

Written submission of the Goa Foundation before the Supreme Court Committee on Intergenerational Equity (Macro-Environmental Impact Assessment)

(Oral presentation of these points was made by a three member team of the GF on 22nd January 2014)

Dear Sirs,

We are thankful for being given an opportunity to make our submissions before this Committee on the specific task given to it by the Supreme Court of India by its two orders dated 11.11.2013 and 18.11.2013. I am accompanied today by two of my learned colleagues, Mr. Rahul Basu and Mr. Rajendra Kakodkar. They will supplement this presentation.

Mr. Rahul Basu has submitted a written note, “Implementing Intergenerational Equity in Goa.” Mr. Rajendra Kakodkar has submitted a written note on “Intergenerational equity unachievable without ban on iron ore exports.”

The two notes, together with this written submission, may be accepted as the joint submission of the Goa Foundation to this Committee.

The Supreme Court has mandated this Hon’ble Committee with an unprecedented task, which is to decide on a practical, feasible, realistic and reasonable cap on iron ore production in the State of Goa keeping in view the demand of Intergenerational Equity and Sustainable Development. In other words, provide a Macro-Environmental Impact Assessment relating to mining in the State of Goa.

The occasion for this request from the apex court was the revelations made by the Justice Shah Commission of Inquiry in its Report on Illegal Mining in Goa.

The Justice Shah Commission determined that permissions for extraction of some 65.692 mt of iron ore from the State of Goa had been granted by the various statutory authorities including the Ministry of Environment & Forests (MOEF) and the Indian Bureau of Mines (IBM). From the information made available to the Commission, it appeared that the total quantum of iron ore reserves in the State of Goa was in the region of some 927 mt of which some 577 mt remained for

extraction in the ground (when mining activity was suspended on 10.9.2012). (See chapter 6, Report of the Shah Commission of Inquiry).

The Commission therefore arrived at the conclusion that at an extraction rate of 65.5 mtpa, iron ore would be exhausted in the State of Goa in approximately 9 years.

The Commission determined that this extraction rate had been allowed without consideration of the demands of intergenerational equity and sustainable development – both of which have been declared law of the land by the Supreme Court in several of its judgments.

It also became apparent during the Court's hearing of the Goa Foundation petition (No.435/2012) that there was nothing in the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) or its Rules, which require that the statutory authorities approve mining plans or grant any other clearances keeping in view the need to comply, or be in harmony with, the requirements of these two principles.

It was clear that the MoEF had granted environment clearances without having any idea of the total quantity of ore that could be allowed for extraction in the state of Goa. Neither had the IBM, when approving individual Mining Plans and Mining Schemes, conducted itself any differently.

Thus both these principles – which are part of Art.21 (Right to Life) – were violated in the grant of the approvals for mining activities in the state of Goa:

a) Intergenerational activity was being violated as bulk or almost all the ore would be removed within the present generation and therefore it would not be available to the coming generation in any form. In fact, since the extraction rate enabled total removal of ore in 9-10 years, even the demands of the present generation would go unmet.

b) The extraction of approximately 65.5 mt could not be made without considerable damage to ecological assets including wildlife sanctuaries and their buffer zones, biodiversity rich areas of the Western Ghats, forests, water bodies, water sources, agriculture lands, etc., protection of which is also a part of Art.21.

Thus the Court, considering that we were dealing with a publicly owned resource, was keen to be advised on what extraction rate would allow meaningful intergenerational equity demands and also ensure that the natural environment was not undermined beyond recovery or rehabilitation. It therefore decided that this task be given to a special committee of experts. Though the task set was unprecedented and without adequate guidelines, the answer sought by the Court was very precise and concrete: what should be a suitable cap in terms of tpa equivalent on iron ore production in the State of Goa, considering both the demands of environment protection and the demands of intergenerational equity.

This presentation is designed to assist the committee in its task and to present to the committee the results of considerable work that has been done on this matter by the members of the petitioner organisation.

