of the remnants of Potash salts will be carried back into the underground and take around 22 years to finish. A numbers of meetings and public hearings have been organized by the protesters. Pitfalls in the EIA report and unfair agreement in the contract were the major arguments. People in the mining areas have been separated into two opposite sides.

Roles of Health Impact Assessment: The HIA working group of the Health Systems Research Institute has joined the Udon Thani working group to organize a seminar on "The Application of Health Impact Assessment Process" on 17-18 May 2003. There were around 500 participants. The seminar processes consisted of lectures from academics, APPC, Human Right Committee and small-group brainstorming sessions to listen to voices of health concerns among participants. Afterwards, the Minister of Natural Resources and Environment has directed his staff to study the seminar documents. On 3 June 2003, the committee of experts in environment reconsidering the EIA report has concluded that the EIA report has a numbers of major mistakes and was not suitable for the permission process. Seminars and public hearings in communities both rural and urban have still been organized regularly. Bringing "Health Values" to the debates about development is strongly beneficial. The approach can be leading to sustainable development.

Keywords: Health Impact Assessment, Potash, Mining, Thailand

2. The Context

- **The Udon Thani potash concession**

High quality potash deposits have been discovered in Udon Thani Thailand since 1981 and have been described as the “world-class potash resource” due to “the high-grade, shallow depth” and “one of the lowest-cost producers industry.” The deposits cover an area of 2500 hectares (ha). The area contains roughly 225 million tones of Sylvie ore. This is among the highest grades potash industry.¹

Asia Pacific Potash Corporation (APPC), 90% owned by Asia Pacific Resources Ltd (APR) based in Vancouver Canada and 10% owned by the Thai Government, holds a 85,000 hectares (ha) exploration and mining concession in Udon Thani province¹ (Figure 1).

APPC has formed a strategic alliance with United Infrastructure Company International Ltd. (UIC) and Norsk Hydro Asia Ltd., the world’s largest finished fertilizer producer. Crew Development Corporation is a major shareholder of APR (and thus it is APPC), and Bechtel Enterprises Holdings is the whole owner of UIC. The finance of project will be arranged by the HypoVereinsbank International Finance Corporation (a member of World Bank). Crew and Bechtel have ever been criticized for their mining operations in the Philippines and Bolivia, respectively.²

In 1998, a feasibility study has been completed by APPC. The deposits are expected to have 25-30 year life production and 2.0 million tones of potash per year (APR expects mine slower rate). It has been estimated that cost per tone will be less than US\$ 50, F.O.B. Gulf of Thailand, including sales costs, royalties, mining taxes, rail transports, port and ship loadings. Potash is currently (2003) sold at approximately US\$120 per metric tones F.O.B Vancouver, of which shipping costs of Asian markets must be added. Therefore it is estimated that APPC can make a total income of 6 billions from the mine. APPC will be the first major potash mine in Asia.²



Figure 1: Map of Location of Udon Thani Province, Thailand

Potash refers to a group of potassium mineral salts used in the production of agricultural fertilizers. An estimated need of fertilizer in local market is 13 million tones per year and the grow rate is 4-6% per year.²

APPC has planned to invest around US\$ 645 millions on the mine. It has purchased approximately 170 ha of land on which processing and tailings storage will take place, but it will mine a total area of 2,500 ha beneath residential areas, farmland, a national highway and railway linking Bangkok with Nong Khai (at the border to Laos PDR) and military installations³ (Figure 3).

The company plans to mine a thin layer of potash salt located 350 m below the surface, roughly one-third height of the major potash mines in Saskatchewan Canada where potash mines operate with depths of more than 1 km underground.⁴

More than 90% of the potash product will be sold to fertilizer manufacturers, the rest will be used as raw materials for detergent, soap, glass, synthetic rubber, ceramic and weapon industries. Expectedly, 5 millions of the potash wastes will be carried back into the underground. It will take around 22 years to finish the process.¹

APPC holds a number of exploration licenses under the overall concession agreement with the Thai government. However, the company has not received mining lease under the current Minerals Act of Thailand.



Figure 2: The Model of Potash Mining Project by Asia Pacific Potash Corporation

- **Local opposition**

There are significant oppositions to the project by local communities who fear widespread subsidence, salt contamination of agricultural land and groundwater contamination. People were afraid of the impacts of the mine which will affect their people, their children and grandchildren. They were also afraid of their agricultural based livelihood will be destroyed⁴ (Figure 3).

