Hongsa Health Surveillance Start-up and Approaches

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Introduction

Lao People's Democratic Republic is committed to graduate from the list of Least Developed Countries by 2020 and to be the "Battery of ASEAN". As a key step in achieving of this goal, Government of Laos (GOL) plans to build hydropower and mining coal power plants, of which Hongsa Project is one; the first mine-mouth power plant, and the largest capacity power plant in Laos.

Hongsa District is located in Xayaboury Province, Northwestern Laos; approximately 34 km from the border with Thailand. Streams and small rivers flow into the valley and onto the Mekong River, and forest accounts for 60% of the area. Hongsa is home to a diverse ethnic population of about 27,000 persons.

Why is Hongsa Health Surveillance Important?

Hongsa Project comprises a coal-fired power plant of 1,878 MW capacity, coal mine, limestone mine, and supporting infrastructure. The power plant uses approximately 14.3 MT of coal per year. Construction commenced in 2010 and Commercial Operational Date is March 2016.

Though Clean Coal Combustion Technology has been functioning through the operational period, there was a concern about environmental health for the Project Affected Persons (PAPs) regarding exposure to potentially hazardous materials. This hazard raised the question of health impacts associated with proximity to coal mining, and operations and emissions associated with the coal-fired power plant.

Hongsa Power Company (HPC) arranged a Health Impact Assessment and Public Health Plan in 2012, which was broadly prepared to comply with requirements. However, establishment of the health surveillance program still encountered challenges.

As an adequate monitoring and evaluation system of environmental health and its realistic long-term funding was essential, Hongsa Health Surveillance program was developed in 2014 based on a needs analysis of different groups of project stakeholders and knowledge gained from global experience of coal-fired power plants. The program targets communities located within 10 km of the power plant to ensure that over the operation period:

- environmental health concerns are given attention and priority;
- communities have the resources available to participate in the process;
- there is transparency and accountability for a healthy community; and
- communities understand the decision-making process and are involved to the extent that allows for acceptance of the final outcomes.

How has Hongsa Health Surveillance been implemented?

Hongsa Project has piloted, with close collaboration with GOL's Public Health offices, a health surveillance program in the communities located within 5 km from the power plant (the first sensitive area). This program includes a detailed approach to longitudinal health monitoring and

surveillance, based on a set of objective and identical assessments and laboratory techniques, as follows:

Strengthening Village Health Volunteers*:* In order to establish an effective mechanism in the community, the existing village health volunteer system was strengthened through an environmental sanitation campaign. Each volunteer was responsible for one cluster of approximately 15 households. A form comprising key indicators for environmental sanitation was developed that included investigation of related infrastructures and behavior. The strategy was adopted of organizing a competition to find the cleanest house in each cluster. This activity, which was implemented by the Project in late 2013, provided greater education and knowledge of environmental sanitation and health, which will continue through the duration of the operation period.

Baseline Health Check*:* As the Project entered the operational period, the health surveillance program, focused on eight communities located within a 5 km radius from the power plant, was arranged during March-May 2015. The Project arranged for all PAPs to undergo a general health check, including respiratory issues, non-communicable disease, stress, ear problems, etc. The results of the health check were disclosed and recommended health promotion was discussed through small groups of PAPs. Note this holistic health check was implemented by GOL's medical team as part of the capacity building.

In parallel, landmarks relating to type and location of household sanitation, and potential hazards were mapped by the Project, using GPS and photos. Data on household sanitation and health check of all PAPs was established as the baseline prior to operation of the power plant in June 2015.

For those communities located within a 6-10 km radius of the power plant (the second sensitive area and located inside the municipal area), the baseline health check will be arranged in early 2016. Indicators for the health check will focus on respiratory and related issues, and non-communicable diseases, and the target group will consist of populations at risk e.g. children, elderly, pregnant women, and persons with underlying diseases.

Capacity Building Program*:* Hongsa Health Surveillance has focused on-the-job training and specific technical training, such as training on environment-related health surveillance. For example, training has been, or will be, arranged for GOL's public health officers on linkage analysis between environment and health, popular epidemiology, occupational health, health risk assessment, basic and advanced biostatistics, etc. Active and passive surveillance has been implemented through village volunteers and public health posts, respectively. A study trip will be arranged for exploring the successful aspects of health programs, etc. including technical collaboration on health programs between the two countries (Lao PDR and Thailand).

Introduction of Popular Epidemiology (*or Community-led Mapping to Break the Cycle of Illness):* The concept involved PAPs drawing a map, noting landmarks, burning sites (burning of fields following harvest and prior to planting is a common practice among communities in this region), other hazards and location of people who have been sick, and record illness on the map. Later the map was painted with colorful symbols and it provides an illustration of sick people

clustered around fields that have been burned (or other sources of hazards), which would be the starting point for discussion on how they might reduce burning and/or sources of vulnerability or hazards. Popular epidemiology is a key to improvement of public health, by enabling PAPs to link environmental causes with illness and understand better the broad determinants of health. People become engaged when they make discoveries and then take action to lead their own health promotion. It can be said that community-led mapping is a tool for the community to monitor the Project in terms of the Health, Safety and Environment perspectives.

