

Journal of Energy and Management



Journal homepage: https://www.pdpu.ac.in/jem.html

ISIS AND ITS IMPLICATIONS ON ENERGY SECURITY

Sanjay Kumar Pradhan¹

¹Pandit Deendayal Petroleum University

KEYWORDS

ISIS, energy, market, infrastructure, external powers, energy security, nexus, prospect

Abstract: The Islamic State of Iraq and Syria (ISIS) or Islamic State (IS) militants have captured significant oil and gas fields in Iraq and Syria and developed their independent financial mechanisms to recruit cadres, carry operations and run caliphate administration in their occupied territories. The IS-controlled oil fields in Iraq and Syria produce 25,000 to 40,000 barrels of oil per day, which is about \$ 1. 2 million. They earn money at earliest, demands protection money and transit fees and sells oil in the local and international black market with cheap rates. Thus, the cheap oil and energy market has turned as a source of income for the poor or displaced Iraqis and Syrians. In the national and international market, they have buyers, traders, businessmen and middle man who support and assist this black marketing. Apart from domestic black market, the oil is being smuggled out to Iran, Kurdistan, Turkey, Syria and other countries as well. As a consequence, there has been reduction in oil production, loss of revenues and disinterest of foreign companies to invest in the regions. The external forces such as US and Russia and their air strikes and ground operations have disrupted makeshift refineries, pipelines and transport convoys of IS to deliver oil to the black market. However, since there is no large scale ground operations by the external powers, most of the oil wells and refinery are under the IS control, and 'nexus' between government and militia have troubled the operations against IS and their oil trade. The paper will anyalse the mechanisms through which ISIS carries out its oil market, ISIS and its adverse impact on energy market and infrastructure in Iraq and Syria, Implications of energy market, intricacies or nexus in black market, outcomes of armed operation by external powers such as Russia and coalition forces with specific reference to United States.

1. INTRODUCTION

The Islamic State of Iraq and Syria (ISIS) or Islamic State (IS), a terrorist organization and transnational criminal group, seeks for a caliphate comprising a vast stretch of territories and countries through the means of selling of oil,

ransom, looting and black marketing. On October 30, 2014, the U.S. Treasury Under Secretary for Terrorism and Financial Intelligence David Cohen noted that the Islamic State has "amassed wealth at an unprecedented"

pace," including receiving at least \$20 million in ransom payoffs since January 2014 (The Jamestown Foundation, 2015), \$675 million from looting of banks and \$145 million in oil sells, plundering everything starting from antiquities to private property, protection money, demanding 5% to 20% taxes on salaries, plus fees for a range of economic activities, as revealed by US officials (Lakshmanan, 2015).

Although IS receives donations, especially from Gulf-based financiers, yet, they are relatively insignificant contributor to its coffers (www.economist.com). Instead, recently, the bulk of its money comes from oil revenues from fields under its control or stealing from the oil fields in western Iraq and eastern Syria. Ben Van Heuvelen, the managing editor of Iraq Oil Report, recounts, "ISIS was stealing oil out of pipelines and storage tanks, loading it onto trucks and selling it to drivers. With \$2 million in daily revenue from black market oil, the Islamic State insurgency not only holds sway over swathes of Syria and Iraq but has also begun to lay the foundations to become a - a proto-state of small petro-state (Pizzi, 2014). The Islamic State shortly after the fall of Mosul revealed that the group had assets worth of \$875 million, which increased to an estimated \$2 billion dollars, susequently. The 11 oil fields that the IS controls in Iraq and Syria have made it financially stable organisation. The oil fields occupied by IS produce between 30,000 to 45,000 barrels of oil per day, which is worth of \$2 million. This shows the significant share of oil in the total earnings of \$3 million per day (Dalby, 2014).

The regional energy picture in areas, controlled by the Islamic State and surrounding regions in Syria and Iraq, is a complex phenomenon since energy infrastructure cuts across territories controlled by different groups such as IS, Kurds, rebels and the government. Nonetheless, some trends are clear: the UK risk management firm Maplecroft revealed, the Islamic State has controlled six out of Syria's ten oil fields, including the large Omar facility and main oil fields in Deir Az-Zor province; and in Iraq, at least four small fields, including those at Ajeel (near Tikrit city), Kaz (Anbar province) and Hamreen have been captured, and the group sold up to 80,000 barrels of oil a day worth several million

dollars through the regional black market (Financial Times, 2014 and Bodissey, 2015).

