

Petroleum Economics and Management
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Module - 07
Petroleum Discoveries and Structural Changes
Lecture - 35
Country Experiences

Hi everyone, I am Dr. Anwasha Aditya, your instructor for the NPTEL course Petroleum Economics and Management. We are in module 7 of our course, where we are discussing Petroleum Discoveries and Structural Changes. So, this is the last lecture of module 7 that is lecture number 35 of our course where we are going to discuss some Country Experiences.

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So, if you remember we have already discussed about the phenomena of Dutch, disease and resource curse. We have discussed in depth the steps of resource curse; means, how a Dutch disease can set in once a resource is suddenly discovered. And that resource may not be necessarily its petroleum only or it is applicable to any other type of natural resource like natural gas.

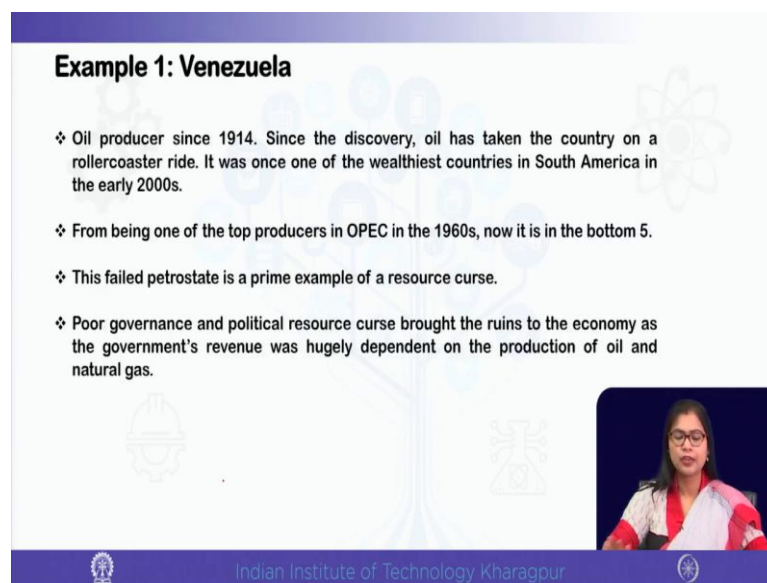
So, we have discussed the phenomena, we have studied a theoretical model a very simple two sector economy, we have already studied with a traded and non traded sector. And

we have seen what happens to production, consumption and allocation of factors of production after a discovery of resource. And how there can arise a stagnation in the economy leading to a Dutch disease.

But we have also seen that Dutch disease may not be permanent, it can be cured also. Now, for studying the theoretical model we also studied some basic concepts of economics; so, we are more or less almost on the verge of completion of module 7. Now, in the last lecture of module 7, we are devoting to analyze to explore some country experiences, some experiences of the countries which are endowed with natural resource.

So, mainly for our purpose we are mainly focusing on the oil endowed countries. And we will discuss about how these countries whether they have experienced any resource curse or Dutch disease phenomena or not and we will also discuss the geopolitics related to the world oil market.

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Example 1: Venezuela

- ❖ Oil producer since 1914. Since the discovery, oil has taken the country on a rollercoaster ride. It was once one of the wealthiest countries in South America in the early 2000s.
- ❖ From being one of the top producers in OPEC in the 1960s, now it is in the bottom 5.
- ❖ This failed petrostate is a prime example of a resource curse.
- ❖ Poor governance and political resource curse brought the ruins to the economy as the government's revenue was hugely dependent on the production of oil and natural gas.

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Now, you see for time constraint we cannot discuss about all oil exporting countries or all the countries which are major producers and exporter of oil; we have already detailed out what are the countries as part of OPEC and non OPEC. So, we are just discussing some examples we cannot devote more than one lecture for discussing this part.

But I hope that this course actually generates lot of interest in you; so, that you can also do some research on yourself; so, you can study about the country experiences. So, we

have relied on various resources from the internet and we will also share with you the references. So, you can also go through those references, the websites of OPEC and EIA to know more about the resource endowed countries how whether they have suffered any phenomena of resource curse or not.

So, we have chosen only four examples or four country experience; so, so, the first very interesting case study that we are going to discuss is about Venezuela. So, what happened to Venezuela? Once resource was discovered and how Venezuela ran into recession; so, how the Venezuelan economy suffered as it got so much dependent on petroleum products. So, we are also discussed we took this example earlier also, but in today's class we will discuss in depth about it.

So, Venezuela is oil producers since the year 1914 and since the discovery oil has taken the country on a rollercoaster ride. You see the economy has always been very unstable, doing very good sometimes and doing badly sometimes. It was one of the richest countries in the South American region in the early 2000's.

You see in the Latin American region when you do any economic analysis many times we do not include Venezuela when we are suppose we are doing any study on Latin America, because Venezuela being an oil exporting country. So, it is subject to lot of fluctuations and the country as we are discussing that oil has taken the economy into a rollercoaster ride sometime doing very good sometime doing badly.

So, we cannot compare the experience of Venezuela with other Latin American countries let us say Brazil, Argentina, Mexico; so, Venezuela itself is a very interesting example. So, from being one of the top producers; in fact, if you remember it was Venezuela also founder member in OPEC. So, it was one of the top producers inside OPEC till the 1960's and now it is in the bottom 5, it has come to the last 5. So, till 1960's and even after few years also it was one of the top producers, but then now it appears at the end.

