AIRPORT SOLARISATION - CIAL STEALS THE THUNDER

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The fact that sun is the ultimate power house had dawned up on human mind long ago, however availing its abundant energy to solve the ever growing power woes remained a technical challenge. Modern world saw the emergence of photovoltaic cell technology as an opportunity in this direction, but its commercial success remained elusive. The PV cell technology based solar power proved to be costly in its generation, its support systems and its maintenance. The litmus test for its universal acceptance was finally the cost of electricity generated from it in comparison with the energy generated from conventional sources like coal, hydropower, or petroleum. The fact remained that the solar power cost at consumer end was 3 to 4 times the cost of power from other sources, and that proved to be a stumbling block in its wide acceptance. Governments across the globe have been offering tremendous financial support for initiatives in solar energy, hoping it would induce much more efforts in this area finally unleashing a technological revolution to make it competitive in all respects. Germany and the rest of the western world have been leading such efforts and all were looking up to them for a solution, but a small entity from God's own country has stolen their thunder by becoming the first Airport in the globe to meet all its energy needs from solar energy. It may have surprised the whole world, but not those who have closely followed the genesis and growth of CIAL, the first International Airport in India to form on a Public Private Partnership (PPP) model. Immensely successful in whatever it did, CIAL is envied as an organization where creativity and innovation has become a way of life.

Probably nothing portrays the vision, values and dreams of CIAL more emphatically than its logo - a green glider shaped out of coconut leaves rearing to reach the horizons of hope. Its pointed nose ready to pierce the skies and its sharply wedged tail blazing a trail of success sagas behind, graciously it glides, its structure in coconut leaves pronouncing a subtle nativity and its greenness permeating an enduring unison of CIAL with the nature that the God's own country is famous for. The business that CIAL has carved out to harvest energy from the sun-god is an eloquent narration of its vision statement '*Changing lives though excellence in aviation and beyond*' and makes a stimulating case study.

HISTORY OF CIAL

CIAL is the biggest international Airport in Kerala. It is the fourth busiest airport in terms of international passenger volumes and the seventh busiest in terms of total passenger volumes. It is also one of the most profitable airports in the country. Commissioned in 1999, CIAL started making profits from 2003-04, its fourth year of operation. In financial year 2014-2015, CIAL reported a profit after tax of ₹144.58 Cr, with a gross income of ₹414 Cr, an increase of 14.4% from the previous year. Years of uncertainties and struggles starting right from conceptual stages and all through its formative stages have shaped a unique character for CIAL, the strength of which is driving it from success to glory, taking occasional setbacks in its stride.

CIAL is not the first airport of Cochin. Originally Cochin had a small naval airstrip in Willingdon Island operated by Navy which was of second world war vintage. As times advanced Cochin, the commercial capital of Kerala and an emerging metropolis clamoured for an international airport. The Gulf boom in the 1980's opened up vast employment avenues for Keralites, and they flocked to Middle East in great numbers. Poor air connectivity from Cochin to Middle East made it necessary for them to take connecting flights from Chennai or Mumbai, squandering almost a day in transit. An international airport at Cochin with flights to all major destinations in the world would make connectivity exceptionally easy and convenient and would be of much cost saving to the travelers. The tourism potential of the state was being recognized by the outside world, and the tourist inflow was also on the ascent. Many foreign airliners were keen to incorporate Cochin in their operations because of these reasons. But the length of the runway and other facilities at Willingdon Island were deficient, hindering the operation of new generation passenger aircrafts. There was, therefore, an urgent need to raise the facilities at the airport to international standards.

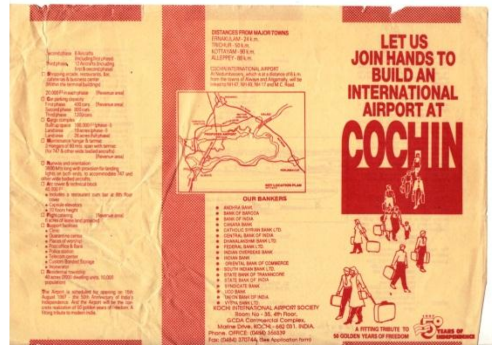
However, proposals to expand the facilities at Willingdon Island kept running into rough weather due to various reasons. Extension of the length of runway required reclamation of land from backwaters, which was a technically complicated affair and posed environmental issues. Willingdon Island was the Head Quarters of Southern Naval command and Navy was not in favour of having a busy international airport there because of security concerns, and night flight permission could never be granted. Willingdon island was in the heart of the city and there was paucity of space to develop the infrastructure required for an international airport of global standards. Even for the runway expansion, the estimated cost was to the tune of ₹70 Cr, and securing additional land for it was all the more difficult.

It was in this context that the union minster of civil aviation, Late Shri Madhav Rao Scindia advised Government of Kerala to search for suitable land to set up a new international airport in Cochin. Seeing the risk of Cochin getting wiped out from the global aviation scenario of the country Shri V. J. Kurian, the then District Collector of Ernakulam, voluntarily assumed the responsibility of identifying the same. Of the various shortlisted sites, a sleepy village called

Nedumbassery, about 30 Km from the city, was considered to be ideal owing to its locational advantages and topography. The land proposed lay between NH 47 and MC Road, the two main highways in the state and was also near the railway line. It comprised mainly of vast areas of uninhabited paddy fields and partly of sparingly inhabited dry land, requiring least dislocation of people for airport construction, an important consideration in one of the densest populated states of the country. Land rate was modest and was abundantly available for the purpose. Approval was granted to the new location. Soil investigations conducted at site found it suitable for construction.

