

Volume III, Issue 2011

# ODISHA!

The voice of a resurgent people

## ASOKAN LEGACY

CRUSADER OF PEACE

## JHARSUGUDA'S GIANT LEAP

A TRANSFORMATION STORY

## WOMAN OF SUBSTANCE

INTERVIEW WITH MANORAMA  
MOHAPATRA, RENOWNED ODIA  
POET AND WRITER

## BORN FREE

EXPLORING ODISHA'S WILDLIFE



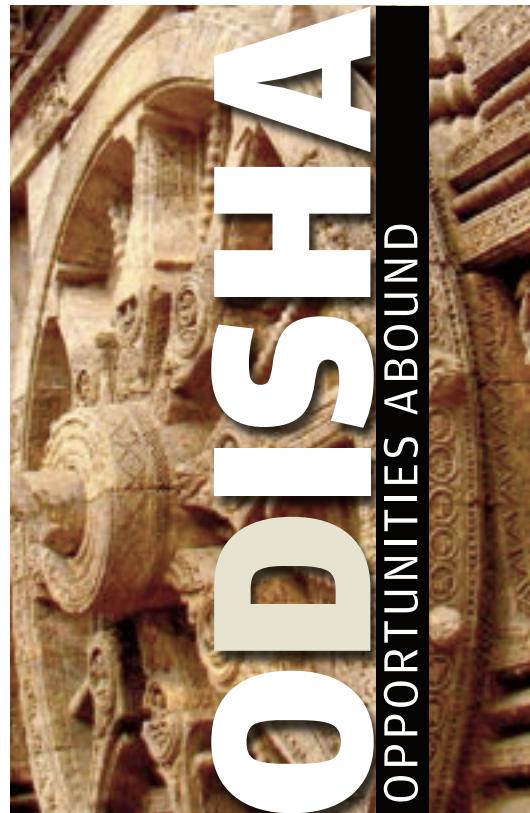
**Our vision is far-reaching. The stimulus for change is perceptible. It is merely a matter of time before Odisha emerges as a force to reckon with.**

**W**ITH THIS EDITION OF O-Disha magazine, we move a step ahead, delving deep into the recesses of history, gauging the momentum of the present and mapping the vision for the future. We present the manifold possibilities of the state of Odisha, evident in the differences made by institutions and individuals at the grass roots.

Our vision is far-reaching. The stimulus for change is perceptible. It is merely a matter of time before Odisha emerges as a force to reckon with.

The overwhelming response to our magazine from all quarters continues to encourage us. The challenge is to scale greater heights with every issue.

Vedanta has become a part of Odisha's growth story, one of the spokes in the wheel that propels the state's growth. Having established our presence with large projects, we seek to widen our horizon by touching the lives of the state's people in more meaningful ways. The pace may vary but the journey continues.



The release of this issue coincides with the auspicious festive season, bringing with it divine blessings.

I must thank all those who have contributed in carrying this unique endeavour forward, setting the standards for the quality and content of O-Disha.

Your comments will be highly valued. Do write in to us!

Sincerely,

Anil Agarwal  
Chairman, Vedanta Group

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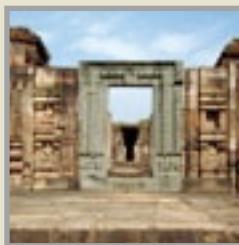
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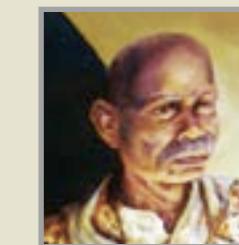
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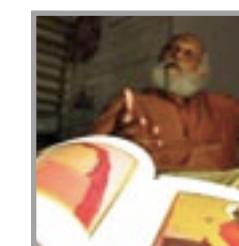
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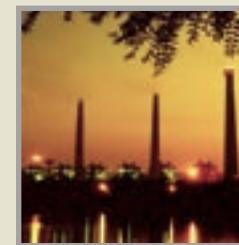
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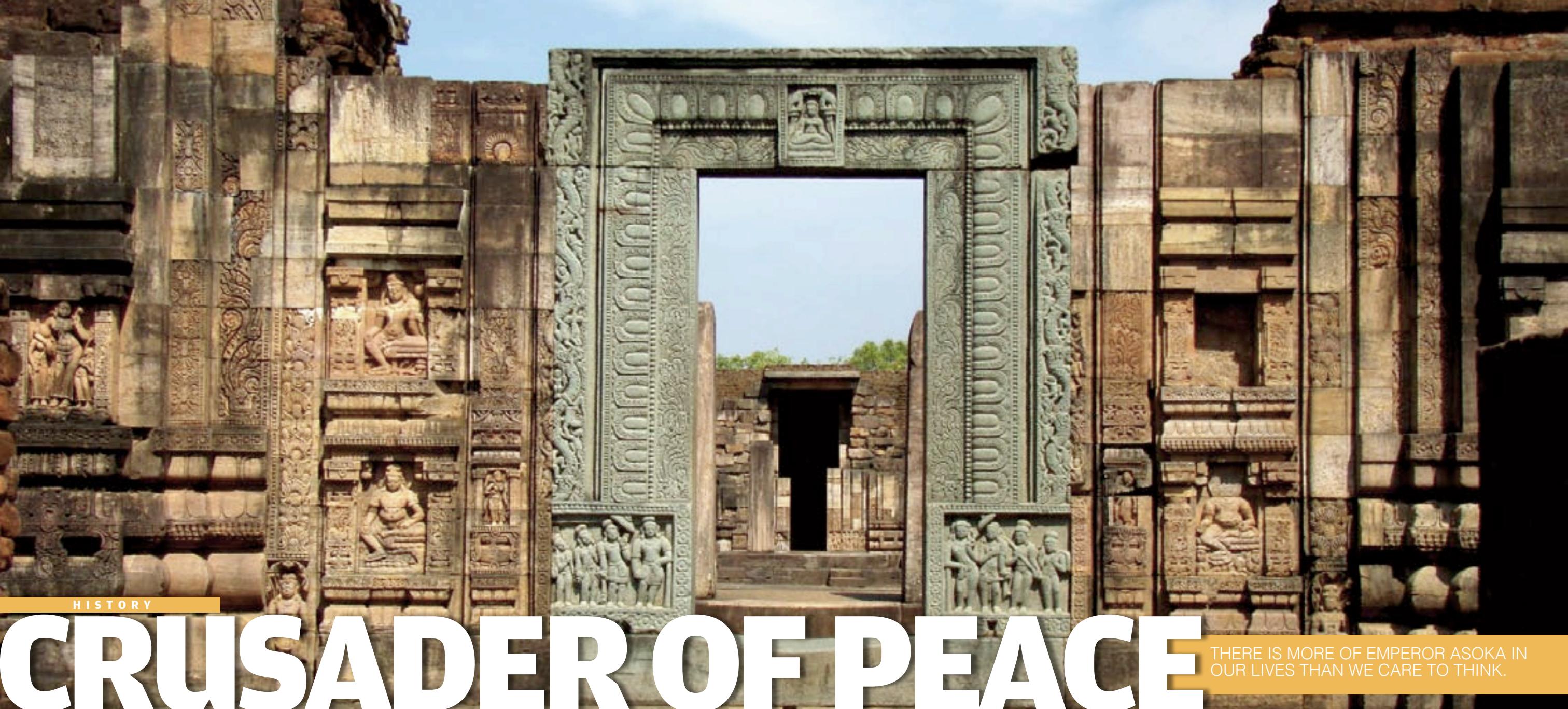
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HISTORY

# CRUSADER OF PEACE

THERE IS MORE OF EMPEROR ASOKA IN OUR LIVES THAN WE CARE TO THINK.

**a**SOKA IS REPRESENTED IN THE wheel, which adorns the flag of free India. He was the lord of a vast empire, yet he took an oath of non-violence and swore to never fight again. He made a decision to carry the light which he had discovered to other lands, dedicating himself to the victory of righteousness.

What makes a king of more than 2200 years relevant today? The answer: the power of a great idea.

There are few instances in history as engrossing as that of the son of Bindusara and grandson of Chandragupta Maurya.

Following Bindusara's death, there was a succession struggle for four years. The legend (according to Mahavamsa and Divya Vadan) is that Asoka massacred 99 brothers and became ruler. The bloodletting did not end; the early years of his monarchy were, according to legend, marked by a violent disposition leading to the unenviable label of Chandasoka.

And here lies a twist. Asoka's self-commissioned edicts convey exactly the opposite: Rock Edict V from the thirteenth year of his reign expresses concern for the families of his brothers, prompting

the feeling that the king could not have been hypocritical enough to preach compassion on the one hand and eliminate family members on the other.

And there comes yet another twist: that perhaps Asoka's cruelty was a background deliberately exaggerated to create the platform for the greatness of Buddhism, which Asoka followed after the Kalinga War. The greater his initial cruelty, the bigger the case for the subsequent influence of Buddhism; the more gory his earlier years, the bigger the transformation of Chandasoka into Asoka.

## Early career

As a prince, Asoka commenced his political career as the Viceroy of Ujjain and Governor of Taxila. During these years, he demonstrated supreme prowess in suppressing the rebellion of the Taxilan people and conquering the territory of Svasa, situated between Jhelum and Kashmir. As a result, he was announced a worthy successor of the Mauryan Empire.

During the first 13 years as king, Asoka pursued the traditional Mauryan policy of aggressive imperialism within India, while maintaining peaceful relations with



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foreign powers. The highlight of Asoka's rule was 261 B.C., when he invaded independent Kalinga (modern Odisha), which had once formed a part of the Magadhan Empire under the Nandas but later asserted independence during the reign of Bindusara. Following independence, Kalinga turned hostile towards Magadha by allying with the Cholas and Pandyas of South India; when Bindusara attacked the Cholas, Kalinga attacked and compelled him to retreat.

Asoka recognised the economic and psychological need to subdue Kalinga. One, Kalinga on the eastern coast obstructed

**Asoka became an active Buddhist who would not merely practice but preach as well; he would not merely preach but send his message of non-violence to other lands; he would not merely disperse the message but create a platform for a reorganised Buddhist community.**

the Mauryan connectivity to South India through land and sea routes. Two, Kalinga was a prosperous maritime power worth annexing.

#### The march on Kalinga

Asoka was aware that Kalinga's conquest did not merely represent a strategic need; it was a moral requirement. Magadha could not evoke peer respect as long as Kalinga remained a dominant power. So Asoka marched into Kalinga. A bloody battle was fought on the River Daya, near Bhubaneswar; Kalinga put up a valiant resistance but was conquered. Not before thousands had been killed and the water of the river supposedly turned red. Asoka himself proclaimed in his Rock Edict XIII (engraved in different parts of his empire): "One hundred and fifty

thousand were deported, one hundred thousand were killed and many times the number perished..."

Asoka should have been pleased; on the contrary, he was remorseful. Asoka should have gloated on the power of his army; on the contrary, he decided to never fight again. Asoka should have reveled in the material; on the contrary, he became spiritual. The obsession with Dugvijaya had been replaced by a yearning for Dharmavijaya. The Chandrasoka was ready to transform into Dharmasoka.

#### Active Buddhist

Asoka became an active Buddhist who would not merely practice but preach as well; he would not merely preach but send his message of non-violence (Dhamma) to other lands; he would not merely disperse the message but create a platform for a reorganised Buddhist community (Sangha) through the Third Buddhist Council at Pataliputra in 251 B.C.

The emperor had undergone a sea-change. Two sets of special rock edicts engraved at Dhauli and Jaugada testify: in these, Asoka did not even refer to the victory in the Kalinga war as a mark of respect to the vanquished. He declared: "All men are my children and as I desire for my children to get peace and prosperity in this world and the world beyond, so I desire for all men."

#### Revival of Buddhism

As sweeping as the effect on Asoka was the impact on Buddhism. Buddhism was an obscure creed confined to the middle Ganga valley during the pre-Asokan period; suddenly, following official patronage, it emerged within a decade of Asoka's conversion, a vigorous all-India religion.

Buddhism flourished in Odisha until the 16th century AD, enriching the cultural tradition of the state. According to the Mahavagga and Anguttara Nikaya texts, Tapassu and Bhallika, two Utkala (Odisha) merchants, became the first disciples of Buddha, whom he gave eight handfuls

of his hair, who, in turn, enshrined it in a magnificent stupa at Asitanjana. The faith received a new lease of life following the Kalinga war, when Asoka embraced it in search of peace. Buddhism became the state religion; scores of Buddhist establishments came into existence. And this is where Asoka's sense of governance became more visibly apparent. Asoka never confused his personal allegiance to Buddhism with his duty as an impartial emperor. None of his royal proclamations mention anything specific about Buddhism. On the contrary, a devout Buddhist, Asoka declared that all sects were worthy of respect.

#### Veritable storehouse

The Assia range, an offshoot of the Eastern Ghats, stretching across the districts of Cuttack and Jajpur, is a veritable storehouse of Buddhist vestiges today. The range is marked by archaeological remnants of ancient structures, loose sculptures, architectural fragments, bricks and potsherds, among others, affiliated to Buddhism. Archaeological excavations conducted at Dhauli, Lalitgiri, Ratnagiri, Udayagiri and Langudi have unearthed spectacular Buddhist establishments, constituting the diamond triangle that is now a tourist attraction.