So, why this has failed? So, much ok; so, you can think of Venezuela as an example of a failed petro state. Petro state means it is so much dependent on petroleum product, but it has failed it could not use the petroleum wealth prudently. So, it is a primary example, it is a very important case study to analyze the phenomena of resource curse; so, that is why we are starting our discussion with the case study of Venezuela.

So, what are the reason? Main reason you can attribute for this failed performance of Venezuela is poor governance and political resource curse. You remember in one of the classes of the I think the very first class of this module we discussed about resource curse. And we also mention that from some literature we mention that often the natural resource curse also brings along a political resource curse.

And that is what has happened with Venezuela; so, there is lack of democracy poor governance in political resource curse. So, that ruins the economy as the government revenue was hugely dependent on production and export of oil and natural gas; so, that is what has happened to the Venezuelan economy.

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❖ Now the country is in shambles, facing political protests due to widespread corruption, a crumbled healthcare system and food shortages.

❖ USA imposed sanctions on the country's state-owned oil and natural gas company Petróleos de Venezuela, S.A. (PdVSA) resulting in losses.

❖ USA imposed further sanctions in 2019, making it difficult for foreign companies to operate business in the country. Then in 2020, further sanctions by the USA and the Covid-19 pandemic had adverse impact on the economy.

❖ As of now, Venezuela has largest proved oil reserves in the world (303 bn barrel). Crude oil production has dropped to an all time low due to the worsening financial state of PDVSA, strikes, and power outages.

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And the country is now in depreciation, it faces lot of protest, political turmoil due to widespread corruption, very failed poor healthcare education system, shortage of food. See there were also some sanctions like US imposed sanction on Venezuela state owned oil and natural gas company, Petroleos de Venezuela or in short form this is more commonly referred to as PDVSA which leads to the losses. Because US imposed restriction and that led to huge loss, because earlier Venezuela was exporting oil to US market and other markets also.

And again further also in 2019 US imposed after further restrictions and it was very difficult for the foreign companies to operate business inside Venezuela. And then we know that the COVID pandemic struck the world and Venezuela also was no exception

to be suffered or adversely hit by the pandemic. And again in 2020 apart from the COVID-19 pandemic further sanctions were imposed by US on Venezuela.

So, as of now if we look at the data empirical observation tells us that Venezuela is the largest proved reserve in the world. So, it has the highest endowment of proved reserve of oil in the world if it is estimated to be around 303 billion barrel. And the crude oil production has dropped to all time low due to the deteriorating financial state of the Venezuelan state owned oil and natural gas company PDVSA. And there were strikes, political turmoils, power disruptions; so, you see that Venezuela is a typical example of resource curse.

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Venezuela's Resource Curse

- ❖ Having a natural resource like oil is not always a blessing. For instance, in 1990, Venezuela's oil rents as a percentage of GDP were around 30%.
- ❖ Due to structural changes like the 2014 oil price shock and recent geopolitics around the industry, the heavy reliance on oil exports shook the economy. Also, crude oil production reduced substantially over the years.
- ❖ On the other hand, countries like Qatar, diversified their economies as they reduced their dependence on oil rents and increased natural gas production over the years. For instance, Qatar's share of oil rents as a percentage of GDP declined from around 57% in 1971 to 12% in 2020.

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So, in spite of having a very huge amount of proved reserve, you can see till now the proved reserve is highest in the world, proved reserve of oil is highest in the world in Venezuela. But till the economy is not doing good and the socio-economic political scenario is not good; so, it is a typical example prime example of resource curse. It has not been able to use the oil rent prudently rather it has become too much dependent on oil and ran into a problem like we have discussed in the theoretical model.

So, having a natural resource like oil is not always a blessing and it has actually affected the Venezuelan economy adversely. For instance we can see that in 1990, Venezuela's oil rent as a percentage of GDP was around 30 percent; so, you see almost one third of GDP came from oil sector in Venezuela; so, it was very much dependent on oil. And due to

structural changes like we know about the shale oil revolution, how the shale oil revolution actually reversed the rising pattern of oil price, because oil price was increasing very high.

If you remember we had the commodity boom period of 2005- 6 when the world economy was doing very good; so, oil price increased. And then again there was the global financial crisis which started in US and then it percolated to other parts of the world.

But from 2012 onward the US economy and the world economy was also coming out from the global financial crisis and the demand for oil increased and oil price again started rising. But we all know that the oil price trend was just completely reverse due to the shale oil revolution, because US started supplying shale oil; so, oil price fell suddenly; so, that also adversely affected the economy.

So, now can you relate it with the theoretical model that we have studied, because in the theoretical model what we have studied? We have seen that what happens if the country runs out of the resource or the value of the resource falls in the world economy. So, then the country is adversely affected, because consumption may be stuck at higher level, but production or the total income of the country falls. So, that is what has precisely happened to the Venezuelan economy when the shale oil revolution led to a decline in oil price? Because that was not anticipated by Venezuela.

