Optimal Use of Natural Resources

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1. Background

- Last few months have witnessed series of crucial developments related allocation and utilization of the natural resources. The successful auction of coal mines and spectrum for radio frequencies have fetched good amount of funds for the Central and State governments.
- In the past, allocation of resources has been one of the most controversial exercises in India, with the auditing agencies and the Supreme court, striking down key policy decisions vis-à-vis allocation and utilization of some of the natural resources.
- Coal scam, 2-G spectrum scam etc had led to an atmosphere of uncertainty in natural resource sector. The current successful allocation of resources has renewed the debate about effective method to utilize key natural resources.
- Recently passed Mines and Mineral (Development and Regulation) Bill, 2015 led to national debate on resource allocation, and utilization of resources such that it benefits all stakeholders and secures the future of coming generations.

2. Principles in Resource Utilization

- A committee was appointed in 2011 to look into the issue of allocation and utilization of natural resources, named after its chairperson Mr. Chawla. The Committee focused on issues of transparency in allocation and in particular, open, transparent and competitive mechanisms of allocation, pricing and utilization of natural resources. It analyzed the principles of transparency, effectiveness and sustainability in resource allocation.
  - **Transparency**: With respect to decisions about allocation, it is important that the reason why a person or firm was allocated a resource and equally, why another was not, be clear to both. Open transparent and competitive market linked processes are more likely to make this happen. In a bid situation, one firm is allocated the resource because it bid higher, while the others did not match the bid.
  - In the allocation of natural resources, it is not always the best method to offer the resource to the highest bidder. Public purpose may demand a different use of the resource from what the market may put it to. The merits of competitive mechanisms and the consequent revenue generation need to be offset against other public purposes. However, it is also true that not all public purposes require the giving up of competitive allocation mechanisms.
  - **Effectiveness**: For ensuring optimum utilization of resources, effectiveness in exploration, extraction and regulation is key principle. While exploration activity is conducted by the private sector, it is important that there be a core technical capacity available with the government to oversee private activity and undertake exploration activity that may have limited commercial value, but high national value.
  - In the context of regulation and efficiency, it is important to realize that the essence of a regulatory mechanism is a substitution of its judgment for that of the market, where the price reflects the collective judgment of market participants weighted by their economic heft.
  - **Sustainability**: Sustainability is perhaps the most multi-faceted concept among these three. Three identifiable facets are –Environmental, Social and Inter-generational.
    - Environmental permits are often viewed as impediments to development, but they are also necessary to prevent irreversible damage to ecosystems and are thus necessary for preserving long-term development opportunities.
    - The social facet of sustainability has two aspects to it – Relating to local populations affected by the activities related to natural resource extraction; and relating to equity between the Union and the states.
      - The later aspect of social sustainability is particularly relevant to a federal polity such as ours. It is related to equity between the Union and the states. This is an extremely important issue in natural resources, since the Constitution grants ownership of many of these resources to the constituent states.
Finally, there is the concept of **intergenerational sustainability**. The rate of resource extraction cannot be based solely on the needs of the current generation; these resources are limited and valuable and hence the benefits must be distributed between immediate consumption and future use.

- As future generations will have to deal with the potential negative effects of decreased resource availability and environmental damage caused by us, their needs for such resources may be even more than ours.
  - Another reason to delay the extraction of natural resources is technology. If the choice is between extracting and using resources inefficiently right now, or effectively later, it may make sense to delay extraction until the technologies are sufficiently developed.

### 3. Resources

**A. Coal:**

- **Introduction:**
  - The coal industry in India has changed considerably in the last 50 years. From being a predominantly private industry around Independence, it was nationalized completely in 1973 once the government realized coal’s essential role in meeting India’s power needs.
  - Until recently, coal sector was governed by the Mines Act, 1957 and the Coal Mines (Nationalization) Act, 1973 (CMN). With the passing of Coal Mines special Provisions Act, 2015 and Mines and Mineral Act, 2015 (MMDR) new provisions and structures are created to tackle the policy and regulatory mess experienced in last few decades.

- **Allocation Mechanism:**
  - In the coal industry there are two important kinds of allotment: the allotment of mines and the allotment of coal. Ultimately, both kinds of allotment lead to the procurement and use of coal for some productive purpose, but functionally the two are quite different.
  - Mine allotment gives an entity the right to set up a coal mine and extract coal for a designated end-use. Coal allotment, on the other hand, is done after mining.