In the meantime the era of globalization set in India in 1990's was pushing the economy into a high growth trajectory. To facilitate this all government policies including the civil aviation policy were being reviewed. The civil aviation traffic had seen an unprecedented growth on account of booming Indian economy. But airport infrastructure had not kept pace with the growth in the civil aviation traffic. There was a long felt need for radical reforms in the sector and GOI paved the way for it with the AAI Act 1994. By this act, GOI constituted a new statutory body - Airport Authority of India (AAI) - for operating all the civilian Airports in the country vesting with it the authorities of defunct International Airport Authority of India (IAAI) and National Airport Authority (NAA). The act decreed that AAI shall manage the airports, the civil enclaves and the aeronautical communication stations efficiently, including the provision of air traffic service and air transport service. It also gave mandate to AAI to assist the establishment of private airports by rendering technical, financial, or other assistance which the Central Government might consider necessary. Ministry of civil aviation of Government of India was pressurising State Governments to raise the standards of air connectivity in the states in a time bound manner.

The green field airport at Cochin was top most in the priority list of Government of Kerala. However, it was not in a position to invest in the project which had an initial estimate of a whopping ₹200 Cr in 1993. Financial constraints did not permit National Airport Authority to invest in the project. They promised technical support for building the new Airport. It was then that Shri V. J. Kurian conceptualized the novel idea of developing the Airport with the joint financial participation of Airport users (mainly non-resident Indians), Airport Service Providers and the Government, such an experiment being tried with out any precedence in India. Funding was envisaged to be mobilized through interest-free loans from non-resident Indians, industrial undertakings, exporters, cooperative societies and from the state government. It was thought that Non Resident Keralites (NRKs) would support the funding process wholeheartedly as Keralites working abroad were the biggest beneficiaries of the project. The main hope rested on the 20 lac odd Middle East Keralites, who were demanding better connectivity between Cochin and Gulf for a long while. A visionary that he was, Late Shri K. Karunakaran, the then Chief Minister, could promptly foresee the great potential of this concept, and permitted Shri V. J. Kurian to go ahead with the proposal, inspite of extreme resistance from bureaucratic circles.



Kochi International Airport Society (KIAS) was established under the Charitable Societies Act, with Shri K. Karunakaran as the Chairman and Shri V. J. Kurian as the Managing Director. Office space was arranged in the Marine Drive Shopping complex of Greater Cochin Development Authority for a nominal rent. Ernakulam Chamber of Commerce obliged the District Collector with one PC for the workplace and Vyapari Vyavasayi Ekopana Samiti – the association of traders and manufacturers - with a fax machine. The office of the Managing Director of KIAS was ready and all was set to go! Activities started in right earnest. Committees were formed in different countries with sizeable populace of Keralites to mobilise funds for the project.

FINANCING A WILD IDEA – THE DEBIT AND CREDIT

During those days an instrument called Indira Vikas Patra (IVP) was in vogue, a term deposit which would double at the end of 66 months. This was conceived to be an ideal tool to operate with, to attract loans from NRKs. The modus operandi was simple. Once ₹5000 was received as a loan, an IVP could be taken for ₹2500 and ₹2500 could be set aside as capital for the project. The IVP would redeem at the end of 66 th month as ₹5000, for repaying the loan.

It was thought that out of the 20 lakh Gulf Malayalees, if only 20 % could be roped in for providing the loan of ₹5000 each, ₹100 Cr could be generated as capital. GOI had a scheme of providing long term loans for 75% of the investment in IVP at very low interest making another ₹75 Cr for the project and the remaining ₹25 Cr could be collected as contributions from Corporates or individuals making the required aggregate sum of ₹200 Cr towards project capital. First major contribution to KIAS came from Mr. C.V. Jacob, Chairman of M/s. Synthite Group, who contributed ₹25 lakhs.

In spite of the fact that the new International Airport at Cochin made headlines in the Gulf and elicited enthusiastic response from few businessmen like M A Yousuf Ali, it got clearer and clearer as days passed by that generating ₹200 Cr was not going to be an easy task. Keralites are known for their conservative spending. Further, exposure to leftist idealism for generations had induced a sense of general aversion among Keralites against the so called capitalist attitudes and ventures! Barely could the State narrate any such success stories to the contrary. The project in PPP model was too novel an idea for the State. The gulf Malayalees were skeptical about its success and were not willing to risk their hard earned money in an unheard project model. For a resident Keralite, air travel was far distant a possibility in those days to inspire him to contribute for constructing an Airport. By end 1993 all that could be generated was only ₹4 Crore against ₹200 Cr projected. KIAS funding scheme ended in a fiasco.

But the Government under the leadership of Shri K. Karunakaran was committed for the airport and proceedings for land acquisition had already commenced. A retreat at this stage would have been a major setback for the government. The Government had a lot of confidence on Shri V. J. Kurian. Be that as it may, none could make an airport happen with just ₹4.15 Crores in hand, however efficient he might be. It was a dark alley and none knew the way forward. It would have been an abrupt end of dreams for lesser mortals; but as the saying goes '*When the going gets tough, the tough get going*.' A ingenious Shri VJ Kurian returned to Shri K. Karunakaran with a proposal for constituting a Public Limited Company in the place of KIAS which would not only enable raising large equity investment from Government, Institutions, and public investors, additionally will have a base for debt leveraging through Institutional lenders. He could rope in couple of institutions against the offer of exclusive rights for business opportunities in the airport. Those who were in his list included The Federal Bank, a scheduled bank based in Cochin, who conceded for a term loan of ₹24.60 Cr against banking rights, M/s Bharat Petroleum Corporation Ltd who offered to take shares worth ₹5.25 Cr against an exclusive right for hydrant refueling facility in the airport, and M/s Air India who agreed to take shares worth ₹5 Cr and deposit an amount of ₹11 Cr for exclusive ground facility handling contract. M/s Indian Oil Corporation Ltd offered to give ₹75 Lacs for an exclusive petroleum products retail outlet in the airport. Thomas Cook was eying for an exclusive forex dealership in the airport and agreed to deposit ₹25 lacs for it. KIAS already had a fund of ₹4.15 Cr collected. Overall, the situation looked much more promising. The Chief Minister gave nod for the proposal and a company in the name and style of '**Cochin International Airport Limited (CIAL)**' was registered on 30th March, 1994 with an authorized capital of ₹90 Cr, with Shri K. Karunakaran as its Chairman and Shri V. J. Kurian as the Managing Director.