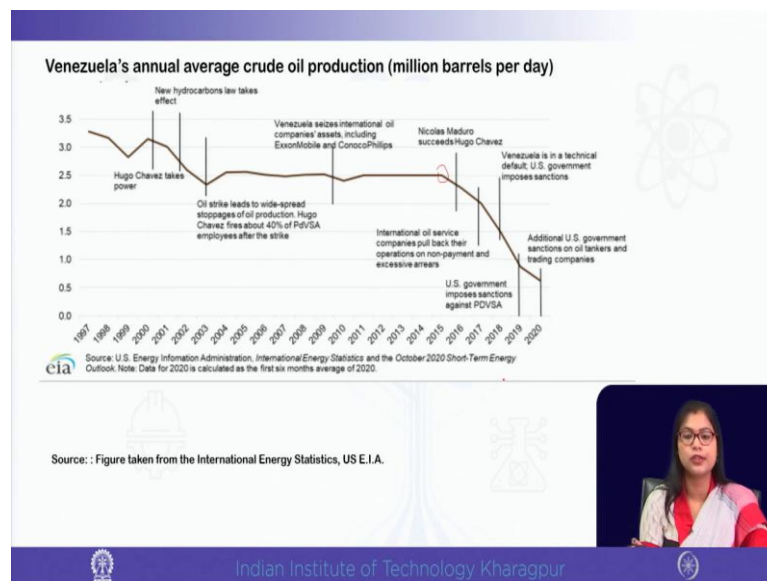
So, when suddenly there oil export , means the export revenue that they earned from oil that suddenly declined; so, they suffered a lot. And there was also the recent geopolitics around the industry as we mentioned the sanctions against imposed by US against Venezuela. So, this heavy reliance on oil export also adversely affected the economy, because if US stopped buying oil from Venezuela that was also a loss to the Venezuelan economy. Because, the export market was affected adversely and it is difficult to change the export market instantly.

So, later you can diversify, but instantly if you are exporting to a country and suddenly the country imposes a ban; so, it will adversely affect the exporting country; so, that is what has happened to Venezuela. Also crude oil production reduced substantially over the years, even though the proved reserve is high, but the crude oil production rate has fallen over time.

On the other hand there are other countries like say Qatar which has diversified their economy over time. If you remember when we discussed about oil rent, we have seen that most of the middle-east countries though they were greatly dependent on oil rent for their GDP. But after 2000 onwards mainly they have started diversifying there are other sectors like manufacturing and service sector have started growing.

We have seen this with the example of UAE, Saudi Arabia and even Qatar. So, these economies started diversifying their economies and they started reducing their dependence on oil rent and they increase the natural gas production, like Qatar has increase the natural gas production over the years. You can see the example that Qatar share of oil rent as a percentage of GDP, it declined from 57 percent in 1971 to 12 percent in 2020, but Venezuela was still very much dependent on oil.

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So, we have taken a figure from the international energy statistics, you can see US international energy US EIA. And we have shown the Venezuela's annual average crude oil production in terms of million barrel per day and you see we have plotted the data from means we have actually directly taken the figure and we have provided the source.

So, those who are interested you can look at the source and you can study more in depth about it, because so, this figure shows the Venezuela's average annual crude oil production from 1997 to 2020 and see how it has steadily declined. You see around 2000, 2001 there was a spike and that was due to the political scenario Hugo Chavez

takes power. And then how there was a steady decline especially from 2014 onward, you see how the shale oil revolution affected the Venezuelan economy.

So, cannot we find out a resemblance to our theoretical model? So, in the theoretical model in the very last part we studied, what happens if the value of the natural resource falls in the world market, how the economy runs into a recession. So, you can see how after the shale oil revolution, the annual average crude oil production steadily declined in Venezuela. So, you can see the impact of the sanctions; so, due to time constraint I cannot elaborate each of the events; so, those who are interested you can go to the sources directly and you can explore more it is a very interesting case study.

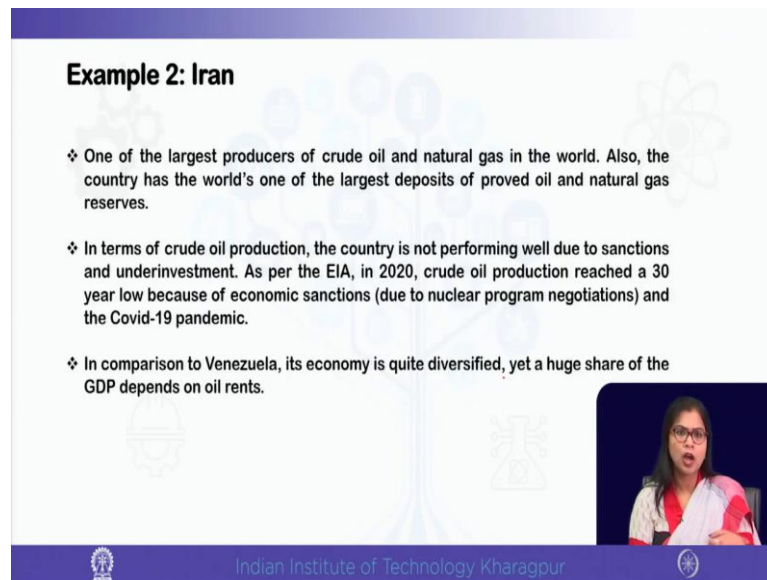
And if you remember in 2018 Venezuela went into a huge recession the country's currency depreciated a lot, the currency was not sufficient to give people enough purchasing power to maintain their minimum level of consumption. So, many people migrated out of the country and those who are there their standard of living also was very much adversely affected; so, you can read more about this.

