

# FRACKING OF SHALE OIL AND GAS: THE FORTUNES AND FATE OF INDIA'S NEXT BIGGEST RESOURCE FRONTIER

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## I. INTRODUCTION

The ever compounding demand for energy fuel in the world pushed many countries on a frantic search mission to discover alternative sources of energy to meet the worrying demand-supply balance of energy. After years of research, the world found a promising panacea – ‘shale gas’, an unconventional natural gas resource, which had the potential to give the global energy industry, a momentous turnaround. The shale gas and oil (hereinafter shale gas) Exploration and Production (hereinafter E&P) in the United States (hereinafter US) was a major game changer as it turned tables for the country which was once in a deficit of natural gas; making it a self-sufficient natural gas nerve-centre of the world. The revolutionary natural gas reversal in the US caused a stir globally and soon enough a rapid development of shale gas resources around the world gradually metamorphosed the global gas market outlook.

Drilling for shale gas in India is only at a nascent exploratory phase. The domestic shale gas reserves in India once unlocked could minimize the energy demand as well as significantly reduce its energy imports. Ironically, India is the largest producer and exporter of ‘guar gum’ (cluster bean), a key ingredient in the extraction of shale gas; but India is yet to cash in on the production of shale gas. As promising and efficacious the idea of shale gas exploration is, it has its own share of concerns. A number of pressing questions linger around the issue of shale gas exploration in India like the viability of the similar *modus operandi* of shale gas extraction which worked for the US; will it also do the trick for India? Despite the huge untapped shale gas repository in India, will the dearth of requisite water supply and other factors cause a setback to the country's maiden endeavour at achieving self-sustenance?

## II. SHALE GAS AND HYDRAULIC FRACTURING: AN OVERVIEW

Natural gas from unconventional sources is called ‘unconventional gas’, a type of which is called ‘shale gas’, found within the rich organic shale-beds or layers of low-

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permeability rocks. These are sedimentary rocks which contain quartz, clay and other minerals. The US Geological Survey holds that shales have only recently been known to be reservoir rocks than the earlier view, which suggested that shales were source rocks for oil and natural gas.<sup>1</sup> This latest development has spurred extensive research on shales for their resource potential and has revolutionised the US gas regime.<sup>2</sup> According to the World Energy Council, shale gas is usually found in proximity to conventional reservoirs and there is also a variation in their depths.<sup>3</sup> The extraction of shale gas is typically done between 5,000 ft. to 9,000 ft. below the surface.

The shale rock is however at times found 3,000 metres below the surface. This poses technical difficulties to the exploration companies which have to use higher pressures, temperature, fracking pressure, etc.<sup>4</sup> Thus, in order to extract the shale gas, mere deep vertical drilling does not suffice as horizontal drilling for substantial distances in different directions have to be coupled with it for successful extraction.<sup>5</sup> It is here that the process of “hydraulic fracturing” or “fracking” comes in. To release the shale gas from the shale bed, an admixture of water, sands and chemicals is injected into the well at high pressure (8,000 psi) to create perforations in the rocks, through which minute particles of sand enter and keep them open and allow the gas to escape to the surface, where it is collected.<sup>6</sup> The injecting process is repeated multiple times and the number of wells drilled for extracting unconventional gases far exceeds that of their conventional counterparts.

The latest report from Public Health England shows that the depth at which fracking is carried out along with proper construction of the drilling well will not contaminate the groundwater.<sup>7</sup> Proponents of shale gas exploration argue that the water used in the process can be treated before it is released into the drilling wells and also recycled for

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<sup>1</sup> World Energy Council, *2010 Survey of Energy Resources* (2010) <[www.worldenergy.org/wp-content/uploads/2012/09/ser\\_2010\\_report\\_1.pdf](http://www.worldenergy.org/wp-content/uploads/2012/09/ser_2010_report_1.pdf)> accessed 27 October 2015.

<sup>2</sup> World Energy Council, *Survey of Energy Resources: Focus on Shale Gas* (2010) <[www.worldenergy.org/wp-content/uploads/2012/10/PUB\\_shale\\_gas\\_update\\_2010\\_WEC.pdf](http://www.worldenergy.org/wp-content/uploads/2012/10/PUB_shale_gas_update_2010_WEC.pdf)> accessed 27 October 2015.

