NOT FOR SALE

Geonesis

(A GEMCO KATI INITIATIVE)
Indian Mining & Exploration Updates

VOLUME 6, ISSUE 1 DECEMBER 2018

Deadline for fresh exploration of expiring mining leases across India likely to be missed

DEADLINE FOR FRESH EXPLORATION OF EXPIRING MINING LEASES ACROSS INDIA LIKELY TO BE MISSED

The Mines Ministry deadline of December 2018 for all states to complete exploration of 329 mineral blocks where mining leases are scheduled to expire on March 31, 2020, is largely going to be missed.

The Mines Ministry earlier in the year directed all state governments to make mineral blocks where leases were to expire ready to be put up for fresh auction by completing exploration of the entire lease hold area by December, so that rounds of auction could start next year and new miners be allocated the blocks and avoid any risks of disruptions of production from operational mines.

According to information from the government, only 101 mineral blocks of the 329 were ready to be put up for auction with exploration completed in these blocks.

The highest number of mining leases up for expiry are in Goa (184), followed by Karnataka (48) and Odisha (17).

In case of any delay in completing auction by March 31, 2020, and production having to be stopped after the date, loss in production from Odisha mines alone has been projected at 66-million tons and all mines with expired leases in all other states could result in total loss in mineral production of another 90-million tons.

All existing mining lease holders were directed to complete new exploration within their respective leasehold areas within 60 days which was to expire in December 2018, and the state government would have another 30 days to approve such exploration reports for each of the mining leasehold areas.

Even as timelines for completion of auction before March 31, 2020, are showing signs of slippages, the Mines Ministry is putting together a committee comprising representatives of relevant federal ministries and from mineral-bearing states.

The committee would be tasked to handle all post auction issues to ensure seamless transition of ownership of the mineral blocks to new miners and the committee acting as a single agency to facilitate the new miners securing all mandatory approvals to commence operations at the new leasehold areas, government officials said.

AUSTRALIA SEEKS TO TAP INTO GROWING INDIA MINERALS SECTOR

The Australian resources sector has welcomed the federal government's response to the India Economic Strategy to 2035, which acknowledged the role that mining would play in the future.

The India Economic Strategy report, which was commissioned earlier this year, recommended practical measures to cement India as a top economic partner for Australia.

"This report provides a roadmap for our economic future with India," said Prime Minister Scott Morrison.

"India is the world's fastest growing major economy and offers more opportunity for Australian business over the next 20 years than any other single market."

The federal government has provided its support for the 20 priority recommendations made in the report, and over the next 12 months will focus on a number of key actions, including the expansion of the Australia-India Mining Partnership at the Indian School of Mines, which connects Australian companies to India's minerals-rich north-eastern states, supported by the new Consulate-General in Kolkata.

The Minerals Council of Australia (MCA) has welcomed the federal government's endorsement of the report, with CEO Tania Constable saying that as the world's fastest growing large economy, India presented significant opportunities for Australia's minerals sector.

"The establishment of the Australia-India Mining Partnership at the Indian School of Mines is an important initiative to showcase Australian mining technological innovation and Australia's world-leading expertise in mining governance and environmental management," Constable said.

She noted that the government's announcement to establish a consulate in Kolkata in the first half of 2019 should also be of particular value to Australian small and medium-sized

(Continued on Page 2)...

GEMCO KATI

mining, equipment, technology and services (METS) companies.

"Australia-India trade was worth A$27.4-billion in 2017. Australia's minerals sector has had a big role to play in this trade relationship, which has grown from Australia's ninth largest to fifth largest trading partner in five years.

"In 2017, Australia's minerals exports were worth more than 71% or A$11.2-billion of our A$15.7-billion in merchandise exports to India," Constable said.

Coal was worth A$9.2-billion, a growth of 38% in 12 months and an 11% yearly growth trend over the past five years, with other key minerals exports including gold, which reached A$689-million, and copper, at A$688-million.

Constable noted that with 300-million people in India still not connected to the electricity grid, and 500-million people depending on biomass for cooking, India was expected to add the equivalent of the European Union's current power generation capacity to meet expected energy demand to 2040.

"Australia is, therefore, well placed to help meet India's energy demands, including the supply of coal to India's new high energy, low emission power plants which will help India in meeting its Paris Agreement targets," she said.

"There will also be opportunities for the A$90-billion METS sector as India's mining industry modernises and explores potential efficiency, productivity and safety improvements.

"As the government's response acknowledges, mining and resources should remain one of the 'lead sectors' for Australia's economic engagement with India."

ENVIRONMENT MINISTRY MAKES FOREST RIGHTS ACT IRRELEVANT IN INITIAL STAGE OF FOREST CLEARANCE

Letter from MOEFCC regarding Western Coalfields projects in Maharashtra also shun tribal ministry's concerns

Ministry of Environment, Forest and Climate Change (MOEFCC) said projects seeking to divert forest lands do not need to comply with forest rights act (FRA) for initial clearance. This sidelines concerns raised by the Ministry of Tribal Affairs (MoTA) and raises concerns that FRA provisions will be diluted.

"… as per the provision under Forest (Conservation) Amendment rules, 2016 the compliance under FRA is not required for consideration of in-principle approval," Deputy Inspector General of Forest Shrawan Kumar Verma wrote to the Maharashtra government.

The December 3 letter was regarding several coal mining projects of Western Coalfields Ltd (WCL) "being stalled at various levels" of the state's forest department. WCL, a subsidiary of the Union Ministry of Coal, sought to divert forest land under for the projects.

Apart from sidelining concerns of the Ministry of Tribal Affairs (MoTA), Verma's letter has also made experts uncomfortable. It clarifies that compliance with the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition Of Forest Rights) Act, 2006 (FRA) is not required for initial stage of forest conservation (FC) approval.

The FC process, according to the Forest (Conservation) Act (FCA), 1980, is carried out in two stages—Stage I, the in-principle approval, and Stage II, the final approval. The rules amended in 2016 made FRA-compliance a prerequisite for diverting forest land.

But the stage in which it is to be done is it required has became a bone of contention. At a January 12 meeting between the two ministries, the MoTA raised the concern that a later-stage requirement for FRA would be a "fait accompli". By the second stage, project proponents would have progressed and Tribals living there in area would be at great disadvantage.

"It has been seen that many a times the project applies for FRA clearance only in the last minute and this results in the project getting delayed for want of FRA clearance. It was suggested that the project proponent should produce proof of having initiated FRA clearance process at the point of going in for Stage I-FCA clearance itself," according to minutes of the meetings.'

The MoEF&CC agreed with the concerns and decided to act on them. But the latest clarification leaves experts disappointed, reminding some of them how the ministry exempted linear projects like roads, transmission lines, etc from the need to get consent from concerned Gram Sabhas.

