Konkan Railway Corporation: Choice of Alignment in Goa

G Raghuram

The Konkan Railway Corporation's project bridging the Konkan gap between Bombay and Mangalore has got embroiled in various controversies—environmental, political, as well as religious. The issue is not about the passage of the Konkan Railway through Goa as much as the choice of alignment among the many available alternatives.

Readers are invited to send their responses on the case to Vikalpa office.

G Raghuram is a member of the faculty in the Public Systems Group of the Indian Institute of Management, Ahmedabad.

It was Friday, March 26, 1993. The bulldozers, cranes, the tunnelling equipment and the pile driving equipment came to a grinding halt as the Prime Minister's order to stop work in the Goa segment of the Konkan Railway Corporation was confirmed by the Chairman, Mr Sreedharan, to his field executives. Apart from the controversy over the impact on the natural environment, the issue of the alignment of the Konkan Railway had got embroiled in the political turmoil in Goa. The current Chief Minister, Mr Ravi Naik's tenure was uncertain due to a controversy over the validity of his elections. While Mr Ravi Naik and the Transport Minister of Goa, Mr Panduranga Raout were clearly in favour of the alignment on which construction was in progress, the Deputy Chief Minister, Mr Wilfred D'Souza and Mr Eduardo Faleiro, the only Minister in the Union Cabinet from Goa, were vehemently against the alignment. Former Union Minister and sitting MP, Mr George Fernandes, a key architect of this project during his tenure as the Railway Minister in 1989-90, said in a statement to the press that "the power struggle in Goa between the Chief Minister Mr Ravi Naik and Mr Faleiro had forced the Prime Minister to suspend the ongoing work of Konkan Railway in Goa." In fact, the Prime Minister had given an explicit green signal to the project on March 16, 1993, when a section of the Konkan Railway was opened for traffic. The Goa Government had also reiterated to their assembly, both on March 23rd and 24th, 1993, that work would proceed on the current alignment, in answer to questions.

The controversy also appeared to be taking the garb of a nasty inter-community and inter-regional fight between the Hindu-dominated North Goa and Christian-dominated South Goa. The additional costs due to stoppage of work would be at least Rs 10 lakh per day as interest on borrowed loans. Further, the project completion was likely to be delayed from the much touted October 1994 deadline, since the work stoppage was during the prime working season of summer. The issues regarding the Konkan Railway alignment had got increasingly complicated over a period of time. However, one thing was clear—the problem was not about the passage of the Konkan Railway through Goa as much as
the choice of alignment among the many available alternatives.

**Konkan Railway Corporation:**

**The Background**

In 1990, a new chapter was added to the history of the railways in India, when, for the first time, the construction of a new railway line was taken up under the EOT scheme (build, operate, and transfer). This was to bridge the Konkan gap in the railway network of about 1,000 km between Bombay and Mangalore on the west coast of India (Exhibit 1). This had been a long felt need for nearly a century which finally got fructified when the "Konkan Railway Corporation Ltd." (KRC) was set up under the Indian Companies Act on 19th July, 1990. The final push had been given by the Janata Dal Ministry at the centre when Prof Madhu Dandavate was the Finance Minister and Mr George Fernandes was the Railway Minister, both of whom hailed from the Konkan region.

KRC was set up with the active participation of the central government and four state governments of Maharashtra, Karnataka, Goa, and Kerala, to raise the necessary finances for a project of this magnitude and to execute it within a tight time schedule of four years. The project was then estimated to cost Rs 1,400 crore for the construction of a 768 km long railway line between Roha in Maharashtra and Mangalore. The portion from Bombay to Roha had been constructed earlier to meet the needs of the industrial development in the region. The project was to be financed through equity capital of Rs 400 crore and the balance through bonds and loans. The equity capital was to be split between the centre and the four beneficiary states in the ratio of 51:49, the share of each of the states being 22, 6, 15 and 6 per cent respectively. The project was expected to have an internal rate of return anywhere between 14 and 18 per cent, depending on the tariff charged. The typical savings for the Bombay-Cochin traffic would be 500 km in distance and 12 hours in time, for the Bombay-Mangalore traffic, 1100 km and 26, for the Bombay-Goa traffic, 185 km and 10 hours respectively. Savings in fare would be marginal, if at all. The line would be built with a speed potential of 160 kmph, though actual running speed would depend on coaching stock, which, as per current Indian standards, permitted 130 kmph. Traffic density was expected to be high, like in any main line railway with a single line.

The Konkan Railway alignment passed through backward coastal areas of Maharashtra, Goa, and Karnataka states, the length of line in each state being 382 km, 105 km, and 273 km respectively (Exhibit 2). The terrain of the Konkan region allowed only two broad options while laying down a railway line. It could be either a hill slope line or a coastal one. The chain of hills that constituted the Western Ghats ran parallel to the west coast. The ghats descended sharply to the coastal region on the west, but merged in gentle slopes with the Deccan plateau on the east. Due to high density of rainfall, the western slopes of the ghats were rich in evergreen and deciduous forests. The Konkan coastal zone was generally narrow with a maximum width of 50 km, narrowing suddenly near Karwar in Karnataka, where the ghats almost touched the sea.

Even though the alignment did not pass through Kerala, it would terminate at Mangalore just outside Kerala and was thus expected to benefit the state. All the four states welcomed the Konkan Railway project and felt that it would be a great catalyst for development. The ‘least cost’ alignment proposed by KRC was accepted in toto by the states of Maharashtra and Karnataka. Unfortunately, the alignment in Goa developed into a contentious issue with a see-saw battle between the various interest groups.