The judiciary within India and internationally has itself done considerable thinking on both the principles of intergenerational equity and sustainable development. There are several outstanding judgements and findings in which executive decisions in several countries have been made to run the gauntlet of the two principles and failed. The executive decisions have then been set aside.

The Supreme Court in several judgments has held that “inter-generational equity” is part of the principle of “sustainable development” which is an important facet of Right to Environment and Right to Life guaranteed under Article 21 of the Constitution. In the Glanrock case (2010) 10 SCC 96, a 3 judge bench of the Court held in the case of another natural resource, forests:

“Forests in India are an important part of environment. They constitute national asset. In various judgments of this Court delivered by the Forest Bench of this Court in the case of [T.N. Godavarman v. Union of India](#) [Writ Petition No. 202 of 1995], it has been held that 'inter-generational equity' is part of Article 21 of the Constitution. What is inter-generational equity? The present generation is answerable to the next generation by giving to the next generation a good environment. We are answerable to the next generation and if deforestation takes place rampantly then inter-generational equity would

stand violated. The doctrine of sustainable development also forms part of Article 21 of the Constitution.”

The solution imposed by the Supreme Court in the form of Net Present Value (NPV) and compensatory afforestation costs (through CAMPA Fund) assessed carefully by experts including Kanchan Chopra Committee, Forest Survey of India and CEC is very close to what is now proposed in respect of other natural resources like iron ore. The committee would therefore be benefited by a study of the judgements and expert committee reports relating to the *Godavarman* case.

However, the Supreme Court was concerned that there did not seem to be practical workable proposals available which ensured that the demands of economic development were being balanced with the demands of intergenerational equity, especially in the case of mining. Petitioners submitted a detailed note to the Court on **the legal aspects of intergenerational equity**. Copy of this document is now being submitted to this committee in the second set of documents being submitted by the GF (the first being submitted already on 22nd January 2014.)

Thus the matter before the committee is of great public interest and service. Two specific grounds are listed below:

a) The Supreme Court has already determined in its judgement on allocation of natural resources in the 2G scam and in the Presidential Reference on the 2G scam judgement, that natural resources could only be allocated through the process of public auction. What this committee therefore decides would have in some sense material bearing on this issue since iron ore is a natural resource owned by the state and the people of Goa and is to be used and exploited in the manner that would bring the maximum benefit to the people of the state and not necessarily for enhancing the budgetary allocation of the state.

It is an admitted position that the existing leases have been granted without the authority (erstwhile colonial regime) being aware that the real value of the ore has not been taken into consideration.

Since the grant does not acknowledge the value, and the leases have been privatised, much larger amount of production is required to get the same revenue as would entail from smaller quantities being extracted under state ownership. Thus, State of Goa received only in the last two years each, approximately Rs.900 crore in royalty on production exceeding 45-40 mt. However, it could get the same revenue on 5 mt extraction, provided its capture rate of the value exceeds 50%. Thus who is extracting also has a great bearing on a cap.

b) The MMDR Act is sought to be replaced by a new legislation which has been approved by the Cabinet but is yet to be passed by Parliament. The reason for delay in the passing of the bill is not known. However, the delay is not really a disadvantage as the findings of this committee would become available to the government and hopefully be also reflected in the final draft of the new Act. Though public auction is part of the proposals in the new bill, the issue of intergenerational equity has however not been addressed even in the new proposed legislation.

What this committee therefore finally determines as a cap (and why) is of interest and importance not just to Goa but to the rest of India where similar type of mining activity is taking place.

The present proceedings in the Supreme Court are also being closely followed by several countries over the world. Many countries are actively grappling with these issues. My colleague Rahul Basu will show the committee how some of these countries (including Botswana and Norway) have successfully dealt with the demands of intergenerational equity. We also need to have the latest thinking from institutions, including the World Bank, regarding the economic aspects that have an essential bearing on intergenerational equity.