The first individual protests against potash mine planned in Udon Thani occurred during the APPC exploration survey period beginning in 1993. Since then local opposition to the mine has gained considerable momentum with currently over 1000 people in 21 villages within concession area,

The protesters marched rallies to provincial hall, local temples and Bangkok front Parliament house. The villagers traveled to Bangkok to submit petitions to the Canadian Embassy requesting that the Canadian company should be instructed to follow the same social and environmental standards as required in Canada.⁴

The company did not pay compensation for the damages i.e. salinity of agricultural soils, caused by the exploration activities so that community people cannot believe the company will solve any problems that will occur as a result of mining activities.

Public consultation and participation were lacking. During exploration stage neither company nor government informed villagers about drilling activity nor gave information about the type of mine to be built. They only talked about how rich people would become and about increased job opportunities.



Figure 3: Social, Environmental and Human Health Concerns raised in the Local Protest against the Potash Mining Project

In response to complete lack of public consultation about the basic project plans, local communities concerned about potential social environmental impacts of the potash mine have established Udon Thani Environmental Conservation Group in 2001. The group has since worked to disseminate information about the project to the surrounding villages. By means of regular walking tour to over 45 villages. The villagers have then been informed about the project and its potential impacts.⁴

Other public sectors were gradually participating in the movements. National environmental groups, media, academicians, research institutes, independent senators and members of the Human Right Commission then paid more attentions to the problem and provided some supports. The villagers therefore have greater access to technical documents related to the project plans.

A numbers of seminars, meetings, public hearings have been organized by the protesters and allies. The group has submitted letters to related government officials and the prime minister. Pitfalls in the EIA report and unfair agreement in the mining contract were the major arguments.

The chief governor of Udon Thani has then appointed a working group to investigate the problem. The work force has held a number of meetings and public hearing sessions. The Minister of Natural Resources and Environment responded by setting up a six –member committee of environmental experts and government officials to re-evaluate the EIA report previously approved by the concerned authority.⁵

- **The faulty EIA of the project**

The Environmental Impact Assessment (EIA) for the project has been heavily criticized.^{2,4,6-8} The EIA predicts a subsidence of more than 70 centimetres (cm) resulting in depressions in the land surface over the entire 2,500 ha area affected by the mine. Further subsidence following mine closure after 22 years is expected but the EIA does not predict how much. An independent geologist from Rangsit University Bangkok informed that geology above the salt deposits of the Northeast of Thailand is predominantly claystone or soft rock which is not stable therefore subsidence can be great.

In addition to structural damage to homes and infrastructure, it is likely to disrupt groundwater quality and flow and drastically alter natural drainage patterns, sending streams off course and potentially creating water logging and flooding problems.

Moreover, local communities anticipate severe salt contamination of agricultural land and water resources as the mined mineral is composed predominantly of rock salt (sodium chloride).

The pure potash product will have to be extracted on site, leaving the rock salt, chemicals and other waste to be stored at the surface until further reprocessing. Salt dust will be continually emitted from an exhaust stack during extraction and mineral processing, eventually settling on adjacent farmland, destroying crops and degrading soil.

The salt waste, however, is the primary concern of village people. 20 millions tones of salt waste will be stored at the surface in a 40m high tailings pile that is to remain uncovered and exposed to wind and rainfall.

As rainfall dissolves this salt it will flow into a brine pond and inevitably leak into the soil beneath. As it seeps into the ground it will enter and contaminate the thin and fragile layer of fresh groundwater that local communities rely on for domestic water supply.

In the case of unusually heavy rains or large floods, there is a high risk that dikes designed to contain the tailings area will be breached and 20 million tones of salt will be released into the environment causing devastation for rice farmers, destroying forests and polluting lakes, reservoirs and rivers.

Geological engineers have deemed the EIA for the mining project insufficient in many ways. The following points detail the main problems with the EIA³:

1. The EIA is not a valid document in terms of the mining law. Controversial issues of public participation, liability for property damage, and the burden of proof.

Property damage in the form of extended subsidence cracks or increased salinity levels from salt dust fallout or groundwater contamination is likely to occur. However, a baseline soil salinity survey has not been carried out on or off the concession area and it will therefore be extremely difficult to prove that increased soil salinity, for example, was caused by the mining activity. The soils in the region already contain a certain level of salinity, making it even more difficult in the future to prove that the mining activity was the direct cause. In order to demonstrate the direct relationship between property damage and mining activity, a geological survey must be done. This burden should definitely not be held by the landowner.