<sup>3</sup> *ibid.*

<sup>4</sup> MA Mian, ‘Shale Gas Development Prospects’ (*CWC School of Energy*) <<http://www.cwcschool.com/shale-gas-development-prospects/>> accessed 27 October 2015.

<sup>5</sup> The Energy and Resource Institute, *Shale Gas in India: Look Before You Leap* (June 2013) <[www.teriin.org/policybrief/docs/Shale\\_gas.pdf](http://www.teriin.org/policybrief/docs/Shale_gas.pdf)> accessed 27 October 2015.

<sup>6</sup> *ibid.*

<sup>7</sup> Environmental Protection Agency, *Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources* (United States Government, June 2015) <[http://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=523539](http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539)> accessed 27 October 2015.

further extraction. The British Department of Energy and Climate Change in one of its report said that the intensity of the greenhouse gas (hereinafter GHG) emissions for shale gas is lower than that of Liquefied Petroleum Gas and coal.<sup>8</sup>

### III. SOCIO-ENVIRONMENTAL ISSUES: CHALLENGES AND SOLUTIONS TO IMPENDING ROADBLOCKS

Development almost always comes at the cost of environment or the lives of the people. Though the process of fracking is being hailed as path-breaking in the energy sector, it is not free from pitfalls and challenges. A special report on the world energy outlook by the International Energy Agency (hereinafter IEA) on unconventional gas titled "Golden Rules for a Golden Age of Gas" said that boosting energy diversity and security through unconventional resources should be done in an environmentally acceptable manner.<sup>9</sup> The report takes into account the fact that the exploration of unconventional gas is a more intensive industrial process than that used for exploration of conventional gas and hence it leaves a bigger environmental footprint. The process of hydraulic fracturing throws a number of challenges at every country ranging from environmental to social to economic in nature. India, as per the estimates of US Department of Energy, has close to 96 trillion cubic ft. of recoverable shale gas reserves.<sup>10</sup> However, India has not been able to chance upon the commercialisation of shale gas production because of the myriad impediments that it faces.

#### I) CONTINUOUS INCREASE IN CARBON EMISSIONS

It is argued that generation of electricity with the use of unconventional resources like shale gas is much cleaner when in comparison to coal-fired generation.<sup>11</sup> The key to

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<sup>8</sup> Department of Energy and Climate Change, *Potential Greenhouse Gas Emissions Associated with Shale Gas Extraction and Use* (Government of United Kingdom, September 2013)37, para 106<[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/237330/MacKay\\_Stone\\_shale\\_study\\_report\\_09092013.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237330/MacKay_Stone_shale_study_report_09092013.pdf)> accessed 27 October 2015.

<sup>9</sup>World Energy Outlook, *Golden rules for a Golden Age of Gas* (International Energy Agency, 29 May 2012)<[www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012\\_GoldenRulesReport.pdf](http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012_GoldenRulesReport.pdf)> accessed 27 October 2015.

<sup>10</sup>Energy Information Administration, *Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States*(United States Government, June 2013)<[www.eia.gov/analysis/studies/worldshalegas/pdf/overview.pdf](http://www.eia.gov/analysis/studies/worldshalegas/pdf/overview.pdf)> accessed 27 October 2015.

<sup>11</sup>Malcolm Brinded, 'The case for shale and tight gas'(Foundation for Science and Technology, London,9 November 2011)<[www.shell.com/global/aboutshell/media/speeches-and-articles/2011/brinded-london-09112011.html](http://www.shell.com/global/aboutshell/media/speeches-and-articles/2011/brinded-london-09112011.html)> accessed 27 October 2015.

cleaner renewable or more nuclear generation lies in the production of more gas.<sup>12</sup> The US Environmental Protection Agency has attributed the 9% fall in the carbon emissions to shale gas use.<sup>13</sup> However, in a recent statistical review of world energy by British Petroleum (BP), it was said that despite the enormous growth of shale gas, there has been a drastic rise in carbon emissions globally. In its global energy outlook, BP said that 27% of the global energy consumption would be taken up by gas while the global emissions will rise to 29% by 2035.<sup>14</sup> In India, coal consumption increased by 7.6% (accounting for 21% of global growth) and there was a proportionate increase in the carbon emissions.<sup>15</sup> The uninterrupted increase in the carbon emissions could pose an obstacle to the future shale gas development in the country.