The company then approached HUDCO for a loan of ₹135 Cr and managed to get a favourable response from them on the condition that the loan repayment shall be guaranteed by Government of Kerala. Once again the resolve of the government to make the airport happen came to the fore, as this condition also got the approval of the Chief Minister. There was no hindrance for HUDCO to release the loan now. SBT was likewise in the loop with a term loan offer for ₹25 Cr. Thus the project capital sum worth ₹200 Cr looked realizable for the first time and few rich Malayalee businessmen in the Middle East were now inclined to take shares in the company floated. Government of Kerala is the largest single shareholder of CIAL. Composition of the Board of Directors of CIAL with the Chief Minister of the state as its Chairman and five government directors has helped the company to coordinate with various government departments effectively and to expedite statutory clearances and provide other support needed. The only corporate shareholder is M/s Synthite Group; an Ernakulam based upcoming industry in spice processing business. The lone individual among the promoters group, Shri C.V. Jacob is a director of CIAL till this date. There are four directors representing private shareholders, who along with Shri Jacob belong to a class of successful Kerala businessmen with experience in building business empires brick by brick.

The accumulated surplus of CIAL today stands at ₹326.10 Cr with a net worth of ₹632.20 Cr which bestows upon CIAL an envious capacity to trade on its equity. It is not a big surprise that bankers are more than willing to chip in with sizeable funds for developmental works at CIAL now.

On 21st August 1994, when the foundation stone of the airport project was laid by Shri K. Karunakaran, the Chief Minister of Kerala, in the presence of Shri Ghulam Nabi Azad, Union Minister for Civil Aviation and other dignitaries and commenced the construction of runway, CIAL had acquired only 20% of the land required for the project. A determined Shri V. J. Kurian wanted to give a loud and firm message to the world that the Airport will be a reality come what may! What was to be built was not just another airport , but was the first ever airport to be built in PPP model in India, much before even Government of India formulated policies on PPP model.

CONVENTIONAL PPP MODELS AND THE CIAL CONTINUUM

For the cash starved economies of the developing world the concept of PPP and its acceptance by public at large has come as a god-sent. The Private Partnership Policy, 2011 defines PPP as "Public Private Partnership means an arrangement between a government/statutory entity /government owned entity on one side and a private sector on the other, for the provision of public asset and/or public services through investment being made and/or management being undertaken by the private sector entity for a specified period of time where there is well defined allocation of risk between private sector and public entity and the private entity receives performance linked payments that conform to specified and predetermined performance standards measurable by the public entity or its representatives."

As is evident from the above definition the underlying factor in the many incarnations of PPP models that have emerged has been the channeling of finance and/or management efficiency from private entities for the stated public service or goods. Varying in ownership of capital assets, responsibility for investment, assumption of risks, or in duration of contract period that they are, choice of a particular model takes into account the country's political, legal and socio-cultural circumstances, maturity of the country's PPP market and the financial/technical features of the projects and sectors concerned.

Convinced that airport development needed private investment and managerial efficiency to bring it to global standards matching the new pace of economic growth, Government of India was actively promoting various PPP models for developing airport infrastructure. A position paper on airport development released in 1993 read, "Development of quality infrastructure will have an impact on international competitiveness and economic growth. This requires faster development of civil aviation infrastructure on public private partnership mode."

Till March 2015, five airports have been developed on PPP basis. Investment made by the private sector during the 12th FYP is projected to grow at a CAGR of about 30 per cent during FY 2013-17. The following airports are seen as role models of the PPP route of development in this sector.

Summary of PPP Airports in India

Airport	Passenger traffic in FY2014	Timing and Status	Largest Shareholder	Foreign airport shareholders
Delhi	36.9 m	Brownfield airport, transferred to PPP operator in 2006.	GMR	Fraport, Malaysia Airports
Mumbai	32.2 m	Brownfield airport, transferred to PPP operator in 2006.	GVK	Airports Company of South Africa
Bangalore	12.9 m	Greenfield airport, opened in 2008.	GVK	Zurich Airport
Hyderabad	8.7 m	Greenfield airport, opened in 2008.	GMR	Malaysia Airports
Cochin	5.4 m	Greenfield airport, opened in 1999.	State Government of Kerala	n/a

Source: CAPA – Centre for Aviation, Airports Authority of India

Hyderabad International Airport is a green field airport developed under PPP model and is structured on a Build, Own, Operate and Transfer (BOOT) basis. The GMR Hyderabad International Airport Limited (GHIAL) is a joint venture company promoted by the GMR Group (63%) in partnership with Government of India (13%), Government of Andhra Pradesh (13%) and Malaysia Airports Holdings Berhad (11%). The Company was incorporated to design, finance, build, operate and maintain a world class greenfield airport at Shamshabad, Hyderabad. Delhi International Airport (P) Limited (DIAL) is a joint venture, formed as a consortium between GMR Group (54%), Airports Authority of India (26%), and Fraport AG & Eraman Malaysia (10% each). GMR is the lead member of the consortium, Fraport AG is the airport operator and Eraman Malaysia is the retail advisor. The concession to operate, manage and develop the IGI Airport was awarded to the consortium in January 2006, following an International competitive bidding process. DIAL entered into Operations, Management and Development Agreement (OMDA) on April 4, 2006 with the AAI. The initial term of the concession is for 30 years extendable for another 30 years. For the development of Bangalore airport, GVK Bangalore International Airport Limited was constituted. It is a green field airport. 26% of GVK BIA's equity is owned by the Airport Authority of India and the Karnataka State Industrial Investment & Development Corporation, while the remaining 74% is held by private promoters. In January 2012, GVK acquired 43% of this equity from the private promoters. The Government of India has given BIAL the exclusive right and privilege to carry out the development, design, financing, construction, operation, and management of the airport for a period of 30 years from its opening date, with an option to extend the concession for another 30 years. It can be seen that two leading private promoters namely GMR and GVK were instrumental in ushering in the changes in these airports. Since February 2006, Mumbai airport has been managed by Mumbai International Airport Ltd (MIAL), a consortium of GVK Industries and Airports Company South Africa (ACSA). It may please be noted that Cochin international Airport was commissioned in 1999, almost a decade ahead.

