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To,
Shri S.Sundareshan
Secretary,
Ministry of Petroleum and Natural Gas,
New Delhi.

Sub: Shale gas exploration policy

Dear Shri S.Sundareshan,

We understand that the Ministry of Petroleum and Natural Gas (MoPNG) along with the Directorate General of Hydrocarbons is drafting a policy for exploiting the shale gas reserves in the country and has constituted a Multi-Organization Team (MOT) for this.

Serious concerns have been reported about the impact of hydraulic fracturing (or 'fracking'), the technique used to extract shale gas, on ground water resources. There are also concerns about land subsidence and resulting salinity of ground water due to activities such as extraction of natural gas. These concerns must be addressed fully while drawing up a shale gas exploration and extraction policy. Some of the major concerns are listed below.

Water security

Fracking is a very water intensive process that requires close to 20 million litres of fresh water per fracking, with each well likely to be fracked between 1 and 6 times during its lifetime of 30 years. This translates to a water requirement of 2 trillion cu m every few years even if one conservatively assumes that only 100,000 wells would be dug in the country.

It is very likely that these gas wells will primarily be in rural areas. This may lead to significant water related conflicts since 60% of India's agriculture still depends on ground water irrigation and about 90% of rural water supply depends on ground water. The Central Ground Water Board's assessment states that 35% of the country's population is already dependent on ground water sources that are semi-critical, critical or over-exploited, and this percentage has rapidly increased over the last decade or so. Therefore, during the fracking periods, there could be severe conflicts among different competing uses of water. These conflicts are likely to be particularly intense if the wells were to come up in states such as Rajasthan, Punjab, Haryana, Tamil Nadu, Gujarat and Karnataka where ground water in over 50% of blocks are semi-critical, critical or over-exploited. It has been reported that the Cambay basin and Krishna Godavari basin are likely to be potentially rich in shale gas. However, groundwater situation in both these regions is alarming and setting up shale gas wells in these regions should not be undertaken unless it is scientifically established beyond all reasonable doubt that there will be no land subsidence and no deleterious impact on the quality of ground water resources and the overall availability of water for agriculture and other needs of the people.

Ground water pollution

The possibility of ground water pollution due to fracking is a major concern. The question is currently being extensively debated in the U.S. and there is a possibility that the exemption awarded to fracking from the Safe Drinking Water Act will be repealed. Further, the Pittsburgh city council unanimously decided to ban all gas drilling within its city limits on 16th November 2010 and the U.S. EPA has constituted a study to fully understand the impacts of fracking for shale gas on ground water. Some of the chemicals used in the fracking process (such as benzene, Aldecide G and deodorized kerosene) are known to be very harmful to humans and other animals, and there have been worries of these chemicals leaching into the underground aquifers and contaminating the groundwater supply. Remediation of groundwater from such pollutants is highly challenging, time-consuming and expensive. Given the weak and fragmented regulatory regime currently overseeing issues of water pollution in India, fracking could pose a serious threat to water quality for irrigation and drinking water, and severely endanger public health.

In addition to the threats of pollution from chemicals mixed with water during fracking, there are also fears of contamination from the material coating the drill-bits and from the possibility of the escaping gas mixing with ground water. Thus, there are significant worries regarding pollution of ground water sources due to the fracking process.

Land subsidence

There are also concerns that extraction of natural gas from some geological formations may lead to land subsidence if the reservoir rock is not strong enough to withstand the loss of pressure beneath. In turn, land subsidence may result in groundwater becoming saline making it unfit for consumption or agriculture. In fact, an expert group constituted by the Ministry of Environment and Forests to examine possible land subsidence in the Krishna-Godavari delta has recommended that "Since land subsidence has been reported & observed in the areas where extensive extraction of underground water, oil & gas or mining in various parts of the world including India (coal mines) has been carried out, this aspect needs to be taken into consideration while taking up any project on underground extraction." Therefore, this issue must also be examined in the context of not only shale gas extraction, but also oil and gas extraction.

Treatment of 'produced water'

The mixture of water and chemicals that remains after the fracking process is called 'produced water'. Since produced water naturally contains many of the toxic chemicals used in fracking, its treatment, disposal and storage is also an important issue that needs attention. If produced water is not stored or disposed properly, it is likely to introduce toxic chemicals into not only ground water sources but also streams, rivers and the soil.

Recommendations

In light of these concerns regarding shale gas extraction process, we request that the *precautionary principle* be adopted while drafting a policy on shale gas extraction. In particular, we recommend the following:

1. Drilling for shale gas in any area should be permitted only after performing an environmental and social impact assessment and making sure other conflicting needs of water are not compromised over the well's lifetime, and assurances are obtained from the exploration agency regarding adequately recharging groundwater sources with fresh water to

compensate for the water abstracted for fracking. The assessment and other reports must be subject to public scrutiny and the final decision must be taken only after a public hearing with all the potentially impacted citizens.

2. Each round of fracking should be undertaken only after public consultations (including gram sabhas) and ensuring that sufficient water is available for other competing needs, with fracking only taking place in seasons when there is no scarcity of water.
3. A study on the lines of the U.S. EPA study should be constituted to understand the relationship between fracking, groundwater resources and land subsidence. This study should be done by a credible independent team consisting of experts from both within and outside the Government in the areas of groundwater security, groundwater pollution, geology and land subsidence etc. Fracking should not be allowed until the study is completed, discussed in public consultations and accepted by the Government.
4. Complete details of all chemicals used in the fracking process of each well, including their CAS numbers and their impact on human, plant and animal health, must be disclosed by the drilling company and made publicly available at a centralized location.
5. The safety of each shale gas well must be certified by a suitably empowered and capable agency. Such a certificate should certify that the fracking process will not result in groundwater or soil contamination and that the gas in the wells will not escape into the groundwater and mix with it. The certification and testing process itself must be transparent and verifiable by third party experts.
6. In case of any dispute regarding water (or soil) contamination due to any phase of the shale gas extraction process, there must be an unambiguous and transparent dispute redressal mechanism. Moreover, in such cases, following the precautionary principle, the onus of proof that the fracking process does not contaminate water must lie with the exploration company.
7. Since shale gas exploration has a close relationship to water exploitation, the MOT deciding shale gas related policies must contain a representative from the Ministry of Water Resources and a representative of the Central Ground Water Board in addition to a member from the Ministry of Environment and Forests.
8. Shale and natural gas extraction must be permitted only after geological studies are conducted to ensure that it will not lead to land subsidence and other geo-hazards. Such studies must be done by an independent group and its results must be available for public discussion and comment before being accepted. Existing NELP production sharing contracts may have to be amended to introduce such conditions, while they should be part of all future NELP production sharing contracts.

Implementing these recommendations may require strengthening and streamlining institutions such as the various agencies dealing with water issues across different states and the pollution control boards at state and central level, so that they can regulate the abstraction and use of groundwater.

While we understand that shale (and natural) gas exploration and exploitation is necessary to improve the country's energy security, we also believe that it cannot be at the cost of either water security or public health. Therefore, we urge you to consider these recommendations in earnest and adopt them in public interest.

Thank you.

Sincerely,



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Research Fellow, Prayas Energy Group

The following also endorse the letter completely.

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CC:

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