- **Issues with Existing Mechanism:**
  - The majority of coal in India allocated through a relatively non-transparent system via the screening committee route.
  - Between 1993 and 2011, the government of India gave away 206 coal blocks for free to government and private companies.
  - The Comptroller and Auditor General (CAG), in its 2011 report, estimated that the losses due to the policy of the government giving out coal blocks for free amounted to Rs1.86 lakh crore.
  - This resulted in cancelation of 206 allotted coal blocks. These events in last few years created policy uncertainty in the coal sector.
  - The mining sector is plagued by multiple regulations, discretionary decision-making powers, weak institutions, inadequate monitoring and feeble enforcement. These are the reasons for large scale irregularities—illegal mining, destruction of environment or ill-treatment of mining affected communities. Simply put, the entire governance structure of the sector is outdated.

- **Proposed Changes:**
  - The Supreme Court decision led to two important policy initiatives in the mining sector. The passing of MMDR Act 2015, and Coal Mines Special Provision Act, 2015 are seen as progressive reform steps to clear current mess in mining sector.
  - It effectively ends government monopoly over the extraction of coal, which has existed after coal mining was nationalized in 1973. The MMDR Bill provides for granting all types of mineral concessions through auctioning.
  - Parliamentary approval for the auction of coal blocks — effected through an ordinance that the Bill now replaces — also provides closure to one of the biggest scandals to have rocked the country in recent times: the allocation of 204 coal blocks to private parties, which the Supreme Court had cancelled on the grounds that the allocation process was arbitrary and illegal.
iv. The auctions have helped the coal-bearing States realize over Rs.2 lakh crore by way of royalties over a 30-year period from the 33 blocks auctioned in the first round.

v. The Bill creates a new category of mining license i.e. the prospecting license-cum-mining lease, which is a two stage-concession for the purpose of undertaking prospecting operations (exploring or proving mineral deposits), followed by mining operations.

vi. The Bill provides for the creation of a District Mineral Foundation (DMF) and a National Mineral Exploration Trust (NMET). The DMF is to be established by the state government for the benefit of persons in districts affected by mining related operations.

- **Analysis of Proposed Changes**-
  
i. Auctioning is the best way to allocate concessions where deposits can be accurately established and assessed. But in cases where mineralization is not properly established, auctioning can result in undervaluation of minerals and subsequent lower revenue for the government, or overvaluation, resulting in the inability of the concession holder to meet commitments. Auctioning, therefore, is not suited for prospecting. For prospecting, a transparent first-in-time principle is used globally. By mandating auctioning of prospecting-cum-mining leases, the Bill has introduced huge uncertainty. Similarly, the Bill might end up restricting investments in exploration.

  
  
  ii. The biggest problem is that the Bill jeopardizes all efforts made in the last 10-15 years to improve environmental and social practices in the mining sector.

  
  
  iii. Environmental performance is closely linked to how a mine is opened and how it is ultimately rehabilitated and closed. The MMDR Bill 2015 undermines this very principle.

  
  
  iv. Under the new Bill, all mining leases will now be granted for 50 years. The lease for existing mines has also been extended to 50 years. After expiry, leases can be re-auctioned.

  
  
  v. From an environmental perspective, it doesn’t make sense to keep thousands of mines opened at one point of time as every open mine is a source of pollution.

  
  
  vi. From an economic perspective, it amounts to sitting and speculating on resources. Better option is to open a mine, remove all minerals quickly and progressively rehabilitate and close the mine and return the land to the landowners.

  
  
  vii. The long lease period with subsequent re-auctioning provision would end up in shifting the burden of rehabilitation to future generations.

  
  
  viii. The long lease period makes it will be difficult to establish appropriate financial guarantees to ensure that mine closure will happen.

  
  
  ix. DMFs in big mining districts will get substantial inflows of funds. At current royalty rates districts like Keonjhar would get some Rs. 600 crore annually. It is possible to use this money for the direct benefit of the affected people as well as to invest in their future assets.

  
  
  x. However, the effective use of these funds depends on the rules to be notified for decisions regarding utilization of funds.

- Considering the challenges, these reforms are inadequate and some of them may create more problems

B. **Natural Gas**-

- **Introduction**-

  
i. Gas (natural or from other sources such as coal-bed methane or shale gas) has often been cited as the ‘transition fuel’ to a low carbon future since its greenhouse gas (GHG) emissions are lower than other fossil fuels and its supplies are likely to outlast petroleum supplies.