To evaluate the PPP model at CIAL in the backdrop of above definitions and examples is a bit of brainteaser. There are agencies like Financial Institutions, public sector undertakings and GOK to fit into the slot of public sector in the CIAL PPP model . In any case, if one is looking for a visible private sector partner like GMR in this arrangement he is going to be surprised. There is no partnering of the government agencies with any dominant private sector entity in the making of CIAL, but it associates with a group of retail investors mainly constituted by NRKs. They invested in the project not because they were overtly impressed by the business potential of the proposal but because of their affection for their homeland. That makes the CIAL model unique.

You will not find any conventional BOOT, BOT, or a BOO model in operation here where the role of private partner looks imposing and occasionally alienating. CIAL is the soul, spirit and body of the enterprise that is offering the set of services that this airport is famous for. The Government of Kerala is firmly in control. The collaborating stakeholders are numerous who proudly share the glory of CIAL, grateful at heart, 'for favours received.' For them CIAL is '*apna airport*' now. The values that CIAL holds close to its heart - customer delight, commitment, integrity, safety and social responsibility - is internalised by them. An excellent illustration for the same is the Cochin Airport Taxi Operators Society, which has exclusive rights for taxi operation within the airport. Constituted exclusively of those who lost houses and land during land acquisition, and supported and mentored by CIAL, it is a direct beneficiary of the growth of CIAL. Being the body with considerable influence in this society, CIAL is able to ensure delivery of quality taxi service to the passengers, both foreign and domestic. CIAL grooms them to perform to international standards. It also ensures that the income earned by the society is fairly distributed to the members of the society every week. CIAL offered employment to one member of each family who lost their house/land for the airport. In addition, CIAL earmarked 53 acres of land to build a residential colony for those who lost their houses, and allotted 6 cents of land to each of them. "Our resettlement and rehabilitation programme was appreciated by World Bank" Shri V. J. Kurian looks back with satisfaction.

When CIAL initiated these steps, the concept of CSR was yet to evolve in the country. CIAL is ahead of its times and the soul behind the show, Shri V. J. Kurian, dreams to innovate and innovates to dream.

The ethics and culture that CIAL owns and radiates is unique and exceptional. It is a going concern with benevolent heart-taking stakeholders alongside as it strives to serve and succeed. Here, the society and the enterprise move ahead in harmony, and the rhythm; smooth and swift. A virtuous PPP model – of the people, by the people and for the people - is at work here at its best. It is rather like a continuum between public and private nodes and needs and goes integrating the ideal functions of people oriented governance and market driven deliverables in an airport services milieu. It is a seamless merger of two different streams and the flow, down the confluence, pleasantly calm. A poetry in motion!.

PROJECT EXPANSE

A total of 1253 acres of land was acquired for the construction of the airport. As per the land utilisation plan prepared by Ernst and Young - 594 acres was for runway, 536 acres for terminal building, 53 acres for navigation assistance facilities, and the rest for miscellaneous purposes and the land CIAL acquired for road connectivity to NH 47 was futuristic. It was a five Kilometer long, sixty meter wide **right of way**, adequate to lay a 6 lane road of international standards. Later in the western side of the airport abutting the approach road CIAL Golf Course was developed. This land beneath the approach path of the aircraft to the runway hardly had any utility due to safety reasons. In hindsight, developing a golf course was an intelligent option, as it gels well with the green image of the Airport. In fact, Government of India granted ₹10 Cr for developing the golf course and about ₹ 26 Cr was collected as membership fee.

THE PROJECT TEAM – SIZING UP THE CHALLENGES.

Shri V. J. Kurian was sole harbinger for the project from CIAL until a small internal team was formed during 1994. Later during April 1996, an expert team was roped in on deputation from National Airport Authority. From then on, TEAM CIAL worked together as a coherent unit under Shri V. J. Kurian.

The first challenge faced by the project team was the design of the Terminal building itself. A reputed US Consultant, who was appointed to prepare a design for the terminal building, estimated a mind boggling sum of ₹500 Cr. Shri V. J. Kurian was not inclined to accept this huge figure, and instead advised KITCO, a local consultancy organisation owned by Kerala Government to prepare a low cost design for the terminal building. His fascination for the unique temple architecture style of Kerala was received well by KITCO.

Though KITCO never had any experience in building an airport, they seized this opportunity. With the wholehearted support and encouragement of TEAM CIAL, they proposed an innovative design at one-fifth the cost of the estimate prepared by US Consultant. It was a big morale booster for TEAM CIAL. However, the biggest challenge was yet to unfold - completing land acquisition proceedings for the project as scheduled! Evicting a person from his home is not easy, especially when you do not have the compensation ready to disburse!

An area of 1253 acres of land was required for the project, which belonged to 3824 landowners and 822 households. They resisted land acquisition vigorously with the active support of local political leaders. Then, there was the ticklish issue of demolishing three temples and two churches for constructing the runway. It also warranted realigning four major roads, three high-tension lines and even a river. Local units of mainstream political parties competed with each other in joining the public outcry for stopping the project altogether. Adequate funds were never available to pay compensation to the evictees in time. It was testing times for Team CIAL and its captain. They remember the helping hand extended by The Federal Bank Ltd sanctioning a bridge loan of ₹10 Cr. based on a government guarantee was a timely gesture and a confidence booster to them. The Federal Bank Ltd remained the banking partner of CIAL since then. A banker in need is a banker indeed!

It was a near stale mate situation when TEAM CIAL proposed a novel scheme that broke the ice. They suggested an acquisition package, which offered negotiated rate settlement for the land, and other rehabilitation benefits including freehold title of a 6 cent developed property in airport vicinity. It included job offers. As many as 719 persons came forward for this negotiated settlement. The package by itself became a model and was appreciated by agencies including the World Bank.