One final suggestion before I move on to the specific environment issues involved. This is the question of data on iron ore reserves made available to the committee. The state government has admitted in writing to the Central Empowered Committee that the data available with the government of ore extracted in the last

half a dozen years is in a complete shambles (see letter dated 27.11.2012 from the Chief Secretary to the CEC). I quote:

“Before answering the issues raised, the State government would like to place before the CEC that the previous regime in Goa had failed to discharge its constitutional obligation to regulate mining in the State and ensure sustainable mining that does not compromise the fragile ecology and environment of the State. It had failed to enforce and regulate mining in the state of Goa, inspections were a rarity rather than the norm and record keeping and reconciliation of returns filed were in shambles, records and returns filed by the lease holders were not maintained properly and in most cases hardly any record of transactions carried out was available in the department.

“The newly elected Government has found illegalities and acts of omissions and commission besides active connivance of politicians of the previous political regime and officials in flouting rules to promote and perpetuate illegal mining for personal benefit, the same has been highlighted in the case filed by Goa Foundation, in the report of the PAC, whose Chairman is the present Chief Minister, and to a large extent confirmed by the report of the Shah Commission; but all these irregularities and illegalities were committed in the past.”

In fact, no sanctity can be given to any record relating to reserves or production submitted by any of the mine lease holders in their statutory submissions (H1/F1) to the Indian Bureau of Mines and other authorities. What is truly amazing is the fact that no authority examined the data provided by the mine lease holders in these forms or even noticed the massive discrepancies.

Despite several orders of the Central Information Committee, the Indian Bureau of Mines is still extremely reluctant and unwilling to make available authentic data of iron ore reserves in the state of Goa – and a related issue, the quality of ore available in the state – on its website. There is no data of the quality of ore going out through Panaji minor port. This committee must requisition the data and demand urgent submission.

This committee must also go for a careful examination of Report of the Standing Committee on Coal and Steel (2012-13) of the 15th Lok Sabha which has unanimously recommended a complete ban on the export of ore from this country to the government. The committee has rubbished the proposal that low grade ore and findings cannot be used in this country. However, my colleague Mr. Rajendra Kakodkar has dealt with this issue in his note, so I am not going into any further details.

This committee is reporting to the Supreme Court and therefore it has all the powers of a committee of the Supreme Court to call for data from any of the statutory authorities, institutions and agencies in the country to enable it to come to a considered expert opinion for placing before the Hon'ble Court. I hope this committee will utilize these powers available to it in the course of its duties.

What earlier expert bodies have said on the need to impose restrictions on mining in Goa (with implications for capping)

In arriving at a cap on the extraction of iron ore in the state of Goa, this committee may be guided by a perusal of earlier reports which have a significant bearing on these issues. I am referring to these reports with one single proposal: *the cap should not be considered keeping in mind the annual production figures of the past 5-6 years which are based on extraction for over 100 mines, but should be only in relation to those mines permitted in principle for operation.*

The first Macro-EIA is a major environment impact study sponsored by the Goa government in 1997 from **The Energy Research Institute (TERI)** called “Area wide environmental quality management (AEQM) plan for the mining belt of Goa.” A copy of this study has been submitted over to the Committee by us on 22.1.2013.

Till the ISM study (2013), this was the only comprehensive study dealing with both EIA and EMP for the mining industry as a whole, that too, when the total annual production was in the region of an average of 13 million tonnes. Even at this lower production rate, the damage done to the environment by mining

operations then was extremely severe. The report establishes widespread non-compliance with environment laws.

The TERI study did not suggest a cap but it recommended certain payments per ton to be taken from the mining companies and lease-holders for rehabilitation of the environment and for mitigating environmental impacts. Despite the report being commissioned by the Goa Government, none of its recommendations was ever implemented.