***Health Surveillance System**:* This includes active and passive environmental health surveillance implemented through village volunteers and public health posts, respectively. An Indicators of Environmental Health Survey Form, including physical symptoms relating to respiratory issues, non-communicable diseases, stress, eyes, etc., was developed to be used by village volunteers and reported to GOL's Public Health Office. Health surveillance and *popular epidemiology* have been implemented by a GOL team though village volunteers in one village as a trial, and will be established in eight target villages in late 2016. Also, in order to cross-check community health, health surveys will be arranged for PAPs by the medics team in the following year, and over the length of the operation period.

***Compensation Fund**:* A fund will be established though consultation among PAPs, GOL, and HPC to compensate those who are affected by the Project, with confirmation from a third party, in terms of health services, welfare, etc.

What will be the Challenges?

***Health data collection and monitoring**:* Laos PDR has specific rules and requirements governing the analysis of potential health impacts for large, complex industrial development projects that were summarized within the overall Project Concession Agreement.

For Hongsa Project, reportable health statistics were generated by each level of health care within the relevant geographic areas of concern identified in the EIA and HIA, and key critical observation will follow.

Diagnoses were largely made without objective laboratory confirmation. The burden of disease was likely to be represented; however the absolute magnitude was unknown due to the absence of confirmatory laboratory findings. As such;(a) respiratory diseases were the likely highest burden of disease along with diarrheal disorders, skin diseases, musculoskeletal disorders, and accident/injury; (b) tuberculosis was likely under-diagnosed and actual baseline prevalence rates were unknown; and (c) prevalence of non-communicable diseases (NCDs) including diabetes, cardiovascular and stroke were rising and, with a movement from rural agricultural livelihoods to more industrial wage earning, this trend would be likely to accelerate rapidly.

Baseline: As Hongsa Project has the potential to generate hazardous materials exposure for local communities, and environmental-related health data is new for GOL in terms of type and quality data to be collected and monitored, it is a challenge to establish a proper baseline. The importance of a well established health surveillance program cannot be overemphasized in providing crucial information on emerging health problems and indications of when, how, and where to intervene. It is a tool for health authorities to guide the investment of the resources

available and allows measurement of efforts undertaken by GOL to mitigate adverse health outcomes - a most important health surveillance activity. Information collection can become very complicated and counterproductive if too much data is collected but only a little used.

Therefore, health indicators or information must depend on:

- Type and quality of health data collected and obtained from public health system to establish a proper baseline, as environment-related health data are new in Laos and we are still learning.
- How reliable and representative of the local context they are;
- Issues of conducting annual or frequently repeated surveys to establish and enable assessment of the trends on environmental health.

Capacity development*:* Under GOL's health care system, Ministry of Health is the only health provider and strongly administrative in focus. Priority areas in the national health strategy include primary health care, maternal child health, health systems development, and aid effectiveness and coordination. Utilization of many rural health facilities remains low. And, shortage and unequal distribution as well as the poor qualifications and motivation of many staff in the health sector remain critical issues.

In recent years, a number of activities related to emergency risk management have taken place in the Lao PDR. Assessments have found that most hospitals somewhat meet structural indicators; however, all the provincial hospitals were found to have problems with: emergency management; logistic system management; safety and security systems; communication and information systems; planning for emergencies and disasters; human resource development (exercises and simulation); and monitoring and evaluation.

The community that hosts the Hongsa Project is undergoing an epidemiological transition, with the increasing incidence of NCDs, road traffic accidents and injuries posing a major challenge. Of all NCD-related deaths, cardiovascular diseases and diabetes have the highest age-standardized death rate, followed by chronic respiratory diseases, and cancer. Tobacco and alcohol abuse remain the main risk factors for NCDs. The dynamic baseline conditions increase the difficulty of isolating health impacts due to the Hongsa project.

As mentioned above, capacity development for health surveillance of GOL's public health officials, and village volunteers for the Hongsa Project, which is located in a border area with more industrial workers, will be a critical issue that requires commitment from GOL and HPC.

Project area is overwhelmed by smoke from slash and burn cultivation*:* Burning is the cheapest and fastest way to remove weeds in rural farming areas, and is widely practiced in the Hongsa Project area. Smoke is inescapable; it burns everyone's eyes and makes it hard to breathe, and can lead to stroke and respiratory disease. Local weather patterns may exacerbate these conditions; in the Hongsa District area, during the winter season there are sometimes local temperature inversion conditions that can produce '*valley fogs*".

There is a worldwide growing (and controversial) body of toxicological and public health literature regarding the potential community health impacts associated with proximity to coal

mining. This concern is above and beyond issues related to the operations and emissions associated with coal-fired power plants. The Project has several features that could potentially generate a large concern for local communities, leading to extensive assessment in previous Project reports of potential exposure to hazardous materials. When the Project starts operation, it will be very difficult to distinguish between illness caused by smoke from burning, and that due to emissions from the coal-fired power plant, and the Project may well be easily accused of causing an exaggerated negative environmental health impact.

What can be concluded?

The project emphasizes two key lessons for health impact assessment. The first is the need to gather a comprehensive baseline of health status data and a strong understanding of the current multiple sources of environmental health issues. The second is the importance of involving the project affected population in methods to monitor public health, especially when the official capacity to do this work is limited.

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