The Chairman and Managing Director of KRC, Mr Sreedharan, was a railway engineer with a distinguished service record who rose to become the Member (Engineering) in the Railway Board. On retirement from the Railways, Mr Sreedharan was specially selected to head the KRC. He organized the KRC project into seven sectors, each headed by a field Chief Engineer, for quick execution. Goa was one of the sectors. The organization functioning was marked by quick decision-making, based on trust and reduced bureaucratic procedures. Information technology support was used quite extensively for communication and analysis. The staff profile consisted of just retired railway officials (like Mr Sreedharan), deputationists from Indian Railways (like Mr Rajaram, the Chief Engineer in Goa), and direct recruits. Mr Rajaram had distinguished himself in railway research during his service stint at the Research, Design, and Standards Organization of the Indian Railways. He also had a few international publications on railway engineering to his credit.

The corporate mission and corporate culture of KRC as envisioned by Mr Sreedharan in 1990 is given in Box 1. The October 1994 deadline was taken very seriously and reiterated continuously by the top management. Countdown clocks were put up in all the offices, indicating the number of days remaining for opening. Mr Sreedharan was also keen to open the entire line in one stroke, since operations should not distract construction efforts. However, in March 1993, a 70 km stretch from Udupi to Mangalore at the Southern end of the Konkan Railway was opened for traffic. Preparations
were on to open a 50 km stretch from Roha to Dasgaon at the Northern end, by end 1993. KRC wanted to open these sections in order to experiment with the new maintenance methodology in line with the modern inputs which had gone into the construction. This was basically to develop a measure of confidence to implement this new maintenance philosophy when the whole section would be opened for traffic.

The State of Goa

The state of Goa, the 25th in the Union of India, was formed on 30th May 1987 separating it from the Union Territory of Goa, Daman, and Diu. Goa was liberated on 19th December 1961 after 451 years of Portuguese rule. The state comprised of two districts, North Goa and South Goa with headquarters at Panaji and Margao respectively. The state capital was Panaji (Panaji). Goa was a relatively small state, with a geographical area of 3702 sq. km. Enconced on the slopes of the Western Ghats (Sahyadri ranges), Goa was bounded on the north by Sindhurdurg district of Maharashtra, on the east and south by Belgaum and Karwar districts of Karnataka respectively, and on the west by the Arabian sea (Exhibit 3). It was interspersed with extensive paddy fields and a fine network of waterways. Its rivers Tirakol, Chapora, Mandovi, Zuari, Sal, and Talpona were navigable throughout the year. They had their origins in the Sahyadri ranges and flowed westwards into the Arabian sea, 60 km away, breaking the 105 km long coastline into estuaries and bays which mark off idyllic palm fringed beaches.

Some vital statistics of Goa based on census data are as under:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>795120</td>
<td>1007749</td>
<td>1169793</td>
</tr>
<tr>
<td>Decadal growth rate</td>
<td>36.9%</td>
<td>26.7%</td>
<td>16%</td>
</tr>
<tr>
<td>Sex ratio (F/100M)</td>
<td>989</td>
<td>981</td>
<td>969</td>
</tr>
<tr>
<td>Per capita income</td>
<td>—</td>
<td>Rs. 6231</td>
<td>Rs. 6939</td>
</tr>
<tr>
<td>Literacy rate</td>
<td>45%</td>
<td>57%</td>
<td>77%</td>
</tr>
</tbody>
</table>

In 1984-85, about 62 per cent of the population of Goa consisted of Hindus who were dominant in North Goa, 36 per cent Christians dominant mainly in South Goa, and 2 per cent Muslims and other communities.

Agriculture was the most important occupation in the state, and provided employment to about 1.6 lakh people, providing for the livelihood of about 60 per cent of the population. The next important sector was tourism. Almost 17 per cent of Goa’s population earned their livelihood directly or indirectly from tourism. During 1992-93, Goa had 52 large and medium industrial projects and 5,201 small registered units. Production included nylon fishing nets, ready-made clothing, electronic goods, pesticides, pharmaceuticals, tyres, footwear, fertilisers, automotive components, and ship building. Mineral resources of Goa included bauxite, ferro manganese ore, and iron ore, all of which were exported. There were also reserves of limestone and clay.

The state of Goa housed three wildlife sanctuaries, namely, Bondla forest sanctuary, Cotigao wildlife sanctuary, and Bhagwan Mahavir wildlife sanctuary. Goa was a culturally rich state and was famous for its historic churches, cathedrals, and monasteries. Most of these were in South Goa and were deemed as "national heritage" structures.

Goa had not only one of the best road networks in the country, but also a strong bus operators lobby. The road network comprised of 223 km. of national highways (NH). The NH17 ran from north to south for a distance of 153 km through Goa. It was vulnerable to heavy rains during the monsoon. An east-west national highway linked Panaji with Belgaum which was on the Bombay-Bangalore-Madras NH 4. The state was presently linked to the national railway network through a metre gauge line from Mormugao Port and Vasco-da Gama up to Londa junction where it connected with the Hubli-Miraj main line.

