CONTRIBUTION AT WATER RESOURCE AND SHALE GAS EXPLOITATION

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Abstract— ***Shale gas resources are relatively plentiful in the United States and in many countries and regions around the world. Development of these resources is moving ahead amidst concerns regarding environmental risks, especially to water resources like wastewater,contamination by fracing fluid,water depletion…etc.***

Key-Words-Shalegas,reservoir,wastewater,contamination, Fraking,Wastewater,Water Deplition,Resoureses….

I. INTRODUCTION

SHALE Shale gas is natural gas trapped in shale rock deep below the earth's surface. Until recently, it was inaccessible for development due to its depth and concentration. New advances in horizontal drilling techniques combined with hydraulic fracking technology have enabled producers to capture this once elusive resource. Shale gas production, however, presents many pollution threats to the people of both nations that could negate its benefits. This includes surface and drinking water contamination, air pollution, and global warming pollution.

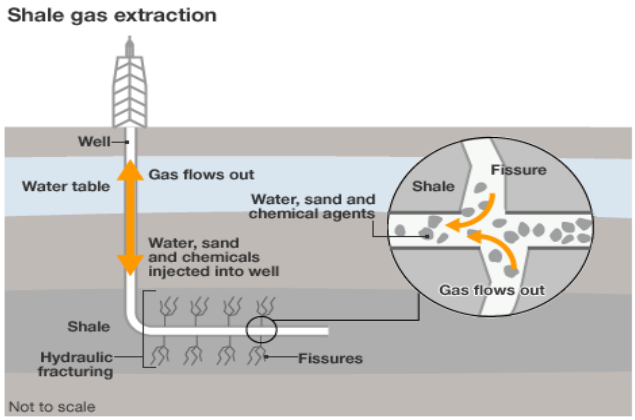

Figure.1.Shale Gas Extraction

II. SHALE GAS WORLDWIDE

Shale gas has become an increasingly important source of natural gas in the US since the start of this centry,and interest has stead to potential gas shales in the rest of the world since 2000.

Some analysts expect that shale gas will greatly expand worldwide energy supply. China is estimated to have the world's largest shale gas reserves.

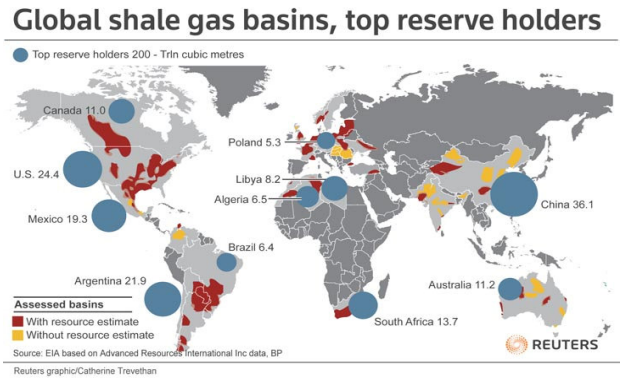

Figure.2.Shale Gas reserves

III. ENVIRONEMENTAL CONCERNES IN SHALE GAS DEVELOPEMENT

Shale gas can reduce greenhouse gas emissions. Natural gas burns much more cleanly than coal or oil, so it produces less acid rain, smog, and toxics that damage public health and contribute to global warming. This is why many experts believe that shale gas could be the bridge between our fossil fuel reliance in the 20th century and clean renewable energy in this one.

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IV. FRAKING FIUID

The first problem came about because of the industry's initial refusal to reveal the ingredients of the slick water used in hydraulic fracking. Pressed by regulators, shale gas companies are now becoming more transparent about the chemicals in fracking fluid.

Typically, what goes down the well is 94.62% water, 5.24% sand, 0.05% friction reducer 0.05% antimicrobial, 0.03% hydrochloric acid and 0.01% scale inhibitor. The actual chemicals are used in many industrial and even domestic applications: polyacrylamide as a friction reducer, bromine, methanol and naphthalene as antimicrobials,

hydrochloric acid and ethylene glycol as scale inhibitors and butanol and ethylene glycol monobutyl ether as surfactants. At high dilution these are unlikely to pose a risk to human health in the event they reach groundwater.