So, due to time constraint and we have other examples also, but you can see that Venezuela is a very typical case study. It is a very interesting case study where you can see how the theoretical model actually holds true for Venezuela. So, that means, it is not enough to discover a resource right; you explore, you find out; so, you remember we have studied the stages of exploration, you do the nationwide mapping and then the private firms come in and start exploring.

So, it is not only enough to establish the proved reserve and extractable resource. But it is very important to manage the resource prudently once resource is discovered; so, it may not be good for your economy rather your economy may fall into a trap; so, that is what has happened to Venezuela. So, it is a great learning experience for other countries which get too much dependent on a particular resource.

So, it is we have to diversify the economy using the rent arising from the resource the country should diversify. But Venezuela actually imported most of the necessary products like medicine and high technology products using the export revenue. But, when the economy was adversely affected due to the shale oil revolution; so, Venezuela could not pay for the import product, the currency they appreciated a lot in 2018. So, you can study in depth about the resource curse phenomena that happened in Venezuela.

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Example 2: Iran

- ❖ One of the largest producers of crude oil and natural gas in the world. Also, the country has the world's one of the largest deposits of proved oil and natural gas reserves.
- ❖ In terms of crude oil production, the country is not performing well due to sanctions and underinvestment. As per the EIA, in 2020, crude oil production reached a 30 year low because of economic sanctions (due to nuclear program negotiations) and the Covid-19 pandemic.
- ❖ In comparison to Venezuela, its economy is quite diversified, yet a huge share of the GDP depends on oil rents.

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Our second example deals with Iran which is one of the largest producer of crude oil and natural gas in the world. And also Iran is having worlds one of the largest deposit of proved reserve of oil and natural gas reserve. So, in terms of crude oil production however, Iran is not doing very well due to the sanctions. So, we know the geopolitics and the political turmoil and war that goes on in Iran with the many countries around it.

So, there are sanctions imposed against Iran and there is under investment; so, people will not invest if the political scenario is not stable if there is war; so, investment is also adversely affected. So, as per the EIA data in 2020, crude oil production reached a 30 year low and it was of course, triggered by the COVID-19 pandemic and also due to the sanctions.

And the sanctions was mainly into 2020, it was due to the nuclear program negotiations. So, due to these two aspects the pandemic and the economic sanctions, the crude oil production reached a very low, this was lowest in the last 30 years. With comparison to Venezuela; however, we can say that economy of Iran is more diversified; however, till now, a substantial part of its GDP comes from the oil rent.

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❖ Lack of foreign investment in the economy is a serious constraint to sustaining production capacity.

❖ Geopolitics: Sanction hit Iran, is exporting oil to China, which started in 2020. The exports in 2022 again declined because of high prices and increased competition from Russia. Thus, the commodity is not anymore a reliable source of revenue generation.

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And there is lack of foreign investment as I just specified and that is one of the major concern for sustaining the production capacity, because you need foreign investment. See the domestic investment may not always be sufficient; now, the foreign investment; like FDI, that will come if the country's political scenario is more stable; so, that may not that always does not happen with Iran. So, you can see the geopolitics, how the geopolitics hit Iran, the sanctions always affect Iran adversely.

So, the sanctions hit the export of oil from Iran to China and it started in 2020. Again, the export in 2022 after two years, it also again declined due to the increased competition from Russia. We know we have already discussed that in 2022, the Russia Ukraine war started and Russia also started looking for exporting oil, because many countries like US banned import of oil from Russia; so, Russia diversified its market export destination.

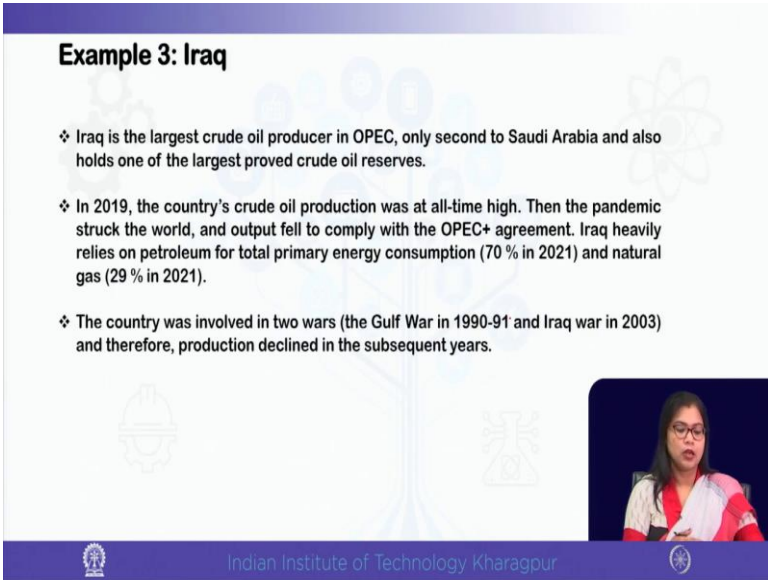
So, that is why Iran also suffered due to changing export destination of Russia and also the high price of oil in 2022. So, we know that during the pandemic oil price dipped because of the demand side shock, we already have studied in depth about the WTI future contract price became negative. Brent price did not become negative, but it failed, but again after the pandemic was controlled with the vaccination and other containment measures.