In all these centres, the Mahayana form of Buddhism flourished during the rule of the Bhauma-Karas for more than 200 years (736-910 AD). Many of the rulers of the dynasty were devout Buddhists, holding Buddhist titles like Paramapasaka, Paramatathagata, Paramasau-gata, among others, as evident from the Neulpur copper plate charter of Subhakar Deva - I. The Bhaumakaras were supplanted by the Somavamsis in the middle of the 10th century AD., who, despite their adherence to Brahmanism, did not antagonise the Buddhists and extended religious tolerance for their independent development.

Towards the end of the 10th century AD, Kalachakrayana, an offshoot of Vajrayana, was introduced in Odisha, influenced by Tibetan Buddhism. Ratnagiri emerged

as a prominent centre of Kalachakrayana. With the arrival of the Gangas, who supplanted the Somavamsis in the beginning of the 12th century AD, Buddhism received a setback.

Buddhist remains in Odisha include large number of stupas, monasteries, shrines, votive stupas, large stone and terracotta sculptures of Buddha and Buddhist deities (Avalokitesvara, Lokesvara, Vajrapani, Padmapani, Maitreya, Tara, Manjushri, Bhrikuti, Hariti, Chunda, Aparajita, Vairochana, Vasudhara Aparajita, Heruka, Sambhara, Hariti, Manjusri, Ashtamabhadra, among others).

**Asoka never confused his personal allegiance to Buddhism with his duty as an impartial emperor. None of his royal proclamations mention anything specific about Buddhism. On the contrary, a devout Buddhist, Asoka declared that all sects were worthy of respect.**

Besides, there are architectural fragments, terracotta seals and numerous Buddhist and secular antiquities.

#### Looking back

So how should the Kalinga War be perceived from a typically Odishan perspective?

The war proved to be a turning point in the state's history and culture as the Buddhism effect nurtured an Asokan spirit of peace, non-violence and brotherhood for more than 2,000 years.

Clearly, an event that transpired in 261 BC continues to echo through modern Odisha today.

*The author can be contacted at spradhan55@yahoo.co.in*



Buddha, the presiding deity in a monastery at Ratnagiri, Jajpur.

# “A serious single-window investment approach can attract large investments into Odisha.”

EXPLAINS

MR. JANAKI BALLABH PATNAIK, GOVERNOR OF ASSAM, AND FORMER CHIEF MINISTER OF ODISHA



#### **What makes you a proud Odia?**

I will answer the question a bit differently. There is so much in the state – past and present – that one can be proud of. Odisha is acknowledged as India's first maritime race. Moreover, one of the most important reasons why I feel proud to be an Odia is that I was born in this state and my mother tongue is Odia. I feel Odia is one of the easiest and richest languages of the country.

In the second century B.C., according to Pandit Jawaharlal Nehru, the Kalingans ventured to South East Asia for trade and

commerce, a pioneering effort in India. In fact, whenever I visit the ASEAN, I am overwhelmed by the mark that Kalinga (ancient name of Odisha) has left there – in south Thailand, there is an area still known as Kalingan; when President Suharto of Indonesia visited India, he declared that Indonesians were the descendants of Kalingans; the Kalingan in Bali is an exquisite silken sari; one can see silver filigree work of Odisha in these countries, especially in a specific lane of Bali; in Philippines, there is a particular place called Kalinga Apeyao.

#### **Most people in India do not know this..**

Absolutely. For around 500 years (1070 to 1568 AD), Odisha remained an independent kingdom. Even as the rest of the country was invaded from Central Asia, Odisha remained unconquered. Besides, the region enjoyed uninterrupted international trade for years. The result: Odisha emerged as a prosperous state where much of its wealth was retained and invested in its temples. So a temple like Konark is not coincidental; this was not just any 13th century temple;

it was a scientific temple built around a level of accuracy that astonishes people even today. Not surprisingly, famous archaeologist John H. Marshall named it among six Indian marvels, alongside the more visible Taj Mahal and Sanchi Stupa, among others.

#### **What was the most remarkable feature of this period?**

Even as the state prospered for five centuries, it was not destroyed as some of the other states or temples in the North and West. Besides, Odisha's international

influence was not inspired by conquest. The state flourished and enriched its culture by assimilation. The fact that a number of international places and products were named after Kalinga indicates that the state's maritime influence must have been intensive and over an extended period. This remains one of the untold stories of India's medieval maritime influence. These are what makes me proud to be an Odia – the state's rich legacy on the one hand and its optimistic future on the other.

### **What concerns me ...**

English has become mandatory for admission into schools/colleges or for job interviews. But this should not undermine the importance of our vernacular language.

Today, most children can't even write a simple letter to their parents in Odia. I think it all comes down to a certain pride in one's own heritage. It is the duty of parents to emphasise and explain the significance of the mother language to their children. The irony is that eventually neither the child's English nor the mother tongue turns out to be presentable.

### **Coming to the present. Do you think Odisha missed the national prosperity bus at some point?**

It is an irony that for a state with rich mineral resources – now widely recognised as the foundation of all infrastructure growth - Odisha lags most other Indian states in economic prosperity. Odisha failed to capitalise on the interest evinced by global companies to invest on the ground; most of the projects have not moved beyond MOUs. My understanding is that the state failed to convert these agreements into actual projects.

### **What should have been the approach?**

An entrepreneur usually brings precious investment but is fairly ignorant about the local terrain. In such a case, it becomes the responsibility of the state to facilitate the availability of land, water, electricity and other resources. Otherwise why would an entrepreneur invest in the state?

We laid down the IPICOL (Industrial Promotion and Investment Corporation of Orissa Limited) industrial policy

### **Looking back with pride**

"At one point, the entire Bhubaneswar was dependent on milkmen. Odisha's White Revolution was conducted through OMFED (Odisha Milk Federation) and the result is that one can find OMFED dairy products (milk, ghee, ice-cream and sweets (Chhena-poda)) wherever you go inside Odisha today." – JB Patnaik

a single-window approach could attract considerable investment.

### **How can Odisha take its education sector into the next league?**

One of the things that strikes me is that there are just too many colleges and institutes offering engineering courses, including the new IIT Bhubaneswar. What is needed is some balancing: we need other educational streams as well. This academic diversification is something that must be seriously looked at: there is a dearth of reputed colleges offering medical and allied streams.

The one watershed was the proposed Vedanta University, which would have bought a world-class university to Odisha. The local population should have been adequately informed about its benefits. Besides, instead of insisting on acquiring 6000 acres for the University in one go on the Puri-Konark roadway, Vedanta could have started with a small stretch and gradually expanded. Odisha would have sooner or later seen the quality of education and co-operated. As it turned out, a part of the local population turned suspicious about the motives behind Vedanta University.

in 1982, which emphasised a congenial policy for entrepreneurs wherein Odisha would provide entrepreneurs land, water and power within 21 days – a one-window approach. The result: thousands of industries were established in Odisha. No-industry districts like Baleswar attracted hundreds of new projects; even backward districts like Bolangir benefited. I don't see why such a phenomenon cannot be replicated today.

### **What initiatives can help attract large global investments into Odisha?**

First and foremost – developing infrastructural facilities. What an industry looks for is good road, rail and air connectivity. The irony is that Bangkok, Tokyo, Hong Kong and Andaman & Nicobar Islands are closer to Bhubaneswar than Kolkata but Bhubaneswar is yet to have an international airport. Come to roads: the state needs to improve the existing roads to four or six lanes. The power and water supply for industries should be re-appraised after a clear idea of provisions and requirements. Since Odisha possesses the requisite amenities,

### **What is your vision for Odisha?**

My vision for Odisha is of a state free from the fear of floods, droughts and cyclones. While man does not have control over natural calamities, the most we can do is effective prevention. What we need is proactive preparedness to stagger the impact and reduce the death toll following such calamities.

Come to irrigation. There is a simple plan that could make Odisha the granary of India. If irrigation is encouraged on around 30 lakh hectares, the state can generate an annual surplus of almost 55 lakh tonnes of grain compared to Punjab, which provides 100 lakh tonnes of produce.

And lastly, agriculture. When we create a farmer, we create an independent entrepreneur, which is the opposite of what we do when we acquire his land for

industrial use. So, if we provide village employment facilities for farmers, he would never need to migrate to urban pockets. Besides, if we create a supply chain that enables the farmer to sell produce at his doorstep, he would not need to visit urban counters at all. This would create the basis for agro-based industries in rural India, combined with small-scale industries, which would boost rural Odisha prosperity.

### **My most cherished memories as Chief Minister**

- Getting the NALCO project off the ground
- Successful post-flood relief work in 1982
- Commissioning the Anti-Guided Missile Training Centre in Gopalpur that put Odisha on India's defence map with Mrs Indira Gandhi's support

### **Mr. J.B.Patnaik, Governor of Assam**

#### **Birth**

January 3, 1927  
Rameshwar, Puri district

#### **Position**

Former Chief Minister of Odisha and Governor of Assam (2009 onwards)

#### **In office as CM of Odisha**

June 1980 – December 1989 and March 1995 – February 1999

#### **Constituency**

Athagarh

#### **Party**

Congress

#### **Achievements**

- Awarded the Central Sahitya Academy Award in 2002 for translating all Bankim Chandra Chatterjee novels into Odia.
- Translated about 14,000 shlokas of the Sanskrit Mahabharata by Vyasa Dev into Odia prose.

### **The big opportunities for Odisha today**

*By JB Patnaik, former Odisha Chief Minister*

**Agriculture:** I don't see why Odisha cannot leverage its rich soil and water availability and emerge as a progressive agrarian state of India. During my tenure as Chief Minister, agriculture was accorded the status of an industry, which facilitated aid and cooperation. Like IPICOL in the state's industrial sector, APICOL (Agriculture Promotion and Investment Corporation of Odisha Limited) was formed for the agricultural sector. The result: Odisha became self-dependent for rice. The time has come for the state to take these standards ahead.

**Tourism:** We are blessed with a long coastline from Gopalpur to Baleswar (480 km), we possess abundant wildlife and tiger reserves, we have a world-class beach in Puri, we have scope to capitalise on tribal tourism, we have scarcely touched the rich scope of religious tourism with so many temples in the 'golden triangle' (Puri-Konark-Bhubaneswar) and Buddhist monuments at places like Ratnagiri and Lalitgiri. Why are they all relevant now? Simply because air connectivity has widened, train bookings are simpler, the state has considerably better roads and more people are traveling today than ever before. This is a tourism opportunity just waiting to be converted.





A quiz question. Which is the world's smallest and most abundant marine turtle?

Answer: The Olive Ridley sea turtle. It has been congregating off the coast of Odisha for millions of years.

Another quiz question. Which is the world's largest rookery for Olive Ridley Sea Turtles?

Answer: Gahirmatha coast, Odisha.

# olive ridley

Odisha's ancient immigrant

## So why do Olive Ridley turtles come to Odisha of all places?

Difficult to tell but there are indicators: beach softness, sandy beach and beach slope, which facilitate mass nesting.

## Why does this make for a magnificent sight?

Because nowhere else in the world will you see millions of sea turtles congregate for mating and nesting like this. They don't merely mate and leave; they spend six to eight months a year - mid October to April / May - in this location inside Gahirmatha Marine Sanctuary.

## Why is it important to save this turtle species?

Because these turtles act as scavengers in the marine eco-system, controlling the predator population that would otherwise affect commercial fish production.

## Is their population endangered?

Yes, due to marine pollution, offshore hydrocarbon exploration, port construction and mechanised marine fishing. A study by Wildlife Institute of India a few years ago indicated that the January congregation patch of about 25 sq. kms would shrink to 15 kms by February each year on account of these influences.

## Why is there such a fascination associated with Olive Ridley sea turtles?

Because they exhibit a unique behaviour of forming nesting aggregation (Arribada). Even today, little is known about their life cycle and journey to and from Gahirmatha coast.

## What kind of research is being done to know more about them?

Transmitters were attached to 12 turtles in 2007 and 14 in 2009 to map their migratory path. Similarly, Platform Terminal Transmitter (PTT) was deployed on sample turtles in Devi and Rushikulya rookery. The findings indicated that there is no separate route used by turtles belonging to different rookery sites in Odisha. Many turtles migrated 400 kms along the east coast, some reaching as far as south and east Sri Lanka. On their return, some moved towards the Andaman Sea and then to Odisha.



## Why has the nesting figure increased and coast mortality declined in the last five years?

The reduction in mortality has been achieved due to consistent sea patrolling by Forest Department, Coast Guard as well as the Fishery and Police Departments. The sustained awareness programme by the Forest Department, in collaboration with NGO support for the fishing community, has reduced incidental deaths. Base camps on the coast have also helped monitor the mortality of Olive Ridleys.

