# INDIA-AFRICA PARTNERSHIP

## TOWARDS SUSTAINABLE DEVELOPMENT

**FIDC**
Forum for Indian Development Cooperation

**RIS**
Research and Information System for Developing Countries

# INDIA-AFRICA PARTNERSHIP TOWARDS SUSTAINABLE DEVELOPMENT

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&
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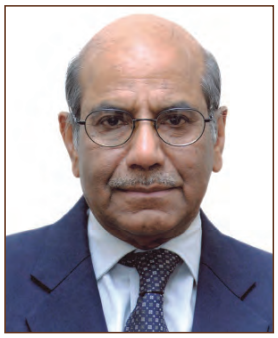
# FOREWORD



**Ambassador Shyam Saran**
*Chairman, RIS*

In recognition of the growing importance of India-Africa ties and prospects for much closer cooperation, it was decided to convene regular India-Africa Forum Summits (IFAS). These Summit have laid the foundation of a new architecture for a structured interaction and cooperation between India and our African partners in the 21st Century. The first such Summit was held in April 2008 New Delhi, the second in May 2011 at Addis Ababa, Ethopia and the third Summit would be held at New Delhi in October 2015.

The first Summit had adopted the historic Africa-India Framework for Cooperation, which sought to foster beneficial cooperation in a very comprehensive format encompassing economic and political cooperation, and cooperation in science and technology, research and development, information and communication technology and cooperation in social development and capacity building. Thus, India-Africa development cooperation truly reflects the philosophy of the modern concept of a 'development compact' which works at the five different levels that include trade and investment, technology, skills upgradation, line of credits, and concessional grants. In fact, the framework of India-Africa cooperation is a unique initiative in the history of South-South cooperation, placing development cooperation within a much broader context of overall relations between India and African countries. It looks at development not merely in economic terms but as a process that is sustained only if located within a larger political, social and intellectual environment. India-Africa development cooperation is conceived in a unique three-tiered pattern, encompassing bilateral, regional and pan-African cooperation.

RIS since its inception has given India-Africa development cooperation a prominent place in its work programme. As a part of this, it has organized a number important seminars and conferences and also brought out a number of publications. On the eve of the forthcoming IAFS, RIS is bringing out this unique volume on successful implementation of several projects in the sectors such as sustainable livelihood and financial inclusion, cultural exchanges, scientific and technical exchanges, solar industry, tele-medicine and tele-education, gas power projects, thermal power plants, and hydro projects. We are certain it would not only be found of interest and use by all stakeholders but would be a source for inspiring many future success stories emanating from the India-Africa development partnership.

Shyam Saran

# PREFACE

**Prof. Sachin Chaturvedi**
*Director General, RIS*

The intersection of African resurgence and India's growing economy and global profile has opened up new avenues for deepening the multi-faceted development partnership between the two emerging growth poles of the world. Increasingly, there is an alignment of India's growth agenda and Africa's Vision 2063, which is set to unleash new possibilities of partnering in key areas which are central to unfolding African resurgence, including education, health, capacity building and sustainable development.

Against this backdrop, India would have to consider consolidation of its development engagement with the African continent. In the process, the major focus will be on five elements as articulated in the Theory of Development Compact. These elements are: (i) trade and investment; (ii) technology; (iii) capacity building; (iv) lines of credits; and (v) concessional finance. In last several years, India has implemented one or other modalities of development compact. However, a comprehensive view with composite approach is extremely important. Since these engagements have happened through the Indian missions based in different countries, the wider process may be called as the 'mission approach' and the mechanism for this is the 'development compact', which, in real terms means a development partnership for cohesive and comprehensive engagement.

This volume chronicles and celebrates various dimensions of the India-Africa partnership, pivoted around capacity building, sustainable development and training of Africa's most precious resource – over one billion people of the continent. As New Delhi hosts the third India-Africa Forum Summit, this multi-dimensional partnership is set to scale new heights in days to come, with profound impact for not just over two billion people of India and Africa, but for the world at large.

Sachin Chaturvedi

# TRANSFORMATIONAL PROJECTS

# DEVELOPMENT COMPACT: TRANSFORMING ETHIOPIA'S SUGAR INDUSTRY

Different facets of the development compact add colour and substance to the burgeoning partnership between India and Africa, the two growth poles of the world. The diversity of this multi-faceted engagement includes capacity building, technology sharing, investment, trade and development finance. The most striking element in this diversified relationship is that it has evolved in Ethiopia and Mozambique. The value chain approach in supporting the sugar industry is a unique experiment in the bilateral relationship with Ethiopia. In the case of Mozambique, financing a solar panel production unit represented a departure from the way India previously supported projects in the realm of advanced technologies. This project has provided not only capacity for domestic rural electrification, but also scope for the export of solar panels.

**The most striking element in this diversified relationship is that it has evolved in Ethiopia and Mozambique. The value chain approach in supporting the sugar industry is a unique experiment in the bilateral relationship with Ethiopia.**

## TRANSFORMATIONAL LOC: SUGAR MILLS IN ETHIOPIA

Ethiopia is one of the few countries in Africa with whom India has enjoyed a long-standing partnership in development cooperation. Areas of broad-based cooperation between the two countries may have undergone major changes, but the spirit of mutually sustaining partnership has remained strong across the past several years, within the development compact framework. A specific sequence and structure in the selection of areas for cooperation may have been lacking but since the 1950s cooperation has continued in capacity building, trade and investment, security, infrastructure and strengthening of education, in particular the supply of trained teachers, who form a sturdy cultural bridge between the two countries.

India provided a major LoC for Ethiopia in 2006 which transformed the dynamics of cooperation and also reflected a growing realisation within the Ethiopian government of the need to strategise economic growth. The US$ 640 million line of credit to Ethiopia for the development of its sugar industry was a landmark development in this regard. India assisted specifically in providing better germplasm for sugar strains, processing plants and related services. Overall, this programme represented India's close and sustained support across the value chain.

## Moving up the value-chain

Value chains improve efficiency and business integration in agriculture. Activity in the sugar sector has expanded rapidly over the past two decades, in the face of low world sugar prices and rising production costs. Finance is always a challenge in the sugar industry because lead times are generally long; hence development assistance assumes great significance. Support is essential for ensuring regularity and continuity of production with consistent quality, and for that reason adequate measures are needed for the assimilation of technology. The fact that India extended support across-the-board is a demonstration of its commitment to the development compact.

**Ethiopia's Growth and Transformation Plan (GTP) has precise targets for the sugar sector, the twin objectives being to ensure sufficient domestic production and setting up an energy generating plant to power key economic activities.**

Ethiopia's Growth and Transformation Plan (GTP) has precise targets for the sugar sector, the twin objectives being to ensure sufficient domestic production and setting up an energy generating plant to power key economic activities. India's project has assumed great significance as Ethiopia identified the sugar sector as one of the engines of economic growth. The GTP envisages facilitating HRD, building institutional capacity and supporting R&D in the sugar industry. The public sector has almost full ownership in this sector.

The development of the sugar industry in Ethiopia started with an agreement in 1951 between the Ethiopian Government and Handles Vereening Amsterdam (HVA), a Dutch company, for the establishment of a sugar factory in Wonji, Ethiopia. This was the first sugar factory in the country with its own plantation. Subsequently, a similar agreement was concluded between the government and the company for the establishment of sugar factories in Shoa and Metehara. The factors that led the company to establish sugar factories were high domestic demand, availability of natural resources and prevalence of infrastructural facilities within the Awash Valley.

Ethiopia's sugar industry is earmarked as having great potential, as both soil and climate in various parts of the country are well suited for large sugarcane crops. Almost 165 million to 172 million of Ethiopia's 276 million acres is suitable for cultivation. However, only 37 million acres is currently in use. Sugar manufacturing is the leading sub-sector of food processing sector which accounts for 53 per cent of sales revenue of the food processing sector and 57 per cent of employment in the food processing sector. Ethiopia produces 340,000 tonnes of sugar on 25,000 hectares of land annually and about 20,000 tonnes a year is sold to the EU.

## Bridging Supply-Demand Gap

Ethiopia's domestic sugar consumption is considerably higher (1.26 times) than its production. Therefore, the country imports about 152,000 metric tonne (MT) of sugar per year to meet domestic demand. Ethiopia has been suffering from chronic sugar shortage for many years, forcing the country to become a net importer of the commodity. Ethiopia's domestic demand for sugar has been rising sharply for the past eight years. Accordingly, it has targeted to increase sugar production from 0.31 million tonnes to 2.25 million tonnes under the GTP (2010-11 to 2014-15). Ethiopia also wants to reduce import dependency and generate a surplus for export.

India agreed to support three different sugar factories, whose combined production was likely to be around 1.58

million tonnes, through the $640 million LoC over the period 2007-2012. The initial target was 2.25 million tonnes of sugar and 304000 m3 of ethanol. Additionally, 607 MW of electric power was to be generated by the end of the plan by bringing in an additional 200,000 hectares under sugarcane plantation. The GTP visualized earnings of US$ 661 million from sugar exports and the creation of 200,000 jobs. The LoC was provided through disbursements over five years in phases of US $122 million (2007), US $166.23 million (2009), US $213.31 million (2010), US $91 million (2011) and US $47 million (2012).

The project covered three sugar mills, Wonji/Shoa, Finchaa and Tendaho. Wonji/Shao is one of the oldest sugar units in Ethiopia. According to the Sugar Corporation of Ethiopia, if Tendaho reaches its full production capacity it will create jobs for nearly 50,000 people which would open the doors to more spin-off employment to Ethiopians.

## Impact Assessment: Unfolding Story

The production by these three factories for the period 2014-15 is estimated to be around 1.2 million tonnes of sugar and approximately 93,000 m3 of ethanol. The total value of the sugar and ethanol output will be US$977 million and the plants will create jobs for some 81,000 people. What has been the impact of India's LoC on Ethiopian sugar industry? An analysis by the Research and Information System for Developing Countries (RIS) finds that on completion these projects would annually produce 1.6 million tonnes of sugar, which is 51.51 per cent of the GTP target. Ethiopia will be increasingly self-reliant in sugar. By end-2015, it will even be a net exporter!

## Ethanol Factor

These three sugar plants will produce about 93 million cube litre of ethanol. The estimated economic gain from sugar and ethanol prodoctuion is US $ 961 million annually, which would be a major boost for the agriculture value chain.

One feature emerging from these projects is the collective participation of almost all stakeholders in the value chain; the projects have tried to address growing pressures for better integration between production and transport sectors. A further gain is the creation of a different context for the development a value chain. In the past, most donors assisted the value chain in support of private

sector development; however, in this case the support benefits ESC, which has a more ambitious business plan of becoming one of the top 10 global sugar exporters within 15 years. The three projects will enhance production capacity and contribute towards the objectives of GTP.

The Ethiopian government has set an ambitious target to be a middle income country by 2023-25. Indian engagement in Ethiopia's sugar sector is part of this journey of the unfolding transformation of this emerging economy in the Horn of Africa.

# FORGING LIVELIHOOD PARTNERSHIPS: THE BASIX WAY

**With the Indian government's focus on inclusive growth and financial inclusion, there is a compelling case for deepening the India-Africa partnership in all-important areas of inclusive development, financial inclusion and poverty reduction.**

The African growth story and resurgence is once again in the global spotlight, with some of the world's fastest growing economies located in sub-Saharan Africa. Influential British publication *The Economist* heralded "Africa Rising" on its cover story in December 2011, and since then there has been no dearth of cheerleaders for the continent's immense potential. For India, which has made partnering in the African resurgence its driving mantra for engagement with the continent, the African growth story has presented new challenges and opportunities. In keeping with its multi-dimensional engagement with focus on capacity building, training, trade and technology transfer, India has been untiringly committing its resources and expertise to spur this African renaissance. India's policy makers have rightfully realized that while growth has to be cheered, it should be equitable and inclusive to ensure the continent's lasting transformation and its capacity to combat widespread poverty.

## South-South model: Inclusive Development

With the Indian government's focus on inclusive growth and financial inclusion, there is a compelling case for deepening the India-Africa partnership in all-important areas of inclusive development, financial inclusion and poverty reduction. There is no alternative but to bridge the rich-poor divide and reduce socio-economic inequalities to take Africans out of the clutches of poverty, caused by a host of factors, including low agricultural productivity, deficit in vocational skills, and massive financial exclusion. The question is whether double digit growth in some African countries would make a difference in the lives of

the poor, for growth is not always inclusive. To ensure that growth benefited the poor more than just through "trickle-down", efforts had to be made on the demand side by building capacities of and organising the poor. Given similar challenges faced by India, India has been specially proactive with its agency and network of global partnerships to cooperate with Africa on a creating a new paradigm of inclusive development.

In this regard, BASIX Social Enterprise Group, whose holding company is called Bhartiya Samruddhi Investments and Consulting Services (BASICS Ltd.), is playing a critical role in aiding sustainable livelihood and financial inclusion. BASIX, whose motto is "Equity for Equity" started operations in 1996 as India's first "new generation livelihood promotion institution".

**The overall goal of BASIX's African Livelihoods Partnership (ALP) was to enhance livelihoods of the poor in select African countries in a sustainable, scalable and innovative manner.**

## Financial Inclusion: Methods and Means

The overall goal of BASIX's African Livelihoods Partnership (ALP) was to enhance livelihoods of the poor in select African countries in a sustainable, scalable and innovative manner. ALP would work with vulnerable populations like smallholder farmers, including pastoralists and fishermen, women as micro-entrepreneurs and homemakers, and the youth, who are aspiring and jobless. Transformational change is catalysed through following three interventions:

- Inclusive financial services through access to savings, payments, insurance (crop and livestock insurance, health and life insurance) and credit, especially for women (for micro-enterprises, home lighting systems, water and sanitation). For youth, the focus would be on savings and micro-equity or participatory finance for start-up enterprises.
- Agriculture and rural development by increasing the output and productivity of smallholders by linking them with value chains, advisory services, and credit and insurance. Smallholder farmers were stuck in a vicious cycle of low output and low productivity, little disposable income, and thus low ability to invest in increasing output or productivity. The focus of ALP would be to mitigate their risks and help them participate in smallholder value chains of the commodities they produce.
- Human resource development focused on youth self-employment, promoting youth entrepreneurship through agro-enterprises and franchises, post

vocational education and training. The ALP focuses on entrepreneurship first and then work with local partners to catalyse the availability of vocational training and self-employment promotion services.

## Nature of South-South Cooperation

ALP began work in March 2013 in Tanzania, Mozambique and Cameroon, representing eastern, southern and central/western Africa. BASIX has the primary responsibility of designing the programmes of ALP, building on the experience of the African strategic partners, after identifying gaps in the developmental efforts related to the three areas of intervention in each country. Best practices have been researched to find innovative solutions to fill the identified gaps.

## Field Innovation

ALP implementation strategy leverages the strength of its strategic partners to act as or identify other organizations as Field Innovation Testing (FIT) Partners. These could be financial or promotional institutions working with low income households in target countries; networks of rural banks or MFIs; actors in agricultural value chains (public or private or cooperatives); and providers of vocational/entrepreneurial/self-employment training.