Yet, the IS don't have refineries to refine crude and for them refined crude is more important than the unrefined. Hence, the ISIS wants to become energy independent and achieve self-funded statehood, a plausible goal if it is cut off from neighbors and establish its own borders (Feldman, 2015). Although the make-shift refineries such as Chinese, Turkish, and mini refineries that use primitive distillation and heating methods have limitations of processing such as 500-1,000 bpd yet, they are looking for state-run refineries like Baiji (Iraq), which is a part of its grand strategy to become a functioning state.

2. HOW AND WHERE THE MONEY IS SPENT

The lack of expertise in extracting and refining oil is a major concern for the IS militants. However, it manages the situation by hiring technicians and experts. The ISIS pays fighters around \$400 a month, which is more than Syrian rebel groups or the Iraqi government offer. It appears to have no trouble in purchasing weaponry, either on the black market or from corrupt officials or militias. The militants run services, not always successfully, across the areas it controls, in the form of paying to schoolteachers, school fees, and financial assistance to poor under national service, and protection of the people in its occupied territories (www.economist.com).

The group is controlling over the oil resources to strengthen its ties with the local tribes and allowing some Bedouin tribes such as the Bar al Milh, al Kharata, Amra, Okash, Wadi Jureib, Safeeh, Fahda in Deir al-Zor province and many other medium and small disused wells in the Jebel Bushra area, to tap wells the IS controls. Moreover, the influential Jabour tribe, whose kin spread across the borders of Iraq has been benefited through the illegal oil trade market. Assisted by the tribals, the traders, largely supportive of ISIS, have continued to build stockpiles, selling oil and even smuggling into government-held areas in Syria (Al-Khalidi, 2014).

Following a series of accidents in the oil wells and installations, owned by IS in Iraq and Syria, the group advertises for skilled technicians to manage the facilities it has captured. For instance, it has offered \$225,000 a year for a manager to run their refineries, the most senior of several vacancies that the Islamic State organization is seeking to fill. The recruiting call has gone out via jihadist networks as far to North Africa. The black market agents in Iraq's northern Kurdish region have also been quietly advertising the vacancies. Robin Mills of Manaar Energy, a consultancy firm in Dubai said, "They are trying to recruit skilled professionals who are Ideologically suitable.

(<u>www.economicpolicyjournal.com</u>)

More to say, in Kurdish-held territory, there are some government staff who still get their salaries from the Syrian government.

3. MODUS OPERANDI

Although the oil grey marketing is prominent today in the Middle East region today, yet, Valerie Marcel, a Middle East and Africa energy specialist at Chatham House, reveals about the root of illegal oil market, "The fact that Iraq was under sanctions, which led Kurdish and Iraqi businessmen to fill a vacuum and create smuggling networks for Iraqi oil. Likewise, Iranian and Syrian networks have grown because of decades of bans on exports (www.economicpolicyjournal.com).

Turkey has been major conduit for illegal oil exports since the days of Saddam Hussein. These smuggling rings are still very active, and are now working with IS and contributing to its exploding wealth (Dalby, 2014). Though the details of the group's oil smuggling operations are murky, the ISIS and its Sunni allies are known to have dominion over extensive smuggling routes, which even touches far away countries such as Afghanistan and Armenia. There are reports that, the crude is transported by tankers to Turkey via Mosul, to Jordan via Anbar province, to Iran via Kurdistan, to the Kurdistan region of Iraq and to Syria's local market, where most of the crude gets refined. The cut-rate price for the crude is \$18-25, refined oil range from \$50-\$60 per barrel, nearly three times the price of the crude and a liter of gasoline sells for half a dollar. Yet, low price is profitable since the loss

occurred through selling is compensated through large-scale selling since there are many buyers to purchase who would sell them at higher price in the black market (Dalby, 2014). Commenting on black marketing, Ben Van Heuvelen, managing editor of Iraq Oil Report says, "IS was stealing oil out of pipelines, out of storage tanks, loading it onto trucks and selling it to drivers for very cheap." The cut-rate price of \$25 a barrel was an incentive for traders to buy--- The drivers were then selling to middlemen, then middlemen would find a way to launder the oil, so to speak, and then sell it on." (www.npr.org, 2014). More to mention, According to Samir Aita, a Syrian economist, "Parties that are fighting each other still exchange services and find bargains." The Oil traders says, that after taking control of oil wells from the rivals, the ISIS has continued the practice of guarding some pipelines, which are transporting crude of Kurds in their fields in northeast Syria to a government-run refinery in Homs in exchange for protection money. They would take fees and transit fees so the oil would go through without blowing up pipelines (Al-Khalidi, 2014).