Work on the runway costing ₹72 Cr. was awarded to M/s KMC Constructions Ltd., during 1995. The site was water logged and the subsoil weak and unpredictable. The long and torrential downpour during monsoons made land development works a nightmare. However effective maneuvering of push and pull strategy by TEAM CIAL ensured that works progressed well. The works on terminal buildings and office buildings including Air Traffic Control building also went ahead well after the initial hiccups. Shri V. J. Kurian concentrated on administration and external environment related matters while the rest of the TEAM CIAL focused on technical matters in which the team from NAA was of commendable support. By 1998 the site was bristling with activity and around 100 contractors were operating simultaneously. All around progress could be seen in all work fronts.

The licensing process of an airport is quite extensive and the agencies involved too many. Five years of rigorous follow up action at various stages ensured that all the technical and procedural requirements for final licensing were met and complied with. For TEAM CIAL the D-day was the day when the final aviation clearance was granted by DGCA.

AIR PORT COMMISSIONING

On May 25th 1999, **The Cochin International Airport** was officially inaugurated by the then president, Shri. K.R. Narayanan. CIAL handled its first flight on June 10, 1999 – marking the dawn of a new star in the international aviation horizon. It was an arrival. What could be more rewarding to the fledgling airport than the fact that the first flight to touch its virgin runways was an international flight! Kaveri, the silver liner of Air India, landed at Nedumbassery from Damam with 203 passengers and 16 crew at 10:55 AM to gets its name written in golden letters in the annals of CIAL history. A moment of ecstasy for the project team! It was a grand arrival for CIAL too in the International Aviation arena. CIAL can always take pride in the fact that they could commission the airport in a record time of 5 years after the foundation stone was laid in 1994. There was not a single day of work stoppage during the project execution phase - a genuine accomplishment in a state like Kerala, known for trade unionism and work disruptions for all the numerous reasons. CIAL was a people's endeavor and in that huge cauldron all the ice got melted. Another feather in the cap of the project team!

FACILITIES IN THE AIR PORT

The airport terminals had 18,580 m^2 (200,000 sq ft) of floor space at the time of inauguration. CIAL envisioned six phases of expansion over 20 years, the third phase of which was completed in 2009. The original airport terminal was small, envisioned to handle just 100 passengers at a time. Nevertheless, by 2001, the international passenger traffic was growing exponentially, making it important to augment the terminal capacity. The original floor area of the airport had risen to 27,870 m^2 (300,000 sq ft) after the expansion of the International Departure block. The Arrival terminal was expanded subsequently, with the addition of a central block, which increased the total area of the international terminal block considerably. The capacity of cargo terminal was increased to handle additional quantum of export/import

cargo. The parking facilities of both domestic and international terminal were substantially augmented and additional airside facilities such as a full-length parallel taxiway and a taxiway link to the Aircraft Maintenance and Overhaul facility established.

CIAL now plans to convert the present international terminal into a domestic terminal, while a state-of-the-art international terminal will be built anew. The new terminal with an elevation featuring the traditional Kerala temple architecture will have all the latest features of international standards. This two-level terminal will have provisions for 112 check-in counters, with in-line baggage screening facilities, 100 immigration counters, duty-free shops of 30,000 square feet at departure and arrival lounges, 19 boarding gates, 15 aero bridges, six baggage conveyor belts and fully covered alighting and boarding area. The present domestic terminal would be converted into "Royal Pavilion" and would handle VIP and private chartered flights and jets. The current international terminal, once converted into a domestic terminal, will have 5 aero bridges and 10 boarding gates facility, apart from increased parking bays. It is fast upgrading towards global standards. Facilities are impressive. However they consume lot of power.

CIAL GROWTH STRATEGY –DIVERSIFY WHILE YOU CONSOLIDATE

One need not ponder much on the reasons for the overdrive of CIAL for diversification, if one goes through its mission statement. The ambitious statement reads, “To become a ₹3000 Cr turnover company by 2023 with 20% aero revenue; 30% non-aero revenue and 50% non-aviation revenue.” But it would surprise many that CIAL started diversification way back in 1999 itself, while it was in its very early stages of infancy.

CIAL was confounded with financial distress right from its conceptual stages as narrated. The first ever test tube baby in PPP mode in the airport infrastructure of the country did not receive the financial care it needed from either of its parents. Neither the public nor the private, were willing to spend any serious penny on this embryo with a very poor survival probability. CIAL had reclined to the fact that it should fetch for itself for survival and the bright brains behind the project started looking at options beyond aero business for survival and growth. The diversification plans of CIAL have their genesis in this mould.

It was a known fact that Airport Duty free shops worldwide were making a huge profit of about 50%. Invariably they were run by global players either directly or through franchisees. All airports in Government sector in India were under AAI, which had contracted the exclusive rights for operating duty free shops to Tourism Development Corporation of India (ITDC). Since CIAL was not in the government sector, it was free to have its own arrangement for operating duty free shops. The challenge was whether CIAL had the business acumen to do it alone. But the nerve for it, they certainly had. Within a period of one year from its commissioning, without any prior experience in retail merchandising, they started the CIAL Duty Free Shop. The fertile minds of CIAL knew Kerala psyche well. Homecoming Malayalee would love to go home with lot of foreign presents as anticipated by his homefolks. It did not matter where he picked them up. However, what to pick up is important. The presents should be of good quality, worth the money spent. It will be appreciated by his homefolks. CIAL knew that it required a global perspective on the brands for their appropriate selection and display. Such an expertise was foreign to CIAL. They went for an international consultant for brand selection. ALFA KREOL, the agency selected did a commendable job. The CIAL Duty free with a home touch is now a 'welcome' experience both for the home returning NRIs and the foreign tourists, as they could purchase international brands at reasonable prices on arrival, giving them a hassle free air travel . Moreover, they could pick up anything from the duty free shop without the fear of being charged for excess luggage. They could also utilise the extra air born luggage space saved, for carrying something extra. CIAL Duty-free is well patronized by NRIs and has become a super hit satisfying both its owner and the customers. It has now grown to become a brand by itself. The revenue earned from CIAL Duty -free was an incredible ₹166 Cr in 2014 – 2015; a steep jump from ₹46 Cr in 2009.