## II) ECOLOGICAL IMPACTS OF FRACKING

The Indian Ministry of Environment and Forests has expressed concerns over the impact of shale gas drilling on the environment as the process would use different chemicals and that might have an adverse ecological impact.<sup>16</sup> Environmentalists argue that shale gas extraction in India will not only increase GHG emissions but also pollute water aquifers which will eventually damage public health and ecosystems. Some others argue that the use of chemicals during extraction pollutes groundwater and soil. The water which is flowed back to the surface after the fracking process might have a copious amount of dissolved solids and other contaminants, the treatment of which becomes vital. India also lacks the adequate geoscientific data which is essential while conducting a shale gas exploration to determine the possible environmental impacts of the process.

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<sup>12</sup> Fred Pearce, 'Fracking: the monster we greens must embrace' *The Guardian* (15 March 2013) <[www.theguardian.com/commentisfree/2013/mar/15/fracking-monster-greens-must-embrace](http://www.theguardian.com/commentisfree/2013/mar/15/fracking-monster-greens-must-embrace)> accessed 27 October 2015.

<sup>13</sup> Michael Brooks, 'Frack to the Future' *New Scientist* 219(2929)36.

<sup>14</sup> Fiona Harvey and Terry Macalister, 'Shale or not emissions will continue to rise' (*The Hindu*, 18 January 2014) <[www.thehindu.com/opinion/op-ed/shale-or-not-emissions-will-continue-to-rise/article5587066.ece](http://www.thehindu.com/opinion/op-ed/shale-or-not-emissions-will-continue-to-rise/article5587066.ece)> accessed 27 October 2015.

<sup>15</sup> Cuckoo Paul, 'Despite rising emission, India's coal use soars' (*ForbesIndia*, 11 July 2014) <<http://forbesindia.com/article/checkin/despite-rising-emission-indias-coal-use-soars/38164/1>> accessed 27 October 2015.

<sup>16</sup> Gaurav Agnihotri, 'Does Fracking have a future in Asia?' (*Oilprice*, 31 March 2015) <<http://oilprice.com/Energy/Crude-Oil/Does-Fracking-Have-A-Future-In-Asia.html>> accessed 27 October 2015.

### III) LAND ACQUISITION AND DISPLACEMENT DUE TO FRACKING

Another pertinent difficulty surrounding fracking of shale gas is the disposal mechanism of flow back water from the fracking process and the eventual land acquisition and displacement of people. Loss of land due to acquisition uproots and displaces people from their socio-cultural environment and makes them completely insecure financially by forcing them to move from their homes and the natural resources which sustain them.<sup>17</sup> Acquisition of lands for the purposes of development affects hundreds of people in a myriad manner and is not necessarily limited to people living in the affected region. Development-induced displacement is rarely limited to the people in the identified project area.<sup>18</sup> Thus, considering the fact that very large land masses are required in the process of fracking, the problem of displacement arises because of acquisition of land can prove to be a hurdle for the shale gas explorers.

In this regard, the new Land Acquisition Act, 2013 provides for some of the most stringent provisions for acquiring a land whereby if the compliance is to be made then it would take 48 months (approximately) to complete the entire procedure. Furthermore, the severity of the provisions concerning the Social Impact Assessment coupled with the 'consent' clause<sup>19</sup> would act as a serious impediment to the growth of shale oil and gas sector.

Therefore, it is required on the part of the concerned government authority to provide adequate relaxations in hydraulic fracturing projects which can be included in a separate legislation (as discussed later) or by way of an amendment under the LARR Act itself.