Selected best practices are tried out in the local context through carefully selected FIT Partners, who are local institutions, with the help of experts sourced from institutions worldwide. African knowledge partners such as universities/specialized higher education or research institutions would accompany the ALP interventions. They measure the impact in an objective way and share the lessons.

Field innovations, which find good local acceptance and have a positive impact, are then scaled up and mainstreamed through a key institutional partner. The lessons from Africa are systematically captured. ALP would disseminate these lessons to policymakers, first in the countries of intervention, then more widely in Africa and in India, through aid agency channels as well as the wider development fraternity. Thus, the learning is two-way and fed back to the project countries.

## Multiple Stakeholders

Multiple stakeholders have been identified to promote and advocate for the lessons learned – knowledge

institutions, specialist NGOs, government laboratories, private sector projects, well-financed, well-run, private or public institutions, advocacy agencies, sectoral/national planning bodies, development scholars, media, civil society and political leaders.

## Specific Activities

### Livelihood Business Centres

Currently, five Livelihood Business Centres (LBCs) have been set up, including two in Tanzania and three in Mozambique. LBCs have been designed as an inclusive business model ecosystem to provide farmers a bundle of financial services (credit, savings and insurance) along with technical assistance to improve agronomic practices that enhance agricultural productivity as well as fetch them higher and remunerative prices through aggregation and linkages to markets. Primary value addition that fetches better prices are part of this ecosystem through supporting budding entrepreneurs in establishing agro-based enterprises. Farmers, as partners in the LBCs, build their capacity to become self-dependent on their own finances and market infrastructure. The centres provide services to both members and non-members at a differential rates.

**LBCs have been designed as an inclusive business model ecosystem to provide farmers a bundle of financial services (credit, savings and insurance) along with technical assistance to improve agronomic practices that enhance agricultural productivity as well as fetch them higher and remunerative prices.**

ALP also works with a few women's economic groups (WEGs) in the rice and cassava value chains along the Beira corridor in Mozambique. Livelihood Business Centres were set up to offer:

- Financial assistance to implement the women's business plans
- Skill development
- Secondary income generation activity
- Diversification of agriculture crops
- Access to additional raw materials to run processing centres at full capacity
- Access to quality fertilisers based on soil testing reports and agro-climatic zones
- Infrastructure for storage
- Market linkages and private sector involvement
- Entrepreneurship Development Programme

**The entrepreneurship development programme improved employability of youth and avenues for income generation and self-employment have been created.**

In Tanzania, ALP is engaged with youth to find innovative and sustainable solutions for livelihoods. ALP has partnered with the central, regional and local governments to train community development officers under Training of Trainers (ToT) mode for entrepreneurship development among rural youth and women by building capacities and improving existing livelihoods, or setting up new enterprises. The entrepreneurship development programme improved employability of youth and avenues for income generation and self-employment have been created.

## Caixa Mulher Microbank Project

ALP is working with GAPI for capacity building of Caixa Mulher, a women-only microbank, at Matola in Mozambique. Caixa Mulher is owned equally (50:50) by GAPI and a group of private women investors. The capacity building intervention includes but is not limited to:

- Procuring and installing appropriate IT and MIS systems
- Introducing best practices for managing savings and loan portfolios
- Strengthening the bank's governance
- Building the capacity and knowledge of human resources
- Designing customer-centric products through market survey and pilot testing

### Youth Entrepreneurship

ALP's innovative model to raise the income of youth and make them self-sufficient was used in the Country Chicken Poultry Project. In 2014, the youth started forming Savings and Loans Associations (SLAs) in partnership with a local NGO in Busega. After the engagements of the groups in the SLA activities for six months, they were provided initial credit to buy local chicken. The chicken cooperatives were built with their own resources. After SLAs were formed, ALP organised them to be registered as a federation to manage day-to-day operational activities which enabled individual members to start SLAs accompanied with an income generating scheme. Forward and backward market linkages were set up with private players to provide inputs and for sale of produce. The federation opened a bank account for deposits members in the CRDB Bank. Currently, then membership stands at 236 members in 16 groups. The aim is to reach at least 300 self-sustainable members under Nyassa Youth Producer Business Center (NYPBC) and link them with formal financial organisations and markets.

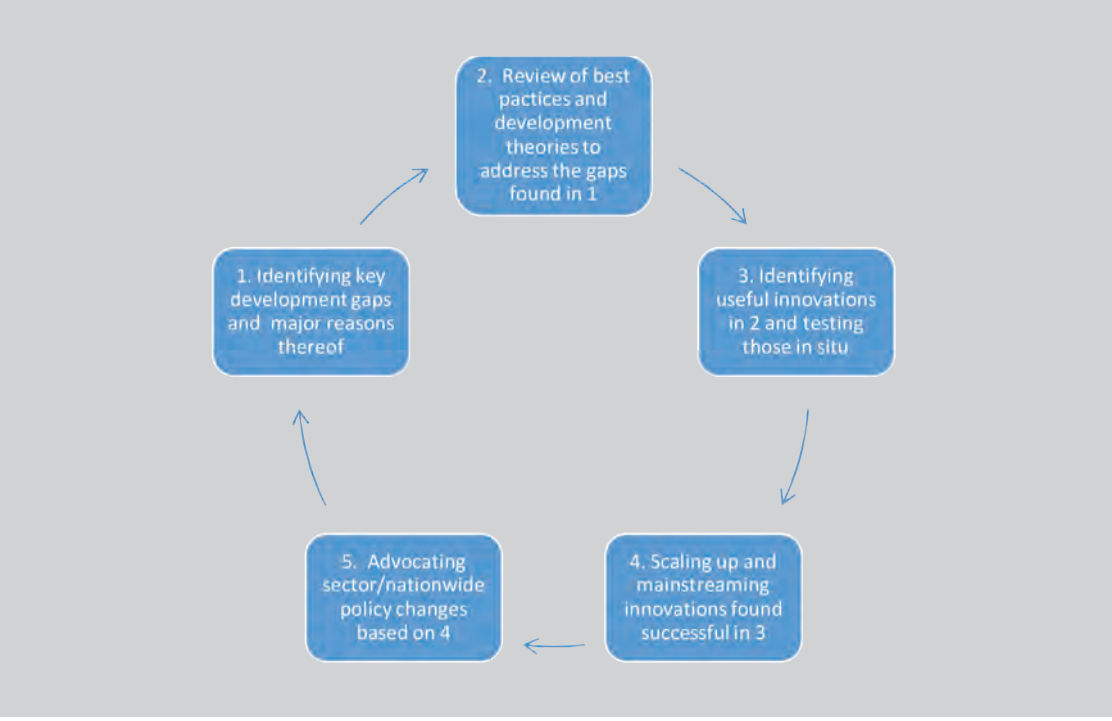
- Increasing the outreach of the branch to 5,000 customers in 3 years
- Introducing mobile and other technology to lower cost of transactions both for the bank as well as the customer
- Pursuing social performance measures as per international guidelines
- Keep control over non-performing assets

Caixa Mulher has recently been permitted by the Bank of Mozambique to expand its outreach by growing its branch network as well as providing agency banking. By the end of 2015, ALP expects to expand this program to two other microbanks in other geographical areas of Mozambique.

## Outcomes and Impacts

ALP completed two years of operations in March 2015. Baseline surveys of livelihoods in all the three countries have been completed. While it is too early to talk of impact, the following outcomes have already emerged:

Food Security and Agricultural Value Chains: ALP initiatives have reached 1058 smallholder farmers under the LBC project (195 in Tanzania and 863 in Mozambique). The aim is to reach current services like quality inputs, training on best agricultural practices and group management, market linkage support and aggregation benefits to 3100 farmers (1600 in Tanzania and 1500 in Mozambique) by



the end of the current financial year. All these services are expected to raise production of better quality agro-commodities and hence increase the income level of rural households along with resolving the issue of food security.

**The aim is to reach current services like quality inputs, training on best agricultural practices and group management, market linkage support and aggregation benefits to 3100 farmers (1600 in Tanzania and 1500 in Mozambique) by the end of the current financial year.**

## Development of Entrepreneurial Skills

ALP has worked with 823 young individuals to develop their entrepreneurial skills. A pool of professionally trained government officers in Mwanza and Dodoma regions of Tanzania has been created. ALP was able to reach 25 district youth officers and women development officers, who in turn reached 14 districts and through ward level youth and women development officers trained 587 youth and women group members to develop entrepreneurial skills. Under the programme to develop entrepreneurial skills in youth through local chicken rearing, ALP is working with 236 members from 16 groups.

## Access to Finance

Financial inclusion services cuts across all the approaches and activities undertaken through ALP. Till date, ALP has touched 1698 individuals through SLAs, some of whom have been linked with mainstream financial services.

In the absence of a legal status within the countries, ALP encountered some operational barriers. It had to depend on local partners to even operate bank accounts and could not own project assets. To overcome such issues, ALP has registered LBI Tanzania as a local organization and plans are afoot to register LBI Mozambique.

The slew of programs launched so far have acquired a momentum of its own and BASIX is attempting to make them sustainable in order to provide uninterrupted services to fulfill ALP's mission. A revolving fund had been set up in the Livelihood Business Centers for smallholder farmers in Tanzania and Mozambique to provide credit for crop inputs. ALP is working on some strong potential proposals for this financial year to receive donor funds in the area of livelihood promotion. ALP will also be bolstering partnerships with an approach to garnering donor funds in the areas of agricultural value chains, financial inclusion and youth employment.


INNOVATION &
CREATIVITY

# BAREFOOT SOLAR ENGINEERS: LIGHTING UP AFRICA

Presciently, Mahatma Gandhi strongly believed that the ultimate solution for fighting poverty in India was not mass production but production by the masses. This is equally true for Africa. If the massive rural-urban migration in Africa is to be contained, if the rich traditional knowledge in the continent is to be preserved, if village skills and practical wisdom in Africa is to be saved from vanishing into the cities or if the quality of life in villages is to be protected and improved, then Africa has to embrace the out-of-the-box Gandhian Model to solar electrifying its villages. The capacity and competence of very ordinary men and women living in remote villages in Africa has to be geared to identify technical problems and devise simple workable practical solutions.

Four decades of experience have taught Barefoot College that formal education and qualifications are not required for the rural poor to bring sustainable energy, clean water, and sustainable livelihoods to their communities. The College today stands as one of the very few Indian organisations that have successfully taken a leading role in setting new development paradigms by scaling a community based model to world-wide proportions through adopting a globally diverse, decentralized approach to implementing large scale solutions. For forty years, this approach has underlined the need to change, learn, unlearn and relearn and encompass diversity of workforce.

**The College today stands as one of the very few Indian organisations that have successfully taken a leading role in setting new development paradigms by scaling a community based model to world-wide proportions.**

## The Gandhian Model

What Africa needs to adopt is a demystified decentralised model where poor rural people of Africa without formal education are trained to fabricate, install, repair and maintain their own solar systems. The Gandhian Model believes solar technology must not deprive people of work in villages. Technology must be selected that will improve the quality of life immediately and tangibly. Finally, the choice of solar technology should be such that the people could maintain it themselves.

## Empowering via solar engineering

It is about empowering women to assemble solar systems in Africa. They have to be trained to be entrepreneurs to fabricate, install, repair and maintain solar systems in their own villages. We have to concentrate only on practical skills that will make a visible difference to the lives of people. It would save millions of litres of kerosene from polluting the environment. Instead of subsidizing the rich indirectly to produce cheaper solar panels in urban areas subsidise the solar systems directly to provide light to remote non-electrified villages on condition the poor pay for the repair and maintenance, thus creating work with dignity. The project effectively demonstrates how solar electrified villages can be totally self- sufficient. This will generate over 50,000 jobs in the rural areas in Africa and prevent migration.

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## A Passage to India

For women who have rarely left their own village, it requires undeniable courage and endurance to leave their village for the first time to travel to a far-off land in India where everything, from surroundings, language, food and weather, to clothes, culture and habits, is different. The first month is a period of many adjustments in their lives, but with time, care and support from their master trainers (who are also semi-literate) they learn to adapt.

"Learning by doing" is the practical philosophy adopted for training by the Barefoot College.

Between 2008 and 2010-12 illiterate women, including Nancy Kanu, were trained from Sierra Leone. They solar electrified the two villages of Kontaline and Mambioma, all on their own. So impressed and influenced was the Government of Sierra Leone that the President built the first Barefoot Training Centre at a cost of nearly $800,000.

"Learning by doing" is the practical philosophy adopted for training by the Barefoot College. In the first weeks of the six months of training the emphasis is on making trainees feel at home and enabling them to familiarise themselves with different terms, tools, components and equipment used in solar technology. Practical demonstrations or 'hands-on' experience and regular repetition help the trainees remember terms, tools, equipment and components that most have heard and seen for the first time. With each passing day their level of hesitancy decreases and their confidence and 'technical dexterity' increases. The presence of women trainees from different nationalities creates a positive environment of cultural diversity but at the same time raises concerns over language and communication. The need for expression gives birth to a unique combination of gestures, signs and broken English cutting across all language barriers. This unique 'language' consisting of a combination of hands, sight and sound remains the means of training and conversation.

The challenges for women and girls in Africa are profound. The need to innovate and develop new definitions and access to "education" in all its forms to allow women to overcome obstacles to livelihood activity is critical and urgent.

## Impact and Milestones

In 2008 the Ministry of External Affairs recognised the Barefoot College as a training institute under its flagship India Technical and Economic Cooperation (ITEC) programme.

It's been a long journey since 2008, with several milestones on the way. These include:

1. Between 2008 and 2010-12 illiterate women, including Nancy Kanu, were trained from Sierra Leone. They solar electrified the two villages of Kontaline and Mambioma, all on their own. So impressed and influenced was the Government of Sierra Leone that the President built the first Barefoot Training Centre at a cost of nearly $800,000. The objective was to train 150 grandmothers to enable them to solar electrify their own villages across the country. Nancy Kanu registered the first Barefoot Women Solar Engineer Association in Sierra Leone and became its first Chairperson. The Association

influenced the government to place an order for 5,000 more solar systems to be installed only by the trained grandmothers.

2. Barefoot College has established Five Regional Barefoot Training Centres in Africa: Burkina Faso, Liberia, Senegal, Tanzania and South Sudan at a cost of $ 400,000 each. The Sixth Barefoot Vocational Centre was inaugurated by the President of Zanzibar in August 2015, with the Government of Zanzibar approving an amount of $ 250,000 for the Centre-the first of its kind in the history of Zanzibar.

At the launch of each centre, Barefoot College professionals, together with Women Barefoot Solar Engineers (WBSEs) from each country, who have been trained in Tilonia, will establish a solar programme and train the first locally trained groups of women solar engineers to electrify their villages. Barefoot College will provide technical assistance to ground partners to oversee training and ongoing operations of the centres.

Once fully operational, each centre will train up to 40 women (mostly grandmothers) over the next two years. Each of these "solar grandmothers" will have the capacity and equipment to solar electrify 40 households, bringing inexpensive, reliable and clean energy to 3,200 homes of approximately 20,000 people, in just two years. Every WBSE is taught to "train on" her skills.