The local businessmen have continued to send convoys, sometimes up to 40 trucks, carrying oil from Islamic State-run wells through insurgentheld parts of Syria even during day time and pass more quickly through its occupied checkpoints. It has encouraged the customers to stockpile and load up as much as possible, offered discounts and deferred payments to supply more oil. The plants have been constructed by private businesses at a cost of around \$150,000 to \$250,000 and processed 150-300 bpd of Islamic State-supplied crude oil. While some local businessmen have made large profits from the illicit oil trade, many other civilians have come to depend on the informal market which sprung up since the start of Syria's conflict. The Americans know that these wells and oil market have opened an opportunity for many Syrians to benefit who even don't have links to militants. Those who buy this fuel are only the poor who use it to make bread and cook their daily meals to feed their families (Al-Khalidi, 2014).

4. IS THERE ENERGY INSECURITY?

Since the outbreak of militancy, many wells have been shut down and foreign firms withdrawn

shares, equipment looted and warehouses emptied. Besides, national industries and multinational companies like Royal Dutch Shell and Petro Canada have stopped their production and abandoned the conflict zones; thus, making full use of natural resources a real challenge in both the war-ravaged countries. But, the old certainty that oil prices respond sharply to geopolitical upset is no longer seems the case. It's a change that reflects a new global market where the rise of U.S. shale fields and Saudi Arabia's determination to defend the country's share of world production ensures ample supply. The Saudi Arabia's decision to pump more than 10 million barrels a day as it tries to grab market share from US Shale has caused more flow of crude oil and gas resources in the global energy market. Iraq has been able to boost production to its highest since 1979, approaching 4 million barrels a day, adding 600,000 barrels day in extra output over the last two years. In Libya, production has fluctuated wildly over the last two years even as militias fight. It is remarkable that when there was the rise of ISIS, hardly any geopolitics of oil price affected the region. In the opinion of oil industry historian Daniel Yergin, "Despite all the tensions in the Middle East, there is little risk premium in oil right now---- and if there is a disruption, supplies can be made up elsewhere" (www.bloomberg.com, 2015).

In Iraq, there is a risk that ISIS and other militant groups could gradually expand operations and begin targeting key energy infrastructure in the south. The IS militants had captured Baiji, a key northern city containing Iraq's largest oil refinery, for a short period (www.eiu.com, 2014), and the fall of Ramadi to ISIS, raised serious question about Iraq's national security. But, oil production in Iraq is situated far south of Ramadi, around Basra on the Persian Gulf, and these massive oil fields are not in any immediate danger. Despite the onslaught of IS, Iraq has scaled up oil output over the last years. From 2013 to 2014, production climbed from 2.9 to 3.1 million barrels per day and it is expected to see its oil exports surge by 700,000 barrels per day in 2015, putting its overall export level at 3.75 million barrels per day (Cunningham, 2015).

Contrast to Iraq, Syria's production has decreased from an average of 28,000 barrels per day (bpd) in 2013, from 164,000 bpd in 2012. Oil

sells made up nearly a quarter of state revenues before the war broke out and the oil industry had been key to the Syrian economy, with a daily output of about 380,000 barrels, until fighting began three years (www.theoilandgasyear.com, 2015). The Syrian government has revealed that it has lost \$3.8 billion in stolen oil because of the militancy. Towards the end of August 2015, as reported by Reuters and UK-based NGO the Syrian Observatory for Human Rights, Islamic State militants have seized the Jazal oilfield, the Syrian regime's last crucial oilfield. More to mention, half of Syria's estimated pre-war production is located in Hasaka province, which the Kurds have taken control, and if the province falls to Islamic State, the IS will have control over the major oil lifelines of Syria.