CUTTING ON ENERGY BILL- MONEY SAVED IS MONEY MADE

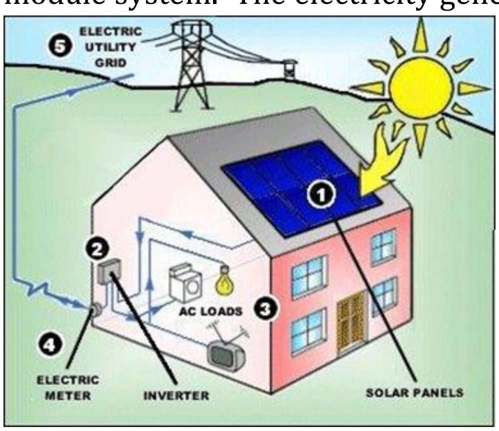
The conception, birth and growth of CIAL in the most difficult and unsympathetic environment brought in parsimony in spending in its operation philosophy. They know that saving money is easier than making it. Though CIAL had outsourced majority of its operations it still had to pay the power bill to KSEB, the state owned power utility, for all its power consuming operations in the Airport at a commercial tariff rate of ₹8.30 per unit. The facilities in CIAL required about 48000 units of power every day which meant a clean draining of about ₹4 lac per day from its kitty. This was just unacceptable to CIAL and there was an urge to bring it down. They undertook power saving measures and energy auditing which derived some benefit. However it was evident that generating own power at a cheaper rate was going to be the only lasting solution. There were, however, technological and legal impediments.

EVOLUTION OF POWER SECTOR IN INDIA

The power sector reform was an accepted agenda for all governments across the world as monopolization by power companies were strangulating consumers. It was seen that more competition in power generation, transmission, and distribution would bring in more efficiency in the system and reward the consumers with a rational tariff rate. In India also, power sector was a monopoly of the government and proving to be a white elephant. India also had to initiate changes in power sector and had to bring legislations to suit. Electricity is a concurrent subject where both central and state governments have authority to make laws. The post independent 'Electricity Act 1948' mandated State Electricity Boards (SEBs) as the sole generating agencies to generate electric power in states who became white elephants over a period of time. In spite of their deplorable performance in technical and financial terms there was a general reluctance among utilities to forego the monopoly they enjoyed in power business and the strong political backing cutting across party lines that they mustered, prevented creation of any new law by state legislatures in any of the states to alter the status. However, a change was inevitable. The Electricity Act, 2003, a path-breaking act in Indian Power Sector, had given the framework for liberalizing the power sector from government monopoly. Government was encouraging private investment in power generation, transmission and distribution. The generation, transmission and distribution of power were likewise to be made independent businesses. As the fossil fuel base for energy in India was limited and polluting in nature, there was lot of thrust given by the government for power generation from alternate energy resources. India was the first country in the world to have a separate Ministry for alternate and renewable power generation as early as in 1992. Ministry of New and Renewable Energy (MNRE) was formed in the year 2006 and since then there was lot of thrust to develop energy from all possible sources right from biomass to waves. India has a high solar insolation and the daily average solar energy incident over India varies from 4 to 7 KWh/m2 and is ideally suitable for solar energy generation.

HOW THE SOLAR THEORY WORKS

The solar module consists of a series of wafer thin silicon cells covered in a protective tempered glass, which convert solar radiation to DC electricity. The silicon cells can be constructed with mono crystalline polycrystalline or amorphous silicon. They are the costliest component of a PV based power generation system. An inverter is another major component, which will convert DC electricity generated by the PV modules in o high voltage AC electricity. Inverter is the heart of a PV solar system and it has to be perfectly in match with the solar module system. The electricity generated can either be used for own use or can be sold to the



grid-by-grid connectivity. The standard lifetime of a PV based solar energy system is about 25 years, which can be extended by proper maintenance. In grid interactive rooftop solar PV power systems, the DC power generated from solar panel is converted to AC power using power-conditioning unit and is fed to the grid. The generated power during the daytime can be utilized fully and excess can be fed to the grid as long as grid is available. In the case of Solar Power not being sufficient due to cloud cover or during the cloudy hours, the captive loads are served by drawing power from the grid. The grid interactive solar system can work on net metering basis where in the beneficiary pays to the utility on net meter reading basis only. The solar modules have a long life of about 25 years. The panels are to be cleaned off dust and biotic growth regularly to ensure that the incident solar light reaches the cells inside.

THE SOLAR ENERGY THRUST BY GOI

Generation of Solar power was incorporated in one of the eight action plans under National Action Plan on Climatic Change and was formally launched in January 2010 christened Jawaharlal Nehru National Solar Mission. Its mandate is to create an enabling policy and regulatory framework to facilitate utility scale power generation with on grid or off grid applications. It also would facilitate enhancement of domestic manufacturing base and would duly support R&D in this field. It has a target to achieve Grid Parity Tariff by 2022 and a capacity generation of **100000 MW by 2020**. The cost of generated solar power used to be very high at about ₹17 per unit, which was detrimental to its progress. However technological innovations over a period of time have ensured a spiraling down of cost and by 2012 it came down to Rs ₹8.5 per unit. Grid based solar power initiatives were pursued vigorously by many Indian states. Gujarat taking the lead to be followed by Maharashtra, Madhya Pradesh and Rajasthan. Kerala was not visible in the picture. Kerala is known for its political activism and trade unionism, and power sector reforms here are hard to come by. Solar energy initiatives taken by the state government had a bad fate and got into political controversies. The solar power generation policy came to fruition in Kerala very late.