What the ministry said did not violate the spirit of FRA, but

(Continued on Page 3)...

diluted its importance, according to Giri Rao, who works on FRA-related issues in Odisha.

"By giving the project proponents the permission to comply with FRA in Stage II, the government is essentially giving a signal to businesses that projects will not be stalled. Getting Stage II clearance after a nod for Stage I is not difficult," he says.

According to him, the government is trying to dilute laws related to the rights of tribal communities to facilitate ease of doing business: "Here we have a case of diluting FRA. Similarly, when it comes to Panchayats (Extension to the Scheduled Areas) Act 1996, the law says that all other legislations in Schedule V areas which are in consistent with authority of Gram Sabha will be amended within a year of passing the law. But this has not happened."

COAL BLOCK AUCTIONS: INITIAL RESPONSE POSITIVE, 69 FIRMS PURCHASE THE TENDER DOCUMENTS PRICED AT RS 5 LAKH

After the failure of last two tranches of coal-block auctions, the coal ministry has received "overwhelming" response for the latest invitations for 19 captive mined.

After the failure of last two tranches of coal-block auctions, the coal ministry has received "overwhelming" response for the latest invitations for 19 captive mined. A senior coal ministry official told FE that "as many as 69 companies have purchased the tender documents priced at `5 lakh". The last two auction-tranches for the coal blocks, where 15 mines were offered, had to be cancelled as they could not even elicit three bidders to participate.

The official attributed the positive reaction from the industry to the changes incorporated in the auction terms, such as, allowing private companies to sell up to 25% of production from the captive mines in the open market. "There are 11 mines which more than three parties want to bid for," the person said.

To regain the interest of private players, the tender terms were amended as per the recommendations of the high power expert committee formed under the chairmanship of former chief vigilance commissioner Pratyush Sinha.

After the Supreme Court, in 2014, cancelled 204 coal mines allocated to various government and private companies since 1993, 89 coal mines (53 PSU allotment, 31 auction) were successfully allocated for captive consumption for power and non-regulated sectors (steel, cement, fertilisers) through the Coal Mines (Special Provisions) Act, 2015. Out of these, agreements have been terminated for five auctioned mines.

Industry sources have attributed the complexities related to procuring environmental and forest clearances to begin coal mining as a major impediment to private participation in the auctions. The last date for receiving final bids for the auctions have been extended to December 16. The ministry official attributed the postponement to the requests from some companies who wanted more time to visit the coal mines and make financial arrangements.

GSI TO SUBMIT REPORTS ON 18 MINERAL BLOCKS BY DEC TO FAST-TRACK AUCTIONS

Though Rs 10.48 billion has been collected as on July end under NMET, fund utilisation remains slow, with only 62 projects being sanctioned

With exploration emerging as a key constraint in the swift auctions of mineral blocks, the Geological Survey of India (GSI) will provide geological reports to states in respect of 18 blocks by December this year.

Additionally, GSI is also expected to offer reports on 13 more blocks by December next year. The mineral blocks readied by GSI contain deposits of copper, gold, manganese, iron ore limestone and bauxite.

At present, two central sector agencies -- GSI and Mineral Exploration Corporation Ltd (MECL) -- are predominantly engaged in mineral exploration activities. Though the state directorates of mining & geology are tasked with exploration work, they haven't taken off in a big way, being hamstrung by lack of manpower or financial resources or both.

The Union mines ministry is currently strengthening the exploration capacities of GSI, MECL and other entities notified for

(Continued on Page 4)...

exploratory activities. The ministry has also urged state governments to invigorate their exploration arms.

The insufficient utilisation of funds accruing to the National Mineral Exploration Trust (NMET) has slowed the pace of mineral blocks exploration in the country.

Though Rs 10.48 billion has been collected as on July end under NMET, the fund utilisation remains slow. Only 62 projects have been sanctioned. NMET is a non-profit body set up by the Government of India to finance exploration projects. As per statute, every mine leaseholder has to contribute to the NMET an amount equalling two per cent of the royalty.

When compared with global exploration standards, Indian exploration scenario offers a grim picture. The quality of the geological database and its ease of accessibility do not stand up well as against other resource-rich nations. More, the country's exploration spends pales into insignificance when compared with the leading mine rich nations. Our exploration expenditure is estimated at $17 per square km, a puny amount compared with $124 in Australia and $118 of Canada, the countries with the highest mineral exploration budgets.

Besides, India has only eight agencies tasked with exploration work compared with over 400 in Australia and Canada. Despite the government's opening up mining for 100 per cent FDI (foreign direct investment), the sector accounts for measly 0.8 share of the total FDI attracted by the country.

To deepen the scale of mineral exploration, the government has promulgated the National Mineral Exploration Policy (NMEP) 2016. The policy aims at bringing private parties on board for exploration over and above the state-owned agencies such as GSI and MECL.

States have hitherto auctioned 50 mineral blocks with a value of resources estimated at Rs 2.2 trillion. The auctioned blocks are projected to generate revenue worth Rs 1.81 trillion over the 50-year lease period.

HOW TO TURN AROUND THE POWER SECTOR AND SOLVE THE COAL SUPPLY ISSUES

Power-generating companies should not be saddled with the burden of cross-subsidising the renewable sector. Promoting renewable energy is laudable, but it has a cost. This has to be borne by the society through taxation

The power sector is in serious trouble. No, this is not 2014 when it was indeed in trouble. This is 2018. Look at the following indicators:

1. As many as Rs 1.74 lakh crore worth of stressed assets with the banks are from power-generating companies. This amount is increasing by the day.
2. Thirty-four power plants are stressed (32 in the private sector and two in the public sector). The capacity of these stressed thermal power plants is around 40,000 MW.
3. There is a shortage of coal supply and fuel supply agreements—the number of critical plants for want of adequate coal stands at 26 as on October 9, 2018, according to the Central Electricity Authority (CEA) data.

The causes

The Parliamentary Standing Committee has identified the following major reasons for the crisis:

1. Coal supply shortage: The reasons are (a) cancellation of allotted coal blocks in 2014 by the Supreme Court, and (b) setting up of projects without fuel linkages.

1. 2. Insufficient number of power purchase agreements (PPAs) made available by states (of the stressed commissioned capacity of 24,405 MW, there are PPAs only for 16,129 MW).

3. Inability of the promoters to infuse equity and working capital.

4. Contractual and tariff-related disputes.

5. Inadequate funding by banks/financial institutions (there are instances where the projects are complete, but banks haven't sanctioned working capital).

6. Delays in project implementation, leading to cost overruns.

In addition, there are some other aspects that have contributed to the current crisis in the sector.

These include:

1. Aggressive and uneconomic bidding in coal block auctions by power-generating companies. In view of coal shortage and uncertainty about the future availability of coal, user entities did not want to take any chance. They wanted coal blocks "at any cost", only to discover, subsequently, about the actual cost they had to pay.
2. Across-the-board cancellation of coal block allocation under the Supreme Court orders had a much greater impact than was expected. As it was subsequently discovered, there were no takers for a number of blocks because their viability depended upon the user industry existing in near vicinity.