Year	Nesting figure	Coast mortality
2006-07	1,47,726	2036
2007-08	3121	2656
2008-09	1,67,222	1983
2009-10	3,56,894	1898
2010-11	3,61,573	533

## Odisha's marine sanctuary comprises 1435 sq. kms

- Reserved Forest Blocks (Hukitola R.F, Bhitarkarnasi (A) and Bhitarkarnasi (B) R.Fs have been included in the Marine Sanctuary).
- The core area of the marine sanctuary is 725.50 sq. kms and the buffer zone has an area of 709.5 sq. kms. Gahirmatha (Marine) Wildlife Sanctuary includes the sandy beaches of Eka-kula, Nasi-I and Nasi-II, where the Olive Ridley sea turtles come for mass nesting.
- The Protected Area is significant because of its ecological, faunal, floral, geomorphological and biological association.
- The Gahirmatha Marine Sanctuary is one of the six Marine Protected Areas in India.
- The turtles are prohibited for trading under the Convention of International Trade in Endangered Species (CITES) and the Convention on Migratory Species of Wildlife animals (CMS).



**Manoj Mahapatra**, DFO, Mangrove Forest Division (Wildlife), Rajnagar. The author can be contacted at [manojmahapatra14@gmail.com](mailto:manojmahapatra14@gmail.com)

# rice to the rescue!

The story of how effective rice sowing reversed migration and brought prosperity to a small Odisha village

**T**HE DEKHETA VILLAGE IN Odisha fears and worships the Dhanua River. *Both.*

Because the community that lives along 100 metres of this river celebrates when the Dhanua provides water for a rich harvest. And mourns when its waters flood the village.

The story of Dekheta was like any other. Over the last decade, villagers grew cash crops to enhance their living standard. But when they came to realise that this was not going to be enough for their livelihood, they turned to rice.

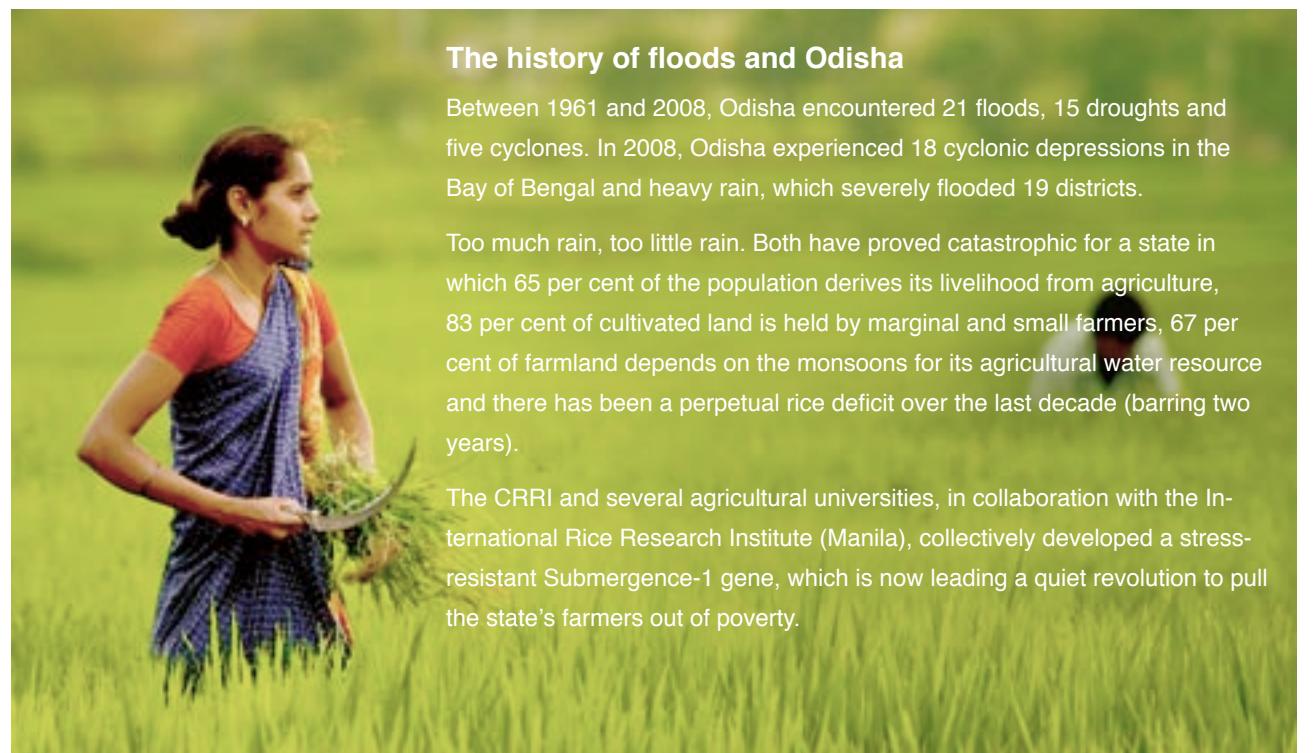
And that is when disaster struck: one year (2006-07), the Dhanua crossed its banks, destroyed the crop, increased dowry demands, collapsed self-help groups and dispersed villagers towards cities - flour mills in Hyderabad, soap and oil factories in Kerala and motor

units in Tamil Nadu - in search of predictable incomes.

All seemed lost. A declining village population indicated that in a couple of generations, the tiny point on the map would be reduced to a ghost habitation.

And then fortune smiled.

Dekheta was selected as a field research base for submergence-resistant rice varieties by Central Rice Research Institute and Association for Integrated Development. Villagers can be suspicious; traditions seldom yield to the modern. Except here, because the villagers had no option, they planted flood-resistant varieties. And then, as if on cue, the floods came again in September 2010 ...water remained knee-high for 14 days. This was going to be the big test. The entire village turned to landholders who had planted flood-resistant varieties.



## The history of floods and Odisha

Between 1961 and 2008, Odisha encountered 21 floods, 15 droughts and five cyclones. In 2008, Odisha experienced 18 cyclonic depressions in the Bay of Bengal and heavy rain, which severely flooded 19 districts.

Too much rain, too little rain. Both have proved catastrophic for a state in which 65 per cent of the population derives its livelihood from agriculture, 83 per cent of cultivated land is held by marginal and small farmers, 67 per cent of farmland depends on the monsoons for its agricultural water resource and there has been a perpetual rice deficit over the last decade (barring two years).

The CRRI and several agricultural universities, in collaboration with the International Rice Research Institute (Manila), collectively developed a stress-resistant Submergence-1 gene, which is now leading a quiet revolution to pull the state's farmers out of poverty.

The old timers in the village said that in their experience, the paddy crop would be destroyed. The scientists who had facilitated the planting indicated that things would be better.

And this is what Dekheta saw: the new paddy crop withstood the flooding and remained intact even as the paddy crop in the other fields was destroyed. One of the landowners who had experimented with the new variety went one step further: he cleaned his crop and reaped a windfall 300 kg of quality rice from just over half-an-acre - nearly twice what he usually derived from regular seed. He now had another problem (a welcome one): need for more warehousing space for the additional grain. The income derived from selling his crop far exceeded expectation.

The tide had begun to turn. More villagers began to examine the new seed and crop. More began to venture for the switch. Rice and flour mills began to whir again. Farms attracted more hands.

And those who had left Dekheta began to return.



HOW VEDANTA HAS  
TRANSFORMED THIS  
ONCE-SLEEPY ODISHA  
TOWN INTO ONE OF  
THE FASTEST GROWING  
POCKETS OF URBAN  
INDIA

# JHARSUGUDA'S GIANT LEAP



Multi-ethnic employees at Vedanta's plant

**There is perhaps no better place to appraise the growth of Jharsuguda than at the manufacturing plant of Vedanta Aluminium.**

The plant accounts for 30 per cent of the city's spatial spread.

The big message then: the growth and development in Jharsuguda today is synonymous with Vedanta Aluminium

#### History

The British breathed life into Jharsuguda through a new railway junction in 1887 and sure enough, the town grew into a trading centre during the next few decades, but faded into oblivion thereafter. In 1942, Jharsuguda returned to brief prominence as a refueling centre for the Allied bomber planes flying into Burma and China, but once the war was over, the town returned to status quo. Then in 2007, something irreversible happened: Vedanta Group (through Vedanta Aluminium Ltd.) decided to commission an aluminium plant in Jharsuguda. The city has never been the same again.

#### Size

The first thing that strikes one about Vedanta Aluminium is sheer size. If you walk every road inside the largest single-location industrial development in India, you would have covered nearly 12 km. If you drove at a safe 20 kmph inside the premises, it would take you more than one hour to familiarise yourself with the entire facility. Until mid-2010, there were around

20,000 people (contract and permanent) working to commission the largest single location aluminium plant anywhere in the world (1.7 million tonnes per year) and even the lower deployment of 12,000 on site today (now that most facilities have been commissioned) would probably constitute a reasonable town anywhere in the world. At peak, a sizeable per cent of the workforce on site was foreign. In the space of less than half a decade, Jharsuguda is no longer struggling for national visibility; it is being spoken of in the board rooms of aluminium companies the world over with awe.

#### City-driver

"Thanks to an unprecedented Vedanta investment, Jharsuguda has entered a virtuous cycle of prosperity," says Abhijit Pati, COO, Vedanta Aluminium Ltd. "The result is that more offices, more schools, more hospitals and more lifestyle amenities are coming into Jharsuguda." There has been a rapid increase in population – a 15 percent growth in population in 2001 over 1991 and a 14 percent growth in population in 2011 over the previous decade. The result is



Phulmani Bag (see box below)

that Jharsuguda has crossed the population threshold of 500,000 and emerged as one of the fastest growing Tier III cities in modern India.

The first question is whether this will last. A sceptic could possibly argue that the city could well return to status quo. However, what makes this growth story more sustainable in its third incarnation are a number of factors: the business model of the largest company in Jharsuguda is integrated, leading to the prospect of viability across industry cycles. Besides, the city is banking on businesses that are clearly linked to an increasing standard of living, which is an inevitable reality in a modernising India. Most important, the city is not depending entirely on the business plan of one company; thanks to the unprecedented Vedanta investment, which has irreversibly transformed the region's prospects, a number of large and visible Indian companies are coming in to commission significant manufacturing capacities - Bhushan Steel and Power, SPS Power & Steel, SMC Power Generation, Jain Steel & Power, Action Ispat, Eastern Steel and Power, L&T and NTPC, among others. The result is that Jharsuguda is no longer being referred to as an aluminium

#### The happy faces of Jharsuguda

**Phulmani Bag** is a woman of determination, who, with the active support of Vedanta, has set an example in championing the cause of women empowerment. She was selected as one of the Gram Panchayat SHG (Self Help Group) leaders for women-based project – Vedanta Asha. Ever since, there has been no looking back. She has facilitated and motivated the training of 100 SHG members in goatery, floriculture and commercial vegetable cultivation. She also lays emphasis on women's literacy.

**Sister Mary Kutty**, Principal, St. Mary's Higher Secondary School: "There has been attractive growth in our school in the last five years – from 1200 students to more than 1750; from 40 students per class to 60; from 10 teachers to 16; from well-to-do to multi-income students. The big change is our new 'Smart' educational method through audio-visual tools."

industry location but a diversified industrial hub.

#### Magnet

"Jharsuguda has become a magnet for small and medium size enterprises (SMEs), which will translate into sustainable employment growth," observes Professor Omkar Nath Mohanty, Ex-Vice Chancellor of Biju Patnaik University of

Technology (Odisha). With this in mind, Vedanta commissioned an industrial park of 150 acres. While this Rs 5000 cr investment is expected to house at least 10-15 medium size downstream units, it will also generate direct and indirect employment opportunity for around 13,000-18,500 people in the coming years.

As a result, Vedanta is not only investing in scale for its own benefit but also for

the growth of a number of downstream companies.

### Ideal location

There is a strong rationale for why this once-sleepy town is likely to sustain its robust growth. "Modern-day Jharsuguda is largely a product of the boom in the global mineral and metal sectors," says Vedanta's spokesperson. "The emerging markets of China, India, Russia and Brazil are driving global infrastructure investment, which is consuming larger quantities of metals, which in turn has resulted in minerals entering a long-term bull market. As the world has moved to the identification of newer deposits of minerals, a district like Jharsuguda – rich in technical skills and proximity to coal, bauxite and water – has emerged as an ideal global location for the manufacture of downstream metals and power generation."

Jharsuguda is also blessed from a logistical point of view. The location enjoys strong connectivity with the industrial centres of Rourkela and Sambalpur on the one hand and railway connectivity with Kolkata, Delhi and Mumbai on the other. And then there is the availability of a significant land pocket (starting with 1000 acres and rising to 2600 acres), a majority of which is non-agricultural in nature.

This productive use of hitherto unproductive land was the subject of a television interview featuring Kishore Mohanty, Rajya Sabha member. "It is a boon for the people of Jharsuguda to let Vedanta set foot on non-agricultural, barren land – a win-win for the state, people and the company," he assessed.