Alignment through Goa

The Konkan Railway line entered Goa in the north near Pernem (524 km from Bombay) and left the state after Loliem, the total route length in Goa being 104.9 km. The proposed locations of stations are as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pernem</td>
<td>6.000</td>
</tr>
<tr>
<td>2.</td>
<td>Axmlyna</td>
<td>5.180</td>
</tr>
<tr>
<td>3.</td>
<td>Mapusa Rd.</td>
<td>9.420</td>
</tr>
<tr>
<td>4.</td>
<td>Mayem</td>
<td>7.400</td>
</tr>
<tr>
<td>5.</td>
<td>Old Goa (for Panaji)</td>
<td>6.000</td>
</tr>
<tr>
<td>6.</td>
<td>Agasim</td>
<td>9.700</td>
</tr>
<tr>
<td>7.</td>
<td>Verna</td>
<td>7.900</td>
</tr>
<tr>
<td>8.</td>
<td>Surivali</td>
<td>4.281</td>
</tr>
<tr>
<td>9.</td>
<td>Margao (junction for existing line)</td>
<td>8.599</td>
</tr>
<tr>
<td>10.</td>
<td>Sarzora</td>
<td>7.480</td>
</tr>
<tr>
<td>11.</td>
<td>Balli</td>
<td>7.620</td>
</tr>
<tr>
<td>12.</td>
<td>Barcem</td>
<td>8.680</td>
</tr>
<tr>
<td>13.</td>
<td>Canacona</td>
<td>9.740</td>
</tr>
<tr>
<td>14.</td>
<td>Loliem</td>
<td>—</td>
</tr>
</tbody>
</table>
The first survey of the railway alignment in Goa sector was done as early as 1970-71, when the Konkan Railway was first proposed. The alignment was to run on the foothills from the Maharashtra border until Margao, where it would meet the existing metre gauge line. From here, it was parallel and was to close to the coast until the Karnataka border. It was to pass through Pernem, Asnoda, Bicholim, Fonda, Shirorda, Raia, Margao, Balli, Canacona and a part of Cotigao wildlife sanctuary. Panaji and Mapusa were not touched by this alignment. Therefore, a branch line taking off from Asnoda through Mapusa to Panaji, stopping on the northern bank of Mandovi river was suggested. The prime consideration was to avoid crossing of Zuari and Mandovi rivers near their junctions with the sea.

The Goa Government had been non-committal about this project, primarily due to the investments required. It was only in October 1984, bowing to public pressure and demands from the state governments, that the Railway Minister commissioned Southern Railway to undertake a final location survey. Since substantial developments had taken place after 1972 such as extensive mining in the Pali-Sankhli belt and building activities along the existing roads, the Central Railway alignment would interfere with the mining operations and would pass through inhabited areas requiring extensive acquisition of houses for construction. In 1986-87, the Southern Railway proposed the Konkan Railway alignment through Mapusa, Panaji, Margao and Canacona, almost all along the coast. The aim was to bring the state capital on the main line itself rather than on a branch line. The State Government accepted this alignment.

In 1990, after the KRC was formally set up, it commenced detailed field surveys to acquire land along the 1986-87 alignment. The field survey resulted in changes to the alignment. The modified alignment was somewhere between the alignments suggested by the Central and Southern Railways. It was felt that an alignment passing through Mapusa and Panaji was not desirable and, therefore, it was shifted through Ponda as originally chosen by the Central Railway. On the southern sector, the alignment was shifted towards the coast to avoid the Cotigao wildlife sanctuary. The alignment was again shifted to the west of Ponda (and closer to Panaji) at the request of the State Government. This was the final KRC proposed alignment.

It was this alignment which raised controversies from various interest groups who proposed a hinterland alignment in 1991. Exhibit 4 shows the alignments proposed by the Central Railway, Southern Railway, KRC, and the hinterland alignment.

**Controversial Issues of the Alignment**

Out of the total of 105 km in Goa, there was no controversy regarding the sections from Pernem to Mayem (22 km) and from Balli to Loliem (29 km). The controversy had arisen for the portion from Mayem to Balli (55 km) for which representations had been received for a change in the alignment to the hinterland. Opposition to the KRC alignment hinged on issues such as the Khazan lands, the Carambolim lake, mangrove swamps and other wetlands, and the settlements and churches of old Goa, etc. Exhibit 5 shows the land use pattern in Goa.

**Khazan Lands**: A unique coastal estuarine agro eco system, Khazan lands, which comprised of 18,000 hectares of land, played a crucial role in the state's ecology. The term Khazan was said to be derived from the Portuguese "Casana" which meant a big rice field.

The Khazan land concept was peculiar to Goa and that too in the estuaries of Mandovi and Zuari rivers due to geological reasons. In these estuaries, lateritic formations had been eroded by the river action creating low lying land, i.e., below the high tide level. These were reclaimed for paddy cultivation by provision of series of bunds and sluice gates allowing rain water to wash the fields, but not permitting saline water to damage the paddy fields. During the first rains, the fresh water washed the fields and paddy was grown. After the paddy was harvested, the tidal waters were allowed through sluice gates and fish farming was carried out.

The system of Khazan was basically an engineering feat to reclaim the area for productive use that would otherwise have been colonized by the sea. The Khazan lands were generally privately owned, though some patches were owned by the local village community. Of about 18,000 hectares of Khazan lands in Goa, 2,000 were used for two crops of paddy, 12,000 for one crop, and 4,000 were inundated the year round. The productivity of Khazan lands was quite low—40,000 tonne per year. The 18 km KRC alignment through the Khazan lands would directly affect 30 hectares of Khazan lands. It was further feared that the KRC alignment would destroy the delicate balance of fresh and saline water in a larger area of the Khazan, thereby making them unusable. Also, once the rain water stagnated in the Khazan land, it was feared that it would become a breeding ground for the Culex mosquito.