5. GOVERNMENT-MILITIA NEXUS IN SYRIA!

There are instances where tacit arrangements have been made between the ISIS militants and local state officials to ensure that basic necessities and services such as electricity and water are not disrupted or destroyed. Traders and middle men with connections on both sides of the war have sought to make a big margin of profit by reselling fuel in government areas as well such as Latakia region, a hub of pro-Assad region. Crude buyers, directly or indirectly, include businessmen close to Assad's ruling circle. "It seems that trade is going through brokers," says Joshua Landis, director of the Center for Middle East Studies at Oklahoma University. (www.pri.org/stories/).

Western trade sanctions block imports of fuel from Syria. Landis says that has made the Assad regime reliant on oil that's either smuggled outside the country or pumped inside Syria itself — which means doing trade with the ISIS. There are accusation and some justifications that, the Assad government in order to run his war machine and cities, needs energy to which the ISIS "cheaply" supplies since it controls much of the country's oil fields. The ISIS also goes for oil trade, primarily for cash to run administration. Danny Glazer, the Assistant Secretary at the U.S. Treasury Department, says, in the BBC2 documentary, "The Assad regime needs the oil and the world's richest terror army needs the cash; hence they are willing partners to do

business even as they're fighting each other." (www.ibtimes.com).

6. WHY SMUGGLING ACROSS KURDISTAN?

After Mosul fell to ISIS, troops belonging to the Kurdistan Regional Government (KRG) claimed to have taken control of Kirkuk when government forces fled the northern oil city. Yet, the heightened insecurity in the north is a risk to Kurdish exports by truck and pipeline. Moreover, Influx of hundreds of thousands of refugees into Kurdistan and low oil price has created an environment where oil consumption increases and black market proliferates. On the other way, the heightened insecurity in the north is a risk to Kurdish exports by truck and pipeline (www.eiu.com, 2014). The British-Turkish firm Genel Energy, which has a 45 percent stake in the Tag Tag oil field in Kurdistan Regional Government (KRG) region, is working together with the Nokan Group, which is accused of supplying ISIS oil through the Kurdish territory. When confronted on Genel's position on working with institutions allegedly involved in transporting ISIS oil, Andrew Benbow, spokesperson for the Anglo-Turkish company, said: "These are all questions to be asked to the KRG rather than ourselves" (Ahmed, 2015).

7. KRG-TURKEY-IRAQ NEXUS!

At the juncture of crackdown on Kurdish oil exports to ISIS in Iraq and KRG, the energy minister Hussein al-Shahrestani of Iraq got succeeded with Abdul-Mehdi. But, Abdul-Mehdi has been accused of having much conciliatory approach to the Kurdish oil question that happens to suit the interest of western investors in the KRG. To counter KRG allegations of black marketing in Iraq, the ruling Islamic Dawa Party, developed "significant intelligence inputs which confirmed that elements of the KRG had tacitly condoned IS oil sells on the black market" (Ahmed, 2015). On the other side of the picture, the KRG and Turkish authorities vehemently deny any role in facilitating ISIS oil sells. But, Turkey's support for Islamist rebels, who opposed to Bashir al-Assad's government in Syria, turned pivotal for the rise of ISIS, and today the country has turned a blind eye to the groups illicit tankers, makeshift pipelines and smuggling routes. The recent satellite image of Russia is an indicative of Turkey's silence over illegal cross border illegal trade of crude and refined oil. Not to deny, the Turkish effort such as tightening of its border and support to US in its operation against the ISIS is too little and too late. At the same time, both the governments of Turkey and KRG have taken measures to crackdown smuggling operations such as arrest of Kurdish "middlemen" involved in the ISIS black market; yet, the evidences continues to emerge that these measures are largely piecemeal, and have failed to address deep rooted corruption at the highest levels. And the recent military coup in Turkey, growing differences between Washington and Ankara on President Erdogen's crack down approach has adversely effected coalition fight against IS in Syria and Iraq.

