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## An Overview of Petroleum Production in India Since Independence

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### ABSTRACT

*The petroleum production industry is fundamental to India's economic development. Despite the global economic slump, India's demand for crude oil remains stable. The purpose of this study was to understand the trends and pattern of petroleum production in the country since independence. In nature, it is a descriptive investigation. Secondary data is used in this study. It is gathered from the Government of India ministry of petroleum and natural gas report, journals, newspapers and financial websites. The findings of this study reveal that petroleum production has increased since independence however, it is experiencing stability in the production these days and we are heavily relying on imports to fulfil our indigenous demands. The main objective of this study is to analyse trends and patterns of petroleum production in the country.*

### 1. INTRODUCTION

At the time of independence, India was a small producer of petroleum, and it remained so until Mumbai High began significant amount. Off-shore production did not begin until the mid-1970s, and until then, all output came from on-shore oil fields (Basu, T. N. (1982). Around 50 per cent of crude oil output in 1980-81 derived from on-shore fields, with the remaining half coming from off-shore sources. Off-shore production rose at a considerably quicker rate than on-shore production after that point. Off-shore resources generated nearly two-thirds of crude oil output for more than two decades, from 1990-91 to 2003-04. In 1989-90, production peaked at 34.09 million tonnes, then dropped to 30.44 million tonnes in 1991-92, 28.46 million tonnes in 1992-93, and finally 27.03 million tonnes in 1993-94. Overworking of Mumbai High oil wells has resulted in a sharp drop in production of over 7 million tonnes in just four years. This was an extremely hazardous trend that had to be stopped at all costs (Grove, E. (2011).

In 1993, a variety of short- and medium-term actions were

implemented, including early production from satellite fields and the adoption of cutting-edge technologies, such as horizontal drilling and drain hole drilling. Production climbed to 32.24 million tonnes in 1994-95, 37.24 million tonnes in 1995-96, and 38.57 million tonnes in 1996-97 as a response of these initiatives.

After 1996-97, there was a second phase of declining production, with production reaching 31.9 million tonnes in 1999-2001. After 2001-02, there was a slight increase in production. India produced 33.4 million tonnes of crude oil in 2003-04, with 11.5 million tonnes coming from on-shore sources and over twice that amount, 21.9 million tonnes, coming from off-shore oilfields. Imports account for approximately a third of India's total energy consumption. This share of imported energy is predicted to rise as the share of hydrocarbons in energy supply/use rises. At the end of 2011, India's primary energy mix included 43.49 per cent oil, 23.03 per cent natural gas, 29.67 per cent coal, 1.30 per cent nuclear energy, 2.35 per cent hydropower, and 1.44 per cent renewables (Cororaton, C. B., & Orden, D. (2008).

Currently, India is 85 per cent reliant on imports to meet its oil needs, and the government has been exploring for ways to increase domestic production and reduce import dependency for a long time. Refineries turn crude oil into fuels like gasoline and diesel. Oil refineries processed more crude oil as demand for gasoline increased. Thus, it becomes important to study an over all production of petroleum in the country.

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**Study area**

India, officially the Republic of India, is a country in South Asia. It is the seventh-largest country by area, the second-most populous country, and the most populous democracy in the world. Bounded by the Indian Ocean on the south, the Arabian Sea on the southwest, and the Bay of Bengal on the southeast, it shares land borders with Pakistan to the west; China, Nepal, and Bhutan to the north; and Bangladesh and Myanmar to the east. In the Indian Ocean, India is in the vicinity of Sri Lanka and the Maldives; its Andaman and Nicobar Islands share a maritime border with Thailand, Myanmar and Indonesia.

**Data and Methodology**

This study is primarily based on secondary sources of data taken from various sources, mainly data published from ministry of petroleum and natural gas is taken into consideration. However, magazines, journals and relevant research papers are also utilized to understand the trends and pattern of petroleum production in India. Simple percentage method is used to analyse the data and excel is used to visualize the data for better comprehension.