  
  
  ii. It has also been cited that gas would be the fuel of the 21st century just as oil was the fuel of the 20th century. The gas sector in India is also in the process of going through some significant changes.

- **Production Sharing Mechanism**-

  Investment Company will invest all capital and take huge risks. Profit margin is also larger. Once, resources are found and developed such as oil fields, and then company can recover all their capital and investments. Later, the profit or production is shared between government and company.

- **Revenue Sharing Mechanism**-

  Here the revenue will be shared between the government and Gas exploration companies from the first batch of production of the oil and gas itself.
changes as more discoveries are likely to come online, policies for shale gas exploration and gas pricing are being finalized, transmission pipelines are being authorized through auctioning.

- **Existing Mechanism:**
  i. Petroleum and Natural Gas regimes around the world can be classified into three broad groups, (a) Concessions, based on royalty and taxation, where the ownership of the resource is with the concessionaire (b) Production Sharing Contracts (PSC), where the sovereign retains the ownership and there is a contractually predetermined sharing of revenues and (c) Service contracts where the concessionaire’s remuneration is not dependent on prices.
  ii. In India we have a PSC type regime along with royalty and corporation taxes for blocks awarded under New Exploration and Licensing Policy (NELP). It became effective in 1999 and about 28 exploration blocks signed prior to NELP.
  iii. Under NELP, the same fiscal and contract terms are offered to all domestic and foreign companies. Blocks are offered through an international competitive bidding system on the basis of transparent and quantifiable bid evaluation criteria.
  iv. The blocks are awarded to successful bidders based on the bid evaluation criteria, and on the recommendation of the empowered committee of secretaries.
  v. The Indian system, along with a royalty regime has a variant of the production share system called the pre-tax investment multiple (PTIM).
  vi. Over a period, the PSC system attracted controversy becoming a challenge to both contractors and the government.

- **Proposed Changes:**
  i. On the recommendations of C. Rangarajan panel on Gas pricing and CAG reports Government has announced the revenue-sharing model and a unified licensing regime for all hydrocarbons.
  ii. Successful bidders have to share minimum revenue even if they sell hydrocarbons at a cheaper price, thus protecting government’s income under proposed regime.
  iii. The petroleum ministry has also proposed reworking the allocation policy of natural gas from non-New Exploration Licensing Policy (NELP) blocks, to give first priority to firms selling compressed natural gas (CNG) and piped natural gas (PNG) for allocating the limited resource.
  iv. The government is set to revise its priorities in allocation of natural gas, by putting city gas distribution at the top, followed by atomic energy, urea plants, power and domestic LPG. It will also make this allocation policy uniform; meaning the order of priorities will be the same irrespective of what source the gas is from.

- **Analysis of Proposed Changes:**
  i. The key difference between the PSC and RSC is that the PSC model would encourage investors to take higher exploration risks, and in the event of success, the costs could be recovered.
  ii. Since only one-third of our sedimentary basins have been fully explored, a contract model that encourages intensified exploration activities should have been preferred.
  iii. India remains one of the least explored countries and could hold large potential resources. For example, 15 basins out of a total 26 sedimentary basins in India spread over on-land, offshore and deep-water, are estimated to hold prognosticated hydrocarbon resources of over 200 billion barrels of oil equivalent.
  iv. Out of these, hydrocarbon-in-place volume of 80 billion barrels has been established through exploration activities by the public sector and private oil and gas companies. There is still a significant ‘yet to find’ hydrocarbon resources of over 120 billion barrels. Therefore, significant increase in exploration efforts is critical and this requires the urgent attention of the government.

- **Shale Gas exploration:**
  i. The discovery of new techniques to tap reserves of gas trapped under shale rock formations has revolutionized the gas industry in the United States of America (USA), and promises to do so in the rest of the world.
  ii. While proven reserves of conventional gas reserves in the country are around 50 trillion cubic feet, preliminary ‘speculative’ estimates for shale gas reserves in the country are anywhere in the region of 600 to 2000 tcf and a recent EIA study states that extractable Indian shale gas
reserves could be around 70 tcf. Therefore, it is clear that shale gas has the potential to radically transform the country’s gas market in particular and energy situation in general.

- **Conclusion:-**
  - Gas will be a critical natural resource for India’s development needs in the foreseeable future, primarily for its energy security but also for its food security. Hence, it is imperative that India explores its basins for available gas and uses the available gas effectively to maximize public interest.
  - The way forward in this respect should take into account the following factor:-
    iii. Undertaking an initiative to balance immediate energy needs with long term energy security.
    iv. Ensuring that gas is used efficiently and strategically to maximize energy security until a fully developed market is in place.
    v. Protecting and enhancing lives of communities impacted by oil and gas production by ploughing back some of the revenue for all round local development.
    vi. Ensuring that oil and gas exploration (particularly shale gas exploration) does not happen at the cost of other precious natural resources (such as groundwater) and the environment.