So, once normal economic activity started resuming, oil price again revived and again in 2020, first two months due to the Russia- Ukraine war oil price increased very much. So,

Iran was adversely affected right, because of the Russia- Ukraine war and the rising oil price. So, competition from Russia in its export market and because of increasing oil price.

So, therefore, the oil we can say that petroleum is not any more a very reliable or dependent source of revenue generation for Iranian economy. So, Iran should also desperately should diversify its economy and develop the other sectors of the economy rather than getting more reliant on oil. So, for that it needs a more stable political scenario.

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Example 3: Iraq

- ❖ Iraq is the largest crude oil producer in OPEC, only second to Saudi Arabia and also holds one of the largest proved crude oil reserves.
- ❖ In 2019, the country's crude oil production was at all-time high. Then the pandemic struck the world, and output fell to comply with the OPEC+ agreement. Iraq heavily relies on petroleum for total primary energy consumption (70 % in 2021) and natural gas (29 % in 2021).
- ❖ The country was involved in two wars (the Gulf War in 1990-91 and Iraq war in 2003) and therefore, production declined in the subsequent years.

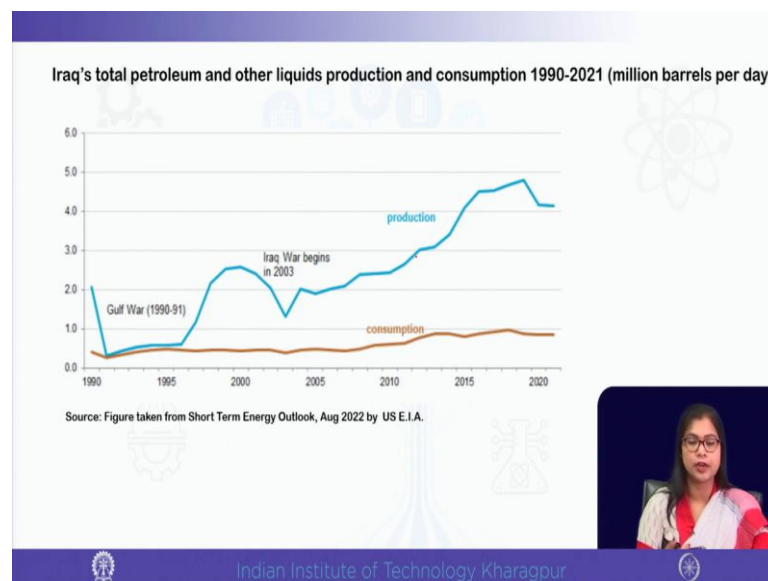
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Now, the third example is Iraq; so, we know that Iraq is the largest crude oil producer in OPEC next to Saudi Arabia. So, first we already know that Saudi Arabia has a leadership position in OPEC. So, just after Saudi Arabia it is Iraq inside OPEC and also it holds one of the largest proved oil reserve. So, in 2019 the country's crude oil production was very high and then we know the COVID-19 pandemic hit the world and like many countries around the globe, Iraq was also adversely affected.

So, output declined due to the agreement made in OPEC plus; we have earlier also discussed, because there was a demand side shock. So, till May OPEC and OPEC plus continued their supply means May 2020, but after that OPEC and OPEC plus countries they agreed to cut their supply because otherwise price would have fallen more.

So, Iraq was adversely affected due to the supply cut agreement of OPEC plus. So, Iraq heavily relies on petroleum for its total primary energy consumption; you can see the data it is around 70 percent in 2021 and for natural gas it the share is 29 percent in 2021. So, country was involved in two wars; we know that Iran, Iraq they often get involve in war; so, the first one was the Gulf War in 1990, 1991 and the other war was in 2003. And therefore, in these war period and after the subsequent years after the war period the production also declined.

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So, you can look at the figure taken from the short term energy outlook report August 2022 by US EIA where we have plotted Iraq's total petroleum and other liquid production and consumption values over the period 1990 to 2021. And the unit over here is million barrel per day. So, the blue line here is the production value and the yellow one is the consumption value.

So, you see that in till 1995 there was the two was moving more or less in the same direction, but after the production has increased and consumption remained in a more or less stable band. So, the gap between production has consumption has widened over time ok; so, that is why we need domestic investment; so, that the domestic demand should also increase.

Because, you see in the world market there can be shale oil revolution, there can be pandemic, but if we have high domestic demand that can also to some extent mitigate the

shocks arising in the world market. So, therefore, we can say that this country is like Iran, Iraq they should now try to diversify their economy, they should try to attract more foreign investment, build their production capacity, start developing the manufacturing and service sectors.

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❖ **Geopolitics:** Due to the Russia-Ukraine war and the economic sanctions on Russia, middle eastern countries got more opportunities to supply crude oil to the world market. Currently, Iraq is exporting oil to China and India.

❖ On the other hand, Russia is also offering discounts to friendly nations.