**The future for Africa is pivoted on a 'Partnership Model' where the government, the private sector, the NGO and the community are equal partners and every one's role is clearly defined.**

At the end of six months the trainees graduate as Women Barefoot Solar Engineers (WBSE). As per the prior agreements with their villages, the 'graduates' go back to their respective villages and electrify the households.They assume the responsibility of repair and maintenance for a minimum of five years. Barefoot solar engineers play the key role in sustaining and replicating solar technology in rural communities, change the perception of what is a professional for villages and challenge both age and gender barriers. Every Woman Barefoot Solar engineer is trained to train, this unique skill means that her ability to disseminate her own knowledge is without limitation. This commitment will create the first ever international network of learning institutions focused on delivering knowledge across literacy barriers, to those previously completely left out of the traditional education system, by bringing Barefoot College's proven, place-based rural development model to six new countries and deepening its reach in 15 countries.

In addition to the foundational solar programme, the training centers will, over time, incorporate other facets of Barefoot programming, including water management; children's and adult education; financial and enterprise skill-building; preventative health and hygiene; artisan development; women's empowerment and reproductive rights; community self-sufficiency; and civil society skills.

Today 270 solar grandmothers have solar electrified 12,000 houses in 161 villages across 36 countries in Africa

at a total cost of $ 4.8 million. Nearly 200,000 men women and children have directly benefitted and improved their quality of life.

**Partnership:** The success of Solar Grandmother model is underpinned by a win-win partnership.The future for Africa is pivoted on a 'Partnership Model' where the government, the private sector, the NGO and the community are equal partners and every one's role is clearly defined.

The future for a resurgent Africa lies in South-South Cooperation between communities learning and unlearning from each other. As Mahatma Gandhi said with profound insight: "First they ignore you, then they laugh at you, then they fight you and then you win."

# BUILDING SOUTH-SOUTH DIGITAL BRIDGE: PAN AFRICAN E-NETWORK PROJECT

It's a digital bridge connecting the two emerging growth poles of the world in a transformational project of mutual empowerment and resurgence. Blending technology, innovation and creative diplomacy with the overarching project of socio-economic transformation and sustainable development, the Pan-African e-Network is bridging the digital divide across the African continent and is bringing tele-medicine and tele-education to the African people living thousands of miles away by linking them to premier educational institutions and super-specialty hospitals in India. The path-breaking e-network has emerged as a radiant example of South-South cooperation and underlines the creative possibilities of harnessing ICT to catalyze lasting socio-economic changes.

**The path-breaking e-network has emerged as a radiant example of South-South cooperation and underlines the creative possibilities of harnessing ICT to catalyze lasting socio-economic changes.**

## Genesis: Power of Idea

The pioneering idea behind the showpiece digital connectivity project was born eleven years ago in the mind of India's eminent scientist and thinker, the then President A.P.J. Abdul Kalam. Addressing the Pan African Parliament on September 16, 2004 in Johannesburg, South Africa, which was attended by many representatives of the countries of the African Union, President Kalam unveiled the "concept of a Pan African e-Network on behalf of India for providing seamless and integrated satellite, fiber optics and wireless network connecting the African countries." The concept, President Kalam has written, was animated by his independent study of the communication, healthcare and education needs of friendly African countries.

## Scope and Implementation of the Project

The idea acquired a life of its own quickly, with the project report completed in a record time of four months. It was coordinated by Ministry of External Affairs (MEA), with technical experts drawn from President's Office, Department of Space and Telecommunications Consultants India Limited (TCIL) in 2005. In sync with the culture of consultation that defines the multi-faceted India-Africa project partnership, the MEA extensively engaged with African Union (AU) and member countries in this period. The process culminated in the signing of the MoU between India and the African Union on October 27, 2005, marking the beginning of the operationalization of the project that will set new benchmarks for sustainable development partnership between India and Africa.

The project is equipped to support e-governance, e-commerce, infotainment, resource mapping and meteorological and other services in the African countries. The project also includes setting up a highly secure "VVIP" network between offices of the heads of state or government across Africa. Thirty VVIP nodes have been set up in African countries for video-conferencing among the heads of states. As of now, the Pan-Africa e-network has come to encompass 48 African nations which have signed bilateral agreements with TCIL for the project.

Another outstanding feature of the project is its sheer cost-effectiveness. Funded by the Indian government, the e-network has emerged as the biggest project of distance education and tele-medicine ever undertaken in Africa. The project was approved by the Union Cabinet of India on July 5, 2007 at a budgeted cost of Rs.542.90 crores (US$ 125 million) which included, among other things, the cost of supply, installation, testing and commissioning of hardware and software, end-to-end connectivity and satellite bandwidth.

**The visionary project has earned rich praise for its pioneering idea of using ICT a catalyst of change and has garnered many accolades, including the prestigious Hermes Prize for innovation in the field of sustainable development..**

## Transformational Project: Impact Assessment

The visionary project has earned rich praise for its pioneering idea of using ICT as a catalyst of change and has garnered many accolades, including the prestigious Hermes Prize for Innovation in the field of sustainable development. The prize was announced by the European Institute of Creative Strategies and Innovation, a think tank that promotes strategies for innovation and renewal

in Europe and worldwide, at a meeting in Paris four years ago. The long-distance interaction between India's Minister of External Affairs and ministers from various African countries during the launch of the second phase in 2010 at the TCI office in New Delhi brought out vividly enthusiasm of African countries for the project. In Gaborone, Botswana's then Minister of Education and Skills Development Pelonomi Venson-Moitoi stressed that her country was looking towards more collaboration with India, describing it as a "centre of excellence", especially in information technology. Egypt's then Minister for Communication and Information Technology Tarek Mohamed Kamel was profoundly grateful that the Alexandria University will be the hub for e-learning for the network in North Africa.

But more than official rewards and encomia, what sets the project apart is its sheer impact on transforming lives of ordinary people living across the resource-rich African continent. Under the tele-education component of the network, more than 2000 students from Africa have been enrolled in five different top ranking universities in India in a host of disciplines like MBA, Master in Finance Control, PG Diploma in IT, M.Sc. in IT and Bachelor in Finance & Investment Analysis. Regular tele-education live sessions have elicited an enthusiastic response from African students. Tele-medical consultations have also started between the African doctors and the Indian specialists. Nearly 700

## Pan Africa e-Network: Implementation Status

### Participating Countries

**The number of AU Member States that have signed the agreement with TCIL: 48**

- West Africa: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo
- East Africa: Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tanzania and Uganda, South Sudan
- Southern Africa: Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe
- Central Africa: Burundi, Cameroon, Central African Republic, Chad, Congo, DRC, Gabon and Sao Tome and Principe
- Northern Africa: Egypt, Mauritania and Libya

**The tele-medicine sessions under the e-network project has proved to be extremely valuable in providing timely and affordable healthcare and specialist advice to patients sitting thousands of miles in Africa.**

Continued Medical Education (CME) lectures have been delivered by Indian doctors from top Indian super specialty hospitals. Energised by the African response, India has even offered training at the regional level by conducting workshops in the tele-medicine and tele-education modules for optimizing benefits of the project.

The tele-medicine sessions under the e-network project has proved to be extremely valuable in providing timely and affordable healthcare and specialist advice to patients sitting thousands of miles in Africa. The CME System, say informed observers, provides a suitable platform to the practicing doctors to not only seek expert guidance but also for keeping them updated with latest breakthroughs and advances in the field of medicine and healthcare. The training component, in particular, is designed to bolster the long-term capacity of Africa's emerging health sector.

Similarly, tele-education has been quite successful by creating electronic virtual classroom and bringing together some of best Indian teachers with African students. The feedback suggests that tele-education has proved to be a useful medium to promote creative and reflective thinking.

## Knowledge Partnership

**The e-network project, therefore, telescopes the trinity of India's engagement with Africa pivoted around Trade, Training and Technology.**

The e-network project, therefore, telescopes the trinity of India's engagement with Africa pivoted around Trade, Training and Technology. Placing the project in the larger context of its ripple effects on socio-economic landscape in African countries, President Kalam had summed up its essence. "PAN African e-Network is an enabler which has a cascading effect on the socio-economic development of many nations and societies. Enterprises and institutions of tomorrow should look at the avenues of bringing about value addition in such enablers which change the environment and rate at which development takes place," he wrote in an article for "Two Billion Dreams: Celebrating India-Africa Friendship." The progenitor of the e-network has described the network as "a model of international social responsibility" that could be emulated by other nations in their partnerships with Africa. "Our efforts aim at sharing the knowledge gained among the friendly nations, so that India, with its mission of a knowledge society, holds the hands of other developing nations together to achieve sustainable development across the world," said President Kalam.

The project is being keenly observed by Africa watchers as an example of the kind of initiative Africa needs to empower its people and better its chances in a rapidly

**The project is being keenly observed by Africa watchers as an example of the kind of initiative Africa needs to empower its people and better its chances in a rapidly globalising world as opposed to extractive and resource diplomacy practiced by many African countries.**

globalising world as opposed to extractive and resource diplomacy practiced by many African countries. The project will also aid Africa's journey towards achieving Sustainable Development Goals (SDGs) targets in education and the health sector and enrich the lives of its predominantly young population. The success of Pan African e-Network project forms the basis of India's proposal to set up an India-Africa Virtual University during the India-Africa Forum Summit at Addis Ababa in 2011.

With its focus on knowledge-sharing and skill-building, the e-network project epitomizes India's development-centric engagement with Africa and the global South. The e-network project has, therefore, to be seen in the larger context of India's collaborative development partnership to partner the African continent in its ongoing resurgence. It is with this larger vision of aiding Africa's quest to become a knowledge-driven society that India is looking to set up over a hundred training institutes across Africa. These training institutes encompass diverse areas ranging from agriculture, rural development and food processing

## Participating Indian Institutions

**Tele-Education Set-up in 5 Indian Universities:**

- Amity University, Noida
- IGNOU, New Delhi
- BITS, Pilani;
- University of Delhi
- University of Madras
- Tele-Medicine Set-up in 12 Super Specialty Hospitals of India:
- All India Institute of Medical Sciences (AIIMS), New Delhi ;
- Amrita Institute of Medical Sciences, Kochi;
- Apollo Hospitals, Chennai;
- CARE Hospital, Hyderabad;
- Escorts Heart Institute and Research Centre, New Delhi;
- Fortis Hospital, Noida;
- Narayana Hrudayalya, Bangalore ;
- Sri Ramchandra Medical Centre, Chennai ;
- Moolchand Hospital, New Delhi.
- HCG Bangalore
- Dr Bala Bhai Nanavati Hospital Mumbai
- Sanjay Ghandhi Institute of Medical Sciences Lucknow

## Participating Institutions from Africa

**Tele-Education Set-up in 5 Regional Leading University Centers in Africa:**

- Kwame and Nkrumah University of Science and Technology, Ghana,
- Makerere University, Uganda,
- Yaounde University, Cameroon.
- Alexandria Faculty of Commerce, Egypt
- (Vsat connectivity provided and IT & Tele-Medicine Set-up in 4 Regional Super Specialty Hospitals in Africa viz.
- Chancellor College, Zomba, Malawi
- Tele Medicine Set-up in 5 Regional Super Specialty Hospitals (RSSH) in Africa:
- Super Specialty Hospital, Nigeria,
- Super Specialty Hospital, Republic of Congo (Vsat connectivity provided, civil work pending)
- Super Specialty Hospital, Mauritius (Vsat connectivity provided and IT & UPS equipment being installed)
- Alexandria Faculty of Medicine, Egypt ( Vsat connectivity provided and IT & UPS equipment are under customs clearance pending due to packing materials issue).
- Fann Hospital, Senegal

## Learning Centers (LCs) in African countries:

Benin, Botswana, Burundi, Burkina Faso, Cameroon, Cape Verde, Central African Republic (CAR), Chad, Comoros, Cote d'Ivoire, D.R.Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea Bissau, Kenya(under relocation), Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Nigeria, Niger, Republic of Congo, Republic of Guinea, Rwanda, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda; Zambia and Zimbabwe.

## Patient-End Hospitals (PEs) in African countries:

Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic (CAR), Chad, Comoros, Cote d'Ivoire, Djibouti, D.R.Congo, Egypt, Eritrea, Ethiopia, AU-Ethiopia, Gabon, The Gambia, Ghana, Guinea Bissau, Kenya, Liberia, Libya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia , Niger, Nigeria, Republic of Congo, Rwanda, Republic of Guinea, Sao Tome & Principe, Senegal , Seychelles, Sierra Leone ,Somalia, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

## VVIP Nodes (for video-conferencing and Voice over IP among the Heads of States) in African countries:

Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic (CAR), Chad, Comoros, Cote d'Ivoire** ,Djibouti, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali*, Mauritania, Mauritius, Mozambique, Niger, Republic of Congo , Republic of Guinea, Rwanda, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, South Sudan, Sudan, Somalia, Tanzania , Togo, Uganda , Zimbabwe and Zambia.

- (VVIP site in Cote d'Ivoire has been destroyed during political crisis as per information received on 06/06/2011 from the country coordinator.
- Mali VVIP site equipment have been lost in the recent political crisis)
- Tele-education as on 01.06.2014
- IGNOU has signed MOU with 32 Universities in 31 countries.
- Benin, Botswana, Burkina Faso ,Cameroon, Cape Verde, Democratic Republic of Congo (DRC), Ethiopia (Addis Ababa University, Harmaya University), Egypt, Eretria, Gabon, Ghana, Guinea, Ivory Coast, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Niger, Rwanda, Seychelles, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Uganda Zambia, Sao Tome and Congo.
- The talks are progressing with Namibia and Nigeria

to information technology, vocational training, English language centres, and entrepreneurial development institutes.

## Intertwined Dreams

The e-network project is moving incrementally towards fulfilment of its stated goals and objectives at a time of renewed optimism about the emergence of the global South. In many ways, the narratives of a rising India and the unfolding African resurgence are intersecting at multiple points, opening up new avenues for scaling up the India-Africa partnership by using the power of innovation, technology and ideas. In an interview to Africa Quarterly, Ghana's then president John Kufuor envisaged a marriage of India's expertise and Africa's resources to fructify the

**No project epitomises this synergy better than the pan-Africa e-network project, which is rightly seen as "a shining symbol of South-South Cooperation."**

full potential of the African continent. No project epitomises this synergy better than the pan-Africa e-network project, which is rightly seen as "a shining symbol of South-South Cooperation."

The tele-medicine and tele-education components of the e-Network are critical to long-term transformation of Africa to achieve lasting resurgence. The demographic dividend, shared by both India and Africa, with the bulk of their population in the age group 19-35, is set to bring the two sides closer in building a multi-pronged partnership in health and education sectors. The e-Network project is also a classic illustration of the ideals of equity and inclusive growth inherent in South-South cooperation, which contrasts starkly with the OECD model of donor-recipient or patron-client relationship. Innovative projects like the e-network also offers new possibilities for forging a new vocabulary of India-Africa relations. India's focus is on the people-rich continent, and not just the resource-rich continent which is eyed covetously by predatory powers. It is this inexhaustible richness of the African people that India, with its proven prowess in knowledge industries and capacity building, is banking on to help fructify the African dream.