C. **Water:-**

- **Introduction:-**
  i. In the constitutional scheme, water is treated as a state subject, but is subject to Union intervention on issues such as inter-State rivers and inter-State water disputes to the extent legislated by Parliament.
  ii. This reflects the prevailing situation when the Constitution was being drafted, when primacy was accorded to inter-State river water disputes rather than issues of drinking water, groundwater management and integrated use of water.
  iii. The report of the National Commission on Integrated Water Resource Development Plan (NCIWRDP), 1999 has estimated that while the total usable water resource is around 1,086 billion cubic metres (BCM) and the present consumption is around 600 BCM; the rate of water consumption is expected to go up to 1,000 BCM by 2050.
  iv. The global warming is going to affect the hydrological cycle which could result in intensification of temporal and spatial variations in precipitation, snow melt and water availability.
  v. In this context comprehensive water management strategy and plan of action is warranted to effectively use existing resources and secure the resources for future generations.

- **Water Management Issues:-**
  i. The existing water law framework in India is also characterized by the co-existence of varied principles, rules and acts enacted over the years including common law principles. Conformity to the National Water Policy is not a binding requirement.
  ii. The multiplicity of principles and rules, a multiplicity of instruments and the lack of an overall framework has created a situation where the principles adopted by the Union and State Governments come in conflict and the basic ambivalence inherent in law is accentuated.
  iii. Unviable pricing (which does not even cover the operations and maintenance [O&M] costs), the allocation of water through these systems poses problems of command area

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**The entries relating to water in the Constitution of India**

**Entry 17, State list:** Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I.

**Entry 56, Union List:** Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.

**Entry 21, State List:** Fisheries

**Entry 57, Union List:** Fishing and fisheries beyond territorial waters.
development (CAD), conflicts between upper and lower riparian consumers/users and lack of a system of regular repair and refurbishment of the assets created.

iv. The unrestricted use of groundwater for agricultural pumping sets, which has steadily led to a depletion of the groundwater levels across the country, with the problem especially pronounced in certain states of the north, e.g., Punjab and Haryana.

v. The allocation of water for drinking water in urban and rural locations and the concomitant issue of sub-optimal pricing which leads to huge transmission and distribution losses, on one hand, and irregular and scanty supply to the population, on the other.

- **Steps Taken by Government:-**
  i. The Central Ground Water Board (CGWB) has been constituted as an authority under Section 3(3) of the Environment (Protection) Act, 1986 for regulation and control of ground water management and development. CGWA – under the administrative control of Ministry of Water Resources (MoWR) – regulates the withdrawal of groundwater in 1,615 over exploited, critical and semi-critical blocks.
  ii. Various schemes are launched by Centre and States to realize the irrigation potential of the country. Accelerated Irrigation Benefit program, Watershed Management Program, Bharat Nirman Mission etc. are efforts aimed at efficient allocation and utilization of surface and ground water.
  iii. Government regularly announces the model Water Policy to guide state governments. The 2012 Water Policy is a comprehensive document providing solutions to the current water issues.
  iv. The main objective of the National Water Mission is “conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management”.
  v. The five identified goals of the Mission are: (a) comprehensive water data base in public domain and assessment of impact of climate change on water resource (b) promotion of citizen and state action for water conservation, augmentation and preservation (c) focused attention to vulnerable areas including over-exploited areas (d) increasing water use efficiency by 20% (e) promotion of basin level integrated water resources management.

- **Recommendations for Future course:-**
  i. There is need of comprehensive national legislation on water. The ‘framework legislation’ will lay down “core” principles of water management for adoption at the levels of Central agencies, States and local authorities, and provide the grounds or basis within which decisions and actions will be taken by various levels of governance in exercise of their own powers.
  ii. The intention of the proposed legislation should not be to shift water management to the Union. Water should continue to be managed at the level of the State Governments, subject to the devolution of local water management to Panchayats and Nagar-Palikas under Schedules 11 and 12, and increasing participation of civil society institutions in water management at every level.
D. Spectrum:-