2. The EIA is ambiguous in its assessment of the location of potential environmental impacts. It does not specify whether the information being presented relates to the 2500 hectare (ha) concession area or to the 170 ha mine site area. The mine site is the parcel of land owned by APPC and is where the mine shaft, processing plant, tailings pile, and brine pond will be located.

3. The EIA did not assess such integral measures as current soil salinity or risks of flooding and salt contamination. Moreover, it did not prepare a modeling of salt dust fallout from processing plant emissions. Instead it claims that the fallout will be evenly distributed throughout a 9 km² area. The EIA obviously fails to account for predominant wind patterns that would concentrate the fallout into a lesser total area of farmland. These assessments are basic requirements under the mining laws held in Saskatchewan, Canada.⁶

- **Protesters were fought back**

The protester groups were fought back in a numbers of ways. While the protests remain peaceful, the government officials and local district heads have threatened several local community members. Conflict within community was growing rapidly.

A group of pro-potash mine has been supported to set up movements for the mine. Several local influential businessmen are being awarded construction contracts. The company returned gathering supports for the mine from other villages. People in the mining areas were separated into two opposite sides.

- **Changing Thailand's Minerals Act**

Thailand has had negative experiences with deep underground mining therefore Thailand's Minerals Act did not provide conditions for the approval of underground mining. Under section 48 of the Thai Constitution, property rights (surface and sub-surface) are guaranteed only for the state. If the state wishes to build roads, railways, other public utilities, it has to purchase land and pay compensation.³⁻⁴

APPC first seek permission for the mine to be operated underground. Since 1997, Department Mineral Resources (DMR) has at least five times submitted a Bill to the cabinet to amend the Minerals Resources Act. The amendment would provide APPC with favorable permitting conditions for its proposed mine. It will allow underground mining without permission of and compensation for the landholders above proposed mine.

The new Minerals Bill represents a government effort to create the structural conditions for further large-scale transnational mining activities in other parts of Thailand while ignoring the right of local communities to be involved in the management of natural resources as awarded under the constitution.

Furthermore, the government continues to ignore its obligation under the constitution to establish an Independent Environmental Monitoring body that would create the means for proper evaluation and monitoring of such mining projects and hence protection of environmental quality and local livelihoods.

The Bill was rejected each time for its unconstitutional and unsatisfactory in terms of public participation and the protection of private property rights.

In October 2001 the Senate amended bill, requiring mining concessionaires seek landowners' permission before proceeding with mining activities on their land. These amendments caused controversy and prompted the formation of joint House-Senate committee on 19 October 2001 to scrutinize the legislation.⁴

The committee has made significant amendments. The legislation will require greater degree of public participation and protection of property rights. The bill will potentially allow local communities to request funding in carrying out an independent investigation into environmental, social and health impacts especially for mining projects where deemed original Environmental Impact Assessment (EIA) report insufficient and considerable risk of environment and livelihoods can be demonstrated. However, the discretion to allow such additional studies to be conducted lies with the government, not an independent environmental monitoring body.

There were strong oppositions against the amendment of Minerals Act. The National Human Rights Commission of Thailand, local communities and independent senators want to reject the amendment bill that would allow such mining operations to go ahead. A number of independent senators plan to file a case with the constitutional court if it becomes law, arguing that it violates landholder property rights under section 48 of Thailand's Constitution.

On 8 May 2002 National Human Rights Commission (NHRC) organised public hearing on the Minerals Bill. Members NHRC sub-committee, independent academics, NGOs, local community members, representatives of Thai Military based near mining area in Udon Thani attended the

meeting. As a result the meeting concluded that if the new law were passed the parliament, the NHRC and Lawyers Association would appeal ombudsman and send the case to the Constitutional Court.²

The House of Representatives passed amended version of the Bill on 21 August 2002. Although a number of amendments of the original Minerals Bill will favour community rights, public participation provisions are still very weak. The Bill, in essence, continues to contradict Thailand's Constitution in terms of landowner rights.⁴

Under Thailand Constitution, community rights are respected in terms of managing natural resources. But the bill allows government to grant concessions to private companies to operate underground mining of over 50 meters depth without requiring permission of community.