### IV) THE UNFORTUNATE TALE OF WATER SCARCITY

However, the biggest hurdle India faces is the availability of the enormous amount of water required for shale gas exploration; which runs into 3-4 million gallons per well. Even the cost of drilling the wells is very steep. The British Royal Society in its report on Hydraulic Fracturing recommended re-use and recycling of wastewater and planning of water disposal options from the outset.<sup>20</sup> In comparison with conventional reservoirs,

<sup>17</sup>Anand Swaroop Das, "Right to Fair Compensation: Can it ever be crystallized?" (2015) 288(5) MadLJ46.

<sup>18</sup>ibid.

<sup>19</sup> The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013, s 2 (2).

<sup>20</sup>The Royal Society, 'Shale gas extraction in the UK: A Review of Hydraulic Fracturing' (2012)6 DES2597<<https://royalsociety.org/~media/policy/projects/shale-gas-extraction/2012-06-28-shale-gas.pdf>> accessed 27 October 2015.

the shale gas reserves are more diffuse and hence the productivity of the shale wells drop very quickly. Keeping the same situation in light, the IEA considers that the availability of sufficient land and water are the most important above-ground considerations for the extraction of unconventional resources.<sup>21</sup> It further notes that access to water might act as a hindrance to shale gas development through technological developments are pursuing to reduce the amount of water required.<sup>22</sup>

Considering the opinion of the IEA in the Indian scenario, availability of sufficient land and water are the biggest roadblocks to shale gas exploration and extraction. Physical and economic water scarcity has marred India since ages. The water worries that India suffers from ranks higher than a number of other countries in the world. And in comparison with developed countries like Europe and the US, the aforementioned issue presents further alarming statistics.

India Water Portal, a web-based interactive platform, presents certain worrying figures of the future Indian water scarcity scenario. According to its estimates, in the next decade, water consumption in India will increase by over 50% whereas the water supply will only increase by a meager 5-10%, thus leading to drastic water scarcity.<sup>23</sup> The Energy and Resources Institute (hereinafter TERI) also conducted a study in 2010, which highlights the fact that India has already become a water-stressed country and is quickly approaching the scarcity benchmark figure of 1000 m<sup>3</sup> per capita. The study further pointed that there would be a rapid growth in the irrigation sector and similar growth in domestic and industrial water demand. By 2025, the per capita water availability will further drop down to 1341 m<sup>3</sup> per capita and to 1140 m<sup>3</sup> per capita in 2050.<sup>24</sup> The UNICEF and Food and Agriculture Organisation (hereinafter FAO) collaborated to release a study in January 2013 titled "Water in India: Situation and Prospects" which also raises the aforementioned concerns. According to the water basins projections for 2030 by the Water Resources Group in 2010, the potential shale gas bearing areas like Gondwana, Indo-Gangetic Plains, Cambay, Krishna-Godavari will face severe water stress by 2030.<sup>25</sup>

<sup>21</sup>Edward White, *Shale Gas and Fracking*(HOC Library, Number 6073 2016) <<http://researchbriefings.files.parliament.uk/documents/SN06073/SN06073.pdf>>accessed 27 October 2015.

<sup>22</sup>International Energy Agency, *World Energy Outlook Report* (2009)415<[www.worldenergyoutlook.org/media/weowebiste/2009/WEO2009.pdf](http://www.worldenergyoutlook.org/media/weowebiste/2009/WEO2009.pdf)> accessed 27 October 2015.

<sup>23</sup> NG Hegde, 'Water Scarcity and Security in India' (*India Water Portal*,3 April 2012)<[www.indiawaterportal.org/articles/water-scarcity-and-security-india](http://www.indiawaterportal.org/articles/water-scarcity-and-security-india)> accessed 27 October 2015.

<sup>24</sup>ibid.

<sup>25</sup>The 2030 Water Resources Group, '*Charting Our Water Future- Economic frameworks to inform decision-making*' (2010)55 <[http://www.mckinsey.com/~media/mckinsey/dotcom/client\\_service/sustainability/pdfs/charting%20our%20water%20future/charting\\_our\\_water\\_future\\_full\\_report\\_.ashx](http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/sustainability/pdfs/charting%20our%20water%20future/charting_our_water_future_full_report_.ashx)> accessed 27 October 2015.