### Prosperity-driver

A conventional premise was that whenever a company made a significant land acquisition for an industrial project, it displaced a number of families with landed holdings. The result was that those displaced would leave the location or state for better prospects. This time the



**Savita Mirig** struggled to earn Rs 600 a month as a labourer. Unable to support her two children and her cancer-ridden husband, the family went into debt. Savita enlisted in a Vedanta scheme to raise poultry and with a loan of Rs 5000, purchased her first chicks. When bird flu struck, she was wiped out. Undeterred, Savita took another loan of Rs 5000 and now plans to sell 100 chickens a week yielding a projected income of Rs 10,000 a month.

scene has been different in Jharsuguda. "According to the state government's guidelines for project displaced families, the company has to rehabilitate these families by providing adequate housing and employment to one member from each displaced family or attractive cash compensation," says Vedanta's spokesperson. "The result was that a majority of the displaced families decided to seek employment from Vedanta. As an extension, the company engaged various engineering / diploma colleges to train the displaced in acquiring new workplace skills leading to their smooth corporate absorption. The company extended this concept one step further and made a preference for providing employment to qualified professionals from Odisha. The result is that around 65% of the selected candidates are from within Odisha today. We felt that this will lead to enhanced incomes, changed mindsets and large



Vedanta Aluminium's Rehabilitation and Resettlement colony (R&R colony)

income retention within the state for its onward sustainable benefit."

### Community initiatives

Vedanta recognised that for a region that had been extensively deprived for a prolonged period, the mere provision of local employment would not suffice in creating a virtuous cycle of prosperity. The company would need to make meaningful integrated interventions in the areas of health, education, infrastructure, livelihood and culture for the results to be visible. "One of the first things that we realised was that without robust infrastructure, none of our interventions would achieve the desired result," says Vedanta's spokesperson. "The result was that we invested around Rs 27 crores in three years to develop roads, water supply, electricity connectivity and community locations across five neighbouring villages on the one hand and providing quality education and health care on the other (through a proposed specialty hospital). Sure people were sceptical when we came in but the moment we

completed three major village roads, there was a transformation in people's attitudes. The benefits of these investments will translate into general well being and higher life expectancy in the region."

### Environmentally clean

The conventional understanding of any industrial hub was an inbuilt assumption that environmental considerations would be compromised for economic benefit. Vedanta Aluminium's showpiece has demonstrated that Jharsuguda's interests have not been compromised. Nowhere is this more clearly reflected than in the company's significant investment of Rs 320 crores in environment protection equipment alone, around 10-12 per cent of the overall investment outlay. "The result is that emissions from our manufacturing operations are well below the standard stipulated by the pollution control authorities," says Abhijit Pati. "We have proved that it is possible to commission scale without comprising environmental integrity."

### Widespread growth

Rarely has any urban location in India transformed as significantly as Jharsuguda in the last five years. Until 2006, there were only a handful of shops within a kilometre from the railway station. Today, around eight hotels have been commissioned (four more proposed). Modern retail brands (like Vishal Megamart and Big Bazaar) have entered Jharsuguda. An INOX theatre is being proposed. A modern township will also be completed by 2013.

### Stepping into the 21st century

So what is the big picture for Jharsuguda? The answer comes from the common voice of Jharsuguda, Naba Kishore Das, MLA: "My dream for Jharsuguda is a new Jharsuguda *nirman* where parks, schools, hospitals and townships take us into the 21st century."

Vedanta has ensured that this day is almost here.

**Sulagna Das**, Owner, Exotica Ladies Beauty Parlour: "I started my parlour in 2009 with Rs 8 lakhs in an 850 sq ft apartment. What was once an establishment patronised by the affluent is now visited by people of all income groups. The result is that our walk-in clientele has doubled in two years. Given this reality, I have expanded my workplace and opened a smaller unit within the Vedanta guest house premises."

**Dr. S. J. Patel**, gynaecologist, Jagyaseni Nursing Home: "Until five years ago, patients from the Jharsuguda periphery depended largely on the district head-quarter hospital that could cater to only 60 patients at a time, resulting in an overflow to Veer Surendra Sai Medical College in Burla. In the last four years, Jharsuguda has as many as six well-equipped nursing homes with ultra modern facilities."

**R.K. Padhi**, Manager-Operations, Shree Shankar Hotel: "Until the late nineties there were no more than a couple of hotels in Jharsuguda, ours being one of them. We went into business largely to cater to business travel en route to Sambalpur, Rourkela, Sudergarh, etc. When IOCL, Bhushan Steel and Vedanta went into business, our occupancy increased, we cleared our debt in two years and doubled rooms to 59."

# SHAKTI CULT IN ODISHA



## TRADITION

**t**he worship of Shakti or the Mother Goddess has prevailed in different parts of Odisha under different names, which makes its research relevant and interesting.

The worship of the deified form of female energy or principle - Shakti - is ancient and traced to pre-Vedic Indus Valley civilization. Gradually, one of the most important developments was the identification of goddesses with Prakriti (or nature seen as the female principle) and with Shakti(s) or energies of their male consorts. In the Sankhya concept, Prakriti was solely responsible for activity while Purusha (male principle) was superior but inactive. In Shaktism, however, the active Prakriti is identified with Shakti (energy).

In the Odishan context, scholars trace Shakti worship at Jajpur (in the form of Viraja) to the pre-Christian era on the basis of references in the *Mahabharat*, *Hari Vamsa* and *Vayupurana*.

### Overshadowed by Buddhism

Interestingly, Shakti worship at Viraja (ancient name for Jajpur) was overshadowed by Buddhism before the Gupta era. However, with the revival of the Brahmanical religion during the Gupta period, Shakti worship at Jajpur assumed a fresh impetus. Not surprisingly, the existing image of Viraja in Jajpur temple - Mahisamardini, a two-handed Durga, engaged in killing the buffalo demon - is the earliest form of Durga traced to the fifth century A.D.

During the early Bhaumakara rule, the Durga image became eight-armed but

during the later Bhaumakara period, became ten-armed. This Dasabhuja (ten-armed Durga) was depicted as a war goddess with the weapons of different Gods (Siva's trident, Vishnu's disc, Varuna's conch, Agni's dart, Yama's iron rod, Vayu's bow, Surya's arrows, Indra's thunder bolt, Kuvera's mace, Brahma's rosary and pot, Viswakarma's sword and Himavan's lion).

### Tantricism's growth

Tantricism's growth from seventh century A.D. resulted in the popularisation of Mother Goddess worship. The Tantriks worshipped the Mother Goddess as a power source (or Shakti) and provider of the highest spiritual bliss. From the seventh century onwards, Tantricism continued to dominate Buddhism, Saivism and Brahmanical religion.

The Buddhist Tantrism (Vajrayana) conceived the Goddess Tara (saviouress) and these images have now been found in Banapur, Vanesvaranasi, Ratnagiri, and Khiching.

During the Bhaumakara period, the Tantrik Shakti worship dominated Bhubaneswar, the great centre of Saivism. The Kapalikas (Siva devotees) worshipped the Tantrik Goddesses Chamunda and Mahisamardini for the attainment of Siddhis. Four Shakti shrines were erected on four sides of the Vindu Sarovar tank near the Lingaraj temple. Of these four temples (Vaitala, Mohini, Uttaresvar and an unnamed one), Vaitala (presiding deity Chamunda) is considered the most important.

### Group of seven

The Shakti worshippers of the Bhaumakara period conceived the worship of a group of seven mother Goddesses (Sapta Matruka) comprising Varahi, Indrani, Vaishnavi, Kaumari, Sivani, Brahmi and Chamunda, accompanied by Ganesha and Virabhadra. These Sapta Matruka images have been found at Jajpur,

Belkhandi (district Kalahandi), near Markandeya tank of Puri, Salanpur (Jagatsinghpur in undivided Cuttack district) and the Parasuramesvara, Vaitala and Muktesvar temples of Bhubaneswar.

A Varahi temple is found at Chaurasi village of the Prachi valley (in the Puri district) and Narendrapur in the Balasore district. The Varahi image of the Chaurasi temple is assigned to the tenth century A.D. - a colossal image on a crouching buffalo holding a fish in the right hand and skull in the left. By worshipping Varahi, people sought to ward off pestilence.

**...the worship of Shakti or the Mother Goddess continues to prevail in Odisha even today. There is a popular Odia poem known as Mangala Stuti which enumerates the numerous shrines of the goddess in Odisha.**

### Yogini cult

Brahmanical Tantricism developed in the form of Yogini cult. According to Kalika Purana, while female Tantrikas (just as Kapalikas) were devotees of Lord Siva, Yoginis were the devotees of Shakti or Durga. The Yoginis and Kapalikas lived in spiritual and sexual intimacy in the pursuit of spiritual bliss. The Yogini temples contain Shakti, (deified form of female energy as the presiding deity) with as many as 64 Shakti manifestations.

In Odisha, two Yogini temples from the Bhaumakara period have been located. The Yogini temple of Hirapur, near Bhubaneswar, is presided by the ten-armed figure of Bhairava and a four-armed Ajakapada Bhairava. This temple contains 63

images symbolising the different Shakti manifestations. The presiding deity of the Yogini temple of Ranipur-Jharial (in the district of Bolangir) is a stunning Chamunda. This temple possesses no less than 40 Shakti manifestations.

During the Bhaumakara rule, the Sulki rulers worshipped a Mother Goddess in the form of a pillar Goddess called Stambhesvari. The Somavamsis were Saivites. During their rule, the worship of Shakti or Tantricism did not suffer any negligence due to the close relationship between Saivism and Tantricism, i.e. the cult of Siva is known as Bhairava and that of His female consort is called Bhairavi, Shakti, Parvati, Durga or Mahamaya.

### Rise of Vaishnavism

However, the Ganga rulers extended their patronage to Vaishnavism and showed no interest in the Tantrik cult. Chodagangadeva was antagonistic to Shakti worship. Interestingly, Shakti worship did not disappear but assumed a new form. The Tantrik cult adjusted itself within the pantheon of deities at Puri or Shreekshetra during the Ganga and Suryavamsi rules. The Bata Avakasha of poet Balaram Das (sixteenth century A.D.) tells us that Jagannath was attended by 64 Yoginis, Katyayani, Saptamatrika, Vimala and Viraja and 76 mother Goddesses.

The result is that the worship of Shakti or the Mother Goddess continues to prevail in Odisha even today. There is a popular Odia poem known as Mangala Stuti, which enumerates the numerous shrines of the goddess in Odisha, each with a different name like Viraja at Jajpur, Samalai at Sambalpur, Sarala at Jhankada, Vimala at Puri, Charchika at Banki and Bhattarika at Badamba and so on, which are thronged by devotees on auspicious occasions.

Sources: Articles by Dr. Atul Chandra Pradhan, Mr. Suresh Balabantray and Dr. Krishna Chandra Acharya. Additional inputs and picture by Mr. Ananta Mohapatra.

# BEING THE DIFFERENCE

**Dr. Shreemanta Parida, CEO of Vaccine Grand Challenge Programme of Government of India, gives an overview of his journey to becoming a globally recognised clinician scientist.**



**Q You are a remarkable instance of professional medical success to come out of Odisha. What got you interested in medicine?**

**A** In school, I was influenced by my father's (Prof. Banchhanidhi Parida) research and interactions with his extraordinary colleagues. He used to study various neuro-physiological functions using the dog as the animal model with various instruments. Besides, the Institute of Physics at Bhubaneswar would subscribe to general scientific journals like Science and Nature. One of my uncles, Vivek Ranjan Das, an English scholar and a voracious reader introduced me to the

British Council Library in Calcutta, whose services I used through post!

**Q Where did immunology come in?**

**A** During my four years of studying medicine at Sriram Chandra Bhanja Medical College, Cuttack, I applied for a summer studentship (Rs 300!) awarded by ICMR and by chance and coincidence met the Acting Director of Regional Medical Research Centre (Bhubaneswar), Dr. Santosh K Kar who was working on leprosy and had unsuccessfully sought collaboration from clinicians at SCB Medical College. The result was that I

offered myself as a collaborator to conduct human clinical studies on one condition: I wanted to learn laboratory techniques to develop scientific skills beyond the requisite clinical involvement to be able to connect the laboratory to the clinic in an interactive cycle to kick-start the process of applied research.

The result was that I initiated a project to study a molecule (phenolic glycolipid – PGL-1) from the causative organism of leprosy with the goal of developing monoclonal antibodies against the molecule which could be the therapeutic molecule for an immunological intervention for leprosy. I started what was probably the first functional lab in the new rented facilities of RMRC. The undertaking enhanced my awareness of the 'missing link' between the world of basic scientists and clinicians, strengthening my determination to pursue immunology. Incidentally, the Nobel Prize in Medicine in 1984 awarded for work on immune system and the production of monoclonal antibodies, galvanized the drive for immunology career. I was in the right segment at the right time.

**Q What was the prevailing environment like?**

The stigma against leprosy was so intense that many doctors would not touch patients and many would do so only with gloves! There was a big gap between research labs and clinics. The result was that I was determined to focus on applied research (also called Translational Medicine). My non-traditional research methods often branded me as 'crazy'.