On August 23, 2002, a petition was signed by seventy-seven Senators. The file requested the Constitutional Court to assess whether the new Minerals Resources Bill contradicts the charter. It is believed that the Bill was pushed forward specifically for the potash deposit mining in Udon Thani, yet under the Constitution a law cannot be passed when relates to only one specific situation. If the court accepts the petition it will put legislation on hold at least 3 months.⁴

- **Constitutional court decision**

Finally, the Constitutional Court has concluded that the amended law does not violate the Constitution. Even though the Constitution Court rules in favour of the Bill, APPC will have to start its approval process again, it must provide public hearing and community can be given funds to carry out an independent EIA.⁴

- **APPC movements**

Media coverage on supports of the mine by some members of parliament and some senators were respectively released. Media people were supported a study tour abroad to visit a coal mine in Australia, (instead of a potash mine in Canada !).

APPC has applied for the Mining Lease. This lease is the final application step for the potash mine project and the decision on the lease lies with the Ministry of Industry. It seemed like the protesters will lose the fight. They were being convinced that the license for Udon Thani potash mine will eventually be endorsed by the government.

- **Hundreds of villagers visit the Ministry of Industry**

On 28 April 2003, around 800 villagers from the Udon Thani Environmental Conservation Group gathered in Bangkok to voice their concerns to the Ministry of Industry. Throughout the day, various local community members took turns addressing the potential environmental and social dangers of the mine on an open stage.⁹

Eventually, Ministry of Industry officials invited village leaders and non-governmental organizations to sit down for negotiations to produce an agreement towards two central points i.e. resolving the project's ownership, and its environmental impact assessment (EIA).

The Ministry promised to organize a special committee to review the legality of the exploration contract signed between APPC and the government. This review committee will appoint representatives from both the Conservation Group and the government.

The Udon Thani Environmental Conservation Group expressed satisfaction in their dialogue with the government and returned home to their 24 villagers throughout Udon Thani province.

3. The Roles of Health Impact Assessment (HIA)

HIA in Thailand is quite new, but it has been gaining more and more public interests. Reviews of international experiences and pilot HIA projected have been commissioned by the Health Systems Research Institute (HSRI). A group of academicians from various disciplines in 6 – 7 universities nationwide were invited to participate in the development of HIA in Thailand. Networks of HIA research groups were organized and additional research staffs were also recruited to facilitate HIA research projects.

The HIA working group has joined the Udon Thani working group to organize a two-day public seminar on “Potash Mining Project and the Application of Health Impact Assessment Process in Thailand” on 17-18 May 2003 in Udon Thani.¹⁰

There were around 500 participants from various groups for example state officials, community villagers, monks, politicians, the APPC company staff, health officials, school teachers and students, veterans, senior groups, academic experts, National Human Right Commission representatives, provincial commerce association staff etc.

The seminar processes included:

- 1) Presentations on recent project progress and opinions of concerned stakeholders e.g. representatives of APPC, academicians, National Human Rights Commission representatives, provincial commerce association, and villagers.
- 2) A presentation of historical development, concepts, principles and procedures of HIA by the HIA working group.
- 3) A presentation of proposed HIA model for the Udon Thani potash mining project by the HIA working group.
- 4) A video presentation of previous piloted HIA project
- 5) Small-group brainstorming sessions to listen to voices of health concerns among participants.
- 6) The last session was “press conference” where the results of the seminar had been announced urging the needs for a comprehensive “Health Impact Assessment” by independent agency.