**Carambolim Lake**: The Carambolim "lake"-wet land had been in existence since ancient times. It was a low lying marshy land of 72 hectares in the Carambolim village. The depth of the water body varied from 0.75 to 1.25 metre. The lake was host to around 120 species of migratory birds from November to March. The lake was
important for local agriculturists as it helped irrigate their field when there were no rains and also helped recharge the water table. The KRC alignment required a part of the lake to be filled up. Environmentalists feared that this would not only alter the ecology of the area but the sound of the high speed trains would scare the birds away.

**Mangrove Swamps and Other Wet Lands:** The inter-tidal mudflat areas of the estuaries of Goa supported about 20 different species of mangrove. Mangrove swamps constituted vital nursery areas for commercially important fishes, prawns, and other crustaceans. The extent of mangroves in Goa was about 2,008 hectares. About 900 hectares were along the Zuari estuary, 700 hectares along Mandovi estuary, 200 hectares along Camburjua canal, and the rest in Chapora, Talapona, Galgibag, and Terekhol rivers. The current alignment passed through 197 hectares of mangrove swamps and other wet lands, though the direct impact of the railway on mangrove ecosystem in coastal Goa was questionable.

**Settlements and Churches of Old Goa:** The present alignment passed through densely populated areas of Salcete, Margao, and Quepem. This was expected to result in changes in the socio-cultural lifestyles of the residents of various villages. The alignment would cut across road networks and cause vibrations and noise pollution. Fears were also expressed regarding the high probability of slums growing along the tracks. The protest groups also feared possible damage to the churches in old Goa, since the current alignment ran close to many of them. The most notable was the 400 year old 'World Heritage Site' of St. Francis Xavier's church, whose location was 1.5 km from the alignment.

**Wildlife Sanctuaries:** It was feared that wildlife, reptiles, and birds may get affected due to excessive disturbance as a result of human and machinery movements during construction and noise pollution during the operation. However, the present alignment did not pass through any notified sanctuaries.

**Stand taken by Various Actors and Interest Groups**

**State Government:** The Southern Railway alignment through Mapusa, Panaji, Margao, and Canacona was accepted by the State Government in 1988, when Mr Pratap Singh Rane was the Chief Minister. The KRC alignment through Pernem, Asnoda, Mapusa, Mayem, Old Goa, Agassim, Verna, Suravali, Margao, Sarzora, Balli, Barcem, Canacona, and Loliem also had the approval of the then Chief Minister, Dr Luis Proto Barbosa, in 1990. When Mr Ravi Naik assumed power, the alignment earlier cleared by the State Government was once again reviewed on March 25, 1991, by the entire Goa cabinet along with the ML As of the concerned regions and the KRC engineers. With a slight modification between Majorda and Cansaulim, the KRC alignment cleared by the previous ministry was once again confirmed.

**Mr Eduardo Faleiro:** It was only after the last general elections, i.e., in July 1991, that the first opposition to the present railway alignment surfaced. Mr Eduardo Faleiro, an MP from south Goa, was the first to raise an objection to the alignment as proposed by KRC and asked for realignment through the hinterland (Exhibit 5). According to him, the original plan incorporated in the regional railway plan took the line along the foothills of the Western Ghats through the hinterland talukas of Goa. The present alignment through densely populated areas of Quepem, Salcete, Margao, and other coastal areas was not acceptable. He demanded changes in certain sectors, particularly Salcete. He did not want the line to pass through populated districts. He said that the hinterland route would be required to take the rail line to mine heads where 750 million tonne of low grade ore were stockpiled.

**The Gomantak Lok Paksh:** A local environmental group, the Paksh came out first to organize a public campaign against the KRC route. The volunteers argued that the ill-conceived route involved demolition of a large number of houses and acquisition of farmland. They felt that it would also divide the villages of south Goa and destroy the harmony of life. An environment education magazine, *Down to Earth*, reported: "While the project was received with public enthusiasm in Maharashtra and Karnataka, a strong and influential section of Goa's population rose up in arms against the proposal and what they saw as vandalism of the west coast. It is not the Konkan Railway they are opposed to, but the route chosen. They want the realignment of the line which, according to the KRC blueprint, runs almost all the way close to the coast and at places like Majorda in south Goa, is just about a kilometre from the seashore. Since human settlements are also concentrated along the coast, they are especially incensed by the fact that the line passes through thickly populated areas, particularly in south Goa."

**Mr Wilfred D'Souza:** The Deputy Chief Minister of Goa and a bitter critic of the present KRC alignment stated, "This railway line is not meant for Goa and the Goans. Goa is being used just as a corridor."

**KRRAC:** The most pitched opposition to the present route came from various groups of environmentalists, who had come together under a federation called the 'Konkan Railway Realignment Action Committee' (KRRAC). The KRRAC was agitating for the railway
route between Asnoda and Balli to be shifted away from the coast towards the eastern hinterland which was less developed with a lower density of population. Mr M K Jos, a KRRAC activist and local entrepreneur, stated: "Superfast trains travelling at a speed of 140 km an hour will have a tremendous ecological impact, and destabilize buildings." Mr Matanhy Saldanha, another KRRAC leader and veteran of many an environmental battle in Goa, pointed out that the present route will "totally destroy" the "extremely fertile" Khazan lands between Mayem and Cortalim and the Carabolim lake wetland where migratory birds from all over the world come to nest in winter.

