How to improve the quality of environmental auditing by taking stakeholders' perspective and role

SAI Korea

Many stakeholders including public officers and citizens involve environmental auditing because environmental issues are directly related our life as well as environment. The requests and perspectives of the stakeholders need to be considered during the auditing process for the good acceptability of the audit recommendations. However the types of stakeholders are various and it is not easy to meet all the requests by them. Therefore, BAI(SAI Korea) tries to characterize the types of stakeholders and setup a methodology to consider their perspectives and roles during environmental auditing.

The types of stakeholders are 1) public officers who are the auditee of environmental auditing, 2) businesses who are affected by the audit result on the aspect of their economic benefit, and 3) citizens who are affected by the audit result indirectly. Scientifically reasonable evidences for the recommendations are helpful for the stakeholders to understand and agree the audit results. However it is suggested that the evidences are provided by the experts with the stakeholders perspectives, because some stakeholders who are not satisfied with the audit results criticize the weak point of the evidences and try to insist the audit results are biased or not objective. These claims make all the audit results bad and weak.

Public officers have dual positions on environmental auditing, that the positions are policy maker who can handle and solve the environmental problems, and an auditee who must be inspected for the accountability of their performances. Therefore, it is effective that the officers take part in the field audit and discussion to find out the problems of their policy with the audit team.

Businesses are interested in their economic benefit, so if their business area can be affected by the audit result, they try to actively provide their opinion on the audit. So, it is necessary that they can anticipate the result of the audit and impact of the recommendations. Then let them provide substitutional measures if the impact cannot be avoided on their business area.

Citizens are interested in their life. So if the audit result or recommendations affect their life, i.e. their children or around their living area, they can attend to the audit results. In order to minimize misunderstanding on the audit results, it is required that scientifically sound and easy evidences have to be provided in the audit report, and the evidences are suggested by the experts who can be known by the citizens.

Under the consideration of the above characterization, BAI conducted environmental auditing as follows:

CASE 1 : Ground-water Quality Management around Carcass Landfill Site

Background and Audit Planning: In 2011, Foot-and-Mouth Disease was epidemic in Korea. Because of the emergency disease control, so many carcass burial sites had been constructed without considering careful environmental pollution control method. Groundwater and soil was polluted by the leachate from the burial site and the pollution was not remediated until 2014. Also so many citizens around the burial sites worried about the pollution by the carcass leachate and expressed their complaints about the groundwater quality decrease due to the leachate from the burial site. So the objectives of the audit was to protect soil and ground-water quality from the leachate of carcass burials by scientifically sound management of the landfill site.

Fig. Carcass burial site

Audit Period: Nov. 2014 ~ Dec. 2014

Methodology: In this audit case, the most important stakeholders were citizens around the burial sites and public officers of the local governments who constructed the burial sites in 2011. In order to conduct the audit, BAI considered scientific groundwater monitoring methodology to lessen the uneasiness of the citizens and the role of the public officers of the local governments.

BAI asked many groundwater experts and academic associations to provide professional and scientific methodology to identify groundwater contamination by the leachate. We also considered that the local government officers did not have a major authority to decide burial site and management. They just executed based on the guidelines from the central government. Also 2011, carcass burial was a kind of emergency plan to fight against the epidemic. This means that we cannot request the higher responsibility to the local government officers. So, BAI asked the local government officers to take part in the field inspection of the burial sites to amend unreasonable guideline from the central government and improve the burial site management methodology.