❖ Iraq's crude oil export by seaborne trade to Asia (64%) and Europe (24%) in 2021 is around 88%, followed by Africa and the Middle East (7%). **Their export to India is around 28%.**

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So, you can also see the geopolitics revolving around Iraq; so, due to the Russia-Ukraine war and the economic sanctions on Russia, the Middle Eastern countries got more opportunities to supply crude oil in the world market. For example, you see as we already discussed that when US banned oil import from Russia, Russia diversified its export destination.

So, same Iraq also did, Iraq is now exporting oil to China and India. On the other hand, Russia is also offering discounts to the friendly nation. So, Iraq's crude oil export by the seaborne trade to Asia was around 64 percent and to Europe was around 24 percent in 2021 and total it was around 88 percent. And this was followed by Africa and Middle East which together account for around 7 percent. And their export to India is around 28 percent; so, you see India also buys lot of oil from these countries ok.

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Example 4: Saudi Arabia

- ❖ The country is the largest exporter of all petroleum liquids in the world. Also, they have one of the largest crude oil production capacities and proved oil reserves. All in all, the country can be said to be the leader in the oil industry.
- ❖ They are also the biggest consumer of petroleum products in the Middle East.
- ❖ Among the OPEC group, they have about a third of the cartel's production capacity. Thus, it can respond to variations in the market. Saudi Arabia seeks to maintain a stable oil price to keep oil competitive over the long term since it has a high reserve to output ratio.

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And the fourth and last example that we are going to consider is Saudi Arabia. Now, see we have already discussed many times regarding Saudi Arabia, we have in one of our modules, we have discussed that whether we can explain the nature of oil price movement from the point of view of OPEC. And there we devoted a lecture on role of Saudi Arabia, we discussed whether Saudi Arabia how it influences the oil price, we have seen that Saudi Arabia is often referred to as the swing producer.

Swing producer means, if Saudi Arabia changes the supply a little bit, price of oil is also affected; so, it can swing the oil price. So, we have already devoted some time to discuss about Saudi Arabia; so, I am not devoting much time to detail out the Saudi Arabia's experience. So, just some few interesting points that I would like to mention over here is that we know that Saudi Arabia is the largest exporter of petroleum products in the world. And they also have one of the largest crude oil production capacity and proved oil reserve.

So, overall we can say that the country can act as a leader in the world oil industry; we have time and again said this within OPEC. Saudi Arabia has the leadership position given its endowment of oil. And not only that we have also discussed that the oil endowment is of good quality and cheap, because the oil is available in the coastal region; so, that the cost of transportation refining are also less.

So, and Saudi Arabia also has the biggest consumer of petroleum products in the Middle East. So, that means, its domestic demand is also high as compared to other countries like we have just now seen that the consumption in Iraq was quite low. But, in within the Middle East countries the domestic demand for oil is high in Saudi Arabia as compared to other countries.

So, inside the OPEC group of countries, Saudi Arabia has almost a thought about its production capacity; so, one-third of OPEC's production capacity is accounted for by Saudi Arabia. Therefore, we can say that it can respond to its variation in the world market; so, that means, if Saudi Arabia changes the supply, it will affect the world oil price.

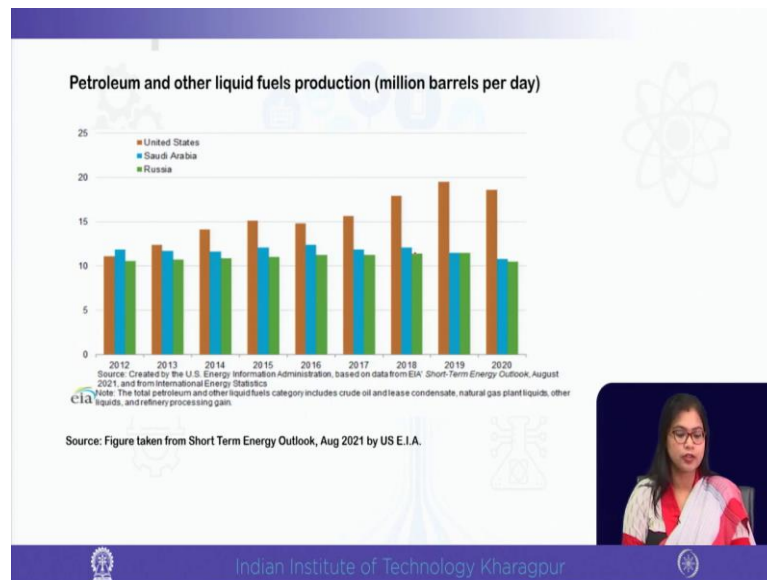
So, Saudi Arabia; however, wants to maintain a stable oil price to keep the oil price competitive over a long period of time and it has a high reserve to output ratio. So, you must remember that we have discussed many times that there are situations when Saudi Arabia's intervention stabilize the world oil price, like in case of 1991 Gulf War and in 1991 when the then Soviet Russia broke down.

Saudi Arabia increased its oil supply otherwise oil price would have increased much more; so, Saudi Arabia's view is to have a oil price which is not too high. So, it is because of Saudi Arabia's objective also, we can say that to some extent OPEC did not exert its price power, OPEC maintained the price in a more or less stable range and it is one of the reason why OPEC is there for such a long time right.