#### IV. OVERCOMING EXISTING POLICY CONSTRAINTS: THE WAY AHEAD

In 2000, when the US successfully extracted the shale gas through the process of hydraulic fracturing, it opened the floodgates for similar extraction of the potentialities of one of the most sought after unconventional hydrocarbons worldwide. Following suit, the Government of India issued a 'Draft Policy for the Exploration and Exploitation of Shale Oil and Gas in India, 2012',<sup>26</sup> which was later on approved by the Indian Government with certain modifications. The new Policy Guidelines for Exploration and Exploitation of Shale Gas and Oil in India, 2013 (Approved Policy)<sup>27</sup> has allowed only the National Oil Companies (hereinafter NOCs) such as Oil and Natural Gas Corporation (hereinafter ONGC) and Oil India Limited (hereinafter OIL) to explore and exploit the shale gas from the shale rocks.

The need for having a separate government policy regulating the exploration of shale gas arises due to the fact that the existing legal paradigm governing the oil and gas industry, specifically excludes, inter alia, the regulation of shale oil.<sup>28</sup> The Oilfields (Regulation and Development) Act, 1948 regulates the oilfields and development of mineral oil resources,<sup>29</sup> which include natural gas and petroleum.<sup>30</sup> However, the term "petroleum" means naturally occurring hydrocarbons which do not include any substance which may be extracted from coal, shale or other rock by application of heat or by a chemical process.<sup>31</sup> The Approved Policy while listing out the responsibilities and duties of the licensees, expressly mandates that the licensee entities are required to adhere to the international best practices such as Good International Petroleum Industry Practices (hereinafter GIPIP) and American Petroleum Guidance document "Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing".<sup>32</sup> It is pertinent to note that even the aforesaid Approved Policy on shale gas has its own shortcomings.

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<sup>26</sup>Ministry of Petroleum & Natural Gas, 'Draft Policy for the Exploration and Exploitation of Shale Oil & Gas in India' (GOI, 2012) <[www.dghindia.org/admin/Document/notices/25.pdf](http://www.dghindia.org/admin/Document/notices/25.pdf)> accessed 27 October 2015.

<sup>27</sup>Ministry of Petroleum & Natural Gas, *Policy Guidelines for Exploration and Exploitation of Shale Gas and Oil by National Oil Companies under Nomination Regime* (GOI, 2013) <<http://petroleum.nic.in/docs/oidb.pdf>> accessed 27 October 2015.

<sup>28</sup>The Petroleum Act 1934 (30 of 1934). See also Petroleum and Natural Gas Rules 1959; Oilfields (Regulation and Development) Act 1948 (53 of 1948); Petroleum Rules 1976; New Exploration License Policy 1999.

<sup>29</sup> The Oilfields (Regulation and Development) Act 1948 (53 of 1948).

<sup>30</sup>*ibid* 3(c).

<sup>31</sup>The Petroleum and Natural Gas Rules 1959, r 3(k).

<sup>32</sup>Ministry of Petroleum (n 213)9, paras III, IV.

## I) PRIVATISING THE EXTRACTION OF SHALE GAS

Privatisation, as a concept, refers to the reduction in the State's ultimate ownership over the resources by way of disinvestment of government-controlled assets in order to subject them to the private market.<sup>33</sup> Though the Indian Government has already taken an initiative in this regard by allowing the privatisation in the oil and gas sector *per se* through the introduction of NELP in 1997 (effective from 1999),<sup>34</sup> the similar benefit has not been extended to the field of shale oil and gas.