- **Concepts and principles of HIA**

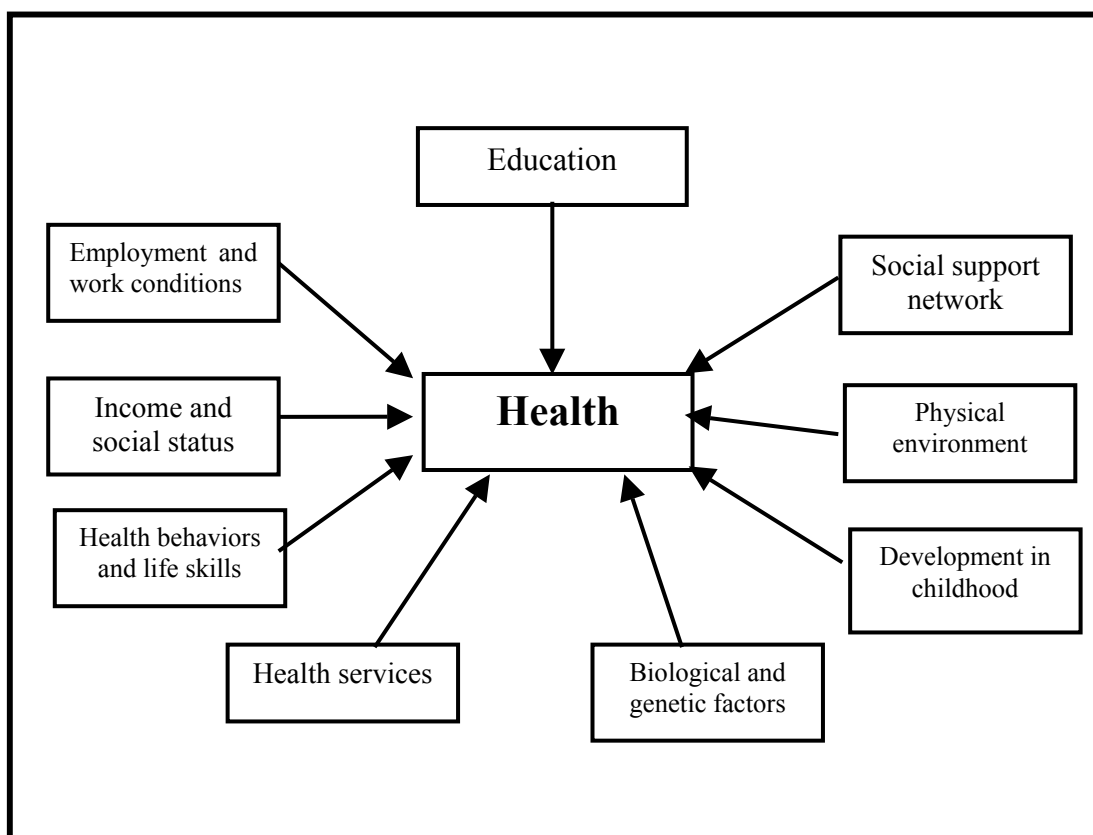
HIA is quite new to the public as well as the participants in the seminar. The concepts and principles of HIA were presented and the following points were stressed.¹¹

- 1) The significant of “Health Values” in public policy
- 2) The importance of systematically collected evidences on potential health impacts
- 3) The crucial roles of all stakeholders as dispensable resources for the development policy

- **Proposed HIA model for the potash mining**

The HIA group presented a proposed HIA model to the participants and then followed by opened discussions.

The proposed HIA model for the potash mining in Udon Thani was based on the framework of the 9 groups of health determinants developed by the Canadian Environmental Health.¹² The framework of health determinants was shown below:



The framework was intentionally proposed because the owner of the mine project was based in Canada and positive experiences of implementing it were gained in a HIA pilot study.

The framework provides holistic and social views on health issues. It was used to exemplify how health impacts of a proposed project can be assessed.

- **Social and health issues raised in the seminar**

Serious concern has been expressed regarding the potential social and health impacts of the mining project.¹⁰

In terms of social impacts, the level of financial investment surrounding the mine project will cause further socioeconomic change in the Udon Thani town. This may affect patterns of employment, migration, housing, transportation, private investment, and tourism.

The issues of health risks associated with the development of the potash mine were raised. The lack of health risk assessment and no public safety nets will be put in place in order to prevent and manage these risks.

Potential health problems include physical conditions linked directly to mining activities such as respiratory disease but also encompass emotional and psychological conditions, stress, suicide and crime related injury and death, which result from social change and conflict within communities.

Health impacts arising from a loss of livelihood and degraded environment are also critical to evaluate. Furthermore, impacts on sexual health, particularly the incidence HIV/AIDS, in the wider community are of serious concern.

A labour force of over 800 workers, many temporary, coming from outside provinces or abroad will have a major influence on prostitution in nearby urban centres such as Udon Thani. In addition, no risk assessment for health impacts arising from accidents and spills has been carried out.

The capacity of the community and local health services to cope with such potential health impacts is doubted given that no base line health data has been collected, no health monitoring process is planned nor steps taken to evaluate and eliminate risk.

The extent of health impact assessment carried out in this potash mining proposal has been limited to only the collection of hospital patient figures in Udon Thani.

- **Comprehensive HIA**

As a result of the seminar in May 2003, the Department of Health and the Health Systems Research Institute have co-financed a comprehensive HIA study for the potash mine.¹³⁻¹⁴

The HIA study commenced in July 2003. Consultant firms or economic researchers were not hired to conduct the study. Instead, stakeholders such as state officials, community villagers, monks, politicians, the APPC company staff, health officials as well as academic experts would be invited to conduct the study together.