SOLARISATION OF CIAL

Phase 1

CIAL knew it was time to act and act it did. They set up a 100 KW PV based solar power plant on roof top of Arrival block as a pilot project during March 2013. It required 400 panels each with a capacity of 250 Wp. Each panel was about 1.6 Sq meter of area and the panels are set at a tilt angle of 10 degree facing south. The installation was designed and executed by Kolkata based Vikram Solar Power. This system functions in a way that the electric power generated by the solar panels is not fed directly into the utility grid. The inverters convert the direct current output from the solar array into a grid compliant AC voltage, which feeds it into the utility grid system. Since the substation was close by hooking up to the grid was easy. This facility generated 400 units of power daily, the absence of battery backup reducing the capital cost drastically. This was a revelation to the technical hands in CIAL who could see a broader picture. Why not attempt a bigger capacity installation?

Phase 2

When the SOLAR policy was pronounced in 2012, CIAL was the first to respond. A 1 MWp plant was the capacity they contemplated and installing 4000 numbers of monocrystalline modules of 250 Wp each in a record time of 7 months inside the Aircraft Maintenance Hangar facility and in the adjacent areas, M/s Emvee Photovoltaic Power Pvt Ltd commissioned the facility in November 2013. It generated an average of 4000 units of power a day. The cost of the project was ₹7.4 Cr.

Phase 3

Having done the homework well, CIAL team knew that technology related aspects were within its reach and higher capacity plants would bring in economies of scale that would alter the cost of generation drastically. The next step was only logical; to go for full generation of power required for the entire operation of CIAL, adding up to around 48000 kilowatt hours per day, from PV based solar system in its own backyard. Land required for installation, of about 45 acres was available near the North West boundary in the area earmarked for the future expansion of the cargo terminal. The capacity of the system was to be about 12 MWp with a capacity to generate 50,000 kilowatt hours to make the airport grid neutral. KSEB meanwhile granted permission to CIAL for banking of electricity for grid neutrality. The generation during normal sunshine hours between 9.00 am and 4.00 pm would be available for CIAL for its own use and the excess exported through 110 kV sub-station to the KSEB grid.

Bosch limited was entrusted with this prestigious job through a transparent tender process. They did it with élan and with flawless technical perfection that Germans are famous for. The project components include PV modules of 260 Wp capacity, manufactured by Renesola, and inverters of 1 MWp capacity manufactured by ABB India. The PV module warrantee is for 25 years. The total project cost is about ₹62 Cr. at about ₹5.17 Cr/MW which is substantially less than the bench mark set by regulator. The project payback period is under 6 years. M/s Bosch handles the system maintenance as well, on a contract, at a cost of ₹50 Lac per annum.

A proud Chief Minister of Kerala, who is also the Chairman of CIAL, inaugurated the 12 MW power plant on August 18, 2015. It was the first Airport in the world to go total solar. Several airports across the globe do have solar plants. But none of them are completely solar powered. CIAL is the first to do it. The global media is projecting it as a model to emulate across the world - an image that can stimulate solar energy prospects in the developing world a great deal!

CIAL, as is its wont, stole the thunder and demonstrated a simple answer for a pressing problem – a trait that CIAL has made a habit of. It can be seen that CIAL had woven every single little advantage of the existing infrastructure and policy framework to create an enviable business model. It has an inborn and natural spirit of innovation in it, which coupled with determination, enables it to come out of difficult situations every time with its thumps up. But the real test before CIAL is to make CIAL solar power less expensive than the KSEB grid tariff. With its resolve to exceed expectations in whatever it does, that day like ways, may not be far too distant

CIAL DIVERSIFICATION PLANS – ADVANTAGE FROM ADVERSITY

The aero revenues of CIAL is expected to hit a plateau with the policy of AERA (Airport Economic Regulatory Authority), the regulatory body on Airport Tariff Rates constituted by the Department of Civil Aviation, GOI, to fix tariffs for services based on the capital expenditure incurred on facilities. As CIAL constructed the facilities at a low cost, the services offered by CIAL entail only low Tariffs. It is amply clear that to grow CIAL has to diversify and diversify quickly, or else it may face fund crunch for expansion to the scale and size it aims for.

CIAL Infrastructure Ltd is a subsidiary Company of CIAL where it has 99.96% share holding. It was started in 2011 by Shri V. J. Kurian to leverage the expertise that CIAL has acquired in project management. They now have the capacity to offer technical consultancy for the construction of airports, which involves integration of many streams of engineering knowledge and practices. Kerala is a state short of power and the neighbouring state of Tamil Nadu has an perennial thirst for energy. Kerala banks on Hydel Energy for its power needs and possesses lot of untapped potential in its small rivers and streams emanating from Western Ghats for setting up Small Hydro Electric Plants (SHEP). If CIAL can produce energy it can be sold to the needy and can have a profitable business operated. By 2014-15, CIAL Infrastructure Ltd made a strong entry into the green energy business of the state. It bagged a contract to own and operate 8 small hydro plants with a total capacity of 50 MW (individual capacities ranging from 1 to 21 MW) in the Western Ghats of Kerala on BOOT basis. They have commenced preparation of projects reports for another 8 to 10 SHEP projects at different places and are marching ahead confidently. CIAL invested ₹35 Cr in 2014 for augmenting the capacities of CIAL Infrastructure Ltd.

"We see ourselves as a major producer of power from renewables in future, and we are preparing for it" says Mr Kurian. Something new is in the anvil. CIAL is the laboratory for him to experiment and he does it with meticulous care. Work for the new international terminal is progressing well. Obviously, once completed its power requirement will be met from solar power only. CIAL has already identified the places to position the PV panels. Surprisingly all panels are not going to rest on solid ground this time. A portion of them is going to rest over canals and car parking area. CIAL has a canal with neatly constructed embankments running close to its southern and eastern boundaries, over which solar panels will be installed to generate approximately 7MW of power. "Our discussions with vendors on floating PV solar panels are in an advanced stage, and I am assured that the technology will be successful. If so, we can think of a tie up with irrigation department, and using the same technology generate solar power from the canals and dams they own - sort of Hydro Solar Power", tells Shri Kurian with a wink in his eye. It is true, Irrigation Department in Kerala hold vast expanse of unhindered solar insolation area in the irrigation canals and the reservoirs of the seven major dams they own. His statement looks simple and straight. He dreams of CIAL turning into a major power producer in Kerala. Prospecting for another innovation is already on. It is time, to prove the adage 'winners do not do different things; they do things differently!' genuinely true, once again.