The pan-Africa e-network has shown the way to think innovatively and partner Africa in its transformational journey. Buoyed by the success of the project, India is looking to share its expertise with other parts of the global South like Central Asia and Pacific Island Small States. One can expect this arc of knowledge and innovation partnership to widen in days to come.

## AMITY University has signed MOU with 39 universities in 38 countries:

Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Eritrea, Egypt, Gabon, Gambia, Ghana (Kwame Nkrumah University Kumasi, University of Ghana), DR Congo, Ivory Coast, Lesotho, Liberia, Malawi, Mali, Madagascar, Mauritania, Mauritius, Mozambique, Sao Tome and Principe, Niger, Rwanda, Senegal, Sierra Leone, Seychelles, Somalia, Sudan, Tanzania, Uganda, Zambia, Togo AND Guinea Conakry, Burundi, Namibia, South Sudan

## UNOM has signed MOU with 34 universities in 33 countries:

Benin, Cameron, Ethiopia (Addis Ababa University, Haramaya University), Eritrea, Gabon, Mauritius, Madagascar, Mauritania, Niger, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, Togo, Tanzania, Ghana, Ivory Coast, Zambia. Mozambique, Sao Tome Principe, , Sudan, Liberia, Lesotho, Egypt, Cape Verde, Central African Republic, Burkina Faso, Democratic Republic Congo, Republic of Djibouti, Malawi, Republic of Guinea, University of Mali

## Delhi University has signed MOUs with 24 universities in the following countries:

Burkina Faso, Cameroon, Cape Verde, Democratic Republic of Congo (DRC), Gabon, The Gambia, Guinea Bissau, Ivory Coast , Lesotho, Liberia, Madagascar, Mauritania, Mozambique, Niger, Sierra Leone, Somalia, Senegal, Sudan , Sao Tome and Principe, CAR, Guinea Conakry, Mali(University of Bomako),RWANDA, Namibia

## BITS Pilani has signed MOUs with 20 universities in the following countries.

Benin, Cameroon, Madagascar, Ivory Coast, Gabon, Niger, Rwanda, Sierra Leone, Mozambique, Lesotho, Mali, Sao Tome and Principle, Cap Verde, Congo, Liberia, Burkina Faso, Namibia, Somalia, The Gambia and Guinea.

# KNOWLEDGE POWER

# EMPOWERING KNOWLEDGE PARTNERSHIP: KOFI ANNAN CENTRE OF GHANA

Knowledge partnership is a robust pillar of the multi-faceted India-Africa partnership. Ghana's former president John Agyekum Kufour had captured the essence of this focus on knowledge-driven collaboration when he said famously that if Africa's resources can be married with India's expertise, anything is possible. This belief in the power of knowledge industries to spur an African renaissance is epitomised in an iconic project of bilateral cooperation: the Ghana-India Kofi Annan Centre for Excellence in ICT. Significantly, the bilateral agreement to enhance information and communications technology cooperation between Ghana and India was signed during a state visit to India by Ghana's then President Kufour in 2003. The presidential visit built upon decades of cordial relations between the two countries that hark back to the first visit by Ghana's much-revered leader Dr. Kwame Nkrumah to India 1958.

**This belief in the power of knowledge industries to spur an African renaissance is epitomised in an iconic project of bilateral cooperation: the Ghana-India Kofi Annan Centre for Excellence in ICT.**

The Advanced Information Technology Institute-Kofi Annan Centre of Excellence in ICT (AITI-KACE) was commissioned jointly by the leaders of the two countries, Prime Minister Atal Bihari Vajpayee and President Kufuor, on December 8, 2003. The government of Ghana provided the physical infrastructure for the establishment of the Centre, while the Indian government provided technical expertise in terms of the rolling out of IT training of lecturers and the provision of IT equipment to the Centre, and financial assistance totalling US $2 million. The Centre for Development of Advanced Computing (C-DAC) was the nodal agency from India for setting up of the AITI-KACE and continues to provide assistance to the Centre in course designing and training of faculty.

## ICT Hub: Ethos and Modus Operandi

The Centre serves as a world-class advanced ICT hub in Ghana and the ECOWAS sub-region, stimulating the use of ICT as a tool to enhance social and economic development. The Centre has 40 staff, including 30 per cent females. Government subvention and internally generated revenues are used to fund the operations of the Centre. The Centre offers specialised training in Innovative ICT for Development Projects, software development and ICT consulting services and research and development. It provides outstanding ICT training to graduates of tertiary institutions, working professionals seeking to improve their knowledge in ICT, private enterprises, NGOs, CSOs, educational institutions, academicians and private individuals.

Explaining the ethos and modus operandi of the organisation, Dorothy Gordon, Director General of AITI-KACE, says that, "in order for the Centre to realize the vision to make ICT education easily accessible and make enrolment affordable for interested individuals, it subsidises some of its courses." The centre also places a strong emphasis on building networks and developing mutually beneficial partnerships and works with institutions located in Africa, Asia, Latin America, Australia, Europe, and America.

**The Centre offers specialised training in Innovative ICT for Development Projects, software development and ICT consulting services and research and development.**

## Supercomputer: Raising the Bar

Currently, the Centre houses a supercomputing cluster, designed and built by its Indian partner C-DAC. The Indian government donated this high performance-computing cluster to the Centre. The computing cluster was recently upgraded to the PARAM Nkontabo. During a visit to the Centre, Professor Rajat Moona, Director General of C-DAC, commissioned the upgrading of the super computer cluster. The PARAM Nkontabo was the first super computer of its sort in West Africa and has proved to be very useful to scientists in ECOWAS by aiding them to perform high level processing of equations and logarithms. Abdus Salam Centre for Theoretical Physics in Trieste, Italy, partners with the Centre to use the PARAM Nkontabo in conducting research.

## South-South Cooperation

The Centre asserts that "India's approach to partnership is truly an excellent way of increasing ties between countries and strengthening South-South friendship." C-DAC has adopted a collaborative approach in engaging with the Centre. The role of India has been very important, given its high level of IT expertise and approach to open knowledge

sharing. India has also provided hardware and scholarships to the Centre and its beneficiaries.

## Beneficiaries: The way Ghana sees it

Since its commissioning in 2003, the Centre has committed itself to delivering high quality technical training to students. Over 10,000 students, from both Ghana and the ECOWAS sub region, have benefited from the core courses being offered by the Centre. Some of these students have moved on to develop software applications that are being used currently in Ghana and beyond.

**Over 10,000 students, from both Ghana and the ECOWAS sub region, have benefited from the core courses being offered by the Centre.**

The popularity of AITI-KACE is surging among Ghanaians. With well-trained lecturers and a strong knowledge partnership with prestigious ICT institutions in India, and well-equipped state-of-the art computer labs, the centre is deemed as one of the prestigious ICT establishments in the nation and a leader in its field on the African continent.

AITI-KACE is seen as the hub of cutting edge technology and innovation in the field of ICT. Since its establishment, the centre has made it possible for Ghanaians to obtain a first class ICT education without having to travel abroad. The course structure provides opportunities for students to have hands on experience and also engage with professionals in their disciplinary field. The course content is updated regularly in order to meet the requirements and demands of the changing ICT industry. Individuals who attend AITI-KACE are mostly referred to as "well-marketable" students, due to the quality education they receive from the centre. Chichi Abena Anuforo, a student at the Centre, lauded the high standard and quality education being offered at the Centre and stressed that the Centre provides students with an all-round education, giving them a upper hand in the ICT field compared to your peers in other similar institutions in the ICT field.

AITI-KACE is to seen as an inclusive ICT hub. In many developing nations, ICT programmes are usually considered

a luxury which only citizens from wealthy backgrounds can afford. However, AITI-KACE has challenged this social notion by making it easy and affordable for all citizens passionate about learning ICT to enrol.

Women empowerment and gender balance are animating mantra of the Centre. AITI-KACE is seen as an institution with a strong corporate social responsibility strategy aiming to encourage female graduates venture into the male-dominated ICT world. Currently, the Centre provides opportunities for both professional and nonprofessional women to get assistance from qualified personnel to help them create websites that will help market their professional skills and businesses.

## Local partnerships and capacity building

The Centre partners with some governmental agencies and ministries in ICT. For example, the Environmental Protection Agency (EPA) in Ghana uses the PARAM Nkontabo clusters to conduct research. In order to build local capacity in the ICT arena, the Centre provides training and consulting services to both government and corporate institutions.

**The centre has been able to introduce cutting-edge technology to the technology community both in Ghana and in the ECOWAS region.**

Most important, the centre has been able to introduce cutting-edge technology to the technology community both in Ghana and in the ECOWAS region. For example, the Centre has been able to introduce Industrial computing, including IO Nodes, Embedded Computing, Raspberry PI, High Performance Computing and 3D Printing into the ICT arena in Ghana and the ECOWAS region.

## Impact

The establishment of the Centre has greatly impacted Ghana and the ECOWAS sub-region in terms of stimulating the use of ICT as a tool to enhance economic and social development in Ghana and beyond. By bringing key stakeholders together bi-monthly to discuss issues in the realm of ICT and also creating the forum for clients, students and the public to appraise ICT innovations in Ghana, the Centre is able to educate the youth on careers in the ICT field.

**Creation of jobs:** Graduates from the Centre successfully gain employment in various sectors of the industry, including start-ups, Internet Service Providers, government institutions and transnational organiations such as Mozilla, Ushahidi, Google, etc.

**Development of consumer service applications:** As a result of the bi-monthly forums, participants have been able to share ideas on how to better improve living standards of the average Ghanaian. Director General Ms Gordon remarks that "the Centre is very proud of the contributions being made by alumni in the consumer welfare arena. Consumers have benefitted immensely from the Centre in the area of mobile application development. Many of the exciting mobile applications being used in Ghana were conceived at these forums." These include: the pocket Chef app, Snoocode, Nandimobile, Motech, Clakimpressions, Votomobile, Ahwenepa.com, Subaapp, Agripro, Kusima and Yougora.

Many of the exciting mobile applications being used in Ghana were conceived at these forums." These include: the pocket Chef app, Snoocode, Nandimobile, Motech, Clakimpressions, Votomobile, Ahwenepa.com, Subaapp, Agripro, Kusima and Yougora.

**Corporate Social Responsibility:** AITI-KACE has been very instrumental in poverty alleviation through the means of ICT education. "The centre employs a strong corporate social responsibility strategy in order to bring about rural and urban development," says the Centre's Chief. As part of its 10th anniversary celebrations, AITI-KACE partnered with the MTN Ghana Foundation and the National Union of Ghana Students (NUGS) to organise two-day ICT training for women in tertiary institutions across the Northern, Upper East and Upper West regions of Ghana.

A notable example of the Centre's projects with schools is the successful implementation of the i2CAP (I Too Can Programme) project, which seeks to build the programming skills of senior secondary school students. In 2007, the Centre, rolled out a project called Project Kane, which involved a research on guided reading practices for children using an automated 'Listen Reading Tutor'.

A notable example of the Centre's projects with schools is the successful implementation of the i2CAP (I Too Can Programme) project, which seeks to build the programming skills of senior secondary school students.

**Youth Capacity Development:** AITI-KACE organises a training program focusing on mobile application development. This training workshop is sponsored by UNESCO in partnership with AITI-KACE with the aim of introducing the youth to relevant ICT tools and technologies in an effort to bridge the IT digital divide. Another key goal of the programme is to develop the capacity of the young leaders to solve challenges in their own communities and district assemblies using mobile technology and thereby contributing to national development. The leaders are also expected to act as trainers and change agents in their respective communities.

## AITI-KACE AND WOMEN EMPOWERMENT

In an interview, the Director General of the Centre says that the "AITI-KACE makes a conscious effort to provide opportunities for females to enrol in ICT courses". Females are encouraged and provided with the right opportunities to enable them to compete in the male dominated ICT sector. This approach by the AITI-KACE has resulted in an ever-

"India has effectively achieved its goal to develop and sustain stronger South-South relationship through the establishment of the AITI-KACE."

increasing cohort of females handling complex technical issues and delivering ICT training in Ghana.

The Centre also provides free training for girls and young women in rural communities. The training has not only instilled confidence in the girls and also break the stereotype that ICT can only be studied by males. Currently, close to 1,000 girls have been trained in ICT courses by the Centre through these programmes. The trained girls are expected to act as agents of change in their communities by reinforcing and sharing the knowledge they gained from the Centre.

## Exemplar Project: South-South Spirit

The case of AITI-KACE has been one of the most successful Indo-African techno-economic corporations in the ECOWAS sub-region. Placing the project in the larger context of South-South cooperation, Dorothy Gordon has says: "India has effectively achieved its goal to develop and sustain stronger South-South relationship through the establishment of the AITI-KACE." The Centre not only shows India's commitment to enhance relationship with Ghana but also demonstrates mutual benefits to both countries. Moreover, India's continuous efforts to build stronger bond with Ghana through the Centre led to its recent two-year extended assistance to the establishment.

The Centre was established in order to help develop the local capacity of Ghanaians. Since its commissioning, local staff that have strong background in ICT have always managed the Centre. The staff aims to incorporate local context to ICT for the growth and inclusivity of the Centre. In addition, lecturers are recruited locally and provided with training support from education facilities and ICT vendors around the globe.

The institute underscores the importance of ICT in the development of the Ghanaian economy and therefore

### Empowering ECOWAS Region

Ghana's neighbours in the ECOWAS sub-region have also benefited greatly from the services of the AITI-KACE. In reflecting on the how other African nations have benefited from the Centre, the centre's DG says: "Since its establishment, the Centre has opened its doors to students from the ECOWAS region. The Centre is patronized by nationals both Ghana and Africa." The centre aims to ensure that both Ghana and the ECOWAS will have a critical mass of IT professionals that can help drive the knowledge economy and as such hopes to develop greater partnership with relevant stakeholders in the ICT field in the ECOWAS region to help promote this vision.

satisfies the urgent need to educate citizens in the ICT sector. The Government of Ghana has lauded the positive impacts that the Centre was having on its citizens and thus incorporates some of the Centre's modules into the basic education curriculum.

The overarching vision to make the Ghanaian master technology does not only belong to the AITI-KACE Centre but also to the Government of Ghana. The Government of Ghana, in partnership with AITI-KACE, has set up Community Information Centres (CICs) in districts around the country in order to provide communities with access to bandwidth, content and a place where one can receive high level IT training.

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## The Way Ahead: Challenges and Solutions

The AITI-KACE rents out its auditorium to both public and private institutions in Ghana and the ECOWAS region. This enables the Centre to generate funds to help support its operations. The management of the AITI-KACE plans to become a self-sustaining tertiary institution. The Centre also plans to increase its ICT consultancy services for both public and private institutions in the nation.