According to Mr Urban Lobo, a civil engineer and a KRRAC activist, the railway line was bound to be a health hazard and would cause epidemics of vast magnitude that could wipe out whole villages. Ms Aruna Rodriguez, a management consultant from Goa, felt that a shift of only 20 km to the east of the planned coastal alignment to the midlands, along the foothills of the Western Ghats (a mere increase of around 15 km) would halt the grim prospect of environmental destruction and degradation of the quality of life. The feasible midland route was desirable in the interest of sustainable development, based on integrating ecological and economic criteria.

Goa Architects Association: According to Mr Ralino D’Souza, Chairperson of the Goa chapter of Indian Architects Association, "Goa's villages and towns are thickly populated and the railway line will split many of them. It will add to congestion and harass the people."

The Church: The church in Goa was very critical of the project, making it an issue even during church sermons. South Goa was the hub of the Christians where all the architectural remnants of the past stood. The Hindus, who dominated North Goa, were by and large in favour of the present alignment. The near unanimous protest to the present alignment by the Christian dominated South Goan community had been interpreted as communal in some quarters.

Mr Raj an Narayan: A local media person, Mr Narayan suggested a different point of view that "If the railway line had passed through the hinterland, it might have helped to catalyse new industries in the hinterland to provide alternate employment opportunities to the residents of Goa who would be rendered unemployed when the mining resources were exhausted. By rejecting the hinterland alignment, the Konkan Railway Corporation and the Government of Goa have sacrificed the interests of future generations of Goans in the hinterland for the short-term benefits of the mining industry." The mine owners did not want the hinterland alignment due to fear that mining concessions would have to be given up along the route.

Mr Mario Cabralesa: A counter point was provided by Mr Mario Cabralesa, a local journalist who was also the media advisor to the KRC. He felt, "environmental threats were being brought up only to promote personal gains." He alleged that real estate prices along the Goan coast were astronomical and "every single inch of land had already been negotiated by developers. A railway line close to the coast would affect the exclusivity of this land and hence affect the prices." One luxury hotelier admitted, "we do not want the railways so close to the coast. Besides the noise, they bring a lot of riff-raff who are simply a nuisance to our tourists." More importantly, the "official" land prices at which the government would acquire the land were much lower than the "unofficial, but actual" prices of land transactions. This was true even of the farmlands and Khazan lands.

Mr George Fernandes: Goa not only had one of the best road networks in the country, but also had a strong bus operators lobby. A rail line close to the National Highway, especially in the highly developed Salcete area, was bound to affect business adversely. In this context, the former Railway Minister, Mr George Fernandes, alleged that Mr Eduardo Faleiro was acting at the behest of the powerful transporters lobby of the region.

Response by the Railway Ministry

The original demand of the KRC alignment opposition group was that right from Pernem to Loliem, the alignment should be taken about 25 to 30 km to the east into the foothills of the Western Ghats. Later, in the meeting convened by the Railway Minister, Mr Jaffer Sharief, at Delhi on August 21, 1991, Mr Faleiro and the chief protagonists of the realignment reduced this demand of realignment to about 50 km between Mayem and Balli. (The Congress party had come to power at the centre in early 1991. They did not change any of the decisions regarding the KRC which were taken by the Janata Dal Ministry. Mr Sharief, elected to the parliament from Karnataka, and Minister of State for Railways during the previous Congress regime, was made the Union Minister for Railways.)

The Railway Minister explained that realignment through a virgin forest territory would again need a detailed engineering study which would give a setback to the whole project by at least one year to get necessary permission for surveying through reserve forest areas and to finalize the engineering proposals. From the study of topo maps, it would appear that such an alignment would be about 19 km longer and would
involves an additional 7.5 km of tunnelling, resulting in an additional cost of about Rs 55 crore. This, coupled with the cost escalations and interest costs due to the one year delay, would cost the KRC an additional Rs 250 crore. The Railway Minister stated that if the Goa Government was prepared for this delay and to bear the additional cost of Rs 250 crore, he would have dialogues with other participating State Governments to make them accept the delay in completion of the project. A letter to this effect was sent to the Goa Government.

The State Government under Mr Ravi Naik promptly advised the Railway Ministry through their letter dated 30.9.1991 that they did not want any major change in the alignment already finalized. They, however, suggested that the portion between Margao and Balli be slightly shifted eastward so that heavily built up areas south of Margao could be avoided. The government felt that the fears expressed by the KRRAC protest group regarding the coastal alignment, in relation to environment and socio-economic changes, etc., were not supported by facts.

Mr Rajaram, Chief Engineer of KRC for the Goa sector, felt strongly that the present route would have the least environmental impact. He argued that the alternative route being suggested by the KRRAC and some other groups passed through rich forests and mines and this would cause more severe environmental damage as it would destroy forests spread over 350 hectares. The KRRAC countered him by saying that the hinterland alignment would affect only 54 hectares of forests.

In view of the representations received against the coastal alignment, the Minister for Railways set up a one-man committee in October 1991 headed by Mr M Menezes, a Goan and former Chairman of the Railway Board, to give an opinion on the alignment in Goa. In the meantime, land acquisition and construction had begun in the Goa sector by mid-1991.