CIAL has started two more subsidiaries - Cochin International Aviation Services Limited and Air Kerala International Services Limited in which it has 99.96% shareholding each. Meanwhile another two initiatives by CIAL in the non-aviation business sector are doing well. The International Trade Fair Centre that CIAL owns and operates is attracting lot of events to its halls whereas the CIAL Golf Club has put CIAL in a different league all together. The only 18 Hole golf course in Kerala, CIAL Golf Club claims to be the first course in the country to offer an Island green on the 18th Hole for an extremely exciting and challenging round of Golf. It has been developed on 130 acres of rolling greens. CGC is designed to play to a length of over 7430 yards and is open 365 days a year, and aims to be the numero-uno of the golfing circuit in this part of the world. The appeal of the offer can be judged only by a true Golfer. A nature lover would agree that the disciplined greenery that the Golf course has additionally brought in gels well with the Green Airport image that CIAL proudly nurtures and builds.

WIND FALL OF EXPECTATIONS – COST OF SUCCESS

During the conceptual stages of the solar project, none in CIAL ever thought that one day it will attract such a worldwide acclaim. It was born out of a need. But it catapulted CIAL into the league of global icons. Now CIAL is confronting another problem. The success stories are putting a great deal of pressure on CIAL. They have solicitors from across the globe, especially from third world, thronging to their solar farm to see, hear and feel what it is all about. For them CIAL is a personification of skill, modesty in execution, and perfection at everything it does. They want the guidance and support of CIAL to solve a range of issues. "The trust on us is tremendous. We want to tell people that we have failures also. We do not have Midas touch on everything that we do," says a CIAL official. Not that everything they do is successful. The Air Kerala International Services that CIAL launched, as a flagship airliner of the State of Kerala to cater to the needs of Gulf Keralites for low cost airliner connectivity, is yet to take off. DGCA ruling that 5 years of experience in operating flights and ownership of 20 aircrafts are pre requisites for starting international aviation services is proving to be a stumbling block. The CIAL International Aviation Services is yet to make profit after its second year of operations. For those who know CIAL, these reverses are only trivial and transient. 'CIALians' compose their own scripts, and they are good at it too.

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Exhibit - 1 Financial performance of CIAL 2004-2015					
YEAR	**TURNOVER** (Rupees in crores)	**PROFIT BEFORE TAX** (Rupees in crores)	**TAX** (Rupees in crores)	**PROFIT AFTER TAX** (Rupees in crores)	**Dividend %**
2003-04	85.26	36.04	36.04	21.11	8%
2004-05	100.26	48.03	48.03	28.79	10%
2005-06	110.66	38.8	38.8	31.78	10%
2006-07	111.86	44.39	44.39	37.19	8%
2007-08	138.206	51.233	51.233	46.813	8%
2008-09	173.06	68.931	68.931	59.343	10%
2009-10	211.63	96.61	96.61	77.52	12%
2010-11	245.59	116.22	116.22	90.1	15%
2011-12	275.94	134.43	134.43	102.03	16%
2012-13	306.5	142.22	142.22	111.41	17%
2013-14	361.39	157.46	157.46	124.37	18%
2014-15	413.96	179.3	179.3	144.57	21%
Source : CIAL Annual reports					

EXHIBIT 2 a - SHARE HOLDING PATTERN OF CIAL - MARCH 2015					
Sl No	Category	Name	Value (Rs)	Share	%
A	**Promoter**	Indian			
1	Individual		615,000	61,500	0.02
2	Govt. of Kerala		986,800,000	98,680,000	32.24
3	Any other		301,800	30,180	0.01
	Promoter foreign				
	Nil				
	Total A		987,716,800		**32.27**
B	**Public Share Holding**				
	Institutions				
1	Banks/Fis		1,700,000	170,000	5.55
2	CPSUs		305,005,000	30,500,500	9.97
3	SPSUs		54,005,000	5,400,500	1.76
	Subtotal				17.28
	Non institutions				
1	Body Corporate		264,260,300	26,426,030	8.63
2	Resident Individuals up to 1 Lac		147,589,190	14,758,919	4.82
3	Resident Individuals more than 1 Lac		125,676,500	12,567,650	4.11
4	NRIs		1,006,345,200	100,634,520	32.88
	Subtotal				50.44
	Total public share holding B		2,072,881,190		**67.73**
	Grand total A+B		3,060,597,990		100

Source CIAL Annual report 2014-15

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Exhibit 2 b : Board of Directors
Sri Oommen Chandy
Sri.K.M.Mani
Sri.P.K.Kunhalikutty
Sri.K.Babu
Sri.K.Roy Paul
Sri.Jiji Thomson
Sri.Yusuffali M.A
Sri.N.V.George
Sri.C.V Jacob
Sri.E.M.Babu
Smt.A.K.Ramani
Sri.V.J.Kurian

Exhibit 2 c -Countries hosting the NRIs Investors in CIAL	
1. Australia	16. Qatar
2. Egypt	17. Emirates
3. Japan	18. Botswana
4. Mexico	19. Uganda
5. Sweden	20. Kuwait
6. Germany	21. Bahrain
7. Austria	22. Oman
8. Canada	23. Nigeria
9. Switzerland	24. Kenya
10. Brunei	25.Indonesia
11. USA	26.United Arab
12. Italy	27.South Africa
13. Iran	28.Malaysia
14. UK	29.Singapore
15. India	30.Saudi Arabia
Source: Malayala Manorama, May 25, 1999, P. 1	