The Kofi Annan Centre has emerged as an exemplar success story for South-South cooperation. Indeed, its impact traverses beyond the borders of Ghana. Its impact is not only felt in the teaching and learning corners but as well as in the streets where apps developed by past students continue to make life easier for people. Technical expertise and capacity building will, therefore, remain central to the burgeoning India-Ghana cooperation and India's relationship with the African continent.

# IGNITING MINDS, CHANGING LIVES

Igniting the spark of scientific curiosity and showcasing possibilities of human ingenuity in the scientific realm, the Rajiv Gandhi Science Centre in Port Louis, Mauritius, has emerged as an emblem of emerging India-Africa partnership pivoted around knowledge-creation and knowledge sharing. Ever since it first opened to the public since 1 December 2004, the Centre attracts hordes of students and has spawned a generation of people eager to re-fashion their life and nation through scientific learning and empowerment. In terms of sheer scale of public outreach and its diverse range of activities to make science fun and engaging – around 10,000 visit the centre every year –RGSC is a pioneering experiment in taking science to ordinary people and awakening them to transformative power of S&T in their lives.

## A Brief History

Spread over 5.3 acres of land, the Centre epitomises the principles of co-ownership and blending of core competencies inherent in the India-Africa development partnership. The Indian government, through NCSM, has provided exhibits on donation, trained key staff and helped in the planning of the Science Centre. The Government of Mauritius has provided land, a 400sq.m building, furniture and equipment, and provides grant for the running of the Centre.


After its inauguration, the Rajiv Gandhi Science Centre was opened to public on 1 December 2004.

India's approach is geared to the building of relationships to enhance capacity to deliver quality education within Mauritius.

## Vision and Mission

The facility was conceived as a Centre of Excellence that can serve as a hub for non-formal education and popularisation of Science and Technology among the population through various media to encourage creativity and innovation, particularly among young people; supplement education in S&T at all levels; and enhance public understanding of S&T.

## Partnership Approach

India's approach is geared to the building of relationships to enhance capacity to deliver quality education within Mauritius. During the years, the RGSC has helped in making science popular among young students. It takes science away from the normal methods and curriculum.

## Activities and Exhibits

The Rajiv Gandhi Science Centre is located at Old Moka Road, Bell village. The building, modelled on Indian architecture styles, accommodates five permanent indoor galleries, and a Temporary Exhibition Gallery which regular hosts thematic exhibition.

The five permanent galleries cover diverse themes, including Origin of Mauritius, Environment & Climate Change, Resources of Mauritius, Frontiers of Modern Technology, and Fun Science. Outdoor is a Science Park with action-oriented exhibits that aesthetically merge with the colourful landscape to provide a unique playground where education blends with fun and entertainment. This Centre is unique in the region. A visit to the Centre may last between one to four hours.

The centre also accommodates a 200-seater auditorium and other facilities available for hire to host a variety of events.

With the rapid development of S&T and its increasing importance in socioeconomic development and in-line with the government's policy to make S&T accessible to all, RGSC has moved into a new direction over the past 3 years.

## New Directions

With the rapid development of S&T and its increasing importance in socioeconomic development and in-line with the government's policy to make S&T accessible to all, RGSC has moved into a new direction over the past 3 years. It has broadened the number and variety of activities to suit a diversified audience. In fact, RGSC continues to propose visits to its exhibition galleries at Bell Village but at the same time has increased its number of science outreach activities. As such, RGSC regularly tours the island including Rodrigues, bringing S&T towards the population.

**The core attraction of the centre remains the five exhibition galleries and the science park which enable visitors of all age groups to get a hands-on experience of S&T on the thematic areas outlined above.**

Numerous activities have been organised in schools, Social Welfare Centres, Community Centres, Village Halls and other public places; some activities are tailor-made to suit specific groups such as students, women and senior citizens. Hence, the activities of RGSC now fall under two main umbrellas: Activities at the Centre (in house) and Outreach activities.

## Exhibition Areas

The core attraction of the centre remains the five exhibition galleries and the science park which enable visitors of all age groups to get a hands-on experience of S&T.

## Young Scientists in Action

The Young Scientist in Action competition was launched in 2014. This is a project-based contest open to primary school students of Standard IV and V. Participants are required to use science and technology to solve a problem that they encounter at home or in their locality. This contests aims at encouraging student to reflect on how they can make their life at home or in the community better by adopting a scientific approach. RGSC also considers YSA as an excellent platform to solve real life problems using science and technology.

## Secondary school competitions

The RGSC launched the first edition of the Science Quest 2014 in February 2014. This is a project-based contest, is open to students of secondary schools. Students are expected to undertake projects to solve a problem that they encounter at home or in their locality. The contest aims at encouraging students to reflect on how they can make their life at home or in the community better.

Science projects were undertaken from a range of S&T themes such as recycling, energy, health, technology, physics, environmental sciences and inventions.

## Sky Observation Programme

The aim of Sky Observations programmes is to initiate the public to astronomy through activities such as astronomy film projections and presentations. The Activities during Sky Observation programmes include:

- Sky watch through telescopes if the weather permits (visitors observe the moon, constellations, the stars and visible planets)
- Film Projection on Astronomy
- Presentation on Astronomy

During 2014, RGSC organised sky observation programmes in 9 locations around Mauritius targeting about 3650 visitors.

The Rajiv Gandhi Science Centre launched a new programme entitled 'Technology for Society' to sensitise the population on the important role of S&T in everyday life. The first edition of the programme was organised July 17,

**The Rajiv Gandhi Science Centre launched a new programme entitled 'Technology for Society' to sensitise the population on the important role of S&T in everyday life.**

2014, in collaboration with the National Women Council and the Ministry of Gender Equality, Child Development, and Family Welfare. The theme was ''Technology and household appliances'' in which around 150 women participated. The workshop was conducted by resource persons from the Mauritius Institute of Training and Development and Rajiv Gandhi Science Centre.

## Junior Mobile Science

In May 2014, RGSC launched the "Junior Mobile Science" programme. The project seeks to encourage youngsters to develop an interest in science and technology. Students are encouraged to study science and later on consider science as a career option

Junior Mobile Science comprised a set of mobile interactive exhibits and hands on demonstrations that occupied a space of one classroom. This activity is targeted to students of Standard IV, V and VI. Each set of exhibits was accompanied by scientists of RGSC who interacted with the students.

Concepts such as electricity and magnetism, light and forces were explored in a fun interactive way, making students enjoy learning about science. The exhibition has a unique text panel designs allowing the exhibit texts to be accessible to a wide range of audiences.

## Talking about Science Programme

"Talking about Science" is a programme that provides a platform to learn and develop an understanding of science and the role and impact it has in our lives. Inventions, discoveries, state of the art technologies, facts, science topics and so many other themes are discussed interactively with students to build an understanding of what it means to know science and make sense of the world around us.

This programme aims at providing schools with opportunities to acquaint the students & staff with the services and contribution of science in their life.

"Talking about Science" is a programme that provides a platform to learn and develop an understanding of science and the role and impact it has in our lives.

## Science on the Move Programme

'Science on the Move' is a set of mobile hands-on exhibition comprising interactive exhibits which travel to public places. The aim of the programme is to bring science to the public in shopping centres and to encourage them to take an interest in S&T during their leisure time. Visitors have the opportunity to interact with exhibits developed at RGSC and take part in science demonstrations performed by our staff. This event attracted approximately 17, 300 visitors.

## Science Fun Day

The motive behind having the Science Fun Day is to involve the general public and school children to take part in simple and fun activities related to science such as science demonstration, Science Quiz, treasure hunt, popular talks and activities for pre-primary.

## Caravane de la Science

This activity has been approved by the cabinet in 2010. Since then, the "Caravane de la Science" has already moved to more than 20 locations including secondary schools with a series of science activities including exhibition, film projections, Science Demonstrations and Science Talks.

This programme seeks to promote public understand of science issues and also aims at enhancing the school curriculum in a non-formal, interactive and fun way.

## Cultural and Educational exchanges

Overall, RGSC is a shining example of South-South cooperation. This type of cooperation helps in building lasting institutions which have a transformational impact on the lives of people as opposed to transactional exchanges. Science plays an important role in bridging the gap between the generation before and the new generation.

# KNOWLEDGE BRIDGE: CREATING DIALOGUE OF IDEAS

Connecting cultures and bonding people through ideas and knowledge-sharing. This is the animating mantra of the Mahatma Gandhi Institute in Mauritius – a unique institution of oriental learning that has served as a bridge for bringing together the cultures of India and Mauritius and has enriched the understanding of each other.

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Over the years, the MGI has brought Indian studies, especially Indian languages, philosophy and culture, into the mainstream of the Mauritian education. The MGI is also a unique project in India-Africa partnership in so far as it underlines the critical importance of culture and soft power in deepening this vital relationship.

The MGI was set up in Mauritius, with the support of the Government of India. The foundation stone of the Institute was laid on June 3, 1970 by Prime Minister Indira Gandhi. The institution was officially set up by an Act of Parliament which was passed on December 23, 1970. It was jointly inaugurated on October 9, 1976 by Prime Minister Sir Seewoosagur Ramgoolam and Smt. Indira Gandhi.

The MGI's Mission is to provide academic and cultural basis for the promotion, consolidation and dissemination of shared cultural traditions between the two countries within the multicultural mosaic of Mauritius. The Institute has a mandate to promote Indian Studies, Performing Arts, Fine Arts, Mauritian Studies, Chinese Studies and African Studies.

The MGI runs a network of seven secondary schools located in various regions of the country as well as the Gandhian Basic School, which specialises in pre-vocational education based on Gandhian principles. It provides vocational training to the dropouts at the primary level.

Through its education facilities, the School of Mauritian, Asian and African Studies, Folklore Museum, Fine Arts

building, Gandhian Basic School for crafts learning and a rich library, the Institute has emerged as a platform for sustained and multi-layered interaction in the realm of culture and ideas.

The tertiary sector regroups teaching and research under five schools, namely; School of Indian Studies, School of Performing Arts, School of Fine Arts, School of Mauritian and Area Studies, and School of Indological Studies. Degrees for these courses are awarded by the University of Mauritius.

## Objectives & Vision

The objective of the MGI is to establish, as a tribute to Mahatma Gandhi, a centre of studies of Indian culture and tradition. It also strives to promote education and culture. The institution pursues its objectives while adhering to certain values and principles, including mutual respect, co-operation, honesty, tolerance, trust, integrity, responsibility, loyalty, accountability, and objectivity.

The institute's vision statement envisages it to be a leading, multifaceted educational and cultural institution offering full range quality and holistic education both at secondary and tertiary levels with special emphasis on Indian Culture and Arts, and committed to become a full-fledged degree awarding body.

## Mission

The MGI's mission is to provide a sound academic and cultural base for the preservation and promotion of our common cultural traditions and heritage.

- To continue to strengthen the administrative and academic capacity to enhance teaching, learning and research at tertiary level in the fields of Indian Studies, Mauritian and Area Studies, Chinese studies, Performing Arts and Fine Arts.
- To provide world class education at secondary level.
- To continue to instil principles and values for character building and good citizenship based on Gandhian Principles.
- To ensure good governance and quality education at all levels.

In October 1998, a one-time grant of INR Rs 5000000 (50 lakh) and a recurring annual grant of Indian Rs. 500000 (5 lakh) for a period of 10 years was approved for the MGI. The grant was released through the Central Institute of Indian Languages (CIIL), Mysore, for collaborative activities under an MOU signed between the MGI and the CIIL on April 28, 2005.

## Perception and popularity

MGI has raised the level of education in Mauritius, especially in the field of languages, and not only oriental languages.

Teachers trained by the MGI have contributed in enhancing the quality of teaching in primary schools and secondary schools. Many teachers teaching Hindi or Urdu in the primary schools have a Masters (MA) in their respective subjects. This has led to a marked improvement in the quality of teaching of the respective subjects.

MGI has become an integral part of the lives of many Mauritians. Organisations willing to hold cultural conferences or shows often enlist the collaboration of the

MGI. The institute has earned a lot of praise from people of Mauritius, including students and faculty. "The MGI has contributed to maintain the Indian Culture in Mauritius," says Ahmad Ramtally, Senior Lecturer in Urdu at MGI. "As a former student of the MGI I benefitted a lot in terms of culture. I have learnt respect for other cultures and benefitted from the Gandhian philosophy. I am proud to work at the MGI as lecturer in Tamil. I feel it is now time for me to give back to the institution which has given me so much," says Mrs Sangahrammanie Manikkam, Lecturer, Department of Tamil, and MGI.

## Partnership Approach

The High Commissioner of India is the ex-officio Vice-Chairperson of the Council of the Institute, which is headed by a Chairperson nominated by the Government of Mauritius.

The Jawaharlal Nehru Chair for Indian Studies was established at MGI in 1993 for a period of 10 years with the support of Government of India. The Chair was administered under the Indian Technical and Economic Cooperation (ITEC) scheme from 1999 to 2003. A Visiting Chair of Sanskrit and Indian Philosophy between ICCR and MGI has been set up since January 2011 under an MOU signed on July 3, 2010. This MoU was renewed in May 2014. The ownership has been transferred to the Government of Mauritius right from its realisation.

## Governance Structure

The institution is managed by a Council, whose members are spelt out in the MGI Act. The Director General is appointed by the PM. The council is accountable to the Ministry of Education.

## Good Practices

The council is set up in accordance to the law. It has adopted international norms of management. Procurement is done within the provisions of the Procurement Act. Recruitment is done according to the provisions of the MGI Act, by the Appointment Committee. Staff salary is determined by the Pay Research Bureau, the same body which decides on salary revision and conditions of service for the Civil Service.

**Working together provides the youth the opportunity to learn from each other intellectually as well as socially. Co-education provides a realistic way of training young people to take their place naturally in the wider community and provides an excellent foundation for the development of realistic and meaningful relationships in later life.**

## MGI Secondary Schools

The Secondary Schooling Sector is headed by the Director, Schooling and consists of seven schools: MGI Secondary School, Mahatma Gandhi Secondary School (MGSS) Moka, MGSS Flacq, MGSS Solferino, MGSS Nouvelle France, Rabindranath Tagore Secondary School (RTSS) and the Gandhian Basic School (GBS).

Schools managed by the MGI offer a number of subjects which are not available in other secondary schools in Mauritius, such as Bharatnatyam, Kathak, Kuchipuri, violin, tabla, sitar, as well culture education.

## Exchange programmes

- Students from the MGI regularly participate in the International Convention on Students Quality Control Circle in Lucknow, India.
- On two occasions, summer school camps were organised for form 3 students who moved to Liverpool.
- The school has an exchange programme with the Lycée des Mascareignes which contributes to the promotion of intercultural education.
- In May 2015, a Memorandum of Understanding was signed between the Mahatma Gandhi Institute and Our Lady Queen of Peace Catholic Engineering School. This school is based in Liverpool. Under

this exchange programme, MGI students visit the school in Liverpool for two weeks during which they have an internship at the Design and Technology Department. Students from the UK are initiated into the Indian culture at the MGI. While travel expenses are borne by students and the respective Parent Teacher Associations, accommodation in Mauritius is provided free at the government-owned Youth Centre in the south.