**Q How would you describe your field of work?**

**A** My career in immunology (study of the human body's defence system) focussed on deciphering the intricate immuno-pathology mechanisms to be able to design interventions for therapy and disease cure/prevention. My early career in immunology at NII focused on two aspects – one in Phase 2 and Phase 3 clinical trials of a leprosy vaccine, which was tried in lepromatous leprosy patients

(severe form of the disease) and their healthy contacts in the family. Phase 2 clinical trial (which evaluates safety and immunological potency of the candidate as well as optimises the best dose combinations) was carried out in Safdarjung and Ram Manohar Lohia Hospital in Delhi with a colleague. Phase 3 clinical trial (the efficacy trial assessing its usefulness in the context – the final process before any product is licensed for human use) was designed, established and launched by me at Kanpur Dehat district in UP in 1990. The immunotherapeutic and immuno-prophylactic agent Mycobacterium w (now termed as Mycobacterium indicuspranii - Mip) was licensed after successful Phase 3 clinical trial, ended in 2000. Mip is a non-pathogenic

mainly in WHO Immunology Research Training Centre in Geneva during 1990–1995 along with my mentors Geroses E Grau and Paul-Henri Lambert in collaboration with other international institutes. I was proud to be associated with this year's Nobel Laureate and contributed a chapter in the book on TNF edited by him in 1992. I received accolades as a rising young professional in many international scientific forums including Heiser Fellowship from New York.

**Q What was the next stage in your professional growth?**

**A** Following my tenure in WHO-IRTC, Geneva, I spent four years in the Justus-Liebig University in Germany in the laboratory of Prof. Trinad Chakraborty to

"I started what was probably the first functional lab in the new rented facilities of RMRC. The undertaking enhanced my awareness of the 'missing link' between the world of basic scientists and clinicians, strengthening my determination to pursue immunology. Incidentally, the Nobel Prize in Medicine in 1984, awarded for work on immune system and the production of monoclonal antibodies, galvanized the drive for immunology career. I was in the right segment at the right time."

strain, a cousin of the causative organism Mycobacterium leprae and was given in heat-killed form as an intradermal injection (under the superficial skin layer).

When given along with the multi-drug therapy, patients cleared bacilli and recovered faster than only with the drugs.

Thereafter, I turned my attention to the molecular immuno-pathology of the lepra reaction, which is the cause of all disabilities and disease impact in leprosy.

Tumor Necrosis Factor is a molecule produced by some cells of the body's immune system, initially discovered by Bruce Beutler (this year's Nobel laureate in Physiology and Medicine) in the context of tumors. I was the first to show its role in the pathological process of nerve destruction in leprosy and also demonstrated it as a prognostic marker for lepra reaction and neurological deficits. This was initiated in Delhi and carried out

learn more about microbial pathogenesis – the games played by microbes in fooling the human defence system. I studied another intra-cellular pathogen, Listeria monocytogenes, and how it crosses the vascular barrier. Subsequently, I began using different bacteria to deliver DNA vaccine orally or mucosally and focussed on novel tuberculosis vaccine development. At that juncture, I proposed a new concept on post-exposure vaccine for tuberculosis.

Let me brief you a bit about TB. Mycobacterium tuberculosis, the causative organism of TB, is coughed out by TB patients with advanced lung TB. These bacilli stay as droplets in the air and are the source of cross-infection. However, nature possesses diverse protective beauties that protect individuals from infection. In only 40% of those exposed, the bug is able to enter human beings

## **Landmarks in his journey:**

- Launched Phase III efficacy trial with a vaccine against leprosy in January 1990
- Topped among 20 international developing world participants in the WHO Immunology & Biotechnology Course applied to Infectious Diseases in 1990
- Postdoctoral Fellowship from Heiser Foundation for Leprosy Research, New York in 1991
- Early proponent of the concept of Post-exposure vaccine for tuberculosis in 1998
- Vaccine Innovation Award from Sequella Global Tuberculosis Foundation in 2001 and 2002
- Diploma in Advanced Vaccinology at Foundation Merieux, Annecy, France, 2003
- Lead Participant in PABIN (Pan African Bioethics Initiative) movement, 2003-2005
- Lead training and teaching in immunology and infectious diseases under the Faculty of Medicine in Addis Ababa University, Ethiopia as an International Senior Clinician Scientist
- Programme Coordinator of Grand Challenge in Global Health Consortium on Tuberculosis Biomarkers
- Received accolades from international organisations like WHO, NIH, CDC, ECDC, EU, among others for his contributions to tuberculosis, global health, translational medicine and vaccines

(in the rest, bug does not even make an entry due to the body's defence system); we are yet to understand the mechanisms involved. Among those infected, only a fraction are finally afflicted by TB (usually 10-12% of those exposed) and among the rest, the bug is 'locked' by the body's protective system where it remains in a latent form. Around a third of the world's population has this latent TB infection and in our country, around 60-80% of our population may be in this state. The currently-used BCG vaccine protects children from severe TB, but does not protect adults. My idea was that if we could activate our immune system to detect these hidden bacilli inside the body and eliminate them, then we could possibly reduce disease risk and contain disease transmission.

Since 1998, I focussed on understanding the disease process mechanism with an intention to develop an effective vaccine. In 1999, I worked at the Institute of Pasteur, Brussels, testing new vaccines in an animal mouse model in the lab of Kris Huygen who was the first to make an experimental DNA vaccine for TB. That year I was mentored by Prof. Adrian Hill at University of Oxford to study the latest techniques in molecular medicine where I received the Vaccine Innovation Award from Sequella Global TB Foundation (now Aeras) to pursue work in the area of post-exposure vaccines (also supported by WHO/TDR).

### **Q Where did your next professional move take you?**

**A** From Oxford, I moved to Armauer Hansen Research Institute (AHRI) in Addis Ababa as International Senior Scientist, heading the immunology and laboratory activities at the institute. While working with infectious diseases, one trained a number of Ethiopians in immunology research to empower them to take care of their public health problems. While at AHRI, I was part of the core team to develop a proposal on "Biomarkers of protective immunity against TB in the context of HIV/AIDS

in Africa" for the Grand Challenges in Global Health Program of the Bill & Melinda Gates Foundation headed by Prof Stefan Kaufmann, a colossal figure in immunology research. It was a collective effort of 15 institutions from three continents (Africa, Europe and North America). I contributed in a big way through the multi-step selection process. We were lucky to be among the top 2% to be supported. When we got the support, I was lured to lead the consortium from Max Planck Institute for Infection Biology in Berlin. I moved to Berlin in February 2006.

### **Q What was the Berlin experience like?**

**A** In this ambitious programme, we followed nearly 20,000 individuals at seven field sites in five African countries with

#### **Dr. Parida's belief**

If you want to go fast, go alone. If you want to go far, go together.

a high burden of TB, who are healthy household contacts of newly diagnosed Pulmonary TB patients in various age groups and combination with HIV, to decipher the correlates of immune protection. This huge undertaking kept me going across various time zones from Seattle to Sydney – coordinating with multiple teams working in tandem.

### **Q Where did India come into the picture?**

**A** After more than two decades abroad, I was excited by the responsibility to head vaccine R&D in India. India possesses the best brainpower but we have not learnt teamwork, transparency, accountability, ethics and professionalism. The result is that there are islands of expertise without any connected impact, which is a shortcoming in an interdisciplinary area that needs to link a lab discovery (concept) to credible clinical application (proof) to

public health implementation (policy). Our various practices and influences need to be evidence-based instead of eminence-based. There needs to be a greater focus on science and innovation (theme and goals) rather than who does it.

### **Q How would you appraise scientific facilities in Odisha?**

**A** Most Odisha students are forced to think beyond the state for career options in emerging fields like bioinformatics, biotechnology, among others. To hold them back, we need to look at the long-term picture rather than focus on short-term gain. If I were to set up a modern institute in the state, I would try to improve the scopes of biotechnology. I would like to build a centre of Translational Medicine and Molecular Medicine, which need not be a new institute, but a virtual interdisciplinary institute connecting and anchoring existing institutes, medical colleges and industries to "disseminate the spirit – Nothing is impossible!"

More importantly, I would advocate a famous saying by George Bernard Shaw: "The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to him. Therefore, all progress depends on the unreasonable man." If more youngsters chased their dreams instead of living the aspirations of others, India would be a more successful country!

### **Q Who do you think has contributed significantly towards your success?**

**A** They say, "Nothing comes for free in life". So my thirst for science and its implementation for the welfare of mankind has come at a heavy price, with lots of sacrifice and unconditional support by family members: a sincere acknowledgement to my wife Mayuri, who had to curtail her career despite holding an MBBS degree, and our son Satyam who had to cope with all my eccentricities in the pursuit of my mission.

## **Experiences and appointments**

- CEO of Vaccine Grand Challenges Program of Dept of Biotechnology, Ministry of Science and Technology, Government of India, Delhi
- Independent Expert to EU (European Union), European Centre of Disease Control, WHO/TDR (Tropical Disease Research), National Institute of Health, USA and various other international agencies
- Senior Scientist and Programme Coordinator, Max-Planck Institute for Infection Biology, Berlin, Germany. (February 2006 to September 2010)
- International Senior Scientist and Principal Investigator, Armauer Hansen Research Institute (AHRI), Addis Ababa, Ethiopia. (August 2003 to January 2006)
- Clinical Lecturer/Principal Investigator, Cellular Immunology & Vaccine Development, Nuffield Dept of Clinical Medicine (NDM), Oxford University. (July 1999 to July 2003)
- Research Scientist, Institute of Medical Microbiology, Justus-Liebig University, Giessen, Germany. (October 1995 to July 1999)
- Visiting Research Fellow, Pasteur Institute of Brussels, Belgium. (January to July 1999)
- Post Doctoral Research Fellow, WHO-IRTC, Dept of Pathology, University of Geneva. (August 1992 to August 1995)
- Senior Research Fellow & Staff Scientist, Microbiology & Immunology, National Institute of Immunology, New Delhi, India. (January 1987 to August 1992)

### **Q What three institutes are helping shape the Odisha of tomorrow in your field?**

- A** I can give you three names being talked about:
- Institute of Life Sciences (ILS, Bhubaneswar) which has been doing great work in terms of imparting quality research and a post-doctoral programme in the field of biosciences
  - Kalinga Institute of Medical Sciences (KIMS) and Kalinga Institute of Industrial Technology (Biotechnology Center)
  - Research centres like Regional Medical Research Centre (RMRC), Indian Institute of Production Management (IIPM), Central Rice Research Institute (CRRI), among others

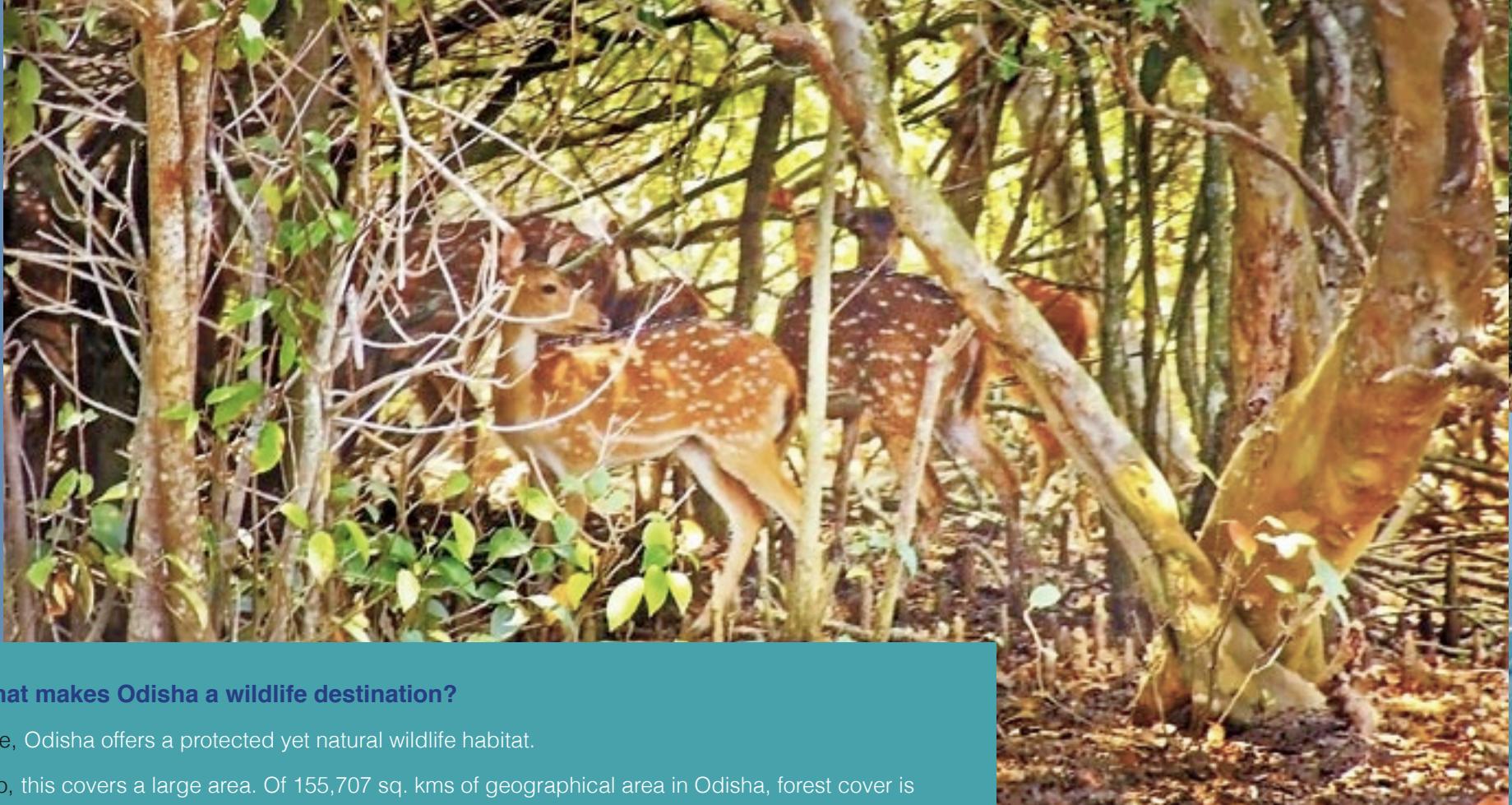
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WILDLIFE TOURISM IN ODISHA

# BORN FREE

Odisha makes it possible to explore hills, valleys, forests, waterfalls and lakes – without needing to go to the ends of the earth or costing the earth either





### What makes Odisha a wildlife destination?

- One, Odisha offers a protected yet natural wildlife habitat.
- Two, this covers a large area. Of 155,707 sq. kms of geographical area in Odisha, forest cover is spread across 52,472 sq. kms. Some 10% of the state's forest area is occupied by sanctuaries, accounting for 4% of the state's total land area.
- Three, the sheer diversity. Odisha has 21 wildlife sanctuaries, making it home to over 19 varieties of amphibians, 110 species of reptiles, 473 species of fauna, 86 breeds of mammals and 225 species of fish.
- Four, Odisha's important wildlife conservation projects have met with success, raising the wildlife population. The result is that many of Odisha's national parks and sanctuaries are now globally renowned. The romance of Odisha's jungles will unfold when you stay at one of the state's forest houses deep inside the Simlipal range, where you will be privy to the roar of a big cat, the thump of wild elephants and the blur of a leopard. Confront gigantic crocodiles or Olive Ridley turtles at Bhitarakanika. Or experience the vast serenity of Lake Chilika and the natural cacophony of Siberian migrant winter birds.