The Approved Policy has restricted the E&P activities in shale oil and gas sector only to the NOCs,<sup>35</sup> whereby the ONGC and OIL were given the right to exploit the shale oil and gas under their existing Petroleum Exploration Lease/Petroleum Mining Lease granted on nomination basis, as contrary to the current regime of auction basis or competitive bidding.<sup>36</sup> However, domestic players like Reliance Industries Limited (RIL) and Cairn-India had to invest outside India in the absence of a governing legal framework allowing them to contribute in the indigenous production of the shale oil and gas. As a result, these domestic companies' foreign investment became highly dependent upon the oil prices in the host country, e.g. "the shale gas investment made by the RIL in the US went bad in the June quarter"<sup>37</sup> due to the falling prices of crude oil in the US.<sup>38</sup>

Other countries like Mexico, UK, US have already privatised their shale gas sector in order to enhance the competition in that sector, and for India, the Vijay Kelkar Committee has recommended the involvement of private players in the field of shale gas in order to reduce the import dependency of hydrocarbons.<sup>39</sup> Thus, the aforementioned scenario builds a strong case for privatization in the Indian context which can additionally

<sup>33</sup>OECD, *Privatisation in the 21st Century - Summary of Recent Experiences* (2010)7<[www.oecd.org/daf/ca/corporategovernanceofstate-ownedenterprises/43449100.pdf](http://www.oecd.org/daf/ca/corporategovernanceofstate-ownedenterprises/43449100.pdf)> accessed 27 October 2015.

<sup>34</sup>Ministry of Petroleum & Natural Gas, *New Exploration Licensing Policy (NELP)*(GOI, 1999)<<http://petroleum.nic.in/docs/exp.policy.NELP2015.pdf>>accessed 27 October 2015.

<sup>35</sup>Draft Policy (n 212)5, para 3(1).

<sup>36</sup>Ministry of Petroleum (n 213) para 3.

<sup>37</sup>Reliance shale gas returns turn negative in US'(Anirudh Sethi Report, 28 July 2015)<[www.anirudhsethireport.com/reliance-shale-gas-returns-turn-negative-in-us/](http://www.anirudhsethireport.com/reliance-shale-gas-returns-turn-negative-in-us/)>accessed 27 October 2015.

<sup>38</sup>'US shale oil boom masks declining global supply' (*The Financial Times*,11 February 2015) <[www.ft.com/cms/s/0/a623e1e8-b11a-11e4-831b-00144feab7de.html#axzz3hQhpWV4B](http://www.ft.com/cms/s/0/a623e1e8-b11a-11e4-831b-00144feab7de.html#axzz3hQhpWV4B)>accessed 27 October 2015.

<sup>39</sup>Ministry of Petroleum and Natural Gas, *Roadmap for Reduction in Import Dependency in the Hydrocarbon Sector by 2030* (GOI, September 2014)20, para 2(5) (2)<<http://petroleum.nic.in/docs/FinalReportKelkarCommittee2014.pdf>>accessed 27 October 2015.



benefit the country in reducing its import bill and augment its indigenous E&P of shale gas.

## II) NEED FOR A SEPARATE LEGISLATION

Under the existing legal regime, the US Government has recently, in March 2015, finalised the rules pertaining to the extraction of oil and gas through hydraulic fracturing (US Fracking Rules),<sup>40</sup> thereby replacing the existing three-decade old rules. These federal rules were formulated with the objectives of protecting water supplies, managing the residual of the fracking process in an environmentally protected manner, and making public disclosures of chemicals used in the process.<sup>41</sup> Despite the existence of such a comprehensive governmental policy addressing various fracking-related issues effectively, US proposed an entirely different legislation for the sole and direct regulation of the fracking and water injecting processes, namely, the Fracturing Responsibility and Awareness of Chemicals Act (hereinafter FRAC Act).<sup>42</sup> The FRAC Act aims to amend the Safe Drinking Water Act by inserting provisions like the primary enforcement of the State to be only in relation to fracking operations and the mandatory disclosure provision concerning the chemical constituents used in the fracking process to the public. Thus, the importance of enacting a separate legislation for a particular process which has changed the face of the energy and gas industry of a country like the US can't be overlooked.

Unlike the US, the Indian scenario of the extraction of shale oil and gas is still at an emerging stage but carries a lot of potential. In order to explore such potential, it is required on the part of the government to involve both public as well as private players in it. Considering the fact that such an expansion of the oil and gas sector would attract various socio-environmental as well as regulatory challenges, it becomes indispensable to regulate such an issue with a suitable piece of legislation.