(Continued on Page 5)...

3. Mining in a number of coal blocks was stuck up for want of clearances. This has always been a problem in the country and continues to impact progress.
4. Cross-subsidising for renewable energy—the coal-based thermal energy sector has had to bear the cost of the ambitious targets set out for renewable energy.
5. Variety of cess imposed on coal has put additional burden on coal-based power plants.

The action so far

The focus, so far, has been to grapple with some of the issues for select few generating companies in the following manner:

1. Special linkages for some entities by Coal India;
2. The recent move to allow cost pass-through to some entities to relieve them of the burden of increased import price.

These piecemeal efforts are not likely to create substantial impact on the sector that is faced with serious crisis, though it would relieve some of the entities from the cost burden. This, too, would come at someone else's cost.

Moreover, hydroelectric power generation has not kept pace with the requirement. The grid balancing that could have been done through hydroelectric power for renewable energy is now being "enforced" on coal-based power plants. They have been "asked" to back down at a substantial cost to "accommodate" solar energy transmission. There is a cost to it, and someone has to bear it. Unfortunately, thermal power plants have had to bear this cost.

The possible way forward

There are two sets of issues that afflict the sector: these are both demand-side and supply-side issues.

Demand-side: The demand for power exists, but the discoms (distribution companies) are unable to articulate this demand as they are themselves in financial mess. The Ujwal Discom Assurance Yojana (UDAY) needs to be implemented in letter and spirit to get the discoms out of the mess in a manner as has been done in Gujarat even before the dawn of "UDAY". It is doable, but the same commitment and political will has to be demonstrated by other states. Some initiatives have been taken, but a lot more needs to be done. The discoms hold the key to the power sector.

Supply-side: These issues will have to be tackled differently and in a comprehensive manner.

Supply of coal will have to be increased by Coal India by following a strategy pursued during 2014-15 and 2015-16, when coal production saw an unprecedented increase. The factors that impact coal production relate to land acquisition, environment and forest clearances, and evacuation of coal. Most of the issues that impact the first two factors relate to the actions by respective state governments. Hence, the strategy will have to centre around going down to coal-bearing states to resolve such issues. It has been done in the past. There is no reason why it can't be done now.

Facilitate various clearances for the coal blocks that were auctioned or allocated. These clearances haven't moved forward in the past couple of years. Also, revive the Project Monitoring Group (PMG) at the Centre and pursue clearances aggressively. This, too, has been done in the past and can be done again.

Set up a high-level empowered committee to examine each stressed project and work out a rehabilitation package. Only financial restructuring will not help. The package has to be a comprehensive one. This could even entail change of ownership/management and/or adequate sanction of funds that are required for the projects. The committee should also be empowered to settle disputes, if any. Until and unless such a central mechanism is created, the issues will not be resolved.

Power-generating companies should not be saddled with the burden of cross-subsidising the renewable sector. Promoting renewable energy is laudable. But it has a cost. This has to be borne by the society (through taxation) and not by the entities that are already in trouble.

Time is of essence. With each passing day, the problem will become even more complex. All governments in the past have been notorious for delays. This government is different. The current team in the ministry is different. It comprises of members with proven competence. RK Singh was a highly-rated civil servant and Ajay Bhalla contributed substantially to the turnaround of the coal sector. They are capable of turning around this sector as well. Hopefully, they will be able to do that, in the interest of the country.

The author is former secretary, Government of India

'INDIA REQUIRES PROPER MINING LEGISLATION TO CHANNELISE ITS IRON ORE RESERVES'

Vinod Nowal is the deputy managing director of JSW Steel Limited, which is a part of the diversified $13 billion JSW Group, that has a presence in steel, energy, infrastructure, cement, and sports sectors. JSW Steel is one of the major integrated steel company in India with an installed steel-making capacity of 18 MTPA (Million Tonnes Per Annum). JSW Steel's plant at Vijayanagar in Karnataka, is the largest single location steel producing facility in India with a capacity of 12 MTPA. Nowal, who has been associated with the group since 1984, had served in various positions in the group in different capacities.

(Continued on Page 6)...

He talks to THE WEEK about the challenges faced by the steel sector in India, about domestic steel consumption and about JSW Steel's Vijayanagar Works unit in Karnataka being awarded the highest global quality honour, the Deming Prize, for its Total Quality Management (TQM) practices.

What are the challenges faced by the steel sector in India?

I feel that India has huge iron ore resources and it can fulfill the requirements of all the steel plants without depending on imports. However, our government needs to take proactive steps to simplify mining procedures so that this iron ore can be utlised efficiently for steel production in the country. If you look at it broadly, India is self sufficient in iron ore resources but proper mining legislation is required to channelise this resource. Besides this, there needs to be proper connect with the mining companies and the steel manufacturers so that the domestic iron ore resources are utilised properly. Besides, the huge cost of transportation of iron ore from the mines to the steel plants in India is a major challenge as the cost is one of the highest in the world. Due to this, our country's iron ore resources are not being fully utilised.

Vinod Nowal, deputy managing director of JSW Steel Limited

Has there been an increase in the per capita steel consumption in India? How does it fare when compared to other countries?

India fares very low in per capita steel consumption when compared to many other countries. It is currently 68kg when compared to a per capita global average steel consumption of 250kg. In India, more infrastructure development has to take place to increase the per capita steel consumption. Compared to this, China has seen robust growth in its infrastructure development that requires huge amount of steel. China consumes almost 50 per cent of the world's steel. Steel is very vital for the country's infrastructure development and is around 1-1.5 per cent of the country's total GDP. I feel that steel consumption in India will only grow with the times to come.

Recently, your Vijayanagar plant in Karnataka was awarded the Deming Prize. How significant is this award for your company?

The Deming Prize is one of the highest awards on TQM (Total Quality Management) in the world. It was established in 1951 to honour Dr. William Edwards Deming who contributed greatly to Japan's proliferation of statistical quality control after World War II. His teachings helped Japan build its foundation by which the level of Japan's product quality has been recognized as the highest in the world. Although Tata Steel has already been awarded this in India earlier, winning this is truly significant for us as it exhibits the highest quality standards. The selection process is very stringent and there is a committee which looks into each and every part of our practice and then decides on this. Besides our Vijayanagar plant in Karnataka, we now intend to implement TQM across all our steel manufacturing units. TQM implementation at our plant in Salem in Tamilnadu is on track and its implementation at Dolvi Works in Maharashtra is expected to be completed by 2020.

What about your company's expansion plans in terms of production capacity?