- Introduction:-
  i. The Indian telecommunications sector has seen much growth and also much turmoil in the recent past. In the recent past, there has been much discussion on the appropriateness of the existing telecom policy which was predicated on low entry barriers, enhanced competition in the market place and a level playing field between new and existing players.
  ii. The fact that Unified Access Service (UAS) licenses were issued in 2007 and 2008 at an entry fee fixed in 2001 and the auction of 3G licenses in May, 2010 fetched substantial revenues for the exchequer, have underlined the need to review the manner in which telecom spectrum should be allocated.
  iii. The discussion on separating the rights to use the spectrum from the service licenses and moving to a more market related allocation of spectrum hinges to a considerable extent on the multiple uses of the spectrum in a convergent environment and on increasing the clarity on Merger & Acquisition transactions, which is needed if the industry structure is to develop appropriately.

- Existing Mechanism:-
  i. In India, the radio frequencies are confined between 9 kHz and 3000 GHz and are being used for 41 different types of services like fixed communication, mobile communication, broadcasting, radio navigation, radio-location, fixed and mobile satellite service, aeronautical satellite service, radio navigational satellite service etc.
  ii. The TRAI is an independent regulator established in 1997 by the Government of India to regulate the telecommunications business in India.
  iii. There are two types of operation in spectrum operations – first is allocation of the frequencies for various services and second is granting licenses for various services dependent on spectrum.
  iv. The allocation of spectrum carries with it an annual fee in the form of a royalty and license fee.
  v. Besides the spectrum usage charges, the commercial license holders (for both telecom and broadcasting services) have also to pay initial entry fee and annual license fee, in lieu of the right to hold the license. License fee varies from service to service and, in relation to Access licenses, from service area service area.
  vi. Spectrum allotment broadly falls into three categories: administrative allocation, allocation on the basis of a ‘beauty contest’, and market related processes like auctions.
  vii. Auction of spectrums was introduced in the telecommunication market in India after the failure of the administrative process of allocating spectrum.
  viii. In auction theory, an auction takes place when there is a seller who wishes to allocate an object to one of ‘n’ buyers.

- Drawbacks with Existing Mechanism:-
  i. The primary argument against market related processes (including auctions) as an allocation mechanism in the context of spectrum is that they increase the consumer prices and/or lead to unsustainable tariffs.
  ii. This is an issue in a country like India when there is need to enhance tele-penetration and spur inclusive growth. Moreover, such processes typically favour incumbent players who have substantial financial wherewithal to bid high and act as entry barriers for new incumbents.
  iii. The 3G auction held in 2010, for example, fetched a windfall for the government but dealt a blow to the telecom industry. The investment in infrastructure development and expansion of
wireless broadband was hampered due to large loan dues of banks that funded the bidding, frayed balance sheets of telecom operators.

iv. The expensive auctions are turning counterproductive from a consumer point of view. It is no secret that higher spectrum costs puts pressure on telecom operators to either increase tariffs or halt or defer their investments in rolling out new infrastructure. The end result is poor quality service and low tele-density.

v. Programs such as the 100 Smart City project and the e-Governance initiatives require speed — at least a 2 Mbps connection at affordable rates. But for this to happen, telecom operators have to be given adequate spectrum, and at a reasonable price.

- **Future Mechanism:-**
  i. The choice of the appropriate method of allocation of spectrum, therefore, depends critically on the context, market conditions and the objectives of extant telecom policy.
  ii. In relatively well developed economies which have mature markets, where tele-penetration is no longer an issue of concern and affordability / paying capacity is not a serious consideration, market related processes (including auctions) have been found as an efficient way of allocating spectrum licences, both in terms of productive and allocative efficiencies.
  iii. The 2G plan was successful because tariffs dropped 50 times to a limit that even the less well-off could afford. Tele-density touched to 90% of total geographical area. The same must be ensured for upping our abysmal broadband numbers and other services.
  iv. Recent FM spectrum allocations have re-emphasized this point. The bidding got stupendous success in lucrative territories like Delhi, Bengaluru and Mumbai but so far there haven’t been any takers for the smaller towns FM frequencies.

- **Conclusion:-**
  i. In sum, there is need for transitioning to market related processes for allocation of spectrum and development of a liberal regime by allowing mergers and acquisitions and spectrum sharing.
  ii. It is also felt that a more robust regime for spectrum regulation including spectrum legislation is needed which provides for adequate measures for efficient use of spectrum supported by conduct of periodic spectrum audits and necessary provisions for spectrum vacation and re-farming with a view to optimize utilization of the country’s spectrum resources.