#### Simlipal Tiger Reserve

Simlipal Sanctuary and National Park is two things – big (2,750 sq. km) and rich (1,076 species of mammals, 29 reptile species and 231 bird species). This is the natural home of the Royal Bengal tiger, Asiatic elephant, deer and other zoological species.

What makes this an interesting location is that several indigenous tribes form an integral part of the ecosystem –

protecting, conserving and responsibly using local resources.

The bonus: lush valleys and forest land. Simlipal stands tall – 900 metres. The local peaks of Khairiburu (1,178 metres) and Meghasani (1,158 metres) welcome visitors; rivers like Budhabalanga, Khairi, Salandi and Palpala originate in the hills and meander through the forests creating cascading rapids and falls. The panoramic waterfall view at Barehipani (400 metres)

and Joranda (150 metres) are a sight. If you are lucky, you may find elephant herds walking majestically across roads and rivulets. The crocodile rearing centre at Ramtirtha is an added attraction.

A tip: carry a camera and you will return a wildlife enthusiast!

#### Bhitarkanika

Bhitarkanika is bound by rivers on three sides and the Bay of Bengal on the east.



This wildlife sanctuary comprises islands criss-crossed by creeks and small rivers. The confluence of the rivers Baitaran and Brahmani has resulted in a luxuriant mangrove vegetation. The surprise: more than half the world's 60 species of mangrove plants are found here!

Fiddler crabs and mud skippers laze around. A number of resident and migratory birds – Darter, snake bird, Cormorant, open billed stork and Kingfisher, among others – are found. Salt water crocodiles and white crocodiles are a prized sight, one of three habitats of salt water crocodiles in the subcontinent (apart from the Andamans and Sundarbans).

And best of all, near the sea at Gahirmatha lies the famous nesting ground for Olive Ridley turtles who come from long distances – if only to lay eggs twice a year.

#### Chilika Lake

Chilika Lake is India's largest brackish water lake (over 1,000 sq. km). Hemmed between a green range of hills on the

west and the blue sea on the east, Chilika appears like a pear-shaped expanse of water. The lake is a wonderful preserve of a rich variety of marine fauna comprising sponges, fishes, crabs and turtles. About 158 species of fish and prawn are found. Cavorting dolphins near Satpada are a surprise. Winter is the best time to be at Chilika, with thousands of migratory birds flying in from as far off as Siberia.

Chilika provides an ideal ground for breeding and hosting for thousands of resident and migratory birds. Black buck, spotted deer and sambar can be seen grazing in the woods. While the lake's Nalabana Island has been declared a sanctuary for its varied flora, Kalijai island is home to Goddess Kalijai and venue for the annual Makar Mela.

#### Nandankanan National Park

Another attraction is Nandankanan National Park, which justifies its literal meaning (Garden of Pleasure or Garden of the Gods). The park houses India's first captive gharial breeding centre. The local zoo is renowned for white tigers.

#### Elephant reserves

The Chandaka and Mayurbhanj elephant reserves are among the significant elephant reserves. At the Mayurbhanj elephant reserve, the giant male elephants with long tusks are the prime attraction. On the other hand, the Chandaka elephant reserve, spread across an area of 176 sq km has watch towers inside the reserve which enables tourists to view the majestic mammals.

#### Satkrosia Gorge (Tikarpada) sanctuary

Apart from offering a gorgeous view of the surrounding hills, there is excellent potential for angling, boating and trekking in these parts – most notably the Satkrosia Gorge (Tikarpada) sanctuary. It offers an exciting perspective of the mighty Satkrosia Gorge into which the turbulent Mahanadi river crashes with ferocity through 22 kms of emerald forests, changing colour with every meander.

*Courtesy: Department of Tourism, Government of Odisha.*



# PREFERRED PORT OF CALL

Paradip Port is showcasing the modern face of Odisha

**“Our vision is simple,” explains G. Jagannath Rao, chairman of Paradip Port Trust. “We intend to rise from the number five port in India to number one in the country.”**

**a**NYONE INTENDING TO SEE the new face of Odisha may do no better than study the interesting developments in the state's port sector; anyone needing to study signs of the state's competitiveness will do well to analyse the response of Paradip Port Trust to challenges.

This is the reality: Paradip Port Trust reported a 1.72% decline in cargo throughput from 57.01 million tonnes in 2009-10 to 56 million tonnes in 2010-11, primarily due to a reduced throughput of

2.31 million tonnes of iron ore and 1.54 million tonnes of thermal coal export. Rather than go on the defensive, Paradip Port Trust announced a counter-offensive that is headline-worthy: intention to enhance capacity from 76 million tonnes to 157 million tonnes by 2015 and 237 million tonnes per annum by 2020. “Our vision is simple,” explains G. Jagannath Rao, chairman of Paradip Port Trust. “We intend to rise from the number five port in India to number one in the country.”

This intent could not have been stated a

day too soon. The port addresses a hinterland that is rich in iron ore and coal. Iron ore needs to be shipped out, largely to service the growing needs of China's steel sector; coal needs to be shipped in to service the rising appetite of the country's steel and power sectors. The more efficiently that Paradip Port Trust makes these happen, the stronger the growth for exporting and importing companies within the country. As a result, Paradip Port Trust is not being perceived merely as an intermediary; it is being positioned as an economy driver.

The big question: how does the new chairman intend to take Paradip Port Trust to the next level? “We have a number of strategies in mind,” says Mr Rao. “One, we are undertaking projects to augment capacity and diversify operations. Two, we are deepening our channel and berths to handle capesize vessels upto 125,000 dead weight (dwt) in size in the inner harbour. Three, we are developing a new deep draught iron ore terminal and a new deep draught coal terminal on a build-operate-transfer (BOT) basis through a public-private partnership (PPP) that will enable us to handle 10 mtpa each of iron ore and coal. Four, we are constructing a multipurpose berth on a BOT basis through PPP to handle containers and other clean cargoes.”

This announcement could not have come at a more interesting time in the history of the port. There is emerging competition to be taken care of: Posco's proposed captive port at Jatadhari, and Dhamra, a private joint venture port of Larsen & Toubro and the Tata Group.

How will Paradip Port Trust cope? GJ Rao is unfazed. “A competitive environment should stimulate us to improve our efficiency,” he says. “We have been delivering quality services and value-for-money to port users and now possess a core

**Paradip Port Trust is taking the fight to the opponent's dressing room. A few months ago, it proposed to reduce wharfage cost by 30%. This is in addition to providing outstanding service: A 3.29 lakh tonnes of cargo was handled in a single day on December 2, 2010**

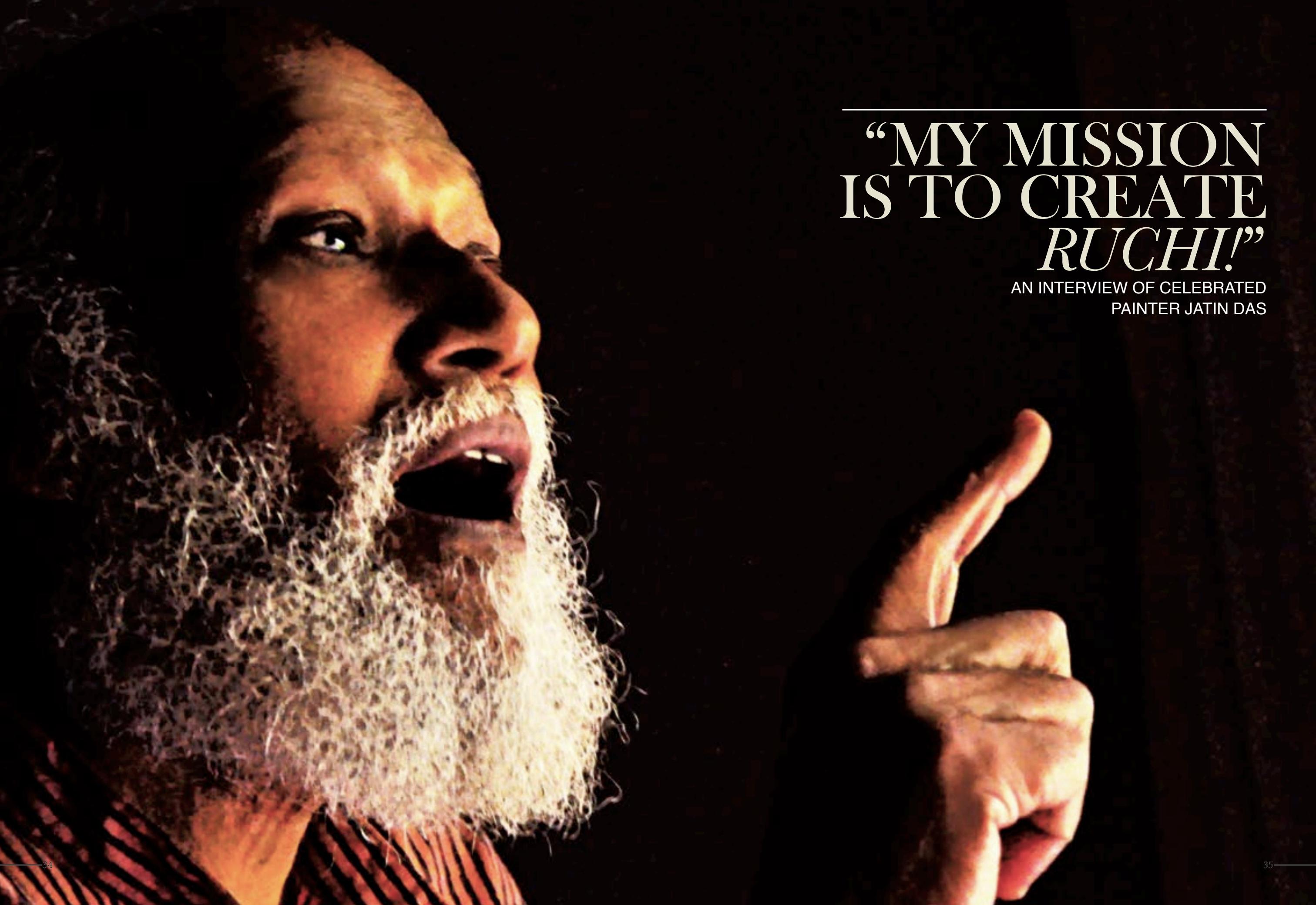
competence in handling bulk and break bulk cargoes. Our capacity expansion projects will attract potential customers. The completion of the Daitari-Banspani rail link connectivity project will dramatically reduce the distance between iron ore mines and the port. We are diversifying our cargo-handling capacity to reduce our dependence on iron ore and coal by extending to new commodities like POL, crude oil, dolomite, motor spirit and value-added products (iron pellets). As a result, our port will enhance value for customers.”

In 1966, Paradip became the first major port to be commissioned on the east coast of India since independence. A modernised Paradip Port Trust is taking the fight to the opponent's dressing room. A few months ago, it proposed to reduce wharfage cost by 30%. This is in addition to providing outstanding service: A 3.29 lakh tonnes of cargo was handled in a single day on December 2, 2010, surpassing the previous record of 3.24 lakh tonnes on March 11, 2009; a record 1,117,628 metric tonnes of crude oil was imported in December, 2010, surpassing the previous record of 1,102,538 metric tonnes in October, 2009; an all-time record of 3,295,646 metric tonnes of total cargo was imported in March 2011 against the previous record of 3,055,751 metric tonnes in July 2010.