In India, we have steel plants in seven locations. We also have steel plants at foreign locations too, with two in the United States and one in Italy. In India, our aim is to reach a production capacity of around 40-45 MTPA by 2030. Currently, we have around 19 MTPA, which is the combined capacity from all our plants in India. With current investments we aim to reach 24 MTPA by 2020 from our Indian operations. At the same time, we have a global presence and are present in around 100 countries.

REVITALISING INDIA'S MINERAL EXPLORATION SECTOR

A recent news report suggested that India has a mineral trade deficit of Rs 3.2 lakh crores per annum currently. Ironically, mineral imports are mostly for commodities like coal, gold, diamonds, iron ore, bauxite, zinc, lead, copper, silver and manganese, and the deficit accounts for 3 to 95% of the supply. Whereas, for most of these minerals, India has excellent geological potential. However, the unique operationalising elements of India's new minerals code, MMDR Amendment Act, 2015, has effectively stalled any opportunity for the best private sector explorers make mineral discoveries in India. The code splits the "mineral value chain" into two, where the accountability to carry out risky exploration leading to a Geological Resource establishment rests with the government using tax-payer's money, and the miner only thereafter gets to mine after winning the mineral asset through a rigid e-auction process.

Lately, however, a realisation has dawned that private sector participation in India's mineral exploration programme is necessary. Hence the fund collected through the National Mineral Exploration Trust (NMET) is being contemplated to be used for attracting international explorers on contract terms. But this process is unlikely to revitalise the stalled exploration to the desired level.

Since 1970s very few effective Greenfield exploration programme have been carried out in India leading to mineable discoveries, except during the phase between 1998–2008, when private sector exploration resulted in discoveries of diamonds, precious metals, basemetals, rare earth elements and other potentially mineable targets.

(Continued on Page 7)...

Globally, after the economic depression of 1973-75, foreign direct investments (FDI) and domestic private sector investments led to a boom in mineral discoveries. India, however, showed a reverse trend during this period, with no major discoveries after Rampura Agucha (zinc-lead), Malanjkhand (copper) and East Coast (bauxite) deposits. Only the exploration window, opened between 1998-2008, resulted in the discovery of three world class deposits viz. the Bunder diamond deposit through Greenfield exploration by Rio Tinto and the brownfield extension discoveries at Rampura Agucha (zinc-lead) and Sindesar Khurd (zinc-lead) by HZL-Vedanta. These successes generated significant interests in India's pre-2015 mineral permitting regime. When India moved into the current permitting regime on 12 January 2015, over 66,000 applications to explore or mine were waiting at various statutory gates of the States and the Centre, most of which got cancelled automatically.

MMDR-2015 aspired to bring in transparency to the process of allocation of mineral assets. However, for reasons unknown, the new act also replaced the successful (exclusive) Reconnaissance Permit (RP) process of the earlier regime by a provision of Non-Exclusive Reconnaissance Permit (NERP). MoM has since discovered that there are almost no takers for the NERP.

Another quirky element of the new code, brought in to facilitate a rigid e-auction process was the necessity to meet the Evidence of Mineral Content (EMC) Rule criteria before dispensing the mineral asset. The EMC meant that only those assets could be dispensed to miners, where a Geological Resource through a detailed drilling have been pre-established. The Geological Survey of India (GSI), Mineral Exploration Corporation Limited (MECL), Indian Bureau of Mines (IBM) and the State Directorates have since struggled to generate EMC compliant assets. In three and a half years since the new act, intense efforts by State agencies have succeeded in generating less than a dozen odd small blocks of gold, base-metals and tungsten, apart from some blocks for bulk commodities like limestones, iron ore (including old lapsed mining leases) and bauxite, in this country of 3.2 million km^2 area! The GSI, which generated the finest quality baseline geological, geophysical and geochemical datasets since independence and identified 0.5 million km^2 of obvious mineral potential (OGP) area in the country, now finds that less than 10% of the area have been explored in any detail, of which most of the defined assets for mainly bulk mineable commodities like iron ore, coal, bauxite and limestone are already licensed!

The fact that a ground exploration of a hundred targets may lead to only one developing into a viable mine, indicates that exploration is a risky business. This means that discovery of another Bunder Diamond Deposit may require up to rupees 2000 crores for exploration, if not more. To achieve the government's self-stated objective of doubling the mineral sector contribution to the GDP, India needs to discover minimum of two Bunder deposits every year. The rupees 400 crores being collected annually in the NMET fund, is thus grossly inadequate to carry out the desired exploration in India.

Policy mandarins of the NITI Aayog and MoM have to realise that the intellectual capabilities of exploration is a restricted domain of few experienced geologists in the world, who specialise in specific commodities of a particular style of mineralisation occurring in a specific terrain type requiring the use of specialised exploration tools.

Such exclusive capabilities rest with a handful of junior and major mining companies of the world. India needs to attract these miners by allowing them the security of title over their discoveries. Additionally, the elements of the act must provide an ecosystem, where specialist geologists from mining companies have the freedom to select the areas to explore from freely available baseline data and invest without a fear that these assets could be taken away by the government for a re-auction.

Biplob Chatterjee is the Director and CEO of Geovale Services who was conferred with the National Mineral Award in 1996. Aparna Roy is an Associate Fellow at ORF

COAL BLOCKS: ADANI-LED JOINT VENTURE GETS SC NOTICE

The Supreme Court on Tuesday sought response from Adani Enterprises-led joint venture Parsa Kente Collieries to a plea seeking deallocation of two coal blocks in Chhattisgarh and filing of a criminal case for violation of allotment agreement that caused financial loss to the exchequer.

The Supreme Court on Tuesday sought response from Adani Enterprises-led joint venture Parsa Kente Collieries to a plea seeking deallocation of two coal blocks in Chhattisgarh and filing of a criminal case for violation of allotment agreement that caused financial loss to the exchequer. The coal blocks in question are Parsa East and Kante Basan that were allotted in 2007 to Rajasthan Rajya Vidyut Utpadan Nigam, which chose Adani as the mine-developer and operator. Parsa Kente Collieries is a joint venture between Rajasthan Rajya Vidyut Utpadan Nigam and Adani Enterprises in which the latter has a majority stake of 74%.

A bench led by Justice M B Lokur issued notice to Parsa Kente Collieries on an application filed by a Chhattisgarh-based lawyer Sudiep Shrivastava alleging that the JV was formed in contravention of the apex court's earlier order on coal block allocation and in the Coal Mines (Special Provisions) Act 2015. He further sought cancellation the joint venture (JV) agreement for Parsa and Kente extension coal blocks and filing of a criminal case against officials of Rajasthan Rajya Vidyut Utpadan Nigam, ministry of coal, Parsa Kente Collieries and Adani Enterprises.

(Continued on Page 8)...