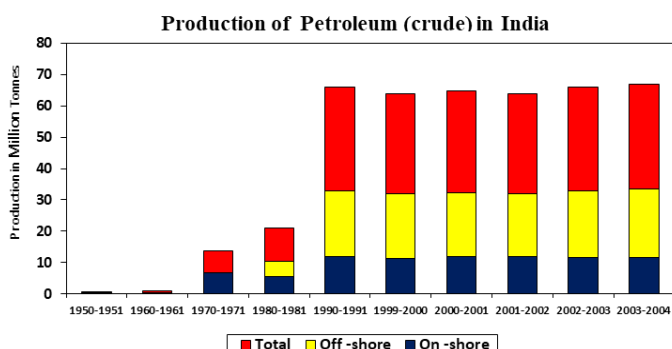
**RESULT AND DISCUSSION**

The analysis shows that on-shore production has increased from 0.3 million tonnes in 1950-51 to 11.5 million tonnes in 2003-04 with an increase of 11.2 million tonnes. Off-shore production also recorded rise from 5 million tonnes in 1980-81 to 21.9 million tonnes in the 2003-04 with 16.9 million tonnes. So, the total production of petroleum grew up from 0.3 million tonnes in 1950-51 to 33.4 million tonnes in 2003-04 with a total increment of 33.1 million tonnes.

**Table 1:** Production of Petroleum (Crude) in India (In Million Tonnes)

Years	1950-1951	1960-1961	1970-1971	1980-1981	1990-1991	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
On –shore	0.3	0.5	6.8	5.5	11.8	11.3	11.8	11.9	11.5	11.5
Off –shore	—	—	—	5.0	21.2	20.6	20.6	20.1	21.5	21.9
Total	0.3	0.5	6.8	10.5	33.0	31.9	32.4	32.0	33.0	33.4

Source: *The Economic Survey of India 2004-05.*



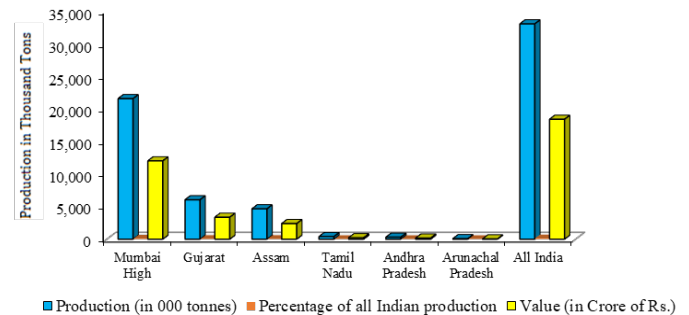
**Figure 1:** Production of Petroleum (crude) in India.

**Table 2:** Production of Petroleum (Crude) in India, 2002-2003.

State/ Area	Production (in 000 Tons)	Percentage of all Indian production	Value (in Crore of Rs.)
Mumbai High	21,573	65.28	12,016.16
Gujarat	6,042	18.28	3,365.94
Assam	4,659	14.09	2,395.6
Tamil Nadu	395	1.19	220.01
Andhra Pradesh	300	0.93	167.01
Arunachal Pradesh	74	0.23	41.22
<b>All India</b>	<b>33043</b>	<b>100.00</b>	<b>18,404.95</b>

Source: *Statistical Abstract of India, 2003.*

Table 2 shows that in 2002-03 that Mumbai high reported 65.28 per cent which was the highest production among all the main petroleum producing states in the country followed by Gujarat (18.28 per cent), Assam (14.09 per cent), Tamil Nadu (1.19 per cent), Andhra Pradesh (0.93 per cent) and Arunachal Pradesh (0.23).