Get material in from customers faster, address a wide portfolio of products, provide specialised cargo management services, deepen the channel draught to facilitate the entry of larger ships and invest in technology to shrink their turnaround time. These are some of the agendas that are being implemented at Paradip Port Trust today to position Odisha as a robust and competitive performer tomorrow.

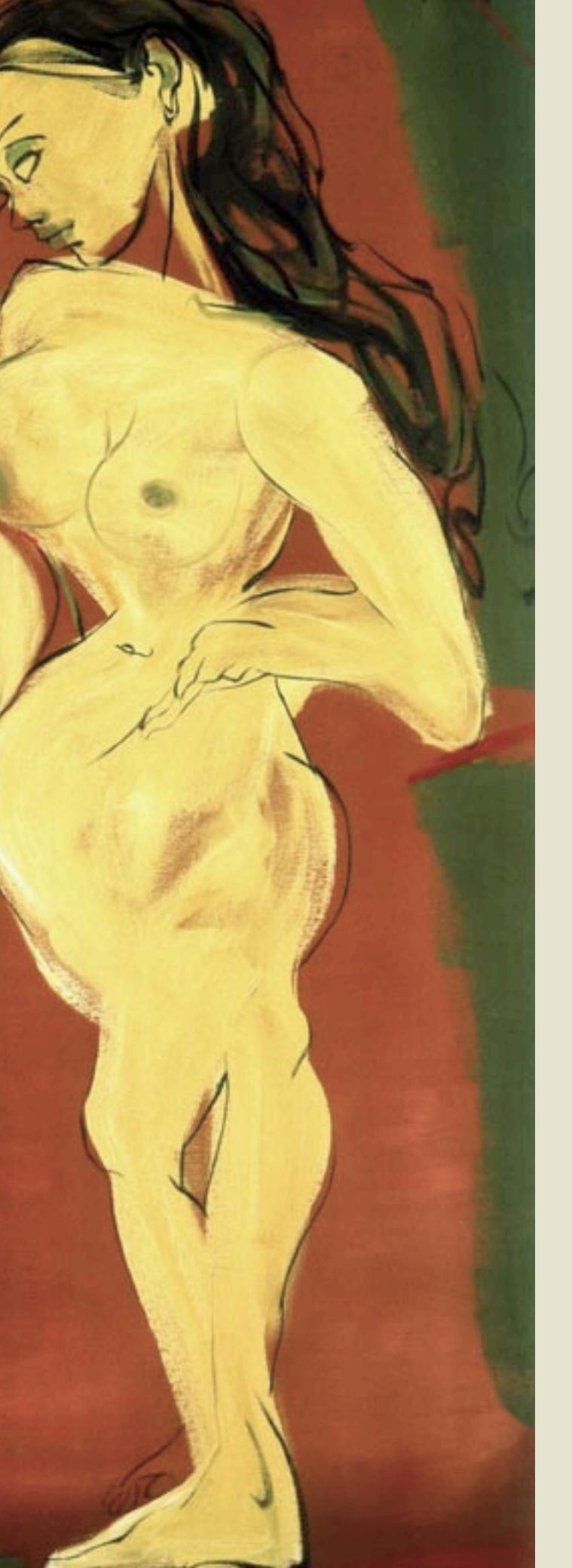
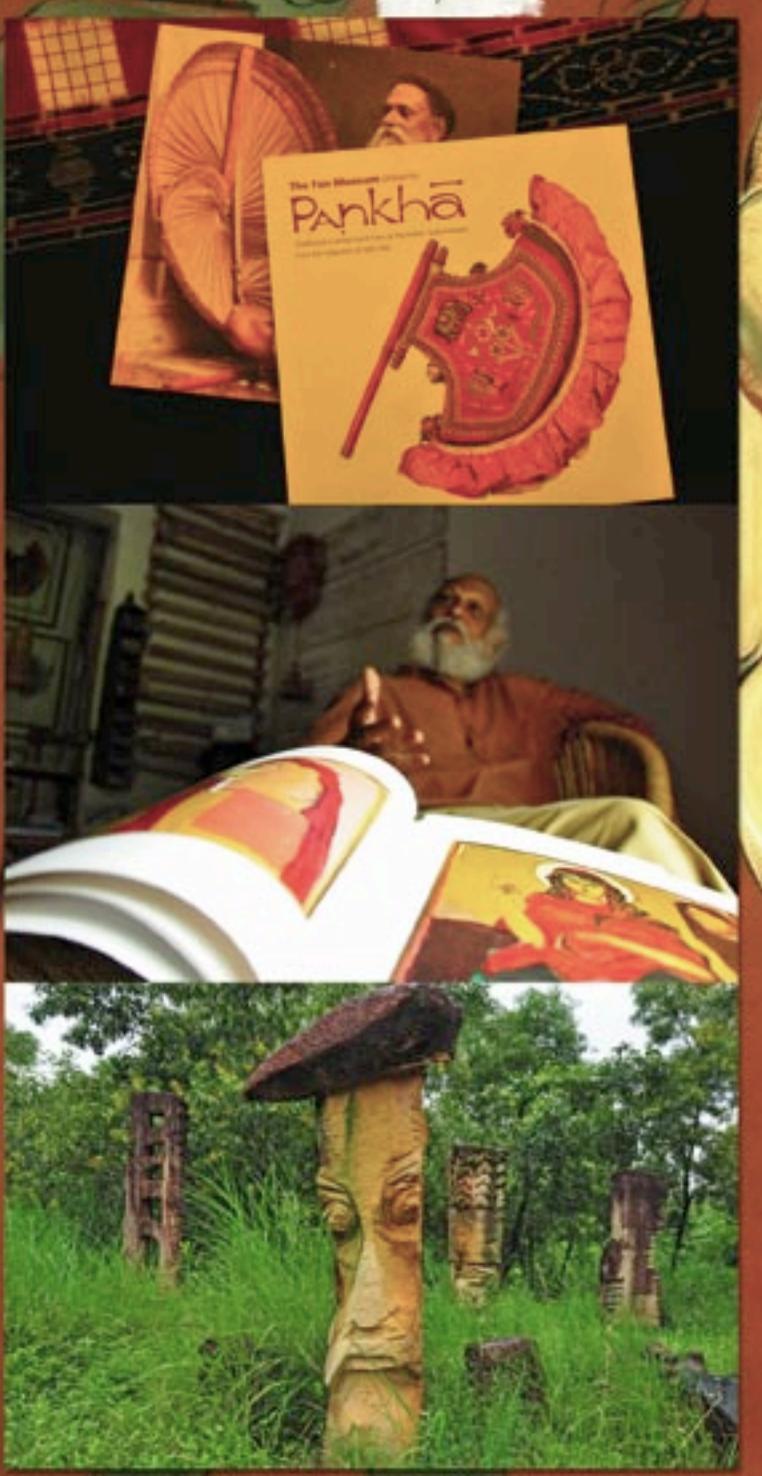
## Paradip Port in numbers

- Commenced as a mono-commodity port in 1966 with one berth; now a multi-commodity port with 14 berths and single point mooring.
- Reported traffic growth from 0.067 million tonnes in 1966-67 to 57.01 million tonnes in 2009-10.
- Grew traffic 22.84% in 2009-10 compared with 5.74% average growth of all major ports.
- Climbed from eighth to fifth among major ports in India (by traffic volume).
- Second in terms of gross surplus, third in operating surplus and fourth in operating income among all major ports of India in 2009-10.



“MY MISSION  
IS TO CREATE  
*RUCHI!*”

AN INTERVIEW OF CELEBRATED  
PAINTER JATIN DAS



**Q There is growing optimism in Odisha. Is the state headed in the right direction?**

**A** Let me start with the country first. I think India as a nation is not headed in the right direction. The country may be making more money but at a big environment and social cost. How can anyone justify industrial development after chopping off thousands of centuries-old trees to create highways? If we are removing an important part of our culture, then surely we cannot be making much progress, even if we are making more money.

**Q How is Odisha placed in terms of its positive transformation?**

**A** Odisha has an amazing mix – culture, history, temples, soil fertility, rivers, coastline and minerals. What more does one need to succeed in today's challenging world? The time has come for Odisha to rise to the global opportunity even as one recognises that various arms of the state need to work in tandem to make positive change sweeping and sustainable.

**Q Can you elaborate?**

**A** Some of us in Delhi – myself, Manoranjan Mohanty and Lalit Mansingh – started an Odisha Forum which would meet every second Saturday to discuss how we could make positive changes in the state of our origin. The result was that when Odisha was affected by a severe cyclone in 1999, we moved into action with the help of Brenda McSweeney of United Nations, going into a village called Noda Arisol, 35 km from Bhubaneswar. The sad part was that whereas Chandrababu Naidu (then CM of Andhra Pradesh) called me at 5am with a simple 'Babu here, what help do you need?' we encountered apathy from our state's administration. We stuck it out and the result was that within a few weeks, we got a women's employment scheme, post office and bank started. The citizens were doing

what the government should have done in the first place. I would like to think that things have improved since.

**Q You are among a handful of artists who have established institutions in their state of origin with the objective of making a positive contribution.**

**A** It was something that just had to be done. I had two options in front of me: sell my paintings, buy more homes or do something more meaningful with my money and life. The result is that the government was kind enough to contribute an acre, the celebrated architect Balkrishna V. Doshi was gracious enough to create a master plan and the rest was mobilised through personal earnings. The result was the creation of Jatin Das Centre for Arts (JDCA) at Bhubaneswar with the objective to preserve and propagate the rich cultural tradition of Odisha. My mission is to create 'ruchi' or taste. Much of my collection of over the decades has gone into the corpus of this trust; the time has now come for industrialists and businessmen of Odisha to take this foundation ahead.

**Q What are some of the Odisha positives that can be built on?**

**A** Let me talk of Bhubaneswar, a city that I am more familiar with. The city possesses the kind of infrastructure that can be built on for decades. The pollution in the city is lower than what one will find in a number of Indian cities today. We now have a new generation of youngsters who have studied in Odisha and also work in the state, resulting in a growing connect with the state's welfare. These are positives that can be built upon, helping start a virtuous cycle of awareness and prosperity.

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*Jatin Das was born in 1941 in Mayurbhanj, Odisha. He has specialised in painting, drawing and sculpture. He was trained at Sir JJ School of Art, Mumbai.*

**JATIN DAS' AGENDA TO ENLIVEN ODISHA**

■ Every major Indian city has a dedicated museum of the arts (Ahmedabad has 20!) but there is not even one in Bhubaneswar. This needs to be corrected.

■ Every major city in India has a major theatre dedicated to the arts (like Nandan in Kolkata); we need one – even if through the PPP route – in Odisha.

■ The Puri temple has been a draw for centuries and the city is a hub for religion, architecture, crafts, culture and tourism; what it needs badly are excellent state roads leading to it.

■ There has been a decline in the number of hoardings in New Delhi following the Supreme Court's decision on visual pollution; the same should be extended to Bhubaneswar.

■ We need to implement a master plan for the city of Bhubaneswar that was formulated by IIT Kharagpur.

■ Odia cuisine is rich in taste but needs to be highlighted as an art form as well.

■ We need to position Odia's Ikat as an art form and replace the hideously ugly stuff passing around as design these days.

■ We need international connectivity to get Buddhist and Jain pilgrims to the various religious sites in our state.

■ We need to get our youth interested in Odisha's culture; we need to create a sense of art and aesthetics in day-to-day life; they could be trained even in the administration of managing the arts and crafts tradition of the state; for a start, it may be an excellent idea for them to make maps of temples and palaces of the state.

■ We need to showcase Odisha's art and craft more aggressively.

# CIFA

## THE GATEWAY OF AQUACULTURE.

By Dr. Himanshu K. De, Senior Scientist, CIFA



### What is driving an interest in freshwater fish farming?

A number of things. Increasing population and rising affluence are transforming diets. The conclusion? Food production will need to increase 40% by 2030 and 70% by 2050 (Source: FAO).

So where does aquaculture come in? One, fish is the cheapest source of animal protein and will need to plug projected food shortage. Two, India is among the world's 15 leading fish producers. Three, aquaculture – the art and science of fish breeding – is a preferred fish breeding method as almost 85% of India's fish production is derived from aquaculture.

#### The CIFA story

A growing emphasis on organised aquaculture places a premium on Central Institute of Freshwater Aquaculture (CIFA) at Bhubaneswar, which is India's premier research institute for freshwater aquaculture (within the ambit of Indian Council of Agricultural Research, New Delhi).

The Institute began as a pond culture division of CIFRI in Cuttack in 1949

and subsequently became a freshwater aquaculture research and training centre (FARTC) in Bhubaneswar. Thereafter, it grew into an independent institute in 1987 (christened Central Institute of Freshwater Aquaculture) and served as a centre of excellence in research, training and extension in aquaculture with a vision to emerge as an international institute of excellence in freshwater aquaculture research and development for tropical countries. The result: a 320-acre

institute at Kausalyaganga (Bhubaneswar) with 350 ponds and a combined 50 hectare water area.