He told the bench that the Rajasthan Rajya Vidyut Utpadan Nigam had been buying coal at inflated prices from the Adani-led JV violating the conditions of the allotment agreement in a 'wilful manner' causing financial loss to the exchequer. Parsa Kente Collieries is a part of the Hasdeo-Aran Coal fields in Chhattisgarh, with a reserve of 450 million tonnes of coal.

Seeking cancellation of the joint venture and the coal block allocation, the plea sought a direction to Rajasthan Rajya Vidyut Utpadan Nigam to recover the extra money paid to the Parsa Kente Collieries and taken away by Adani Enterprises. "As per new law, any PSU which secured allotment through nomination basis without any auction, cannot transfer any interest to a private company and in the instant case up to 29% production has been allowed to private party in the garb of reject. Even thepowers conferred to the JV includes identification of coal block to land acquisition to mine and operate virtually makes the private party the owner of the mine which is impermissible…The ministry of coal has allowed the continuance of the old JV and CMDA in violation of the coal block judgement and the new law governing the sector," the application stated.

According to Shrivastava, the said arrangement was also impermissible in current regime as it prevented the benefits of having a captive coal block reaching to the allottee (Rajasthan Rajya Vidyut Utpadan Nigam), and thus from passing it on further to its consumers. The Supreme Court had on in September 2014 quashed the allocation of 204 coal blocks allotted to various companies between 1993-2010. It was subsequently held that any joint venture companies set up so as to transfer the mining rights to a private company were illegal under the Coal Mining Nationalisation Act, 1973.

KARNATAKA PLANS FRESH TENDERS FOR DONIMALAI IRON ORE MINES SEEKING 80% PREMIUM; NMDC SUSPENDS OPERATIONS

The Karnataka government is in the process of calling for fresh tenders of Donimalai iron ore mines and may go in for auction in case the state-owned NMDC does not sign the contract agreeing for 80 percent premium in the next three weeks, sources close to the development said.

However, PR Tripathi, former CMD of NMDC says the imposition of 'heavy' premium on a public sector undertaking is not tenable as per law.

NMDC has suspended iron ore mining from its Donimalai mine in Karnataka following the state governments decision to impose 80 percent premium on ore sales from that mine whose lease has been extended by the Karnataka government with effect from 4 November for a period of 20 years.

Based on the request by the CMD of NMDC (N Baijendra Kumar)the matter was again referred to the Karnataka advocate general. But instructions have gone to the officials concerned to prepare fresh tender document for auction of mines allotted to NMDC if they don't execute the lease documents in the next three weeks. Because the AG may not give a different opinion than what he has already given," sources told PTI.

When contacted, Karnataka mining secretary Rajendra Kumar Kataria justifying the premium, said the state law department gave its opinion and the state cabinet had also approved imposition of the premium.

Tripathi alleged the state government became greedy and said the premium is applicable only in case of fresh auctions of mines but not for lease renewals.

"The state government is blinded with the concept of revenue. The Karnataka government has become so greedy that they are looking at the short-term revenues. If any company (PSU) pays 80 percent premium it cannot survive. This is legally not valid. It is valid only in case of auctions. This is not an auction but lease renewal. The issue has to be resolved at the level of the chief minister. The chief secretary should be sensible enough to understand the issue," Tripathi said.

The Karnataka cabinet has approved the mining lease of Donimalai till November 2038, on payment of 80 percent of the average sale value as published by Indian Bureau of Mines, Kataria said.

According to him, the state in the recent past had auctioned 12 mines where the weighted average of the premium was more than 110 percent and NMDC also participated for mines for which it offered 95 percent and 105 percent as premium.

A senior official of NMDC said if the Karnataka government decides to stick to the 80 percent premium, the miner would be losing Rs 1,348 per tonne and may result in a loss of Rs 944 crore per annum as it mines about seven million tonnes per annum from that mine.

ADANI FACES NEW HURDLE OVER HUGE WATER PLAN IN DROUGHT-RAVAGED QUEENSLAND

The federal government faces a legal challenge after sanctioning a plan by Indian mining giant Adani to pump billions of litres of water from a river in drought-stricken central Queensland to feed an open-cut coal mine.

The Federal Court action by the Australian Conservation Foundation threatens to further delay the controversial Carmichael mine, which Adani last week announced it would self-finance

(Continued on Page 9)...

and soon begin constructing.

The legal action challenges Environment Minister Melissa Price's decision to waive a full environmental assessment for a pipeline that will extract up to 12.5 billion litres of water a year from the Suttor River in central Queensland.

Large coal mines require federal approval if they are likely to have a significant impact on a water resource. This is known as the water trigger, and it means projects undergo a higher level of scrutiny than that applied by local and state assessments, including input from an independent expert scientific committee.

Adani had claimed the water trigger applies only to water used in the extraction of coal, and should therefore not be applied to its plan, which it calls the North Galilee Water Scheme.

Coal mines can use water to wash coal, suppress dust, cool down equipment and reduce the risk of fires.

The Department of the Environment and Energy haspreviously defended the decision, saying "stand-alone proposals which involve only associated infrastructure, such as pipelines, are not captured by the water trigger because they do not directly involve the extraction of coal".

The Australian Conservation Foundation, represented by Environmental Defenders Office Queensland, will argue Ms Price made an error of law in not applying the water trigger. It says the pipeline would not be built if not for the mine, and is essential to its operation.

The foundation's chief executive Kelly O'Shanassy said the water volumes Adani sought to extract every year were "nearly as much as all local farmers combined".

"Our climate is breaking down and Queensland is in the grip of drought. This is not the time to be reckless with our water," she said.

The foundation says local wetlands also rely on water from the Suttor River.

The Carmichael mine has faced eight years of delays, including legal challenges and a failure to secure private sector finance. The initial scale of coal extraction and an associated rail line have been dramatically reduced in that time.

Despite Adani's funding announcement last week, a number of hurdles remain. State and federal environmental management plans are yet to be finalised and traditional owners have opposed the potential cancelling of native title rights. The Queensland government is also investigating Adani over groundwater bores allegedly sunk without approval.

Ms Price's office said it would not comment on a matter before the courts.

In a statement, Adani said the legal action would not stop the Carmichael project because work could begin without the water scheme being finalised.

It accused the ACF and the Environmental Defenders Office of "wasting the court's time and resources, while also wasting taxpayer funds and the ACF's own charitable donations".

"Adani will continue to deliver the Carmichael project, and we will do so in line with our approvals, along with the strict regulations and legislation that govern our Australian resources industry," it said.

"Adani's approvals have already been backed by the courts nine times over and still anti- mining activists reject the process."

The company says the volume of water to be pumped from the river catchment has already received environmental approval and the Queensland Government has granted a water licence.

Environmental Defenders Office Queensland chief executive Jo-Anne Bragg said the scale of the water project "makes it vitally important we get the process right".

"The community has a legitimate interest in seeing that big mining corporations like Adani comply with the law, and that they get the same treatment under the law as everybody else," she said.