Thereafter, a comprehensive study of industrial siting in terms of a **Zoning Atlas** was prepared by the Goa State Pollution Control Board (PCB), approved by the Central Pollution Control Board and later formally adopted by a special resolution of the PCB. If one accepts the Zoning Atlas, and its siting guidelines, not a single red category industry is liable to be permitted in the entire state of Goa. Mining extractive industry is categorized as red category industry by the Goa PCB. This committee should call for a copy of the Zoning Atlas from the PCB.

Thereafter, a comprehensive **Regional Plan** governing land use was sought to be prepared for the State of Goa under the provisions of the Town and Country Planning Act, 1944. Pursuant to the decision of the government, a special Task Force on the Regional Plan was set up to draft the plan. It was chaired by the Hon'ble Chief Minister, with Mr. Charles Correira, the eminent world-renowned architect, as its Vice-Chairman. The Task Force also included Mr. Edgar Ribeiro, former Chief Town Planner, Government of Goa. The Task Force was categorical in calling for review of mining activity in the state and for its drastic reduction because of its unacceptable mining impacts. The committee may call for a copy of the Task Force report.

Subsequent to the Task Force report – which became the basis of the Regional Plan 2021 – the MOEF set up the **Western Ghats Ecology Experts Panel (WGEEP)** headed by Prof. Madhav Gadgil. This was an expert committee report on the Western Ghats and there is a specific chapter in the report on the impact of mining on the natural environment and endowments of the state.

The WGEEP recommendations classified the Western Ghats terrain in the state of Goa and other states into three major categories: ESZ1, ESZ2 and ESZ-3.

In Goa, with the exception of a handful of mining leases, majority of iron ore mining leases fell within either ESZ1, ESZ2 or ESZ3. A total of 49 mining leases fall within the ESZ1 zone of the Gadgil Panel report. These are recommended to be closed permanently in view of their location within the Western Ghats ecology sensitive areas. The Committee may therefore call for a copy of the Madhav Gadgil Panel report.

Thereafter, the MOEF appointed the **High Level Working Group (HLWG)** on Western Ghats headed by Mr Kasturirangan, member, Planning Commission. The HLWG recommended protection of Western Ghats in terms of notifying ecologically sensitive areas (ESA) village wise. If one takes the recommendations as final, a total of 38 mines fall within the ESA as determined by the HLWG and these are liable for permanent closure. A total of 36 mining leases are found overlapping in both committee reports.

Table 1 gives the list of mining leases affected by both these committees and is annexed to this written submission, together with other documents.

The ESA villages in which the 38 mining leases (identified by the HLWG) are located in the State of Goa are already subject to a direction dated 13.11.2013 issued under Sec. 5 of the Environment Protection Act, 1986 by the MOEF. No mining lease will operate in these areas if the lease period is already over. (The validity of all mining leases in the State of Goa expired as of 21.11.2007.)

Finally, the **Shah Commission** itself has made an explicit recommendation on capping the extraction of ore from the State of Goa at 12.5 million tpa. This can be found at p.45 of Chapter 6. The rationale for this figure is that it will enable mining to last for at least 50 years.

Thus it can be seen from the above that several official studies either commissioned by government – or done under the auspicious of the government – have required restriction on mining activities in view of the ecological sensitivity of the Western Ghats, an important aspect not taken into consideration when the leases were originally issued by the Portuguese colonial government.

Many of these leases are also in the one km buffer zone of five existing wildlife sanctuaries where no mining is permitted as per order of the Supreme Court, but

where mining was carried on nonetheless. The MOEF has also recommended conversion of the Madei wildlife sanctuary into a Tiger Reserve, which has a larger buffer zone of 10 km.

If one keeps these reports in the background when considering the issue of capping, then this committee's work will be made much easier, since the capping exercise would have to be considered only in relation to the production of those mining leases that can meet the test of these reports and orders. (The committee may like to keep in mind that there is a distinct policy that some expired leases outside these protected zones may be re-auctioned and may become operational in future.) This is one major aspect of my presentation.