**Figure 2:** Production of Petroleum (Crude) in India

**Table 3:** Crude Oil Production, 1951-2006.

Year	Production in Million Tonnes
1950-51	0.27
1960-61	0.50
1970-71	7.20
1980-81	15.50
1990-91	33.00
2000-01	32.50
2005-06	34.50

Source: *Statistical Abstract of India, 2007.*

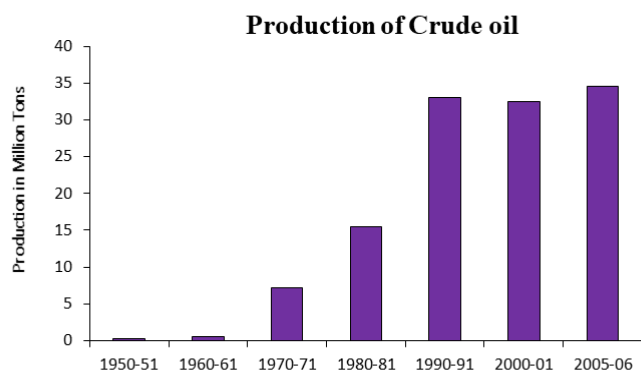


Figure 3: Production of Crude oil

It may be seen from table that the total production of crude oil in 1950-51 was only 0.3 million tons which rose to 34 million tons in 2005-06. The produced oil is however, only about 40% of the domestic need. Oil production in India amounts to 35-40 million metric tons annually. Our total reserves last us only for the next 20 years and our current annual production levels of 35 million would than become grossly inadequate. The production of ONGC fell by 1.9% to 27.7 lakh tons of the four fields of ONGC has two fields, witnessed a fall while the remaining two recorded growth.

Production of OIL fell by 1.9% while that of private operators. Went up by 0.2%. The production of Bombay High, which accounted for nearly 50% of India's total production, fell by 4.6% of ONGC and OIL accounted for 87% of total production during the first ten months of the current fiscal. Growth in crude through put was 4.9% from April to January 2002, as against 23.7% increase in the corresponding period previous year. India produced 80.2 million tons of petroleum products, a growth of 4.2% compared to the period of 2000. Reliance petroleum has already announced its plans for retail marketing of controlled petro-products in the country.

Essar oil has signed a product sharing contract with the government for Ratna and R series of gas fields. As per this, the latter would drilled 30 oil fields which are said to have a potential of 500 million barrels of crude oil. 3365 crore expansion projects at its Panipat refinery have been clear by the Union Ministry for Environment and Forest. The project is expected to enhance 10C's capacity from 6 million tons to 12 million tons per annum.

Energy imports are also currently hindering the nation's economy. The Government of India currently spends billions of dollars on non-targeted subsidies, which the IEA claims the nation can ill afford (Vidican, G. 2014 and Pritchett, L. 2004).

During the financial year 2011-2012, 54% of India's trade deficit – which stood at US\$189.9 billion –, was due to oil imports. Because of such a high deficit, the rupee weakened, inflation soared and there was a drawdown of almost US\$13 billion in India's foreign exchange reserves. According to PwC report, these events could have been avoided had India produced an additional 17 million tonnes of oil domestically. (Source: White paper by Price water house Coopers (PwC), titled "It's our turn now –E&P partnerships for India's Energy Security"). This increase in India's domestic production would arrest currency depreciation, contain Inflation and

reduce import bill – resulting higher GDP.

In 2011, India's proven balance of recoverable reserves was reported at 9.04 billion barrels of oil equivalent, placing the country in an unimpressive 19th position worldwide. However, according to a 2012 report by India's Directorate General of Hydrocarbons – the regulatory body charged with the promotion and management of India's oil and gas resources – in the financial year 2010-2011, 12% of India's sedimentary basins remain unexplored, with a further 22% classed as "poorly explored". In the near future, production from India's underdeveloped onshore and offshore fields is set to increase, as these are yet to realise their full potential.