V. FLAMING FAUCETS(METHANE IN THE GRANDWATER

The British Geological Survey is undertaking a new project to establish the baseline of methane levels in groundwater throughout the UK. Evidence from the USA has shown very high methane concentrations in groundwater in areas of shale gas exploitation.

Figure.3. A house destroyed by methane explosion at Loscoe, Derbyshire

VI. WASTEWATER

Approximately 25% to 75% of the injected fracturing fluid flows back to the surface when the well is depressurised.The volume of flowback water depends on the properties of the shale, the fracturing design .Produced water will continue to return to the surface over the well's lifetime. Wastewaters are instead stored in closed metal tanks before being treated. Leaks or spills of wastewaters can be managed in the same way as spills of fracturing. This hazard is not unique to shale gas extraction but common to many industrial processes.

VII. WATER DEPLITION

Significant quantities of water are required for high volume fracturing operations (up to 25,000 m3 per well over a short period of time).

VIII. ENVIRONMENTAL IMPACTS IN THE USA

A US Environmental Protection Agency (EPA) study reported that hydraulic fracturing had contaminated groundwater and drinking water supplies in Pavillion, Wyoming (DiGiulio et al 2011). The well casing was poorly constructed,and the shale formations that were fractured were as shallow as 372m. Many claims of contaminated water wells due to shale gas extraction have been made. In 2011, the EPA was directed by Congress to undertake a study to better understand the potential impacts of hydraulic fracturing on drinking water resources.A first report of EPA is expected at the end of 2012, and the final results are due in 2014. In 2011, the Secretary of Energy Advisory Board Natural Gas Subcommittee submitted its recommendations to improve the safety and environmental performance of shale gas extraction.

IX. ALGERIA RESOURSES OF SHALE GAS

Algeria continues to set its sights on developing major shale gas business and claims to have an estimated 6,404 trillion cubic metres ("the Third after china and Argentina") of potential shale gas resources. Algeria will introduce new legislation to encourage foreign investors interested in developing and exploration its shale energy resources. This will involve including tax incentives sharing costs and risks. Abdelhamid Zerguine, the CEO of state owned Sonatrach, has said that "for shale resources we want to make (terms) attractive by allowing Sonatrach to take a share of the risk in order to help ensure security of supply long term. Furthermore, at the beginning of August, Sonatrach has been in negotiations with Shell, Eni and ExxonMobil to sign exploration deals.

Algeria, the world's fourth-largest gas exporter, has decided to develop its shale gas potential as well, but experts fear this could cause severe environmental problems. Chems Eddine Chitour, director of fossil energy development at Algiers' Ecole Polytechnique, is concerned that the method used for obtaining the fuel trapped in formations of shale rock could be geologically dangerous and also put a strain on the largely desert country's water supplies.

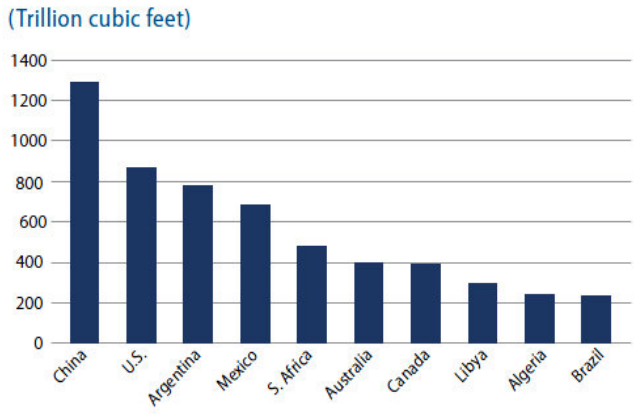

Figure.4.Estimated Shale Gas Technically Recoverable Resources By Country

X. CONCLUSION

Global developpement of shale gas ressources has a potentiel to expand significantly outside the United

States.However ,there continue to be environmental concernes,particularly the water used and its contaminations. Even if environmental concerns restrict shale gas exploitation in some countries, world availability is likely to grow rapidly and to keep a lid on prices.

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