Restrictions from forest angle

The second aspect of my presentation deals with necessary restrictions on mining required from the need to **protect Goa's forests**.

It is commonly known and accepted that bulk of mining leases are either in forest areas or forests protected under the provisions of the Indian Forest Act, 1927. Goa's forest position is reflected in the surveys carried out by the Forest Survey of India – which incidentally was also the survey relied upon by the WGEEP for its report. As per the FSI report, 60% of Goa's land area is covered by three categories of forest. I am enclosing the relevant chapter on Goa from the FSI report for the year 2012 which is the latest available with this representation.

It has also been established that a large number of mines have been working in forest areas without prior permission of the Ministry, required under the Forest Conservation Act, 1980 and orders of the Supreme Court. It is also established that in those cases, where prior permission was indeed obtained for diversion for mining activity, very little compensatory afforestation has been carried out to replace the forest that has been destroyed though the charges for both NPV and compensatory afforestation may have been collected. The committee should recommend in fact that those forest clearances must not be renewed.

The state government has already taken a decision not to allow diversion of new forest land or forests for mining except the ones earlier permitted. This statement is

explicitly made in the **Goa Mineral Policy 2013** notified in the official gazette on 28.9.2013 and filed by the State Government in the Supreme Court of India in WP 435/2012. The document is annexed with this representation.

The forests of Goa contribute significantly to reduction of green house gases, as part of the Western Ghats ecosystem. In addition, they form part of the catchment area of Goa which is subject to rainfall precipitation of 5000 mm per year.

Maximum amount of water is to be found under the forest areas: this has been scientifically established. In none of the forest clearances granted by the MoEF for mining in Goa has the water potential or water retaining capacity of these forests been part of the decision making which permitted their diversion.

Restrictions from water angle

It is our major contention that none of the authorities have considered the impact of mining on the water situation of the state.

It is not doubted that almost all the mines are located in the water catchment areas of the state and that the operations of individual mines have created conditions of drought in several mining villages in the State.

In addition, the mining leases are to be found along the river banks and adjacent to drinking water reservoirs, water treatment plants, etc. It appears that between choosing extraction of ore and conservation of water, the statutory authorities have opted in favour of the former because of the power of the mining lobby. This is hardly a wise decision in view of the fact that water scarcity is becoming a major issue in the 21st century all over the country.

In most cases, the mining activity has gone below the ground water table. There is already drought prevailing in several villages and water is now being supplied to communities by mining companies in tankers.

In the village of Sirigao, the wells do not have water even in the month of July which is the heaviest period of monsoon precipitation.

A large quantity of water is in fact extracted and disposed of in nallahs and sent to the sea thus not just destroying the ground water aquifer, but depriving local residents of water supply completely.

The MOEF was aware that mining activity in Goa in several instances would be intersecting the water table. Despite this knowledge, environment clearances were granted. The regional office of the MoEF located in Bangalore in 2005 recommended that no lease should be granted environment clearance without a proper hydro-geological study. This decision was rejected by the MoEF, which granted the environment clearances but required the mining companies to produce hydro-geological reports.

In fact, the first spate of environmental clearances was granted with a validity period of 2 years only, subject to production of hydro-geological report and without halting the mining activity or establishing any benchmark studies. As this procedure was adopted, the results were a foregone conclusion. A number of agencies were recruited to generate ground water studies in respect of specific mines. Predictably, all such studies concluded that mining would not affect the ground water.

In order to underscore this conclusion, the average extraction of groundwater on a taluka level was invoked as a benchmark or indicator by the MOEF, in order to assure public concern that the removal of groundwater in specific mines would not result in scarcity. Annexed with this representation is a sample environment clearance which shows how the water balance concerns were managed by the MOEF in favour of the mining lease holders.

Though the ECs all recommended the installation of piezometers and careful study of water levels in the neighbouring wells for at least 4-5 years, none of the lease owners bothered to carry out these studies or install the piezos. As far as the MOEF was concerned, the files containing the water balance studies together with the papers dealing with the ECs were shelved and stored away.