After studying the proposals carefully including that of the realignment lobby, Mr Menezes submitted his report in November 1991 to the Railway Ministry. He suggested that the controversial rail line may be diverted for a distance of 13 km from Margao to Balli in South Goa while maintaining the present stretch for the remaining 46 km. Mr Menezes discussed the pros and cons of five different realignments through the state before reaching his conclusions. While ruling out various options suggested by different agencies including the Goa Architects Association, Mr Menezes said that some of them interfered with iron ore loading operations on the river Mandovi, while some would pass over the iron ore deposits currently under exploitation where mining activities were expected to continue for the next 30 to 40 years. One of the routes suggested would pass through a wildlife sanctuary while another would mean excessive tunnel length. The report disagreed with the contention of the proponents of realignment that the proposed routes would hit the industrialization of the state and damage the Khazan lands. Mr Menezes also noted that the old metre gauge line had already bisected the villages in Salcete taluka and hence the new broad gauge line would not significantly alter the situation.

Environmental Impact Studies

Environmental impact assessment (EIA) was mandatory to any development project, as introduced by the Planning Commission in 1977. The EIA was meant to describe the condition of the environment, ecosystems, and wildlife in and around the project site, make prescriptions about how to deal with the environment at the time of the project, and suggest monitoring mechanisms so that future damages are minimized. It was, however, not clear if railway projects also had to do an EIA as a mandatory requirement.

In 1989, the Environment Ministry set up an expert group to frame guidelines for railway projects, to be applicable for all new railway projects. The guidelines compelled the railways to prepare an EIA and Environmental Management Plan (BMP).

Soon after the project was approved in the Railway Budget of 1990-91, the Ministry of Railways commissioned RITES on 2nd April 1990 to carry out an EIA of the alignment. RITES, in turn, engaged the services of a well known environmentalist, Dr Madhav Gadgil, head of the Centre for Ecological Sciences, Indian Institute of Science, for the study in the Goa sector, south of Panaji.

A few months after the KRC was set up, Mr R Rajamani, Secretary, Department of Environment and Forests, wrote to the Railway Board Chairman, Mr R D Kitson informing him about the possible adverse environmental impact the Konkan Railway could have in the region. On June 25, 1991, the Railway Board wrote back to Mr Rajamani, stating that the KRC had already conceived an EIA and that an BMP was being evolved. On September 20, 1991, Mr Rajamani got back to Mr Kitson demanding the relevant studies. He also wrote that the Konkan Railway proposal would need clearance from their ministry.

During March-April 1992, the KRC duly submitted an EIA to the Environment Ministry for various parts of the alignment from Roha to Mangalore. The EIA of the controversial section of the Konkan Railway line was...
done by a team of experts and field workers from the Indian Institute of Science, Bangalore. The team surveyed an area of 10 km on either side of the proposed alignment.

The report submitted by Dr Madhav Gadgil of the Indian Institute of Science stated that the alignment chosen was the "least impact" option as far as the Goa sector was concerned and also stated that the hinterland alignment would not only destroy the fragile ecosystem of the western foothills but would also be very close to the Bondla wildlife sanctuary. Such an alignment would also require acquisition of about 360 hectares of reserve forest land. He further went on to state that such an alignment did not stand a chance of getting clearance from the Ministry of Environment and Forests.

The environmental activists in Goa, concerned about the impact the railway line may have on Goa's ecology, decided to file a writ petition in court. Veteran environmentalist and Goa Foundation Secretary, Mr Claude Alvares, filed a writ petition before the Goa bench of the Bombay High Court in April 1992, on the grounds that a satisfactory EIA had not been done before the KRC started work. The judges, however, rejected the petition.

The Ministry of Environment and Forests received a large number of representations from various social action groups and eminent persons of Goa. Mr Kamal Nath, Minister for Environment and Forests, decided in June 1992 to appoint an expert committee to consider the environmental and socio-cultural aspects of the proposed Konkan Railway alignment for a final decision. The committee was to consist of 16 members, headed by a noted intellectual and environmentalist, Dr Kamla Chowdhry. However, only 14 members participated (the Railway Ministry and Goa Government refused to participate). The list of members of this committee is given in Box 2.

The expert committee, while deliberating on the environmental impact of the proposed alignment, could not come to a consensus. The committee split and two separate reports were presented to the Environment Ministry on October 12, 1992. While the chairperson of the committee, Dr Kamla Chowdhry, backed by eight members of the committee reaffirmed KRC's coastal alignment with certain modifications and safeguards,, five dissenting members proposed a midland route which would cause minimal damage to the coastal ecology, the Khazan lands, forest cover, archaeological heritage, and Goa's social and cultural life.

The various hinterland routes, suggested by different people as alternatives to the coastal route, were rejected by the Kamla Chowdhry committee because the members felt that they would cut through the ecology of Western Ghats, cause "three to four times" the deforestation of the KRC route, endanger soil erosion leading to landslides, floods and consequent damage to agricultural fields and coastal areas. The report pointed out that 40 per cent of the mining concessions had been given in the forest areas, already causing great damage to the forests.

Among the safeguards suggested were construction of adequate number of culverts and portals in Khazan lands to allow free tidal flow of water on either side of the embankments. To minimize the disturbance to the communities in the densely populated areas through which the alignment would pass, the committee recommended that KRC provide adequate number of cross passages like over bridges and subways. It also recommended that the Margao station should be relocated to avoid further congestion of Margao town.

The proposal for a midland route was mooted by the dissenting members led by Dr Pai Panandikar, a Goan and a retired senior civil servant. This group felt that their alignment was feasible in a techno-economic sense and was a short cut for the Roha-Mangalore corridor. They stated that the route would not usurp any primeval forest land and consumed little closed forest cover land. It would not affect the wildlife sanctuaries, avoided all surface mining areas, estuarine basins, Khazan lands, and mangroves. The route suggested would open up to development midland and ghat talukas through accelerated settlement growth and at the same time slow down the growth of coastal taluka settlements.