GOA COUNTING THE COST OF IRON-ORE MINE CLOSURES

The government of the western Indian coastal state of Goa has estimated that it is losing $214-million a month in revenues, following the closure of all iron-ore mines since March.

With neither the state, nor central government succeeding in ensuring resumption of mining operations by December, as planned earlier in the year, the Goa government said that the livelihoods of 250 000 people have been directly hit by the Supreme Court's closure of the mines.

According to the government, 25% of the state's economy has been impacted by closure of the mines, if total direct and indirect employment in the mining sector is taken into consideration.

A union of mining-dependent people states that about 5 000 workers directly employed in mines have been rendered jobless, while another 6 000 truck drivers have been benched indicating the spiraling impact on allied sectors.

All iron-ore mines in Goa was forced to down shutters from March 15, following an order of the Supreme Court in February this year, which held that lease renewals of all mines by the Goa government were illegal as such renewals were not through mandatory auction as laid down in the Mines, Minerals Development and Regulation Act 2015.

In a bid to force both state and central governments to ensure resumption of mining operations, about 3 000 people directly associated with mining industry are planning to lay siege to New Delhi from December 11, to coincide with the winter session of Parliament. It is expected that through their three-day sit-in in the capital attention from across the political spectrum will result.

Various allies of the Bharatiya Janata Party- (BJP-) led coalition Goa government on Monday claimed that the BJP, which also

(Continued on Page 10)…

was the party in power in the central government, "lacked the political will" to get mining operations back on the rails and that the party would pay a price for inaction at the Indian national elections to be held in a few months' time.

The central government last month ruled out any legislative changes to circumvent the apex court order claiming any legal amendments would not stand up to court scrutiny.

10 TOP MANGANESE-PRODUCING COUNTRIES

Manganese may not be familiar for many investors. However, it's one of the top four metals used in the world, behind only iron, aluminum and copper. It's also the world's fifth-most abundant metal.

Manganese is primarily used to improve the properties of other metals in alloys, with about 90 percentof mined material going toward steel production. Due to struggling steel demand, manganese prices have declined gradually in recent years, and saw a 12-year low in 2015. The outlook for manganese for 2017 is cautiously optimistic; economic recoveries in countries like Russia and Brazil have helped boost the outlook for global steel demand, in turn improving prospects for manganese. Manganese also has a growing role in the development of dry-cell batteries, and its use in that sector may enhance its outlook in the near future.

1. South Africa

Mine production: 5.3 million MT

South Africa is the world's largest producer of manganese by a long shot, and in 2017 its output of the metal remained the same at 5.3 million MT. The country also holds the largest reserves of manganese, at 200 million MT.

South32 (ASX:S32,LSE:S32) is a major presence in the South African manganese space. South Africa Manganese, one of the company's four operations in South Africa, is made up of Metalloys and Hotazel Manganese Mines, which is owned by Hotazel Manganese Mines Proprietary. Notably, Hotazel Manganese Mines is located in the manganese-rich Kalahari Basin, which holds 80 percent of the world's known manganese ore resources.

2. China

Mine production: 2.5 million MT

China was the second-largest producer of manganese last year, recording output of 2.5 million MT; that's a bit more than the 2.33 million MT it produced in 2016.

As mentioned, the country is a major consumer of manganese as it uses large amounts of the metal in steelmaking. A manganese reserve believed to contain 203 million tonnes of manganese ore was discovered in the country last year, and local authorities believe it is the largest in Asia. However, there's been no word yet as to when or if it will be mined.

In the meantime, reports show that world supply of manganese and silicomanganese is high this year due in large part to Chinese output.

3. Australia

Mine production: 2.2 million MT

Last year, Australia's manganese production decreased slightly to 2.2 million MT from 2016's 2.24 million MT. Though South32 is a key player in the South African manganese space, it also has manganese operations in Australia. Australia Manganese, which the company has a 60-percent stake in, is made up of the GEMCO open-cut manganese mine and the TEMCO manganese alloy plant.

According to the company, GEMCO is one of the world's lowest-cost manganese ore producers. Anglo American (LSE:AAL) holds the other 40-percent interest in Australia Manganese. In July, Australia Manganese reported a 10-percent increase in production year-on-year for the 2018 financial year.

4. Gabon

Mine production: 1.6 million MT

In 2017, Gabon was the fourth-largest producer of manganese. The country produced 1.6 million MT of manganese, slightly down from the 1.62 million MT it put out in 2016.

The Moanda mine is a key manganese operation in the country. ERAMET (EPA:ERA), the world's second-largest producer of high-grade manganese ore, operates the mine through its subsidiary COMILOG. In 2017, ERAMET's overall manganese production totaled 4.1 million tons. According to a recent press release, ERAMET is on course to break a new record for production in 2018.

5. Brazil

Mine production: 1.2 million MT

Brazil produced 1.2 million MT of manganese in 2017, slightly more than it put out in 2016. Major miner Vale (NYSE:VALE) is the largest manganese miner in the country, and accounts for a whopping 70 percent of its market. According to the company, 80 percent of its manganese comes from the Azul mine. Like China, Brazil is a consumer of manganese in addition to being a top producer of the metal. Aninfographic from Visual Capitalist suggests that in the future, much of the manganese that Brazil uses could to go the agricultural sector. The country is a major supplier of agricultural products, but the land it uses to produce those products is low in manganese. As a result, the country's demand for manganese is expected to grow in coming years as farmers look to improve crop health.

6. India

Mine production: 790,000 MT

In 2017, India was the sixth-largest producer of manganese. It produced 790,000 MT of the metal, off slightly from 2016's 745,000 MT.

(Continued on Page 11)...

As with China and Brazil, the country is a big consumer of manganese as well as one of the top producers in the world. Unfortunately, that could pose problems for India in the years to come — according to the Indian Ministry of Mines, the country will face a shortage of manganese for steel production by 2020. The organization's report, "Manganese Ore: Vision 2020 and Beyond," outlines the need for increased production to support growing domestic manganese demand.

7. Ghana

Mine production: 550,000 MT

Ghana's 2017 manganese output clocked in at 550,000 MT, nearly the same as it put out in 2016. Most manganese in the country is mined in the area around Takoradi.

Consolidated Minerals, better known as Consmin, is one of the four largest producers of manganese in the world by volume, and holds a 90-percent stake in Ghana Manganese Company, which runs the Nsuta mine. According to its website, Nsuta has total reserves of 45.01 million MT grading 28.16 percent manganese, and total resources of 101.3 million MT grading 26.8 percent manganese. Consmin signed a 10-year supply deal with China's Ningxia Tianyuan Manganese Industry in 2018.