We now see the most extraordinary case of ground water depletion has occurred in the village of Sirigao in which three mining leases are located. The village is now facing a drought through out the year with the mining company supplying them drinking water. The impact of mining on the ground water has been established by

a careful study conducted by **NEERI** under directions of the Bombay High Court. A copy of the study is included in the second set of documents presented with this written submission.

The CEC report on mining in Goa, submitted to the Supreme Court on 7.12.2012, has categorically ruled out mining activity in those areas which intersect the ground water table. It has recommended closure of mines in areas like the Selaulim Dam catchment which presently supplies drinking water to half the people of the State. This committee should look at that report as well.

A detailed table of water requirement of each mining lease has already been handed over to the committee on 22.1.2014.

Two additional points need to be made in relation to the impact of mining on water supply in Goa.

The Goa Foundation calculated rain water precipitation on the lease areas of approximately 100 working mines in the State of Goa and found that annually this is to the extent of 35 billion kilolitres. However most of this precious liquid was allowed to go waste.

In contrast, the mining industry at its maximum extracted a mere 45 mt of ore (maximum 2010-11).

While the 35 billion kilolitres presumably nourished the areas on which they fell, the removal of 45 mt of ore was based on the destruction of natural forest, water bodies, groundwater aquifers which act as natural water filters, etc. Incidentally, the market price of a litre of water today is double the price of a kilo of ore. We are therefore actually hosting an industry that in terms of market value literally belongs to the past.

Thus, if this committee looks at mining from the water conservation point of view, in the same manner in which we have asked it to look at the closure of mining leases recommended by the MOEF Expert Committee reports on the Western Ghats, then several mining leases would have to be put permanently out of operation on these grounds of damage to water sources, and the total cap needed would have to be calculated on the basis of fewer operable mines, making this committee's task much easier.

Economic arguments for intergenerational equity and sustainable development

The following principles are argued in detail in the note of Rahul Basu and submitted for consideration of the committee:

a) If we are to sell off one asset, we need to invest as much in productive assets to keep our wealth constant and thus ensure intergenerational equity. In the absence of this, we are left to merely slowing down the rate of extraction which is bound to be arbitrary and will never meet the challenge posed by full depletion of the resource. Hartwick's rule requires that as mineral resources are depleted, investments in productive assets need to be made to at least the same extent in order to leave future generations with as much assets as the present. If the ore is no longer available, the capital generated from the sale of the ore would remain as a permanent fund for the citizens of the state.

b) For achieving this, the State of Goa should aim to capture 50% of the value of ore extracted. At present, the capture rate is less than 1%! In some countries, especially in the area of petrochemical resources, the capture rate for the State is 90%.

c) This amount should never exceed 15% of the state budget. If it does, democracy gets undermined.

d) An amount equal to the value of the mineral ore extracted should be invested by the State in productive assets which may include financial assets, or health or education, or environmental rehabilitation (needed due to past mining activity).

This committee should seriously look at number of proposals from across the world on implementation of sustainable development programmes in the arena of natural resources. If best practice proposals are adopted, environmental burden on the state will be grossly reduced, revenue will provide a cushion of income to the state and as a whole, we will also ensure productive employment and better prospects for those living in the mining belt. (For detailed arguments on this, please refer to the Rahul Basu note.)

As stated earlier, as per IBM data produced in the Shah Commission report, total reserves and resources of iron ore in Goa amount to 927.172 million tonnes. Of this, 350.000 million tonnes have already been extracted, leaving some 577.172 million tonnes in the ground. Estimated value @US 100 per tonne is Rs.3 lakh crores or more precisely, 311580 crores. This asset belongs to the people of the State. It cannot be squandered in consumption.

Rajendra Kakodkar has raised the issue of exports of iron ore from Goa to China and other countries, and shown how such exports are not in consonance with the principles of intergenerational equity and sustainable development.