**KRC Goes to the Media**

For nearly two years since the setting up of KRC and for nearly a year through the thick of the alignment controversy, the KRC officials held off from directly going to the press. Finally, Mr Sreedharan decided to use the media to put forth KRC's point of view from May 1992. He published various articles in the press responding to the numerous criticisms on the Konkan Railway project. He placed before the public some facts in regard to the objections raised. The objections were as follows:

1. Passing through thickly populated areas, the railway would uproot thousands of inhabitants who would lose their cultivated lands and houses.
2. It would not serve the industrial belts earmarked for the development of Goa.
3. It would destroy Khazan lands.
4. Works were being taken up in a hasty fashion and bridges across Zuari and Mandovi would be unsafe.
5. It would destroy a whole civilization built over 3,000 years, lifestyles of the people of Salcete village, and the churches and heritage monuments of old Goa.
According to Mr Sreedharan, the total land to be acquired for the Konkan Railway in Goa state was 726 hectares, out of which paddy fields accounted for 340 hectares, reserve forest area about 36 hectares, and Khazan lands about 47 hectares. The number of homesteads affected were just 25. The claim that thousands of people would be uprooted was highly exaggerated. Even in Khazan lands, provision of sufficient waterways had been given to ensure that tidal cycles were maintained and the land retained its characteristics. The reserve forest being acquired was over a length of 7.2 km between Balli and Canacona, out of which 4.5 km would be in tunnels and actual degradation of forest land would take place over less than a 3 km corridor. In regard to bridges across the Zuari and Mandovi, KRC had updated the studies and formulated the scheme for these bridges in consultation with the State Government, the harbour authorities, and the Ministry of Surface Transport. The talk of lifestyle and civilization built over 3,000 years being destroyed was vague and abstract. In short, according to him, none of the objections raised by the anti-alignment group was sustainable.

In subsequent press releases, KRC argued that a change in alignment would cause significant delays (apart from a Rs 250 crore increase in cost). This would affect the development of the Karwar port which was crucial for defence purposes.

Another major adverse feature of any hinterland alignment was that a broad gauge connection to the Mormugao port would be longer and expensive.

When asked by the case writer as to what proactive efforts KRC took to seek the people's views, Mr Sreedharan responded, "from the start of the project, we have been in touch with the State Government. They are supposed to represent the local people. In any case, from mid-1991 when we organized open discussion forums, nobody would turn up—especially from the opponents of the alignment. Then we decided to use the press. Even this has not helped." According to Mr Sreedharan, as far as KRC was concerned, the alignment question in Goa was a settled issue since it was operating on the State Government approved alignment and with the State Government's support.

**Apparent Change of Stand by Madhav Gadgil**

Work continued in the KRC alignment in the summer of 1992 with intermittent disruptions caused by the agitators of KRRAC and various other anti-alignment interest groups. In the meantime, a pro-alignment lobby was also getting built up, though they were not as vocal, presumably because work was somehow progressing. During early 1993, the anti-alignment interests spearheaded by the Church got very active by lobbying directly with the Central Government. At this stage, in March 1993, a new twist to the alignment controversy was offered by Dr Madhav Gadgil, who came out in the open against KRC, suggesting that the environmental concerns were not properly addressed. He charged that the authorities seemed to have created an impression that he had asserted that the KRC alignment was the "least impact" route, when, in fact, he had done no such thing.

In an article in the issue of *Frontline* dated March 26, 1993, he wrote,

"We were given an already determined alignment and asked to list the biological communities and flora and fauna along that route and do little else. In fact, we were explicitly told not to consider any alternative routes. Furthermore, construction along parts of the route—for instance, in the Dasgaon-Panaji sector—was already in full swing before we started out EIA.

We were asked to stick solely to the route south of Panaji (and within Goa); even in this section, the route now being followed is quite different from the one that was specified to us. It has been shifted towards the coast south of Margao, resulting in damage to mangroves, for instance, near Maxem.

In the Margao-Panaji sector, we felt that the route indicated to us was unacceptable in terms of the expected impact on paddy lands and habitation. We, therefore, exceeded our terms of reference and proposed an alternative route. In the final RITES report, this suggestion was deleted. When we complained to the RITES authorities, we were told that it was irrelevant since the KRC authorities had agreed to the alternative route suggested by us. But field inspection reveals that this is incorrect. It is true that some of our suggestions, such as for doubling of the current line between Margao and Majorda, are being implemented, but others are not. For instance, the railway line now passes through the picturesque Carambolim lake, the abode of thousands of water birds. This was by no means part of the route suggested by us.

Not only has the route shown to us been arbitrarily changed without informing us, but our suggestions have not resulted in more careful construction either. In particular, we had requested that the authorities convene a workshop at which we could..."
discuss with the engineers our observations on the environmental damage and ways to mitigate it. We were assured that a workshop would be organized, but it has failed to materialize.

Work on the Konkan Railway thus goes on, with contractors cutting hills, burrowing the earth, filling up wet lands and recklessly cutting down mangroves—all with an eye on profits and with scant regard for the environment. Peasants' protests that this would render their paddy-fields saline are ignored. If the protest is better organized, an attempt is made to examine the matter. One such was the setting up of a committee headed by Dr Kamla Chowdhry. All along, we had been pressured not to publicize our misgivings. We wished to put forth our viewpoint at the committee which we believed was the proper forum, but it never called us. Meanwhile, the authorities seem to be creating the impression that we were competent to endorse—and, in fact, did endorse—their actions. We wish to state publicly that this is far from being the case.