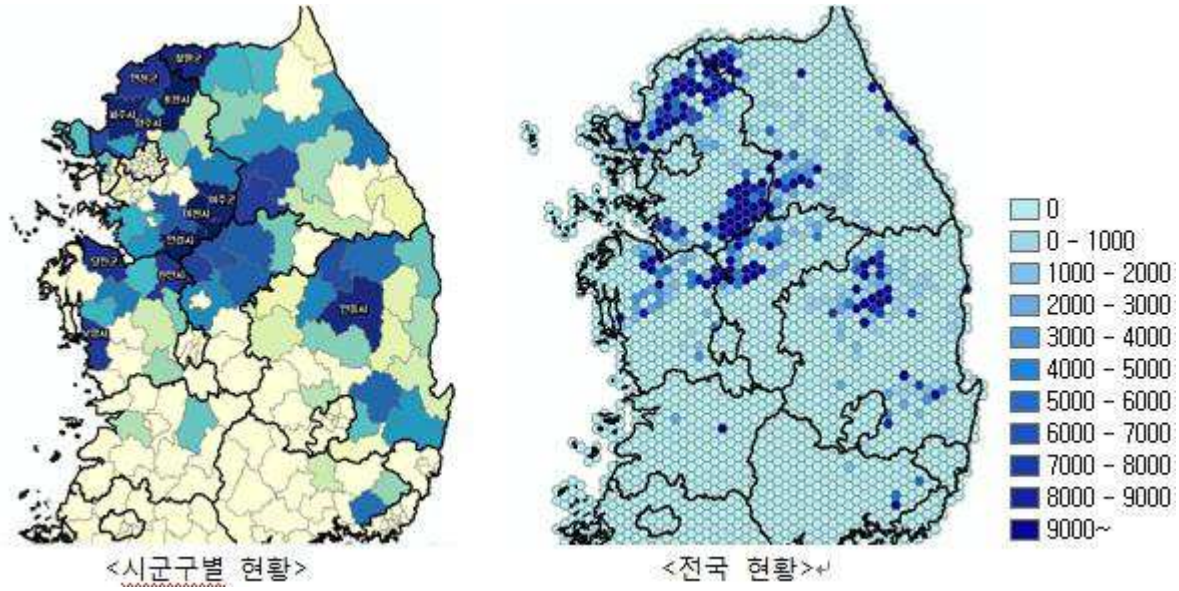

Fig. Groundwater contamination possibility analysis around the burial site by GIS

Audit Findings, Recommendations and their Implementation:

Ministry of Agriculture, Food and Rural Affairs designated 89 reserved burial sites in the water quality protection area against the regulations, and promoted burial technology without verifying the stability and safety of the technology.

Ministry of Environment used and regulated amino acid analysis method as a standard method for inspecting ground-water contamination by the landfill leachate, but the amino acid method was not scientifically verified. Therefore, Ministry of Environment failed management of ground-water quality around the burial sites.

SAI Korea recommended Ministry of Agricultural, Food and Rural Affairs to change the location of the reserved burial sites and to reconsider the promotion of unverified burial technology.

Also, SAI Korea recommended Ministry of Environment to cautiously establish standard method for inspecting ground-water contamination analysis method with scientifically verifying and validating.

CASE 2 : Air Quality Improvement Measure for Seoul Metro City Area

Background and Audit Planning: Air pollution problem around the Seoul metro city area has been decreased since 1960s. Until 1980s, sulfur dioxide gas due to the combustion of coal and solid fuel was the major problems in Seoul. However, after the fuel constituent regulation (requirement of low sulfur fuel usage like gasoline, LNG, LPG) in late 1980s sulfur dioxide concentration in the air had been decreased. But, micro-particulates (PM_{10} and $PM_{2.5}$) and nitrogen oxide has been increased due to the increase of cars and coal combustion power plants. Therefore the Korean government established a special law on Seoul metro city air quality control, and setup an action plan for improving air quality every 10 years since 2005. By 2014, the government invested more than 3 billion USD for improving air quality. However, as on the figure, the improvement goal was not reached. Therefore, it is necessary to analyze the reason of the exceeding air quality improvement goal and amend the 2nd stage action plan from 2015. Also, the audit was involved citizens and businesses because air quality was directly related with their living and the government action plan affects economic benefit by the government investment for technology and regulations.

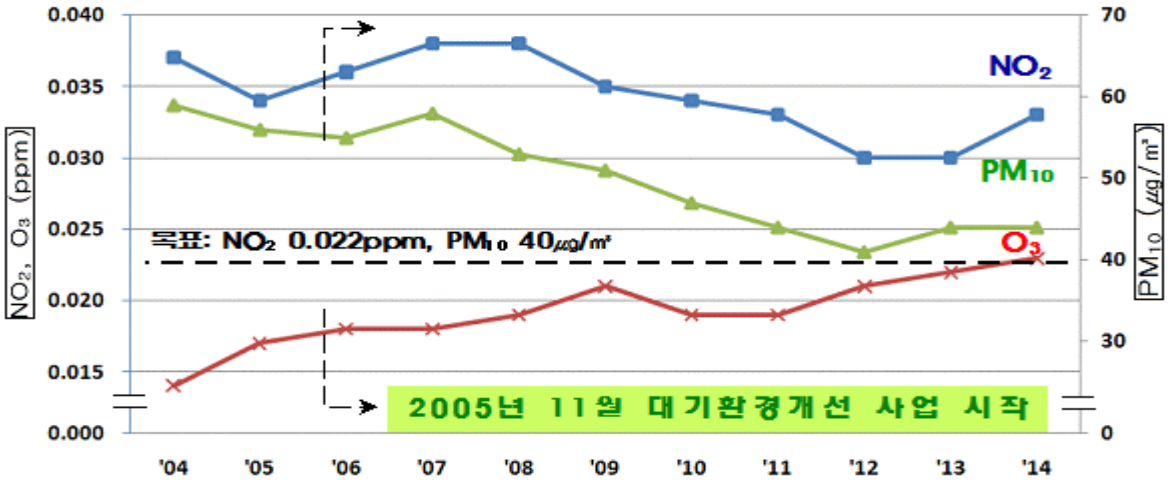

Fig. Air quality trend in Seoul

Audit Period: Oct. 2015 ~ Dec. 2015

Methodology: In this audit case, the most important stakeholders were businesses and citizens who can affect their life or economic benefit by the audit results. In order to conduct the audit, BAI established an audit support panel groups. The group was consisted of air quality management policy, chemistry, meteorology, modeling, pollution measurement, etc. The panel reviewed and supported audit recommendations and scientific data analysis.