Table 4: Production of Crude Oil in India Since 1998 to 2001(Production in 000' tons)

On-shore	1998-99	1999-2000	2000-2001
Gujarat	5828	5665	5785
Assam	5708	4972	5200
Tamil Nadu/Andhra Pradesh	449	523	698
Arunachal Pradesh	38	44	31
OIL	3294	3283	3286
ONGC	8101	7921	8428
<b>Off- shore (000 tons)</b>			
ONGC	18286	16727	16629
Private Joint Ventures	3042	4018	4083
<b>Total</b>	<b>32722</b>	<b>31940</b>	<b>32426</b>

Source: Petroleum Planning and Analysis Cell, New Delhi.

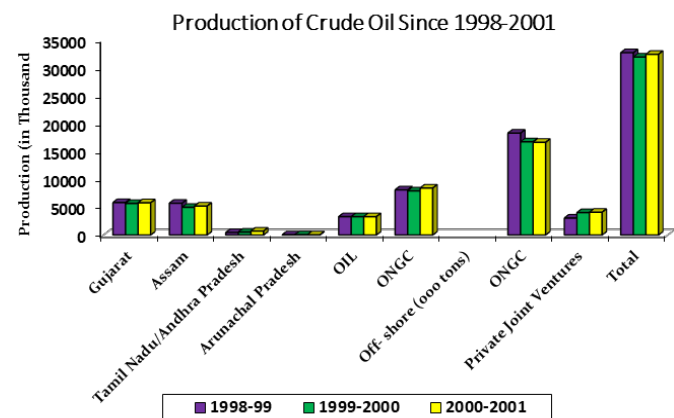


Figure 4: Production of Crude oil.

Table 5: Production of Crude Oil in India 2005-2010(In 000 Tons)

On shore	2005-06	2006-07	2007-08	2008-09	2009-10
Gujarat	6251	6212	6177	5944	5961
Assam	4474	4400	4357	4673	4740
Arunachal Pradesh	104	109	102	102	131
Tamil Nadu	385	353	295	265	238
Andhra Pradesh	216	252	279	289	304
Rajasthan	-	-	-	-	447
<b>Total</b>	<b>11430</b>	<b>11326</b>	<b>11213</b>	<b>11272</b>	<b>11821</b>
OIL	3234	3107	3100	3468	3572

Continued...

ONGC	8095	8058	7921	7563	7515
JVC/Private	101	161	192	243	734
<b>Total</b>	<b>20760</b>	<b>22662</b>	<b>22905</b>	<b>22232</b>	<b>21870</b>

Source: Petroleum Planning and Analysis Cell, New Delhi.

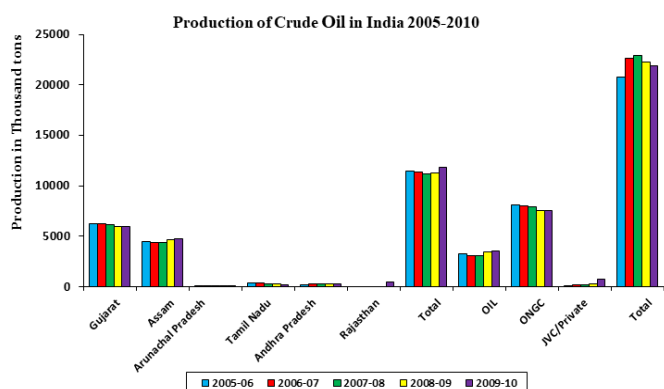


Figure 5: Production of Crude Oil in India 2005-2010

Demand of oil products stood increased from 74 metric tons per annum in 1996 to 90 MTPA in 2000 representing a compounded annual growth rate of 5%. At a level the estimated demand for oil products by the year 2005 is expected to be around 114 MTPA, while the refining capacity would be around 155 MTPA. There had been a distinct annual growth of 5-6% in the consumption of petroleum products for the last two decades. In 1970s, the growth in oil requirement was 7% over the previous decade, while in 1980s the requirement declined 6%. It further fell to 5.3% during the 90s due to the slowdown in industrial activities. The demand for petroleum in India is expected to rise to 110 million tons in 2002-03, while crude production during this period is expected to be 32 million tons. It is predicted that crude production would be rise to 195 million tons. It is this huge gap between production and consumption of which give rise the import of crude oil and petroleum products (.Raza, M. Y., and Lin, B. 2021; Ramadhas et al., 2004; Stern, J. 2014). With close to 70% of its oil requirements imported from more than 8 countries, India is a net importer of oil. The rest 30% provide by the domestic oil production.