We reiterate that we are not endorsing any one route. But we must state that the thoroughly unsatisfactory process of environmental impact assessment (to which we have been a reluctant party) cannot be used to justify any particular route. What is needed is a different, open, democratic, decentralized process for assessing the environmental impact, making appropriate choices, preparing a detailed environmental management plan, and then monitoring the work to see that the plan is implemented. The ongoing, hasty, closed process will not speed up development; it will merely project vested interests, damage the environment, hurt the poor and divide the society."

Alerted to the various controversies regarding the KRC alignment and seeing the situation as an impasse, the Prime Minister ordered stoppage of KRC work in Goa on March 26, 1993.

**Justice Oza Commission**

Subsequent to the Prime Minister's orders, a one-man commission was constituted by the Central Government, headed by Justice C J Oza. He started his work in June 1993 and submitted his report in December 1993. The report was discussed in the parliament in December 1993 by the Railway Minister. The main recommendations of the report were:

* To provide viaducts on Dewar island and Zuari approach wherever the embankment is higher than 10 metres.
* The hillock on Dewar isl and damaged by earthwork should be terraced.
* Anti-vibration measures should be taken in the tunnel near the chapel on the hill to prevent any damage.
* Additional waterways should be provided in the Khazan lands wherever fishing boats have to pass.
* Fencing and boundary wall should be provided where the railway track is passing through settlement areas. Necessary foot overbridge should be provided where school children have to cross.

The current alignment was retained but with the above improvements and an extra expenditure of Rs 18 crore was to be incurred. (KRC claimed the actual lost to be Rs. 100 crore including costs due to stoppage of work.) Soon after, work resumed in the Goa segment of KRC.

In the meantime, Mr Wilfred D'Souza came to power as the Chief Minister since Mr Ravi Naik's election was held as invalid. It was alleged that Mr D'Souza politicized the anti-KRC movement to come to power. However, soon after the Oza committee report and the resumption of work, both he and the KRRAC became reticent. The church also quieted its agitation.

The completion date was postponed from October 1994 to March 1995 to account for the duration of the work stoppage. Further, KRC also distinguished between the time of introduction of freight services and passenger services, the latter requiring more stringent conditions on the track. The March '95 deadline was for freight services while passenger services would be introduced from October 1995. The total project cost was revised to Rs 2,050 crore including Rs 300 crore as interest charges incurred during the construction stage. Of this, the equity contribution of the Central Government and the four participating states would be Rs 600 crore.

KRC was expected to pay back loans (of Rs 1450 crore) within ten years of commencement of operation through the profits earned from operations.

(As of September 1995, the completion date is expected to be December 95 for freight services and March 96 for passenger services. The total project cost has further gone up by Rs 200 crore, financing for which is yet to be obtained.)
Box 1: KRC's Corporate Mission

1. To complete the Konkan Railway Project by October 1994.
2. The project to be completed without cost overruns (except for annual inflations).
3. To make it a model project with high technical standards and quality of construction.

KRC's Corporate Culture

1. Total dedication and commitment to the corporate mission should be evident in whatever we do and say.
2. Integrity of our officers and staff should never be in question.
3. Punctuality is a virtue and a necessity. Target and time schedules are sacrosanct to us.
4. Austerity and economy should be apparent in all our activities.
5. The organization has to be lean but effective.
6. We must have a high - profile image for efficiency, decency and "we - mean - business."
7. We must maintain excellent public relations. Our construction activities should not inconvenience the public.
8. All our structures should aesthetically merge with the beautiful Konkan surroundings.
9. Our construction activities should not degrade the ecology and the environment.
10. The welfare of the workforce is our responsibility.

Box 2: Names of Committee Members

<table>
<thead>
<tr>
<th>Names</th>
<th>Pro-alignment</th>
<th>Dissent Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Kamla Chowdhry (Chairperson)</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Shri Pai Panandiker, Director, Centre for Policy Research, N.Delhi</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Dr J.B. Sardesai, Director (Projects), Ecologist, Wildlife Protection Group</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Ms Usha Albuquerque</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Shri Shyam Chainani, Hon. Secretary, Bombay Environmental Action Group</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Shri Manohar Shetty, Editor, Goa Today.</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Director General, Archaeological Survey of India</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Dr. B N Desai, Director, National Institute of Oceanography</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Dr Kesavan Nair, Director, National Transport &amp; Planning Research Institute, New Delhi</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Dr E F N Ribeiro, Director, School of Planning and Architecture, New Delhi</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Shri M Parabrahman, Advisor, Ministry of Environment and Forests</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Representative of the Ministry of Railways¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Representative of the State Government of Goa²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Representative of the State Government of Karnataka</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Representative of the State Government of Maharashtra</td>
<td>(*)</td>
<td></td>
</tr>
<tr>
<td>Shri T George Joseph, Joint Secretary, Ministry of Environment and Forests</td>
<td>(*)</td>
<td></td>
</tr>
</tbody>
</table>

¹ Did not participate since the Ministry of Railways felt that "the committee consists of persons who are known to have taken an uncompromising stand against the present alignment in Goa."
² Did not participate since the Government of Goa did not see any need for yet another committee.