8. Ukraine

Mine production: 380,000 MT

Ukraine came in as the eighth-largest producer of manganese. The country produced 380,000 MT of manganese in 2017, a decrease from the previous year, when it put out 425,000 MT. The country has the second-largest reserves of manganese in the world, at 140 million MT. According to S&P Global Platts, Ukraine exported 936,700 MT of ferroalloys in 2017, a number that includes the country's manganese products, such as silicomanganese and ferromanganese. At the same time, Platts says Ukraine imported manganese ore and concentrate from Ghana, South Africa and Gabon. As of August, the country's manganese imports were up 1.5 percent year-on-year in 2018.

9. Malaysia

Mine production: 270,000 MT

Malaysia put out 270,000 MT of manganese in 2017, a small increase from the previous year. Roskill notes that over the past decade Malaysia has gone from producing almost no manganese to annual output of over 200,000 MT. Malaysia's manganese is found in the states of Johor, Kelantan, Pahang and Terengganu. According to the International Manganese Institute, silcomanganese production has risen this year and been driven by China and Malaysia.

10. Kazakhstan

Mine production: 230,000 MT

Kazakhstan bumped Mexico from the top 10 last year. The 10th-largest producer of manganese put out 230,000 MT of manganese in 2017; that's up slightly from 212,000 MT the year prior. The country has reserves of 5 million MT of manganese.

Privately owned Eurasian Natural Resources runs multiple manganese mines in Kazakhstan.

THE FINAL FRONTIER: WHO OWNS THE OCEANS AND THEIR HIDDEN TREASURES?

Ransom-hungry pirates, polar explorers, offshore oil giants - the race for the riches of the world's final frontier is on.

From Thailand to Alaska, the battle to tap ever-dwindling resources from minerals to fish is spurring new conflicts over who has the right to the treasures of the deep seas.

As India, China and Brazil seek new sources of cobalt, copper and nickel to build the gadgets demanded by their booming populations, they are preparing to mine a new realm - the dark depths of the ocean.

Over the next decade India will spend more than $1 billion to develop and test deep-sea technologies - including human-piloted exploration submarines - in the Indian Ocean that could give access to once inaccessible mineral riches up to 6.8 miles (11 km) under water.

"We have to depend on ocean resources sooner or later ... there is no other way," said Gidugu Ananda Ramadass, head of India's deep-sea mining project at the National Institute of Ocean Technology in the southern city of Chennai.

But mining the seas - home to the vast majority of life on Earth - carries huge risks and could cause irreversible damage to the environment, campaigners warn.

Oceans - which scientists say are less understood than the moon or Mars - cover more than 70 percent of the Earth's surface, yet less than 20 percent of their seafloor has been mapped or observed, according to the U.S. National Oceanic and Atmospheric Administration (NOAA).

And what lies below the waves is worth trillions of dollars.

The so-called "blue economy" of marine resources is expected to contribute $3 trillion to the world's GDP by 2030 - equivalent to the size of the UK economy - up from $1.5 trillion in 2010, according to the Organisation for Economic Co-operation and Development (OECD).

But from overfishing, to a rush to mine deep seas, to slavery on fishing boats, the world's oceans are a source of growing dispute, not least over who should get access to them.

(Continued on Page 12)...

Experts say oceans are a neglected area of global governance despite the United Nations' 1982 Convention on the Law of the Sea (UNCLOS) and the 193 member states agreeing in 2015 to a global goal to sustainably manage and protect marine resources.

"Oceans' governance is the classic public good challenge," said Dominic Waughray, head of the World Economic Forum's Centre for Global Public Goods.

Smart rules are essential to keep oceans healthy - but because nobody owns them, "we have a real problem", he said.

Liz Karan, senior manager for the high seas at Pew Charitable Trusts, a non-profit organization, said existing regulations were patchy and had struggled to protect ecosystems in international waters.

But a proposed U.N. treaty to protect ocean biodiversity - and prevent over-exploitation - could change that.

Negotiations on a legally binding treaty – which would cover the high seas, or ocean areas that extend beyond national boundaries capped at 200 nautical miles from coasts – began in September and aim to reach an agreement by 2020.

But government and U.N. action are only part of the answer, experts caution.

"Governments are good at setting targets, but to really get things done you're going to need more than hoping U.N. agencies alone can fix this," said Waughray.

He said technology and monitoring tools to enforce the would-be treaty would be crucial.

So who are the main players controlling Earth's final frontier? And how will the global hunt for resources affect the communities who now depend on the seas to survive?

FISHING UNDER THREAT

From fast-expanding tourist resorts to disputes over maritime borders, fishing communities are finding their main source of income increasingly under threat.

In southern Thailand, a tourism boom is pitting the Chao Lay, or people of the sea, against land developers, while marine conservation efforts also limit their traditional fishing grounds.

"Our lives have changed. We have to go further and dive deeper to catch fish, and that is affecting our health," said Ri Fongsaithan, an Urak Lawoi community elder.

Some Chao Lay have taken their plight to the courts, fighting eviction from their homes.

According to Brad Adams of Human Rights Watch, an advocacy group, the Chao Lay "generally do not assert ownership rights because they believe that land and water should not be owned or controlled by one person, but rather shared by many".

The legal fight over the sea is also playing out at national levels.

The Latin American nations of Colombia and Nicaragua, for instance, have for decades fought over a cluster of islands in the western Caribbean - and the fishing rights around them.

In 2012, a ruling by the International Court of Justice redrew the maritime borders around the archipelago of San Andres, Providencia and Santa Catalina in favor of Nicaragua, reducing the expanse of sea belonging to Colombia.

The loss of waters – and of income – has hit the islands' artisanal fishermen hard, with some saying the money they make from fishing cannot even pay for the fuel to power their boats.

"Our territory at the end of the day is the ocean," said Erlid Arroyo, secretary of agriculture and fishing at the governor's office in San Andres. He estimated lost income from the court ruling at "millions and millions of dollars".

But the crisis has spurred a rethink of the island's fishing industry, he said, with the government training fishermen to catch fish in other areas and make more of their catch.

These islands' underwater riches might not last, however. In the last few decades, the oceans have undergone unprecedented warming while currents have shifted.

From the waters off the east coast of the United States to the coasts of West Africa, the changes are causing fish and other sea life to seek out new waters - leaving the communities that depend on them facing disruption as a result.

For other communities, fishing regulations present the most potent threat.

For decades the Inupiaq, a Native Alaskan group living north of the Arctic Circle, have argued that international limits on subsistence whaling were not big enough to meet their food needs.

"They controlled what we could hunt and what we could eat," said Roy Nageak, a retired whaling captain, referring to when the International Whaling Commission (IWC) set quotas on catching bowhead whales in 1977 to protect existing stocks.

The Inupiaq hired scientists to convince the IWC that whale stocks were still healthy and to increase the quota, said Crawford Patkotak, an Inupiaq whaling captain.

Then ensued a constant struggle to negotiate and renew whaling quotas with the IWC - which expired every five-six years - the indigenous group said.