And we have also seen the great oil price collapse period of 1985, 86 where actually Saudi Arabia increased its oil supply, because it found that the demand for oil was declining over time. Because, from mid 1980 onward in the electricity production oil was greatly replaced by other cheaper sources like coal and natural gas; so, seeing that Saudi Arabia abandoned the high price policy; so, we have time and again discussed.

So, it is not that Saudi Arabia has always led to price increase, but we have already studied in depth that there are many instances where Saudi Arabia actually stabilize the oil price. So, because of Saudi Arabia also we can say to some extent OPEC is also therefore, such a long time, OPEC has limited its ambition and it is mainly because of Saudi Arabia.

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So, we can now see we can compare the production of petroleum and other liquid fuel of Saudi Arabia, US and Russia. So, again we have taken this figure from short term energy outlook August 2021 report of US EIA. So, you see the orange one is of so, United States and the blue one is of Saudi Arabia and the green one stands for Russia ok.

So, this is together petroleum and other liquid fuel production in terms of million barrel per day and you can see over time how they have changed over time and you see that Saudi Arabia initially in 2012 was the largest producer. But gradually you see especially after the shale oil revolution of 2014 onwards. 2013 onwards; in fact, you can see that US has replaced Saudi Arabia and in the third place we have Russia.

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- ❖ As per the EIA, globally, the country is the second largest producer after the USA, which took the spot in 2013 due to the shale oil revolution. Russia holds the third spot.
- ❖ A large chunk of Saudi Arabia's economy is dependent on petroleum exports. To comply with the OPEC+ agreement to cut oil production in 2020 (Covid-19 pandemic), their GDP also fell during the lockdown period.
- ❖ Total oil production has declined over the years since 2016. On the other hand, it increased for the USA with the exception of pandemic year (2020).

So, as per the EIA globally, Saudi Arabia is the second largest producer after US and that happened after 2013 due to the shale oil revolution. Because, till 2012 we can see from here until 2012 Saudi Arabia was the largest one. But after 2013 onward; so, it was mainly due to the shale oil revolution that Saudi Arabia was replaced by US and Russia is in the third position.

So, large part of Saudi Arabia's economy is dependent on petroleum export; so, we cannot deny that. And in order to follow the OPEC plus agreement to cut oil production due to the pandemic, the GDP of Saudi Arabia also adversely affected during the lockdown period. And total oil production got declined over years since 2016, you can see over here that it has declined a lot you can see in the recent times these are very quite low you can see.

So, mainly due to the pandemic and especially after 2016 onward and the production of US has increased except the year 2020 you can see, in 2019 it was high; since, US had the highest value in 2019 you can see. And then in 2020 due to the pandemic the value for the US also declined.

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Particulars	Iran	Iraq	Saudi Arabia	Venezuela	OPEC
Population million inhabitants	84.98	41.19	35.46	31.95	518.93
Land area ¹ 1,000 sq km	1648	438	2150	916	12205
GDP per capita \$	2707	5047	23507	1455	5038
GDP at market prices million \$	230014	207889	833541	46501	2614316
GDP growth real PPP %	2.3	3	3.3	1	3.3
Value of exports million \$	58132	86298	286502	9990	1108888
Value of imports million \$	58799	66217	213016	10352	894315
Current account balance million \$	15004	22319	44324	477	176753
Value of petroleum exports million	25313	79788	202166	8816	560633
Proven crude oil reserves million	208600	145019	267192	303468	1241819
Natural gas reserves billion cu m	33988	3714	8507	5541	74242
Crude oil production 1,000 b/d	2392	3971	9125	636	26363
Natural gas marketed production million cu m	257119	9586	120485	23720	672718
Refinery capacity 1,000 b/d	2202	1116	3327	2276	12915
Refinery throughput 1,000 b/d	1691	623	2475	521	7916
Output of petroleum products 1,000	1673	740	2548	270	7943
Oil demand 1,000 b/d	1777	621	2966	232	8249
Crude oil exports ² 1,000 b/d	763	3440	6227	448	19656
Exports of petroleum products 1,000 b/d	333	158	1344	67	4034
Imports of petroleum products 1,000 b/d	99	107	361	69	1505
Natural gas exports million cu m	18425	0	0	0	137275

Source: Annual Statistical Bulletin, 2022, OPEC
 Notes: 1. Land area figures as per official websites. 2. Crude oil exports may include lease condensates and volumes of oil in transit.

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And here we have plotted some data, some facts and figures of the year 2021 from the Annual Atatistical Bulletin 2022 report of OPEC. So, we have plotted the details of Iran, Iraq, Saudi Arabia, Venezuela and also for OPEC together; so, you see these are the four examples of country experiences that we consider. So, we plotted the data, some demographic data like population, land, GDP, values, export, import values, current account values and value of petroleum export you can see, the value of petroleum export.

Even you can see the total value of export in million dollar and you can also see the value of petroleum export in million dollars, how petroleum products are very important part. And you can see over here that for, Venezuela let us say the total value of export is this whereas, the value of petroleum export is very close you see.