BAI also asked the ministry of environment to invest large factories which can emit air pollutants in order to derive an improvement measures to reduce air pollutant emission from the businesses.

Audit Findings, Recommendations and their Implementation:

Air pollution was not followed by the legal administrative area, but diffused by wind and controlled by the natural geographical feature. However, the action plan was only for the Seoul metro city. Based on the modeling by the audit panel group, the coal combustion power plants near Seoul, which was not controlled by the emission reduction plan on the action plan has affected the air quality of Seoul. It means that the action plan must be amended based on the influence area by the pollution sources.

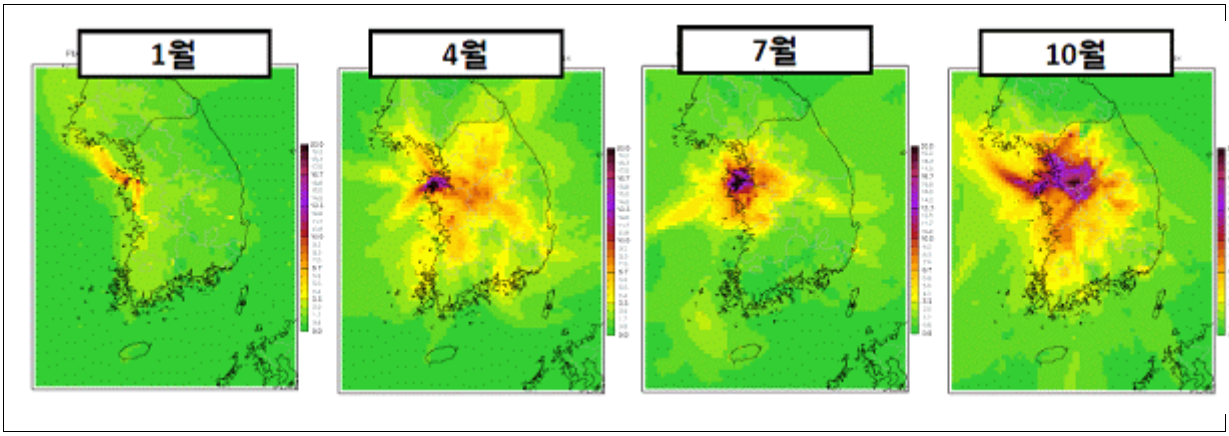

Fig. The diffusion of air pollutants from the large coal combustion power plants outside of the action plan target area

Also, we found that the efficiency of the air pollution reduction measures, i.e., diesel particulate filter (DPF) attachment support program. The program was the most largest financial investment program of the action plan (more than 90% of 3 billion USD for 10 years (2005-2014)). As it is seen on the figure, last 10 years, more than 300,000 diesel fueled cars had been refurbished by attaching DPF. However, it is seen on the figure, compared to the early stage of the program, the cars which does not emit much amount of particulate pollutants had been supported by the program in recent years. This means that the efficiency of the program has been decreased. Moreover, DPF only can reduce particulates, but recent $PM_{2.5}$ or Ozone pollution in Seoul is caused by nitrogen oxides. This means that the action plan is not very much effective for recent air pollution trend. But the support program can affect so many car refurbish businesses. Therefore, BAI let Ministry of Environment hear from the businesses to reduce air pollution from the diesel car and provide the amendment methodology of the action plan.

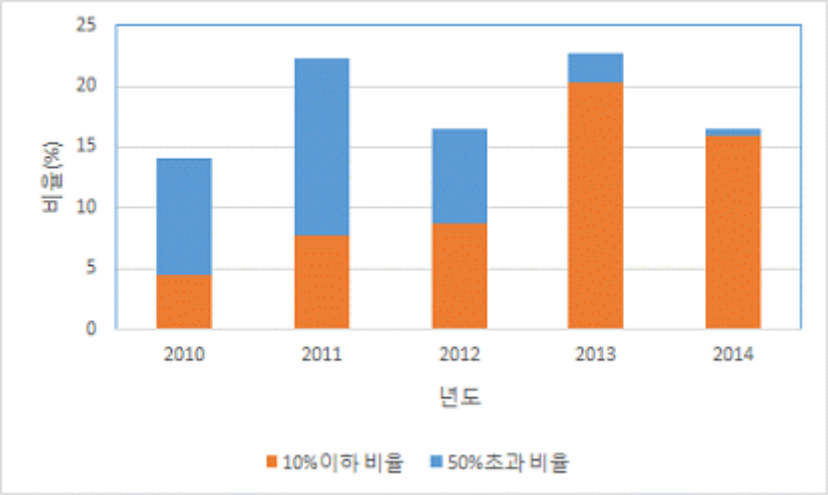

Fig. The trend of DPF attachment support program efficiency

Now, the Ministry of Environment discussed with all other stakeholders including local government, businesses and citizens to amend the action plan.

As a conclusion, environmental auditing is involved so many stakeholders, but if the SAIs conduct the audit under the stakeholders perspectives and provide a role for the stakeholders by letting them take part in the audit processes, the audit result can be improved on the aspect of objective and acceptability to them.