The scope of health impact focuses not only on physical health but also mental health and the livelihood of the people in the community.

The HIA report on this project will be submitted to the government as supplementary information for it to make decisions regarding the project's future. It is the first time the government will have a health impact study as a guideline for making a decision on a project.

The HIA report would be a unique experience and a true learning process.

4. Government Response

Afterwards, the Minister of Natural Resources and Environment has directed his staff to study the seminar documents.

A six-person committee of academics and government official was set up to review the previous EIA, which opponents feel does not accurately assess issues of salinisation of rice fields, subsidence, and a plan of compensation in case of accidents.

On 3 June 2003, the Committee concluded that the old EIA was found to be incomplete on 26 different points. The Committee made recommendations that APPC be required to submit a new improved EIA before any advancement of the mining project is allowed. The Minister of Natural Resources and Environment then sent a letter to the Ministry of Industry informing that the grant of mine license should not be issued.

The Ministry of Industry had previously agreed to fully consider the findings of the Committee and promised not to grant APPC a mining lease if flaws in the EIA were found. But there was skeptical as the Committee's findings have "no legal binding".

The Ministry of Industry therefore requested the Council of State -the government's legal arm- to make the decision whether the Committee's recommendations are legal. Finally the Council of State has ruled that the Canada-based mining company, awaiting a licence to mine potash in Udon Thani, needs to re-conduct its environmental impact assessment (EIA) as its current version is not applicable under the new Minerals Act.¹⁵

Its current EIA, which contains plans to mitigate adverse impact caused by underground mining activities, was conducted under the old Minerals Act, which did not allow for underground mines. The council basically ruled that since the EIA was done under the old law, it needed to insert updated information to comply with the amended Minerals Act. The law was amended to cover that and the amendment came into effect in January 2004.

5. Conflict Resolution in Community

In the process of the comprehensive HIA, seminars and meetings in communities both rural and urban have been organized regularly. A member of the pro-mine group have lately confessed their misunderstandings and now participated in the protest against the mine.

On 29 June 2003, hundreds of local community members from the Udon Thani Environmental Conservation Group marched in Udon Thani City to protest a proposed potash-mining project. Around 700 villagers marched from the train station to Toong Se Muang government monument where they rallied and were joined by hundreds of urban supporters. Attendance reached 1,000 as groups of local high school and university students came in large numbers in the afternoon.¹⁶

There was a lot of cooperation between villagers and city people. It was a great opportunity for people in the city, who won't be directly affected by the mine, to show their support for the local community's struggle.

The march and rally were in response to APPC's application for a mining lease, the last step before construction of mining infrastructure.

APPC submitted the application to the Ministry of Industry at the end of May, but will need to hold public hearings before the Ministry can make a decision on whether to grant the lease. While villagers marched, youth walked alongside and handed out information about the villager struggle, including information about the project's Environmental Impact Assessment (EIA). The EIA has long been a focus of the Conservation Group opposing the project and concerned government officials and academics.

6. Discussion and Conclusion

This report has provided details of the latest developments and issues relating to the potash mine in Udon Thani, Thailand as well as the experience of HIA applications being used as a social tool for conflict resolution.

The concepts and principles of HIA introduced in the two-day seminar were greatly welcomed by the participants.

Subsequent HIA processes revealed that bringing "Health Values" to the debates about the development project is strongly beneficial. The approach can be leading to sustainable development.

Problems of underground potash mining in Udon Thani, northeastern part of Thailand is an example which HIA could be involved as a part of conflict management tool.

Udon Thani potash mining project is an extremely large project, it faces increasing problems caused by fear among local villagers that underground potash deposits would contaminate surface and underground water resources with salinity and may negatively affect their livelihood and finally affect the country as a whole.

We used HIA to promote agreement and understanding of the potash mining project in Udon Thani as well as to disseminate facts and information about the project to the public and the media. The comprehensive HIA study are performing and will be completed within at least three months by the team that comprises of various stakeholders such as provincial officers, community villagers and academic experts.

Listening, encouraging open discussion and keeping everyone focused on the present situation – not only the negative impact but also the positive side – are some of the best ways to move everyone's mindset openly and honestly with each other.

7. Future Development

Further efforts should be focused on international cooperation to push the international legal standards of corporate codes of conduct and extraterritorial operation to ensure that foreign companies operate to the highest international environmental and social standards. This can be eliminating the practice of exploiting often-weaker laws in developing countries.

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