And for in fact, for all these countries these are very close and for Venezuela it is very extremely close. And you can also see crude oil export, the oil demand, output of petroleum product, even crude oil production data; so, we have also shown the natural gas production data and export data also. So, you can see how these OPEC countries and the Middle East countries how much they are dependent on oil and Venezuela is a typical example of resource curse.

And this the other three countries Iran, Iraq and Saudi Arabia they are trying to diversify their economies. But like we have seen that for Iran and Iraq there are lot of geopolitics the political economy scenario is not very good not very stable. So, they should diversify

their economy and they should try to attract more foreign investment. For, Saudi Arabia it has been the leader and it has been the swing producer inside OPEC though it is also diversifying its economy. But you see that Saudi Arabia has been replaced by US as the largest oil producer and exporter after the shale oil revolution.

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Conclusion

- ❖ Resource Curse (From Boom to Bust): Empirical Evidence
- ❖ Sanction hit economies are facing serious challenges

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So, that means, the these countries you see they are hugely endowed with natural resource, even Venezuela also we have seen with data that the proved reserve is very high in Venezuela. But these countries could not do very good in terms of economic growth and human development. Therefore, we should not get too much dependent on a resource rather we should try to develop the other sectors of the economy by using the resource wealth.

Like you can see the example of even Norway and Denmark and Netherlands also right. So, I will suggest you that due to time constraint it is not possible to discuss everything in the limited time period. So, you can also explore the experiences of other countries, especially you see the developed countries like Norway and Netherlands.

So, in the theoretical model or in earlier classes also we have seen that how the balance of payment crisis occurred in Norway in 1986, how Netherland also had the Dutch disease. The name Dutch disease was mainly due to Netherland, after the economy went into a recession after discovery of natural resource. But these economies could come out

of the stagnation very easily, because when Norway in when oil was developed in Norway it was already almost a developed country.

So, it could it ran into a recession, but it also came out of that, there was a balance of payment crisis, but it could came out of that crisis very easily because it being a developed country it could manage the resource wealth very prudently. But this Middle East countries the examples that we have taken these countries often lack the human capital or they do not have proper the governance or political stability.

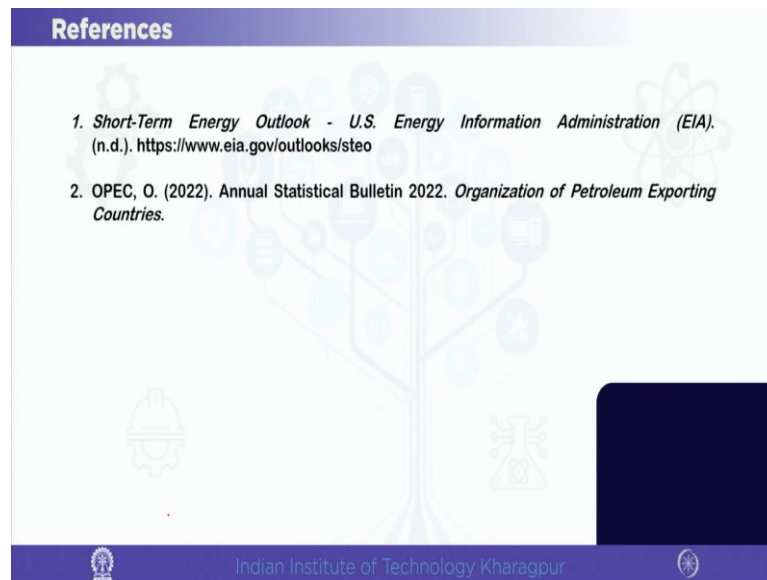
So, it is not enough to discover a resource, it is equally important and you can even say that it is more important to manage the resource very prudently. Otherwise just you discover a resource and you can run into a recession it can prove bad for your economy like it happened with Venezuela right. So, we should not get dependent on a particular resource, we should try to diversify our economy, we should try to develop the other sectors of the economy, we should use the resource wealth for developing the other sectors.

And we should there should be a balance in the economy, we should not get too dependent on one sector; we should try to improve the human development aspects like education, health. And we should try to maintain proper governance, rule of law should try to eliminate corruption and have a more stable political scenario; so, that we can attract foreign investment.

But if we get dependent we discover a resource and we get dependent on the resource that is harmful. So, with this we finish today's lecture and even our module 7 is also now finished. So, in today's lecture we have discussed the country experiences, but once again I am using this caveat that we have only discussed four countries experiences. So, I am requesting everyone that you go, you study you explore what happens to other countries.

And not only the petroleum endowed countries even you can also study the experiences of other countries when resource is discovered. So, I hope that the course will give you enough motivation and interest; so, that you yourself also start exploring experiences of other countries which are suddenly they get endowed with resource and how they do whether they can manage the resource prudently or not. So, you can also look for more country experiences with regard to petroleum as well as other resources.

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So, these are the references that we have followed it is mainly the report of US EIA and also the report by OPEC. So, we will be uploading these materials and we have also provided the hyperlinks; so, we will be uploading these reports in our course material. So, those who are interested they should look into these reports, because these reports also include country experiences of other these than these four countries.

Other four countries which are exporting oil and which are highly endowed with oil and you can also explore for more other countries which are endowed with other types of natural resources apart from oil. So, with this I finish today's lecture and our module 7 also comes to an end; so, I look forward to meet you for our next module.

Thank you.