Other restraints on production connected with capping

Besides the above obviously environmental aspects relating to the capping issue, this committee may also keep the following indicators relating to capping in mind:

a) **Infrastructure.** Mining activity, especially mining transport, became a nightmare to the people of the state because of inadequate infrastructure. Mining trucks blocked both sides of narrow roads, usurping public roads completely and causing enormous distress to the ordinary public. One person died every week under the wheels of a mining truck. The air pollution led to severe impacts on public health. **Capping must be related to existing infrastructure.** Mining activity cannot any more be permitted to harass the ordinary citizens living in Goa's villages as it was allowed to do in the past.

b) **Health.** Mining activity affected the health of most people living in the mining corridors. This has been well documented by TERI studies. PCB monitoring showed air pollution norms violated in all stations. Mining activity cannot be permitted if it raises so much pollution as to damage people's health. The committee may call for the TERI health study. GF can also present a copy.

c) **Employment.** The Goa Foundation is submitting a separate note on the employment aspects of current mining activity (till it was banned). However, the number of jobs in agriculture and fishing eliminated by mining activity has never been computed. Sustainable agriculture was allowed to be overtaken by an unsustainable extractive industry. Committee may note the statements of the

former Director of Agriculture on the return of people to agriculture in mining areas.

d) Cultural identity. Indiscriminate expansion of the mining activity led to a huge influx of labour from states as far away as Bihar, Jharkhand and Orissa. These created new problems and conflicts which the society, especially local communities in mining areas, were unable to deal with. The influx also severely challenged cultural identity, an important issue in the State.

Impact of various caps on production of iron ore

The point we are trying to suggest here is that there are multiple binding constraints that operate independently. For instance, there's a cap arising from existing infrastructure. There's a cap from Hartwick's rule. There's a cap from the water angle. There's a cap from forest / PA angle. Each of these caps has a different rationale, and only if the constraints are eliminated, then that particular cap can be relaxed. Therefore the need for a Macro-EIA.

The capping issue becomes paramount simply because large portions of Goa are eco-sensitive. This is shown in the RP-2021 (taking into account PAs, CRZ, reserved forests, etc.). Similarly, Forest Survey of India shows 60% of Goa under natural forests. Even the rivers are eco-sensitive (clams for instance). Similarly, khazans, which are a large area, are extremely complex ecologically balanced areas that are vulnerable to disruption from barges. When all these other areas are included, more than 80% of Goa will fall in eco-sensitive zone.

The IE committee should ask for the environmental data that the mining companies were supposed to collect as part of their various licences. This must include pizometer readings, pollution analysis reports from the Pollution Control Board, etc. The committee may also have to peruse the report of the Vishwanath Anand Expert Appraisal Committee on Environment Clearances given to Goa mines.

Need to reverse past environmental degradation caused by mining

During the oral presentation, we made a fervent plea in respect of the damage that has already accrued from past mining activity, much of it illegal. (Upto 1997, this is well documented in the TERI report. I have already submitted abstracts of several official studies on this issue. In addition, both the Shah Commission and the CEC have confirmed large-scale degradation.)

We suggested that recommending a cap *simpliciter* may not be a complete solution, since the capping proposals must also examine the extent of environmental damage already done to Goa's environment, its forests, fields, rivers, water sources, ground water aquifers, wildlife, estuaries and rivers, khazans, and coral reefs. In fact, in many areas, topographies have been altered; huge illegal dumps external to the lease have been created, many in forest areas, without any authorisation from any statutory authority. In some areas, hills have been levelled or sliced, their faces completely exposed or scarred.

Thus the capping proposal must be accompanied with a proposal for ensuring complete environmental rehabilitation of the already mined areas. Without this being done, allowing resumption of mining activity would be akin to opening fresh wounds on the natural fabric.

(Dr Claude Alvares)

Director/The Goa Foundation (petitioner in WP No.435/2012)