## Gender issue

The MGI believes that schools are the best places to learn and develop social skills. Working together provides the youth the opportunity to learn from each other intellectually as well as socially. Co-education provides a realistic way of training young people to take their place naturally in the wider community and provides an excellent foundation for the development of realistic and meaningful relationships in later life.

## National and international events

The running of club activities on a weekly basis has enhanced the participation of students in co-curricular and extra- curricular activities at national and international level.

International: In 2011, one student participated in the "Commonwealth Vision Awards" through the presentation of a short film on Women as agents of Change. He was declared Junior Gold Winner 2011.

National: The performance of students of the MGI in a plethora of activities at the national level is highly commendable. Students participate regularly in activities such as the Model United Nations and debates. The MGI also holds the yearly inter-school drama contest which are based on value-laden themes such as respect, responsibility, courtesy, tolerance and compassion. This aims at promoting holistic learning by fostering positive disciplined behaviour. The MGI believes that to educate is to form character, to shape values and to liberate the imagination.

## Achievements of MGI Schools

The Government of Mauritius offers 60 scholarships to the best students from MGI and its partner institutions each to enable them to pursue tertiary education abroad or locally.

## Capacity Building

Professional Development: In line with the mission of the MGI to provide quality education to students, the Institution supports a comprehensive and coherent plan that reflects its need and priorities for the professional development of all staff.

Sharing of best practices: The schooling sector has built a substantial, systematic, and sustained capacity for acquiring and sharing professional knowledge. During winter holidays, workshops on "Sharing of Best Practices" are organised on an annual basis by the schooling sector for educators and heads of schools to encourage reflective practice so as to enhance the quality of education dispensed in our schools.

Training of new recruits: All new recruits undergo training through induction and empowerment workshops prior to their attachment to schools.

## MGI: A Wide Spectrum

### School of Performing Arts

The School of Performing Arts, initially known as School of Indian Music and Dance, started functioning from the year 1964. In 1975, after the inauguration of MGI, it was integrated into the Mahatma Gandhi Institute as the School of Indian Music and Fine Arts. During the recent restructuring process in November 2006, the Council of the MGI/RTI approved the new formation of the School of Performing Arts.

### School of Indological Studies

In pursuance of the MGI's mission to preserve and promote Indian culture and philosophy in Mauritius, the Department of Sanskrit, Indian Philosophy and Hindu Theology was set up in 1991 with a view to running courses in Sanskrit and Indian philosophy at various levels to prepare, in the first instance, teachers to teach these subjects at school level. Since the past fifteen years, the department has been running courses in the above fields from beginners' level up to Diploma / B.A levels and has trained over 500 students who are able now to undertake teaching of Sanskrit and Indian philosophy at school level.

## School of Fine Arts

The School of Fine Arts is a unique learning experience within the larger tertiary education field in Mauritius. Since its inception, it strives to offer a friendly and relaxed atmosphere where the student can develop his or her creative potential. Lecturers and non-teaching staff all share the same informal relationship to help foster creativity and thinking.

## School of Mauritian and Area Studies

The School of Mauritian and Area Studies regroups the Centre for Mauritian Studies, the Department of Bhojpuri, Folklore and Oral Traditions, the Chinese Studies Section and the Folk Museum of Indian Immigration Archives. The Centre for Mauritian Studies operates as full-fledged centre of higher learning since 1996 when the institute was given full responsibility to develop the following fields of learning at the tertiary level: Indian Studies, Mauritian Studies, Chinese Studies, Performing Arts and Fine Arts.

The Centre for Mauritian Studies is involved in the analysis of the Mauritian society through research and teaching as well as cultural activities. It has, since its inception, oriented research projects and taught modules towards a comprehensive multidisciplinary approach, focusing primarily on Literature and Social Sciences. The disciplinary orientation of the research in Mauritian Studies is in History, Literature, Social Geography, Sociology, Social Anthropology and Cultural Studies. The field of Mauritian Studies offers panoply of opportunities for in-depth understanding of the Mauritian multicultural society.

**The Gandhian Basic School provides an alternative model of education that emphasises literacy, social education and practical programmes of education revolving around handicraft, music, and games.**

## School of Indian Studies

A Memorandum of Understanding (MOU) was signed on April 28, 2005 in Mauritius between the Mahatma Gandhi Institute (MGI) and the Central Institute of Indian Languages (CIIL), Mysore, India (under the Ministry of Human Resource Development, Government of India) with the aim of setting up a Language Resource Centre (LRC) at MGI. This collaborative academic programme propagates the cause of Indian language languages at national and international levels and among the Indian Diaspora. The LRC has played an active in accomplishing this task through its various projects, workshops, seminars, training sessions, etc.

Furthermore, for the first time, the MGI is transmigrating towards ELearning and Distance Education mode through its MOODLE E-Learning platform (Introductory courses in various Asian languages, Hindi, Urdu, Tamil, Telugu, Marathi, Sanskrit, Bhojpuri and Modern Chinese) to open its gateway of knowledge in the educational cadre again under the full support and coordination of the LRC.

The propagation of Asian languages, including Modern Chinese, through digital technologies has been one of its major priorities. Some of the completed and ongoing projects is the design of curriculum materials in form of textbooks and techno-pedagogical materials (EBooks in PDF and audio version) for the Secondary sector. The LRC also provides training (e.g. ICT and Asian languages) and conducts workshops/seminars for academics and students of Secondary and Tertiary level to help them bring innovations and further improvements in their teaching and learning context. During the last few years, it has also started developing techno-pedagogical materials for Asian languages for the Sankoré Project, a joint initiative project between the Ministry of Education and Human Resources, Tertiary Education and Scientific Research and the Mahatma Gandhi Institute. And yet another laudable initiative taken by this department is the digitalization project of dissertations for the courses run at MGI mainly the PGCE, BA, MA courses. This project will notably enhance the quality and level of research being carried out at MGI as there will be a vast choice of theses that can be consulted as reference by both academics and students.

## Gandhian Basic School

The Gandhian Basic School was set up, on the October 2, 1984, to inculcate the principles of Basic Education, as enunciated by Mahatma Gandhi, to students who were being left out of the mainstream education system after the Certificate of Primary Education (CPE) examinations.

At present, the school's population consists of around 120 students, of whom a large majority live below the poverty line.

The Gandhian Basic School provides an alternative model of education that emphasises literacy, social education and practical programmes of education revolving around handicraft, music, and games. The students at the GBS are equipped with a measure of trainability so that they may smoothly enter apprenticeship and thus fend for himself as an adult. Furthermore, the school strives in building up

the child's self-esteem through positive perception of his innate abilities and capacities. By the time they leave the school, they have attained an appreciated level of literacy and numeracy. Moreover, they have acquired practical skills in trade that can allow them to earn a living or to undergo further training.

## The Indian Immigration Archives & Folk Museum if Indian Immigration

The MGI Indian Immigration Archives, which has been established in 1977, consists of the largest repository of documentation on Indian Indentured Emigrants in the world. It has 2055 volumes of original manuscripts which are of tremendous historical and cultural value. These registers contain data for around 454, 000 immigrants who came to Mauritius from India as indentured labourers, from 1842 to 1910.

The MGI Immigration Archives is also responsible for providing Mauritians who are descendants of Indian indentured labourers with some of the necessary documents for the application of the Overseas Citizen of India card.

## Folk Museum of Indian Immigration

Since its inauguration on March 11, 1991, the museum is involved in research, communication, and exhibition of the historical and cultural heritage of Indian Immigrants who came to Mauritius from 1834 to 1920. The museum has been set up to inspire the learning about the history of Indian Immigrants and stimulate appreciation for their cultural heritage.

## The Auditorium

The pride of the Mahatma Gandhi Institute is also its auditorium, known for its impressive attributes. With a seating capacity of 650, highly sophisticated light and sound systems as well as its remarkable acoustics, the auditorium plays a prominent role in the socio-cultural life of the Mauritian community. It is also used by the government and other bodies to house major conferences, national and international events.

## The Printing and Publishing Department

The Mahatma Gandhi Institute Printing and Publishing Department is one of the rare printing houses of its kind in the country. It operates as a university press thereby

enabling the institute to bring out numerous research works and publications at a subsidised cost. One of its chief attractions remains its multi-lingual section.

## The Library and Archives

The Library of the Mahatma Gandhi Institute has a comprehensive collection of around 90,000 books in all fields of interest of the Institute. In addition, the Library has under its responsibility the Indian Immigration Archives. These records constitute a unique source of data on the basis of which ancestry search can be carried out.

## The Language Resource Centre

A language Resource Centre has been set up following the signature of a memorandum of understanding between the MGI and the Central Institute of Indian Languages in August 2006 and is yet to become operational. The idea for the setting up of a Language Resource Centre (LRC) emerged from discussions for the development of a language industry in Mauritius. The three main pillars of Language Resource Centre are language pedagogy, development of new tools for language teaching and learning and research to respond to the needs of policy matters, language planners and language users.

## The Rabindranath Tagore Institute

The Mahatma Gandhi Institute and the Rabindranath Tagore Institute, located in an idyllic setting at Ilot in the northern part of the country, function under one Council and one Director-General. Various programmes ranging from Diploma courses, Degree and Post Graduates programmes are offered in Indian languages, Indian Philosophy, Indian Performing Arts, Chinese Studies, Mauritian Studies and Fine Arts. Modules in Mauritian Studies cut across programmes to give students a better understanding of their society while currently promoting intercultural values.

In collaboration with the University of Mauritius, the Mahatma Gandhi Institute is providing the country with graduates in various oriental languages such as Hindi, Tamil, Telugu, Marathi and Urdu. It is also producing graduates in Fine Arts, Performing Arts, Mauritian Studies, Philosophy and Sanskrit. The latest achievement has been the BA in Digital Arts, BA Mauritian Studies, and MA Sitar. These courses are ongoing and students will graduate in the coming years.

## The Way Ahead

The Mahatma Gandhi Institute in Mauritius has emerged as a powerful cross-cultural connector and has ensured that the multi-faceted partnership between India and Africa is nourished by a constant flow of fresh ideas and efforts at mutual understanding. The MGI is also reflective of the deeper impulses driving the India-Africa partnership as it places ideas, traditions, and culture and value systems at the centre of this burgeoning relationship. Knowledge dissemination and knowledge-creation remain sturdy pillars of the India-Africa cooperation, and is exemplified in the ethos and operations of the MGI. Above all, the MGI is a living embodiment of Mahatma Gandhi's conviction that the "commerce between India and Africa will be of ideas and services, not of the manufactured goods against raw materials after the fashion of the Western exploiters."

# SCALING UP S&T PARTNERSHIP: NEW FRONTIERS

**India's experience in bolstering its SME sector has valuable lessons for Africa's quest for broad-basing its economy and moving up the value-chain.**

In the expanding compass of the India-Africa development and economic partnership, the flowering of the Small and Medium Enterprises sector is poised to play the role of a catalyst for transforming the economic landscape of a resurgent Global South. The small and medium scale industrial sector indeed remains the backbone of economy of any country, whether developed or developing. The growth of economy could be augmented by accelerating and enhancing the manufacturing base with the incorporation of appropriate innovative technologies. India has made incredible strides in economic and social development and is poised to realise even faster growth in the years to come because of its ability to generate and use innovative technologies for SMEs. India's experience in bolstering its SME sector has valuable lessons for Africa's quest for broad-basing its economy and moving up the value-chain.

It is well known that despite exceptional good local resources and agro-climatic conditions, the developing African countries are not able to convert local resources into value-added products and develop SMEs because of weak links in all segments of the value chain i.e. lack of availability of capital, technologies and machinery, infrastructure, skilled manpower, transformation and conservation process, marketing and logistics.

Considering the vast experience of National Research Development Corporation (NRDC)of under in the technology incubation, development, transfer and commercialisation, across several sectors and spanning he entire value chain, India's Ministry of External Affairs (MEA) has chosen NRDC as its partner for implementing many of the innovative bilateral socio–economic programmes in Africa.

NRDC has about 2500 technologies in its database related to several socio–economic sectors and has transferred technologies to over 5000 SMEs/Starter/Corporate in India and abroad and assisted inventors to file about 1600 patents.

The corporation has already exported technologies and provided consultancy services to the entrepreneurs in the developed as well as developing countries like the US, Germany, Indonesia, Vietnam, Malaysia, Myanmar, Bangladesh, Ivory Coast, Senegal, Philippines, Thailand, Nigeria and Ethiopia.

The NRDC has already signed MoUs/MoAs for various projects, technology transfer and technical co-operation with a host of African countries, including Cote D'Ivoire, Senegal, Nigeria, Rwanda, Ethiopia, Democratic Republic of Congo, Egypt, Sierra Leone, Burkina Faso, Benin, Ghana, Argentina and Cameroon. The overarching objective is to bolster the local industry through Indian technologies and machinery, thereby providing a boost to economies of African countries.

## Projects in Africa

The projects undertaken in African countries encompass a wide spectrum and underscore the emphasis in India's technical and economic cooperation on local capacity building and training. In particular, four projects deserve special mention. These include: i) Centre for Demonstration and Promotion of Technologies (CDT)in Cote d'Ivoire; ii) Supply of Fuel Briquette Plant to Ondo State in Nigeria; iii) Science & Technology Entrepreneurship Park (STEP)in Egypt; and iv) Pilot Research Project for Tomato Production in Ghana.

**The projects undertaken in African countries encompass a wide spectrum and underscore the emphasis in India's technical and economic cooperation on local capacity building and training.**

## Centre for Demonstration and Promotion of Technologies (CDT), Cote d'Ivoire

Many African countries have not been able to establish industries, in spite of abundant natural resources like fertile land, big rivers, good temperature climate and substantial workforce. This is due to the lack of availability of technologies and capital, information on the technologies that can be available for them for processing their natural resources, inadequate infrastructure and capital, marketing network, logistics and entrepreneurial skills. While working in these countries it was suggested by the government as well as other agencies that showcasing or exhibition and live demonstration of various innovative and simple technologies to the entrepreneurs in these countries would help them to motivate in setting up manufacturing units and the development of a large number of small and medium scale industries in the country. This would not only help them in converting their natural resources and agricultural produce, but also in reducing the dependency of imports to meet the local demand, thereby improving the socio-economic conditions of these countries as a whole.

Based on the Indian experience of setting up and running a large number of small and medium scale industry and dovetailing it with African needs and conditions, it was decided to set up technology demonstration centres in these countries. The objectives of this centre were as follows:

- Development of local resources
- Augmentation of income levels of micro entrepreneurs
- Creation of employment for youth and women
- Augmentation of agricultural production

The plan was conceptualised to benefit the host countries in numerous ways:

**Based on the Indian experience of setting up and running a large number of small and medium scale industry and dovetailing it with African needs and conditions, it was decided to set up technology demonstration centres in these countries.**

- The entrepreneurs get ready made information on plant and equipment for their use
- Witnessing live demonstration creates high-level confidence on the use of such plant and equipment
- Payments in local currency for the equipment eliminates import-related hassles.
- Availability of after-sales-services and spares provides further support.

## Implementation

Under the project, while financial assistance is provided by the Ministry of External Affairs in New Delhi, the host country provides space and infrastructure as well as utilities for the centre.