8. AIRSTRIKES AND IMPLICATION FOR ENERGY MARKET

Since the ISIS is able to pay for everything it needs, the group cannot be defeated without cutting off its funds. Therefore, the coalition forces aims at attacking the sources of its revenue as well as stopping the group from advancing militarily. America and its allies have carried out air strikes on ISIS-controlled oil refineries in Syria and Irag. America and Britain have approached the countries to stop paying ransoms for hostages, and imposition of sanctions against ISIS leaders. However, the siege of Ramadi by ISIS and retreat of Iraqi forces, despite US air support, turned a major setback for US and Iraq (Cunningham, 2015). However, the American airstrikes can destroy the black market of oil trade and cut important source of income for ISIS. Joshua Landis, the director of the Center for Middle East Studies at Oklahoma University says, "The US can bomb IS tankers, can bomb the oil wells, can easily take out the oil, this would be very easy. But, America doesn't want to destroy the oil infrastructures since it will cause a lot of hardship to the civilian population--- I'm sure America is not there yet" (www.pri.org/stories/). So far, the US has conducted 8,605 air strikes, and more than 95 percent of all coalition strikes is launched by the US. Before striking the convoy of oil tankers or trucks of IS, the US fighter jets drop the leaflets, warning, 'Hey, run away, we're about to strike your trucks'. Likewise, Russian forces in Syria have continued to hit terrorists' targets,

conducting from 33 to 88 sorties per day and strikes have been conducted in the provinces of Raggah, Hama, Aleppo, Latakia, Idlib, Homs and Deir ez-Zor. Since the start of the operation, Russian air raids have destroyed more than 380 sites of IS, which includes 32 oil complexes, 15 refineries, 23 oil pumping stations and 1,080 oilhauling trucks. Moreover, both the coalition and Russian forces have naval forces to back air strikes. In the Mediterranean Sea, the US has stationed 4 naval warships, Russia, 1 and France, 1 aircraft career. Likewise in the Caspian Sea, Russia has stationed 4 warships. However, all the forces have left the oil wells untouched, so as to avoid destruction of energy infrastructure and public sufferings.

9. PROSPECT OF ENERGY SECURITY

Eliminating ISIS and restoring oil market stable in Syria and Iraq is a challenging task to all the stake holders of war. Steps have been taken, yet, some crucial points need to be addressed to make the operations a successful one. The future of war, and important strategies of war may include:

Firstly, Keep the ISIS deprived from getting oil fields, starve it of revenue, block it from the maritime connectivity, which is accessible from countries like Syria and Lebanon.

Secondly, Turkey and Syria should show their sincere commitment to stop oil black marketing across their border regions.

Thirdly, the United States must put pressure on its coalition partners in the Middle East to take tough measures against oil black marketing with the ISIS.

Fourthly, inside the countries of Iraq and Syria, shutting down of illicit oil trade requires an entire security arrangement, structure and strategy which will be resistant to corruption. However, this may take a bit longer period.

Fifthly, the oil wells and infrastructures must not be targeted, since it would lead to backlash of the local communities and destruction of energy infrastructure.

Sixthly, the mere air strikes is not suffice to destroy the entire structure and operation of ISIS; most important problem in this operation is

to get information from the hostile territory. Therefore, along with air strike, ground operation, based on concrete and sufficient information, could help both the national and foreign powers fight against ISIS more effectively.

Seventhly, although the Islamic State has stolen hundreds of millions of currencies from banks and other institutes, cash eventually runs out and today they find it harder to sell antiquities on the black market due to tightening measures by the countries concern.

Eighthly, the United Nations Security Council Resolution related to trade in oil and refined oil products, modular refineries and related materials, besides items of cultural (including antiquities), scientific and religious importance, needs to be implemented sincerely without delay.

Ninthly, although the truck convoys face the wrath of airstrikes, and tankers confiscated by the Iraqi and Syrian forces, yet, there are many open roads and alternative routes to carry oil.

Tenthly, destruction of refineries and targeting of oil trade have adversely affected the small traders and local people who even not inclined to ISIS ideology. The war has turned their family life miserable and destruction of livelihood. Therefore, along with operations against IS, the civilian concerns needs to be taken into account.

Eleventh, even with the elimination or check of IS, the oil market is not going to change significantly because of deep-rooted corruption in the region and conflicting interests of all the stake holders.

RFFFRFNCFS

Airstrikes, Oil Prices Hit Islamic State's Funding, The Wall Street Journal, February 27, 2015 Ahmed, N. (2015), UK, US turn blind eye to Islamic State oil sales, http://www.middleeasteye.net/columns/uk-us-turn-blind-eye-islamic-state-oil-sales-553879014

Al-Khalidi, Suleiman(2014). Here's How ISIS Uses Oil To Fuel Its Advances, *Business Insider*

Al-Khalidi, S. (2014), Here's How ISIS Keeps Selling So Much Oil Even While Being Bombed and Banned By The West, http://www.businessinsider.com/r-islamic-state-keeps-up-syrian-oil-flow-despite-us-led-strikes-2014-10?IR=T.