Inupiaq leaders welcomed the International Whaling Commission's decision in September to reaffirm their shared quota of 56 whales per year, increase the number of unused strikes permitted to carry over into the next year, and to renew aboriginal quotas automatically.

"We'll now be able to hunt in peace without the anxiety of worrying about an expiring quota," said Patkotak.

DIGGING DEEP

Much of the quest for ocean resources, however, lies not near its surface but in its depths.

Technological advances and growing demand for minerals used in consumer electronics have fueled a rush to mine the deep seas.

When Oscar-winning director James Cameron ventured in 2012

(Continued on Page 13)...

on a record-breaking solo dive to the deepest-known place on Earth in the Pacific Ocean, he described a flat, desolate landscape, 50 times larger than the Grand Canyon.

But new technology like autonomous robots and deep-diving submarines could allow scientists to unearth treasures like copper, nickel and cobalt.

Resource-hungry countries are racing ahead in the hunt for minerals, with India planning to explore a 75,000-square-km (29,000-square miles) area of the Indian Ocean - equal to about 2 percent of the country's size.

"We are exploring Mars, we are exploring the moon. Why don't we explore our own oceans?" asked Ramadass, of India's National Institute of Ocean Technology.

China, the world's second-largest economy, is seeking minerals in the eastern Pacific Ocean. And Brazil has won rights to explore the Rio Grande Rise off its southeastern coast, in the southern Atlantic Ocean.

"The more (natural) resources are exhausted on the continent, the more interesting marine mining will become," said Lauro Julio Calliari, an oceanographer at Brazil's Federal University of Rio Grande do Sul.

But, with little of the deep ocean mapped or explored, environmentalists worry about the potential loss of species not yet well understood - or even recorded.

Sediment plumes and disturbance caused by mining could wipe out habitats, including for slow-growing corals and fish, said Richard Mahapatra, managing editor of the New Delhi-based science and environment magazine Down To Earth.

In the longer run, disturbing oceans, which absorb carbon dioxide and heat, could affect how they regulate the world's climate, he added.

"We should not rush (deep sea mining). Otherwise we will head towards another disaster," he said.

The hunt for yet another ocean resource - offshore oil - could have disastrous consequences for marine wildlife, campaigners warn.

Last December, Italian oil producer Eni began drilling a new well in U.S. waters off the north coast of Alaska – the first company to drill in the area since 2015, and a move warily eyed by indigenous communities.

Arnold Brower Jr., executive director of the Alaska Eskimo Whaling Commission (AEWC), worries that potentially devastating oil spills could affect whale food sources, including krill.

"Of course we're concerned because we've seen the mess down in the Gulf of Mexico - BP's blowout," he said, referring to the Deepwater Horizon oil drilling rig that exploded in 2010, causing the worst spill in history.

SLAVERY AT SEA

Determining who owns or has the right to the ocean's resources raises another question: Who should police them?

The multi-billion-dollar seafood industry has come under scrutiny – particularly in Thailand – after investigations showed widespread slavery, human trafficking and violence on fishing boats and in onshore processing facilities.

Experts said slavery was also rife on fishing vessels in Cape Town's luxurious waterfront in South Africa.

Part of the problem stems from a lack of oversight on fishermen's working conditions on the high seas, said Brandt Wagner, head of the transport and maritime unit at the International Labour Organization, a U.N. agency.

The main international convention regulating crew safety and conditions on fishing vessels - called the Cape Town Agreement - was adopted in 2012 by the International Maritime Organization (IMO), a U.N. agency.

But only 10 countries have signed it, according to the Pew Charitable Trusts, a non-profit.

"So the international law which is most needed to make sure the fishing vessels are safe is not yet in force," said Wagner.

Dane du Plessis, with South African charity Biblia, has tried to identify and help exploited fishermen when their boats dock in the port of Cape Town.

"People ignore what's going on because these fishermen, they're poor, they're uneducated," he said,

Migrant fishermen told the Thomson Reuters Foundation they were routinely abused by employers, including being punched, forced to drink dirty water and subjected to racist slurs.

Experts hope that could change with stricter enforcement of fishing regulation.

In May a Taiwanese trawler was detained – and later released – in Cape Town after crew complaints about working conditions.

The detention was the first under the International Labour Organization's Fishing Convention , which seeks to improve fishermen's working conditions.

Du Plessis worries, however, that efforts to identify victims of slavery aboard fishing vessels are "only scratching the surface".

"I believe there's worse things happening," he said. "The ocean is so vast - and what happens there, none of us will know."

Authorities are trying to police another kind of criminal wreaking havoc on the seas - pirates.

While piracy has decreased worldwide in the past decade, the Gulf of Guinea off the coast of West Africa has become an increasing target for pirates who steal cargo and demand ransoms, according to the International Maritime Bureau (IMB).

Ships in or around Nigerian waters were the target of a series of piracy-related incidents last year, with 10 kidnappings involving 65 crew members, the IMB said in a report in January.

MAPPING THE UNKNOWN

Crucial to protecting oceans as pressure mounts is understanding

(Continued on Page 14)...

what lies at the bottom, experts say.

A U.N.-backed initiative, called Seabed 2030, is trying to do that by pooling data from around the world to produce a publicly available map of the entire ocean seafloor by 2030.

“Can you imagine operating on the land without a map, or doing anything without a map?” asked Larry Mayer, director of the U.S.-based Center for Coastal and Ocean Mapping, a research body that develops tools for underwater mapping.

“We depend on having that knowledge of what’s around us - and the same is true for the ocean,” he said.

The project initiated by the Nippon Foundation, a Japanese philanthropic organization, and GEBCO, a non-profit association of ocean experts, aims to improve knowledge of marine biodiversity, predict disasters and protect deep-sea resources.

From underwater drones to crowdsourced data from fishing boats, new technology could drastically speed up the mapping process, researchers said.

“With advanced sonar technology it really is like seeing. I think we’ve come out of the era of being the blind man with the stick,” said Robert Larter, a marine geophysicist at the British Antarctic Survey.

Advances in technology could also help in the fight against illegal, unreported and unregulated fishing, with theft estimated to be worth $23.5 billion a year, experts said.

A range of platforms are tracking fishing on the high seas and in marine reserves, aided by radio and satellite data that transmits vessel locations and movements, allowing authorities to identify illegal behaviour.

But political infighting is a roadblock in the way of data and knowledge-sharing, said Julian Barbiere of UNESCO’s Intergovernmental Oceanographic Commission, which is supporting the Seabed 2030 initiative.

Some countries are reluctant to share what they consider strategic data with the project, he said, largely due to national security concerns or because it comes from areas with sensitive geopolitical tensions, such as the disputed South China Sea.

But too much is at stake for countries to hoard data, he said.

“(It) goes back to this principle: the ocean is an international space by definition ... part of the common heritage of mankind,” said Barbiere.