The legislation, enacted by the legislature, provides a clear mandate regarding the applicability of such a normative law. Unlike government policies, a parliamentary law creates rights and corresponding obligations of its subjects upon whom it shall be applicable. Taking into account the challenges faced by the shale gas exploration such as scarcity of fresh water in India, rehabilitation and consent clause in case of newly

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<sup>40</sup>Land Management Bureau, 'Oil and Gas Hydraulic Fracturing on Federal and Indian Lands' (United States Government, 26 March 2015) <[www.federalregister.gov/articles/2015/03/26/2015-06658/oil-and-gas-hydraulic-fracturing-on-federal-and-indian-lands#h-8](http://www.federalregister.gov/articles/2015/03/26/2015-06658/oil-and-gas-hydraulic-fracturing-on-federal-and-indian-lands#h-8)> accessed 27 October 2015.

<sup>41</sup>ibid.

<sup>42</sup>The Fracturing Responsibility and Awareness of Chemicals Act 2015 (HR1482).

promulgated Land Acquisition Ordinance, sustainable development, regulatory mire over the supervisions and environmental clearances between the Central and State nodal agencies; a governmental policy regulating the same cannot sustain for a long time. Taking a cue from the FRAC Act which directly regulates the hydraulic fracturing process and enacting a legislation in India, which will not only address the above-mentioned challenges effectively but also bring uniformity in the regulation process, is vital.

The need for the enactment of a governing legislation becomes compelling when millions of lives of a country could be positively affected by this decision of the government.

## V. CONCLUSION

Although the process of fracking has existed for about five decades now, it has boomed only recently because of the global energy crisis and the depletion of conventional natural resources. India being the newest member of the club has a long way ahead at fully exploiting its vast untapped repository of unconventional natural resources. However, muddying the Indian shale gas exploration venture is a raft of issues, which could push back the whole process if not addressed at the earliest. The foremost concern of India will be to counterbalance water scarcity on one hand and achieving self-sustenance on the other. In the process of formulating a regulatory regime in our quest to achieve sustainable and inclusive growth, water should not play a constraining factor.

Also, the issue of privatization in this sector becomes a major concern as the involvement of private players would immensely contribute to increasing the country's independence in the oil and gas industry and ensuring bona fide competition among all players. The recent speculations suggest that the Indian Government may soon allow the private players to extract the natural gas from the shale resources along with the NOCs, but only for those blocks held by these private entities where the lease is set to expire within two years.<sup>43</sup> Though at the proposal stage, the same has attracted a lot of criticism and protest from the private players who seek equal exploration rights.

The Government is also looking into possible alternatives to restrict the negative impact posed by the water-related issues. On February 18, 2015, ONGC has signed a Memorandum of Understanding with the Bengaluru-based Super Wave Technology Limited for developing Shock Wave Assisted Fracking Technology as an alternative to

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<sup>43</sup>Subhash Narayan, 'Oil firms may be allowed to explore shale under NELP round' (*The Financial Chronicle*, 17 June 2015) <[www.mydigitalfc.com/news/oil-firms-may-be-allowed-explore-shale-under-nelp-round-335](http://www.mydigitalfc.com/news/oil-firms-may-be-allowed-explore-shale-under-nelp-round-335)> accessed 27 October 2015.

the conventional use of hydraulic fracturing.<sup>44</sup> If successful, this could possibly solve the issue of fresh water scarcity which proves to be the biggest hurdle in the development of shale oil and gas sector.

However, in a haste to extract essential natural resources, the regulators must not turn a blind eye to the surrounding risks concerning fracking in the country. The entire process began with the dual purpose of ensuring growth and sustenance, and human well-being. Thus, public health and quality of the environment must not be cast aside as mere obstacles to progress.

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<sup>44</sup>ONGC to look for environmental friendly alternative to hydro-fracturing; inks an important MoU for R&D' ONGC (18 February 2015) <[www.ongcindia.com/wps/wcm/connect/ongcindia/home/media/press\\_release/ongc-to-look-for-environmental-friendly](http://www.ongcindia.com/wps/wcm/connect/ongcindia/home/media/press_release/ongc-to-look-for-environmental-friendly)> accessed 27 October 2015.