Beckhusen, R(2015). Oil Prices are dropping like a rock and hitting Islamic State, https://medium.com/war-is-boring/oil-prices-are-dropping-like-a-rock-and-hitting-islamic-state-b1a3ed439d36

Bodissey, B. (2015). Is the Islamic State Affecting the Market Price of Oil?, http://gatesofvienna.net/2014/09/is-theislamic-state-affecting-the-market-price-of-oil/

Cunningham, N. (2015). Oil markets indifferent to latest Islamic State victory in Iraq, http://www.csmonitor.com/Environment/Ener gy-Voices/2015/0519/Oil-markets-indifferent-to-latest-Islamic-State-victory-in-Iraq.

Dalby, C. (2014). Who Is Buying The Islamic State's Illegal Oil?, http://oilprice.com/Energy/Crude-Oil/Who-Is-Buying-The-Islamic-States-Illegal-Oil.html

Feldman, Noah(2015), 'Oil is Islamic State's lifeblood', *The Japan Times*, August 28, 2015

Financial Times, September 21, 2014

How Effective Are The Attacks On Islamic State Oil Production? The Jamestown Foundation, http://oilprice.com/Energy/Crude-Oil/How-Effective-Are-The-Attacks-On-Islamic-State-Oil-Production.html, January 14, 2015 (Accessed September 14, 2015).

How the Islamic State is Able to Sell Oil on the Black Market, *Economic Policy Journal*, September 22, 2014, http://www.economicpolicyjournal.com/2014/09/how-isis-is-able-to-sell-oil-on-black.html (Accessed October 18, 2015).

How the Islamic State Smuggles Oil To Fund Its Campaign, September 09, 2014, http://www.npr.org/sections/parallels/2014/09/09/346844240/how-the-islamic-state-smuggles-oil-to-fund-its-campaign (Accessed October 18, 2015).

Iraq and global oil markets: The ISIS effect, June 18, 2014,

http://www.eiu.com/industry/article/17919239 63/iraq-and-global-oil-markets-the-isis-effect/2014-06-18 (Accessed July 11, 2015).

Islamic State and global recession play role in falling petrol prices (Dec 31, 2014), *The Irish Times*,

Islamic State militants seize oil field, September 7, 2015,

http://www.theoilandgasyear.com/news/islami c-state-militants-seize-oil-field/ (Accessed October 18, 2015).

Koplowitz, H. (2015). ISIS Oil Revenue: Islamic State Makes Money By Selling Gas To Bashar Assad, New BBC2 Documentary Claims', International Business Times

Lakshmanan, Indira A. R. (2015). *Mafia-like Islamic State taxes and extorts like a drug cartel*. Retrieved from http://www.livemint.com/Politics/JpXQUirzzLoY baer9Ftp3I/Mafialike-Islamic-State-taxes-and-extorts-like-a-drug-carte.html

Oil Market Shrugging off Turmoil in Middle East, (May 22, 2015), Retrieved from http://www.bloomberg.com/news/articles/201 5-05-21/oil-market-shrugging-off-turmoil-in-middle-east.

Opec under siege as Isil threatens world's oil lifeline, (May 30, 2015). *The Telegraph*,.

Pizzi, M. (2014), *Islamic State's bootleg petro-state may prove unsustainable*. Retrieved from http://america.aljazeera.com/articles/2014/8/2 3/islamic-state-oil.html (Accessed July 17, 2015).

Selling cheap oil,

http://www.pri.org/stories/2014-09-16/isis-selling-cheap-oil-its-enemies-syrias-overnment-kurds (Accessed November 29, 2015).

Verma, Nidhi (June 30, 2015), India bans oil trade with Islamic State-linked organizations. The Business News

Where Islamic State gets its money (2015), http://www.economist.com/ blogs/economist-explains/2015/01/economist-explains (Accessed July 18, 2015).

Sanjay Kumar Pradhan Assistant Professor School of liberal studies Pandit Deendayal Petroleum University

E Mail: sanjaypradhanjnu@gmail.com