## Impact of Technology Demonstration Centre.

The concept of the Technology Demonstration Centre has been well accepted by the people, government agencies and other authorities and industry associations in West African countries. The success of the centre has led to a large number of technology enquiries and the machines have been supplied to entrepreneurs through CDT. The operation of CDT has opened up substantial business prospects and a large number of technologies and machines are being supplied to these countries. A large numbers of entrepreneurs established their own ventures as a result of establishment of CDT and the lands and training provided to local entrepreneurs and the processes/machines set up in the CDT. The CDT experiment has been widely cited as one of the most successful India-Africa cooperation programmes. After handing over the project to I2T, the NRDC exited from the project in 2010.

## Supply of Fuel Briquette Plant to Ondo State, Nigeria

The Corporation had propagated the concept of setting up of Demonstration Centre in different West African countries and has signed MOAs for setting up Demonstration Centre in various Ministries/organisations of countries like Sierra Leone and Nigeria for similar project.

In Nigeria, the NRDC had signed MoU with Small & Medium Enterprises Development Agency of Nigeria (SMEDAN) for technical cooperation and setting up Demonstration Centre. During the visit to various parts of Nigeria and visits of delegation from Nigeria, the requirements for various projects were received as follows:

- Cassava to Ethanol (Food Grade) – Capacity of 15-20 tonnes of cassava chips/day
- Cassava flour from dry chips
- Output 30-60 tonnes/day Cassava flour or starch
- Feasibility study on cassava starch production
- Training on design of PCB's for multi-layered boards - 4 layers PCBs
- Single sided or double sided.
- Packaging material
- Packing machines for paper and plastic.
- Sericulture project from silk worms for processing, weaving and making silk products.
- Fuel Briquetting Plant

The Governor of Ondo state expressed the need for projects to utilise the agri waste and generate employment. As they generate an adequate amount of wooden waste from wood processing industries, it was proposed to set up Fuel Briquetting plant at Ondo State.

## Science & Technology Entrepreneurship Park (STEP), Egypt

The NRDC signed an agreement for consultancy service with Social Fund for Development (SFD), Government of Egypt, Cairo, for setting up four Science and Technology Entrepreneur Parks (STEP) in Egypt. Based on the diagnostic survey and discussion with universities, local industry associations, local ministries and bodies, the Corporation identified 160 projects suitable for undertaking entrepreneurship in STEP by science graduates. The Corporation prepared feasibility reports for the projects and after discussion with universities and local authorities, about 80 projects were selected for establishing them in the STEP Phase I. The Phase II of the programme will be implemented after mobilising fund for the same

## Pilot Research Project for Tomato Production in Ghana

The Corporation signed an MOU with Ghana's Ministry of Environment, Science and Technology through its implementing agency, Council for Scientific and Industrial Research (CSIR), Ghana for scientific and technical co-operation. After signing of the MoA, the Ghana government

wanted technical co-operation for enhancing tomato production in the country as the demand of tomato (raw and processed) in the country exceeds indigenous production. Subsequently, a team of scientists and a business development specialist of the Council for Scientific and Industrial Research (CSIR) of Ghana and NRDC visited major tomato producing areas in Ghana. The evaluation report was submitted to Ghana's then vice-president, John Dramani Mahama (who later on became president of the country) during his visit to India in March, 2010.

Based on the evaluation report submitted by NRDC, the Govt. of Ghana proposed to set up a "Pilot Research Project for Tomato Production in Ghana" to demonstrate the recommendations made in the report. Accordingly, a proposal was made jointly by NRDC and CSIR, Ghana for setting up the pilot project. Subsequently, the government of Ghana submitted proposal to the government of India for financial assistance. The Indian government, through Ministry of External Affairs, advised NRDC to implement the prestigious project which is currently under implementation.

**The objective of the project is to conduct the problem-oriented applied research in agro-climatic regions of Ghana to evolve effective cultivation techniques and measures to achieve higher yield of good quality tomato under Ghana's conditions.**

## Objectives and Targets

The objective of the project is to conduct the problem-oriented applied research in agro-climatic regions of Ghana to evolve effective cultivation techniques and measures to achieve higher yield of good quality tomato under Ghana's conditions. The project will be carried out at three locations in Ghana, and aims at the following outcomes:

- Increase tomato productivity through deployment of high yielding, multiple pest and disease-resistant cultivars and proven sustainable crop and soil management technologies.
- Increase income and improve livelihoods in rural areas through development of effective and increased commercialisation of tomato.
- Impart knowledge to the farmers in improved nursery management and farming method
- Facilitate proper extension delivery system to farmers

## The Way Forward

The NRDC proactively participates in building India-Africa partnership programmes organised by Research and Information System (RIS) for Developing Countries and Ministry of External Affairs and contributes critical inputs on issues related to science, technology, innovation and entrepreneurship.

In the emerging global context, considering the wide range of complementarities between the two growth poles of the world, there is a compelling need to bolster the expanding India-Africa partnership through science, technology, innovation, and entrepreneurship to address a host of challenges facing the two regions. The Third India-Africa Forum Summit in New Delhi would firm up a clear roadmap for crystallising this partnership and taking it to new frontier areas emerging in science, innovation and knowledge industries.

# POWERING A BRIGHTER FUTURE

# BRIGHT FUTURE: BOLSTERING POWER SECTOR IN LIBYA

With Africa's economy expected to grow at the rate of around 4-5 per cent in the next few years, the power sector is going to play a critical role in the continent's drive for economic uplift of its over  billion people.

Against this backdrop of upbeat projections for Africa's economic growth story, India's core strengths and expertise in the power sector play the role of a catalyst leading to lasting economic transformation of the continent. BHEL, India's heavy engineering giant, is an active participant in Africa's unfolding economic renascence, starting its journey with the turnkey execution of 2x120 MW extension of the Tripoli West Power Station in Libya in 1970s.

Since that pioneering project, BHEL's operations have spread across 21 African countries including Algeria, Burundi, Comoros, Democratic Republic of Congo, Egypt, Ethiopia, Ghana, Kenya, Libya, Malawi, Mauritius, Nigeria, Rwanda, Senegal, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

Reinforced by the Indian government's vision to spur Africa's growth, BHEL has recorded several milestones in Africa, which include 1174 MW of installed capacity in Libya; the recently completed 500 MW Kosti Thermal Power Station in Sudan which is the largest power plant in the North African country; and setting up the 28 MW Nyaborango Hydro-Electric Power Project in Rwanda on a turnkey basis. BHEL's equipment is also lighting homes and industries in Ethiopia from the 2x12 MW power plant set up for M/s Finchaa Sugar, Ethiopia.

**Against this backdrop of upbeat projections for Africa's economic growth story, India's core strengths and expertise in the power sector has started playing the role of a catalyst leading to lasting economic transformation of the continent.**

Presently, the company is executing orders for cogeneration packages of 120 MW in Ethiopia, thermal power project of 125 MW in Senegal and hydroelectric power project of 64 MW capacity in Democratic Republic of Congo, along with an HFO based power plant of 18 MW in Comoros Islands.

## The Libya Example

India has been associated with the growth of the power sector in Libya since last three decades. It executed 2x120 MW Tripoli West Power Station in 1980 – 1981 on turnkey basis. Besides, India has also undertaken re-habilitation of Tripoli West Power Station, installing Boilers at Zuara, Benghazi and Derna Power Stations and also a series of orders for spares.

In March 2003, an order for Rs 1,100 crore-plus comprising of 4X150 MW, was given to India to make use of the region's gas reserves in Western Area, Al Garbi Libya. By the time of the project's completion in 2006, this project was the largest power plant set up by the BHEL overseas as well as was the highest rating power plant equipment to be exported from India.

India's success in this project not only led to an extension contract, which comprised 2 X150 MW Gas Turbines but also resulted in the formation of an Indo-Libyan company, M/s Electrical Construction Company that focuses on the growing power sector in Libya.

Significantly, the power plant of 2x120 MW Tripoli

West created a record of sorts by running uninterruptedly without any forced outages for over 25 years. Satisfied with the performance of units, the Electricity Corporation of Tripoli assigned India the task of carrying out rehabilitation of a boiler, installed by a European supplier, at the Tripoli West Power Station.

Sensitive and adherence to local laws remain an abiding principle of Indian projects across Africa, and India has scrupulously followed this dictum.

## Capacity Building & Training

In sync with India's thrust on augmenting local capacities through training, the India enterprise, while executing these projects, has trained the local manpower and technical personnel in operation and maintenance at its works in India and at site by associating them during the erection and commissioning of the power plant. This has ensured that the company's equipment was operated as per best O&M practices and increased the overall capacity of the power plant. The Indian company also endeavour to maximise local sourcing and local contracting in such projects and always aims for maximum localisation as well as enhancing local skills in future ventures in Libya.

While the present installed power generating capacity in Libya is around 7,000 MW, it has plans to add another 13,000 MW of new capacity till 2020. BHEL strongly believes that it has the potential to be a significant partner in these projected plans aimed at creating a brighter future for this dynamic country's citizens.

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# SUDAN'S LARGEST THERMAL POWER PLANT: FUELLING GROWTH

It's the largest Thermal Power Plant in Sudan, contributing 500 MW out of the country's total installed capacity of 3000 MW. The project symbolises successful cooperation between India and Africa in the power sector. The Kosti TPS is also BHEL's first crude oil fired thermal power plant in Africa and follows the successful completion of 28 MW Nyaborango hydro project in Rwanda by India's leading power equipment supplier.

BHEL's entry into Sudan started with the securing of one of its kind 4 x 125 MW crude oil fired thermal power plant on Engineering, Procurement and Construction (EPC) basis basis to National Electricity Corporation (presently STPG), Sudan.

The uniqueness of this power plant can be judged by the fact that it was custom designed to make use of available fuel in Sudan, enabling them to be self-reliant on fuel procurement. This plant directly feeds power to the three 220 kV National grid lines, including Khartoum; South Sudan; and west Sudan. What's more, major equipment for the project, including boilers, steam-turbines, generators, controls & instrumentation (C&I) and transformers, have been manufactured in-house.

**The uniqueness of this power plant can be judged by the fact that it was custom designed to make use of available fuel in Sudan, enabling them to be self-reliant on fuel procurement.**

**Electricity generated from this plant, apart from illuminating the lives of people of Sudan, was also fed to sugar and cement industries which in turn led to infrastructure development and employment generation**

Electricity generated from this plant, apart from illuminating the lives of people of Sudan, was also fed to sugar and cement industries which in turn led to infrastructure development and employment generation. Funded with $350 million Indian Line of Credit, the plant has provided stability to the national grid and also stability of power supply to Rabak and Kosti city and villages around power plant.

The plant has visibly impacted the economy of the North African country, generating enormous goodwill for India.

# CLEAN & GREEN

# SUNNY DAYS FOR INDIA-AFRICA TIES: SOLAR PROJECT IN MOZAMBIQUE

**The solar panel assembly plant built in Mozambique shows the way and underlines limitless possibilities for partnering in this eco-friendly source of energy. Photovoltaic (PV) technology is rapidly advancing and is increasingly regarded as a viable, innovative source of renewable energy.**

With India looking to upscale the share of solar energy and renewables in its overall energy mix, in line with its philosophy of spreading clean energy there is a dovetailing of the country's growing capacity in this sector and abundance of sunny days across the African continent. In fact, as India looks to promote solar club, the ongoing white revolution is going to define the contours of India-Africa energy partnership.

The solar panel project in Mozambique shows the way and underlines limitless possibilities for partnering in this eco-friendly source of energy. Photovoltaic (PV) technology is rapidly advancing and is increasingly regarded as a viable, innovative source of renewable energy. Mozambique has huge and virtually unexploited solar potential. Its annual incident solar radiation, distribution evenly across the country, is about 1.49 million GWH – thousands of times more than the country's present annual energy demand.

The solar panel assembly plant built by India in Mozambique is exceptional in several ways, not least because it was finished one month ahead of its October 2013 deadline. Our extensive research did not reveal a single part of the project that had missed a deadline, making it a silver lining in terms of scheduling. Inaugurating the factory – situated within Maputo's Beluluane Industrial Park – in November 2013, Mozambique's President Armando Guebuza pointed out that the timely completion of the project would provide a major boost to a solar panel programme that had already illuminated 207 villages, 244 schools and 403 health units.

Electronics Corporation of India Ltd, a Government of India enterprise, was the technical partner for the project. The contract was signed in September 2011 with the Mozambican Government National Energy Fund (Funae) under a US$13 million LoC, which became effective in April 2012. The construction of the factory has spawned some 780 jobs and, when fully operational, the unit is expected to employ 70 people.

The assembly plant has greatly reduced the cost of solar panels in the country. Before the operationalizing of the plant, the country was shelling out around US$ 5-6 million annually for the import of solar panels. Taken as a whole, the photovoltaic solar energy project has an annual generating capacity of 5 MWe. As many as 17 Mozambique nationals have also trained in terms of skill acquisition for running and managing the facility.

The facility has resulted in substantial financial savings for the country and has consolidated the foundations of it march towards self-reliance in this vital sector of clean energy. The solar panels produced at the plant are being used in several rural electricity projects for villages, schools and hospitals in Mozambique while its additional output is bound to be exported to other African countries. The success of the project has also demonstrated the level of technical excellence to which several Indian public sector enterprises have contributed towards the economic development of the country.

**The solar panels produced at the plant are being used in several rural electricity projects for villages, schools and hospitals in Mozambique while its additional output is bound to be exported to other African countries.**

# POWERING PROSPERITY IN RWANDA

It's a narrative of hope, conjoining an African nation's drive for resurgence with the technical expertise of India. For a country diligently and creatively rebuilding itself from the decades-long civil war, the 28 MW Nyabarongo Hydropower Project, built by Bharat Heavy Electricals Limited (BHEL) with an Indian Line of Credit, has proved to be a game-changer for Rwanda's quest for economic rejuvenation and better life for its people.

**The 28 MW Nyabarongo Hydropower Project, built by Bharat Heavy Electricals Limited (BHEL) with an Indian Line of Credit, has proved to be a game-changer for Rwanda's quest for economic rejuvenation and better life for its people.**

## Energising Rwanda

The 28 MW Nyabarongo Hydropower Project in Rwanda (NHEP) was dedicated to the nation by President Paul Kagame in March 2015.

Rwanda is a small landlocked country in east-central Africa which is in the process of recovering from the decades-long ethnic strife that bedevilled it in the mid-1990s. Rwanda understands the importance of infrastructure development and the role of power for infrastructure and economic growth. Sustainable power generation is critical to bolstering the development programme of a country which had existing power generation capacity nearing 110 MW, when the project was started. Therefore, an addition of 28 MW of power generation promises to be a catalyst for the flowering of the country's economy.

The NHEP is located in farthest end of Muhanga District in Mushishiro sector, about 75 kilometres by road, southwest of capital Kigali. The scope of BHEL was to design, supply, erect and commission the entire Electro-Mechanical and Hydro Mechanical package for this project, with two generating units of 14 MW each.