India's oil consumption has increased and the production almost remained the same. This did not take in to account the recent finding of reliance in KG basin. Even if they did find some other reserves the graph is not likely to be

Table 6: State-wise Crude Oil Production Trends in India

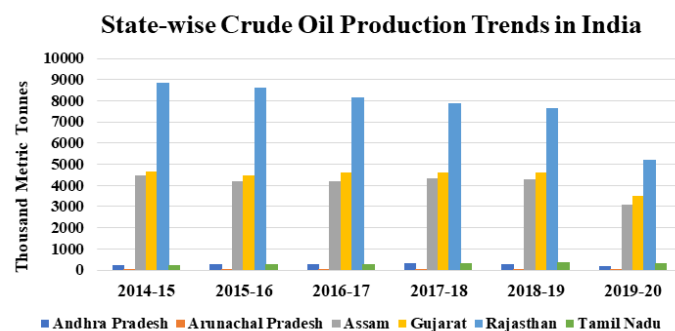
State/Source (Onshore)	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
						(Upto Dec'19)
Andhra Pradesh	254	295	276	322	296	182
Arunachal Pradesh	69	57	55	50	43	41
Assam	4,473	4,185	4,203	4,345	4,309	3,090
Gujarat	4,653	4,461	4,605	4,591	4,626	3,527
Rajasthan	8,848	8,602	8,165	7,887	7,667	5,205
Tamil Nadu	241	261	284	345	395	310
<b>Total Onshore</b>	<b>18,538</b>	<b>17,861</b>	<b>17,588</b>	<b>17,540</b>	<b>17,336</b>	<b>12,355</b>

Source: Ministry of Petroleum and Natural Gas, 2020

changed in the future. Started in 1996 India's importer's exceeded its production. India's production has been fairly consistent.

Crude oil production rose 4.1% to 2.75 million tons despite a 3.5% fall in put of Oil and Natural Gas Corporation (ONGC) to 2.02 million tons according to the latest data released by petroleum ministry.

Form this above table, it can be seen that highest on-shore production of crude oil in 2014-15 came from Rajasthan. The dominance of the same state can be seen in 2019-20 also followed by Gujarat and Assam.



Source: Ministry of Petroleum and Natural Gas, 2020

## CONCLUSION

The results of this study reveal that petroleum production has increased since independence however, it is experiencing stability in the production these days and we are heavily relying on imports to fulfil our indigenous demands. The revival in growth of the industrial sector and decline in international prices of crude oil led to a boost in consumption. Demand for petroleum products increased by 10.86% during April March, 2015-16 over the same period last year. Given the limited domestic availability of crude oil and natural gas, the country is compelled to import over 75% of its domestic requirement. India is an emerging economy it needs energy for the economic growth. So the demand of the energy is growing rapidly. The crude oil price is decreasing from 2014 - 15 in international market because of the excess production, which creates significant impact on import, production, consumption of crude oil in India. It also made impact on the revenues and profits of Indian "oil refinery" and "oil drilling and exploration" companies. From 2014 the revenue of oil refining companies are decreasing. But Profit of oil refinery and oil marketing companies is increasing while profit of oil drilling and exploration companies is

decreasing. Because oil drilling and exploration companies are selling crude oil in a low price to oil refinery so their revenue and profit is decreasing, While the profit margin of oil refinery companies is increasing because they are getting crude oil at a low price. In despite of slowdown in global economy the consumption of Crude oil and natural Gas is increasing in India.

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