The project involved the construction of about 44.5m high concrete gravity dam with three sluice gates. The Intake Structure is located on the right bank of the river, about 15 m upstream from the proposed dam axis. Water conductor system consist of 1.2 km long Head Race Tunnel (HRT); 27 cumecs of water is fed into two Vertical Francis turbines generating 14 MW each capacity through 126.70 m long penstock. Sub surface power house is located on the terrace of the right bank at an elevation of El 1437 m, to utilise a net head of about 59.3 m for generation of 28 MW of power. The power generated will be evacuated from switchyard through 27-km long 110 kV transmission line to Kilinda substation.

The nature and complexity of the project can be well understood from the photographs of the Nyabarongo Hydro project site.

Power is a critical infrastructure for economic growth. Power sector demands intensive capital and technological investment, including a large number of engineering and skilled manpower, and managerial competency. The importance of power sector for the development of a country cannot be overemphasised.

The bulk of the investment needed for the project was provided by the Government of India (80%) by means of concessional lines of credit through Export-Import Bank of India (EXIM Bank). The remaining part was funded by the Government of Rwanda.

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**Power generated by 28-MW Nyabarongo hydropower plant has not only added 18% of the installed capacity to the national grid, but it has also drastically reduced monthly government expenditure on diesel/gas by 43%. Nyabarongo project is now the largest power plant of Rwanda.**

The project, which took six years to build, was not an easy task and was fraught with challenges. Being a part of the government's "vital" seven-year electricity plan (2011-2017) that aims to have electricity access to at least 70 percent of Rwandans by 2017, the dam, whose construction commenced in 2009, was completed in 2013.

Although civil work of a hydropower project is always a challenging job, in this project BHEL had also faced challenges during the transportation and installation of large size hydro-mechanical equipment.

## Economic Boost

After successful completion, the project was handed over to the Government of Rwanda in October 2014. The cooperation and proactive attitude of all the government agencies of Rwanda played a significant role in ensuring the success and time-bound delivery of this project.

Power generated by 28-MW Nyabarongo hydropower plant has not only added 18% of the installed capacity to the national grid, but it has also drastically reduced monthly government expenditure on diesel/gas by 43%. Nyabarongo project is now the largest power plant of Rwanda, and has injected a new energy into the country's economy.

The project is expected to contribute immensely towards ensuring access to electricity for all homes, schools, hospitals

and industries. The NHEP has not only stimulated the much needed infrastructure development of Rwanda, but has also become a source of foreign exchange earnings for the country by exporting electricity to the neighbourhood. The construction project has provided employment opportunities to 500 local people, and transformed their lives in the process. The health centre facility that was set up in the locality to cater for the people working on the site has also contributed to the socio-economic uplift of a nation that seeks to capitalise on every opportunity that comes its way.

**Children can now revise and do homework beyond the normal school hours since our household is now connected. Our locality had nothing to attract investment but due to the hydro power project, several people from neighbouring sectors and districts have started businesses in the area.**

According to local residents of Mushishiro sector, "children can now revise and do homework beyond the normal school hours since our household is now connected. Our locality had nothing to attract investment but due to the hydro power project, several people from neighbouring sectors and districts have started businesses in the area."

Rwanda has consistently registered high growth rates of above 7% over the past 10 years; to keep this dynamic economy rolling, there is need to ensure an uninterrupted supply of safe, reliable and cost effective energy in the country. Needless to say, the Nyabarongo hydropower project has become a lynchpin of the country's energy security and is brightening the lives of the people of Rwanda. The project has also become an exemplar of the Indo-Rwandan friendship for years to come.

# BUILDING GREEN PARTNERSHIP WITH AFRICA: BRICKS AND MORTAR

Promoting green growth and green buildings in a supportive eco-system of technologies and sustainable living are poised to be key focus areas as India and Africa look to upscale their multifarious development partnership, anchored in the ideals of South-South cooperation. This green construct emerges from a larger shared commitment to combat climate change and to ensure a balanced and comprehensive global climate deal (Paris COP21), as enshrined in the 2011 Addis Ababa Declaration. "We take note of the African common position on Climate Change and support efforts towards combating drought and desertification in Africa, as well as support for Africa's Great Green Wall Project," said the Addis Ababa Declaration.

## URBANISATION AND SUSTAINABLE CONSTRUCTION

This commitment to eco-friendly sustainable development is set to gain greater salience in view of Africa's rapid urbanisation and a host of developmental challenges, which requires a different approach from that of the West, and needs greater focusing on the particularities of not only Africa's material conditions, but also the uniqueness of cultural lifestyles and value-systems.

Africa's fast-track urbanisation is an unfolding story, and hence there is scope for creative thinking and solutions to propose long-term sustainable solutions. According to African Development Bank, Africa has experienced the highest urban growth during the last two decades at 3.5% per year and this rate of growth is expected to hold into 2050. The Bank has underlined that between 2010 and 2025, some African cities will account for up to 85% of the population. Glaring urban poverty, rising inequality and

attendant problems of environmental degradation demand a multi-faceted approach that blends right technologies and an understanding of the African cultural concept of Ubuntu, signifying the oneness of humanity. Against this backdrop, the Indian experience and expertise in the emerging area of sustainable construction is proving to be useful and look set to play a bigger role in deepening the India-Africa developmental partnership.

**Along with transfer of technology know-how, it also imparts training and capacity building to entrepreneurs and workers to ensure proper functioning of the newly set-up enterprises.**

Construction and buildings represent an indicator of growth and development in emerging economies. In construction, building materials account for 50-60 per cent of the costs. They also account for the majority (up to 80 per cent in India) of the GHG emissions attributed to the sector. The project undertaken by India's Development Alternatives (DA) group through TARA (Technology and Action for Rural Advancement) in Malawi illustrates possibilities of expanding collaboration in sustainable construction or green buildings. The TARA provides technology transfer services in the areas of energy-efficient and environment- friendly brick production technologies and systems, low emission building materials and industrial waste utilisation. Along with the transfer of technology know-how, it also imparts training and capacity building to entrepreneurs and workers to ensure proper functioning of the newly set-up enterprises.

## The Malawi Example

Malawi is a land-locked country in southern Africa with one of the highest rates of urbanisation, putting tremendous

pressure on the entire building material sector. The 21,000 housing units required annually to meet the urban housing demand will require wood to fire bricks, and forests are destroyed for fuel to produce building material. Bad production practices have affected the quality of bricks as well as the houses built with these bricks. Poor quality housing plus the increasing deforestation in the country prompted the Government of Malawi to take notice of the situation and introduce cleaner production technologies. The Centre for Community Organization and Development (CCODE), a leading NGO in the country, decided to explore technology options. Thus the environment was right to introduce a new technology to solve these concerns. TARA introduced the Vertical Shaft Brick Kiln (VSBK) technology in Malawi in 2014 with the objective of reducing the pressure on natural resources while providing quality bricks in Malawi. The technology transfer programme has found acceptance among the government and support from bilateral agencies.

**The priority is on locally anchoring the transferred technology to augment the supply of quality materials through a critical mass of production units.**

Development Alternatives (DA), an Indian social enterprise dedicated to sustainable development, focuses on practice-to-policy perspective for delivering socially equitable, environmentally sound and economically scalable development outcomes. The focus of India's approach is on innovating eco-solutions to help meet the basic needs of all and works with partners, including micro, small, medium and large scale enterprises, government bodies, private entrepreneurs and civil society, to market these in a commercially viable manner to an ever-growing body of consumers.

The technology transfer programme has entry points from the economic and environmental angle. The idea is to introduce an appropriate technology in the country after conducting an extensive feasibility assessment that includes technical, social, economic and environmental concerns. The TARA team optimises the use of materials, particularly cement and aggregates, to ensure affordability of the building components. The learning of new knowledge is strengthened by disseminating the benefits to a larger stakeholder group.

Over the last 15 years, the Indian agency has been actively involved in technology and knowledge transfer through South-South Cooperation to other developing countries in South Asia and the African continent. Such initiatives have included the introduction of energy efficient and environment friendly brick making technologies in many countries, besides Malawi.

## Modus Operandi

The key building blocks of the technology transfer programmes are:

### Need determination

One of the first steps in the transfer of knowledge related to environmentally friendly technology is to determine the need of local stakeholders. Technologies are not transferred for the sake of technology. In the case of Indonesia and Sri Lanka, the urgent rehabilitation need and the subsequent scarcity of building materials created the need for a rapid response to set up technology enterprises. The added co-benefit of livelihood creation through these enterprises enhanced sustainability. On the other hand, in Malawi the policy driver to look at alternate technologies provided the basis for the technology transfer.

**The programme then creates demonstration sites that provide the "how-to" of constructing, installing and commissioning units using the chosen technology.**

### Feasibility assessment

Once the preliminary need has been established, a detailed feasibility study to explore the potential for transfer of the technology in the local context is undertaken. The feasibility study comprises technical, environmental, social and economic aspects of current production technologies in the region and explores how the environmental, economic, social and institutional situation in the region can be improved. This includes the development of potential options and financial scenarios for various technology options and transfer of know-how. The assessment looks at aspects of production capacity, fuel type, product quality, investment capacity and ability to tap the carbon market.

### High impact demonstration

The programme then creates demonstration sites that provide the "how-to" of constructing, installing and commissioning units using the chosen technology. This requires intensive technical input and sustained handholding by DA in the initial phases of the transfer. In the course of establishing the demonstration units, technical capabilities of the local technology providers are built. To ensure sustainability, a cadre of trained workforce who will be able to independently handle the daily operation and maintenance of the kiln is created. Subsequent kilns are then constructed and commissioned by the country team with only limited technical back-stopping from DA. It is important, however, to have a critical mass of

demonstration units that serves to catalyze accelerated adoption in the country.

## Partner engagement and network building

This is a crucial step in ensuing local anchoring of the technology for long-term sustainability. The Indian agency's experience has shown that having a strong institutional local partner eases the process of transfer. With the presence of a partner, the transferred technology is physically anchored in the area, with the ready potential for further dissemination and accelerated uptake. Besides local partners, it is essential to create a network of stakeholders. This includes new and potential entrepreneurs from the sector who would want to invest and adopt the transferred technologies.

## Capacity building

Capacities are built through skill development workshops and seminars at a multitude of levels to ensure smooth functioning of the sites. The pilot units are used as training grounds to build up the first cadre of skilled personnel. The approach adopted for the training is participant centered, with an emphasis on practical, experiential, learning by doing. They also serve as master trainers who can then set off a Training of Trainers (TOT) program in

collaboration with existing training organisations and resource agencies in order to institutionalise the process and enable sustainability.

## Ecosystem development

Once the hard technology and skill sets are transferred, there is need to focus on developing a conducive environment for the transferred technology to prosper. Systems of knowledge, policy and markets play an important role in developing this ecosystem. Knowledge documents on different aspects of the technology, including details of equipment and accessories, raw material selection, production process, and quality control and application are developed for different stakeholders and for dissemination. Awareness is raised among the stakeholders, particularly new entrepreneurs, by organising visits to the demonstration sites. Similarly, policy support through product standards, quality parameters and incentives for entrepreneurs adopting these technologies is another tool that is used to widen the acceptance of the technology.

## Outcomes and Impacts

The introduction of VSBK and other eco-friendly initiatives can lead to a four-fold outcome in terms of:

- Mitigation of environmental degradation
- Reduced climate change implications due to energy efficient processes
- Reduced pressure on forests and limited deforestation

## Promotion of resource efficiency

- Reduced breakages and the introduction of new products like hollow bricks leading to reduced soil consumption
- Energy efficient firing process including the use of waste materials leading to reduced consumption of fuel (coal)

## Creation of sustainable infrastructure

- Availability of quality building material for construction of infrastructure
- Reduced maintenance and rebuilding costs due to good quality construction

## Development of the local economy

- Establishment of new enterprises to cater to domestic needs
- Creation of better paying decent jobs

## The Way Ahead: Partnering in Green Growth

Looking ahead, the potential of scaling up the use of eco-friendly technologies for sustainable construction in the African continent, as in the case of Malawi, is huge. Achieving impacts though requires long-term engagement for continued support, capacity building for sustainability and partnerships for local anchoring. Technology transfer initiatives to countries in Africa offer an opportunity to further strengthen regional capacities. The strengthening of regional capacities in green construction will play a force-multiplier effect in transforming the urban landscape of Africa by blending needs of growth with basic principles of sustainable development, underpinned by equity and innovation.

**Technology transfer initiatives to countries in Africa offer an opportunity to further strengthen regional capacities. The strengthening of regional capacities in green construction will play a force-multiplier effect in transforming the urban landscape of Africa.**

# CONTRIBUTORS

**RIS** is an autonomous think-tank under the Ministry of External Affairs that specializes in policy research on international economic issues and development cooperation. RIS is envisioned as a forum for fostering effective policy dialogue and capacity-building among developing countries on global and regional economic issues. Prof. Sachin Chaturvedi and Sushil Kumar of RIS contributed the articles on Sugar Industry in Ethiopia and Solar Panel project in Mozambique.

**BHEL** is a leading power plant equipment manufacturer and one of the largest engineering and manufacturing company of its kind in India. The Africa Department of the International Division of BHEL contributed articles on power plants in Rwanda, Libya and Sudan.

**Bunker Roy** is an Indian social activist and educator who founded the Barefoot College, located in Tilonia, Rajasthan, that is focused on training and empowering illiterate women. He has worked extensively on training Solar Grandmothers from various African countries. He has contributed the article on 'Barefoot Solar Engineers.'

**National Research Development Corporation (NRDC)** is India's leading organization for scientific and industrial research. It promotes, develops and commercialises the technologies inventions and patents emanating from various national R&D institutions/ Universities. Dr H. Purushotham, A. Pradhan and Manjulika Otto of NRDC contributed the article on India-Africa Science and Technology Cooperation.

**CUTS (Consumer Unity & Trust Society)** International is a non-governmental organisation pursuing social justice and economic equity, with a strong institutional presence in Africa. CUTS is a leading advocate for consumer empowerment and sovereignty. Dr Pradeep Mehta and Kshitiz Sharma of CUTS contributed articles on Mahatma Gandhi Institute as well as Rajiv Gandhi Science Centre in Mauritius and Ghana-India Kofi Annan Centre of Excellence in Information and Technology.

**Manish Chand** is Editor of "Two Billion Dreams: Celebrating India-Africa Friendship," and has co-edited "Engaging with a Resurgent Africa (McMillan)," a collection of essays on emerging powers' engagement with the resurgent continent. He is CEO/Editor-in-Chief of India Writes Network (www.indiawrites.org), and has served as Editor of Africa Quarterly. He contributed an article on the Pan-African e-Network.

**BASIX Group**, also called Bhartiya Samruddhi Investments and Consulting Services (BASICS Ltd.), specializes in new generation livelihood promotion. BASIX, in association with PRIA, has contributed an article on promoting sustainable livelihood in Africa.

**Development Alternatives (DA)** is a research and action organisation striving to deliver socially equitable, environmentally sound and economically scalable development outcomes. DA, in association with PRIA, contributed an article on Sustainable Construction in Africa.

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