The central focus of the Institute is the development of production technology of major carps, minor carps, catfish, prawn, ornamental fish and molluscs. Besides, the research linked to production covers fish genetics and biotechnology, nutrition and physiology, fish health management, environmental monitoring, aquaculture engineering, economics, statistics and

extension. Considerable investments have gone into the transfer of technology, training of trainers, training of farmers and policy advocacy.

#### CIFA mandate

As a result, CIFA's mandate is:

- To conduct basic, strategic and applied research in freshwater aquaculture
- To undertake studies on diversification of aquaculture practices with reference to species and systems
- To enhance production efficiencies through incorporation of biotechnological tools
- To provide training and consultancy services

#### Achievements

CIFA has a number of achievements to its credit: prolonged and multiple carp breeding, intensive carp production technology for 10-15 tonnes/ha/yr in static ponds, diversification of carp culture and multiple cropping, induced breeding

of major and minor carps, carp polyculture with domestic sewage with the production of 3-5 tonnes/ha/yr, multiple breeding of the peninsular carp *Labeo fimbriatus*, breeding and rearing of pearl spot *Etroplus suratensis* in freshwater environment and the breeding and seed production of catfish.

Other contributions to aquaculture comprise fertilisation measures and schedules for different categories of ponds, development of different implantation techniques for the production of round and

designed pearls, dosage standardisation of major micro and macronutrients to enhance the productivity and technology of wastewater treatment through aquaculture, biofertilisation with *Azolla* as a substitute for chemical fertilisers in fish ponds, design and construction of hatcheries and farm ponds, among others.

This institute was the proud recipient of the Best ICAR Institution Award in 1996 in recognition of its all-round achievement.

Various products developed by the Institute have been patented and commercialised through different agencies.

The Institute has three regional centres in Rahara (West Bengal), Bengaluru (Karnataka), Vijaywada (Andhra Pradesh) and Anand (Gujarat) to cater to regional needs for research and extension.

Under the rural aquaculture programme, CIFA operated numerous lab-to-land programmes to support farmers with tested technologies and initiated a helpline (0674-2111849) to address farmer queries.



*"Freshwater aquaculture which began as a small scale activity in the Eastern part of India has now transformed into a major economic activity across the nation."*  
— Dr. P. Jayasankar, Director, CIFA.

With the setting up of this centre, many distressed farmers improved their skill and production following regular training. Most of these farmers work as part

of the outdoor team of the Institute. A dedicated team of 300 research personnel (scientists, technical officers, research trainees, administrative, supporting)

form a major part of this Institute. With fish being one of the staple foods, the concept of aquaculture has been well received in Odisha.



An illustration of famous astronomer Samanta Chandrasekhar



## ALL IN THE STARS

By Prof. Lakshmidhar Satpathy,  
Institute of Physics, Bhubaneswar

### Success stories of how CIFA has transformed destines in Odisha

- At 59, Bata Krushna Sahoo is a retired employee of the Bhubaneswar secretariat and a farmer who once cultivated rice and other crops. After he was introduced to CIFA, his destiny transformed. Today, his sales from fish seed and grown fish are Rs. 15 cr a year. His farm is 9 km from CIFA, stretches across 3-4 hectares. With constant guidance from CIFA's scientists, he acquired technological skills needed in fish farming. Today, he provides advice to farmers on how to improve their yield at his training institute. This is what we usually call a farmer-led-farmer approach leading to effective aquaculture extension.
- Manabendra Moharatha is a 60-year old farmer with a M.A. in History. His ponds are spread across 27 hectares in Chilika, 80 km from CIFA. This hilly area receives substantial rainfall. With his introduction to CIFA and the constant encouragement from scientists, Manabendra made provisions to conserve rain water by interconnecting them to his ponds, which was earlier wasted. Today, he has big fish in his hatcheries and a lot of fish seeds to sell. From no seed, he has seen his pond grow as a quality seed bank servicing farmers from different districts. His son is an MBA who is helping him expand the business.

The author can be contacted at [hkde@sify.com](mailto:hkde@sify.com)

9th December 1874. The transit of Venus. Unique celestial event. A rare opportunity to measure the earth-sun distance through the observation of transit timings.

A number of global astronomer expeditions travel to India to view the phenomenon. Observatories built by princely states study the transition. Multi-lingual booklets are printed to explain its significance.

Ironically, no ripple of this sweeping excitement reached remote Khandapara in Odisha, where perhaps lived one of the most passionate astronomers of the time. No newspapers. No proximate observatory. No peer astronomer community.

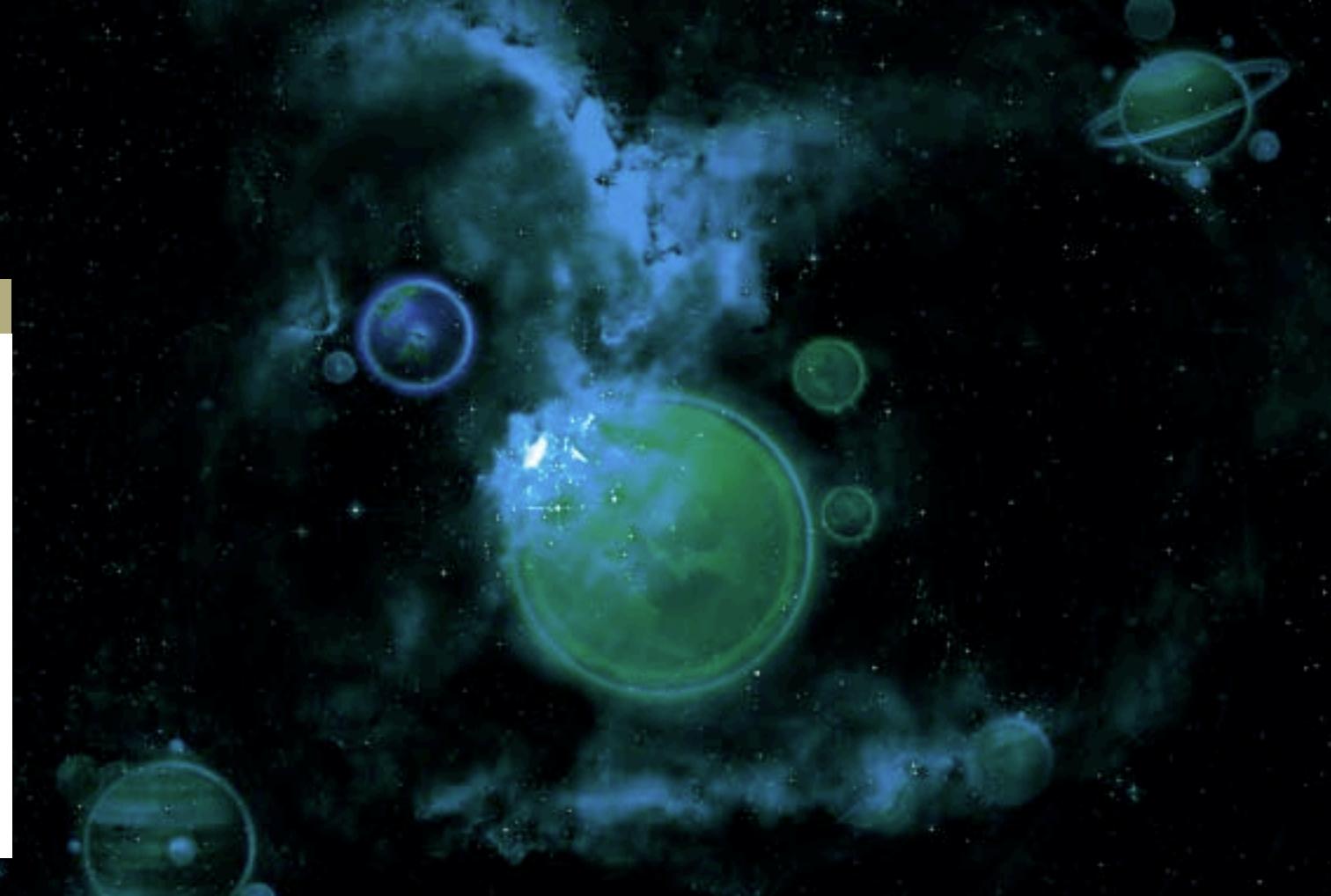
Samanta Chandrasekhar prepared for the event in studious solitude.

However, the importance of the occasion did not escape this lonesome astronomer training his eye at the heavens. Because he scribbled the following in Sanskrit: "Solar eclipse due to Sukra (Venus) – To

find the eclipse of the Sun due to Sukra, their bimba (angular diameter) and size of other tara graha (stars and planets nearby) is stated. In Kali year 4975 (1874 AD), there was a solar eclipse due to Sukra in Vrischika Rasi (Scorpio). Then Sukra bimba was seen as 1/32 of solar bimba which is equal to 650 yojana. Thus, it is well proved that bimba of Sukra and planets is much smaller than the Sun."

This is amazing because Samanta not only observed this transit, but sitting in a remote pocket of Odisha, he predicted the celestial event based on his calculations, quite unaware of the sheer excitement that this single phenomenon was causing across the world.

What was more amazing is what he concluded on paper: the ratio of the



## Who was Samanta Chandrasekhar?

One, the torchbearer of a tradition - siddhantic astronomy – that started from the Vedas and perhaps ended with him.

Two, master of a traditional system of astronomy with predictions comparable to modern astronomy.

Three, an astronomer belonging to the class of Aryabhata, Varahamihira, Brahmagupta and Bhaskar.

Four, the rectifier of numerous errors accumulated over the centuries, helping evolve the subject to perfection.

Five, the passionate professional who laid down a legacy of precise astronomical observations, unprecedented data accuracy, new calculation methods and a planetary system model - without telescope or optical instrument.

*bimba* or apparent angular diameters of Venus and Sun as 1/32. This is why: on the date of these observations – 9 December 1874 - the apparent angular diameters of Sun and Venus were 32 minutes, 29 seconds of arc and 1 minute, 3 seconds of arc respectively. The ratio was discernable as 1:30.93.

Modern astronomers with their heavily powered telescopes have proved that the ratio is precisely in this range. Interestingly, Samanta Chandrasekhar's observations were only made with handmade instruments and the naked eye.

### Birth of a genius

The story of Samanta Chandrasekhar started in a royal family of the princely estate of Khandapara in Odisha in 1835. Samanta received primary education from a Brahmin Sanskrit teacher but soon forged his own way. He started teaching himself *Lilavati*, *Bijaganita*, *Vyakarana* as well as ancient astronomical works like *Surya Siddhanta* and

*Siddhanta Siromani* picked out of the family library.

By 15, Samanta was doing something more enterprising. He was checking the predictions of the *siddhantas* with his astronomical observations. And in doing so, he was surprised to find discrepancies. Either the stars and planets did not appear at the right place in the sky, or when they did, they did so at the wrong time. The young Samanta made a daring conclusion: the ancient *siddhantas* were wrong.

It was one thing for a young man to pass judgment on the wisdom of the ages. It was another for this untested youngster to embark on the challenging exercise to correct these himself.

### Growing confidence

But that is what Samanta did. For a start, he devised his own instruments for the measurement of time, height of distant objects, latitude and longitude of

heavenly bodies.

Thereafter, he devised a formulae for his astronomical calculations.

By his mid-thirties, Samanta aggregated his learnings and findings into *Siddhanta Darpana*, covering 2,500 Sanskrit shlokas in Odia script on palm leaves. The work proved to be defining. By 1876, an almanac based on *Siddhanta Darpana* had been adopted for the regulation of rites at the Jagannath Temple and the rest of Odisha. The result is that most Odia almanacs now attribute their calculations to Samanta's pathbreaking work.

### Magnum opus

*Siddhanta Darpana* was an astronomical work in more senses than one.

The accuracy of the findings that Samanta achieved with his naked eye compares favourably with sophisticated modern telescopes.

His discovery of the *Digamsa* (annual

"In the final analysis," commented *The Nature* in 1899, "Prof. Ray compares the author very properly to Tycho. But we should imagine him to be greater."

equation) irregularity in the motion of the moon was previously unknown; he measured three irregularities with unprecedented accuracy.

His geocentric model – in which the earth is supposed to be stationary and the sun, moon and other planets moving around it – is a contribution to astronomy that was otherwise fully heliocentric. Samanta used only an inconvenient coordinate system with the earth as the origin, while the modern heliocentric model uses the sun as the origin.

Samanta's rudimentary precision instruments measured and observed astronomical movements with accuracy.

### Window to the world

Since *Siddhanta Darpana* was in Sanskrit, the weightiness of what Samanta achieved may have been largely obscured had it not been for Prof. Jogesh Chandra Ray's scholarly 56-page introduction to this work. It proved to be the window through which the world would perceive the classic. "In the final analysis," commented *The Nature* in 1899, "Prof. Ray compares the author very properly to Tycho. But we should imagine him to be greater."

*Knowledge* provided a fitting conclusion. "It is a complete system of astronomy founded on naked eye observation only. The work is of importance and interest to us westerners also. It demonstrates the degree of accuracy which was possible in astronomical observations before the invention of telescopes."

### Titles conferred on Samanta Chandrasekhar

Mahamahopadhyaya  
By Viceroy Lansdowne in 1893

Harichandan Mahapatra  
By Gajapati, King of Puri, in 1870



Prof. Lakshmidhar Satpathy is Emeritus Scientist, Institute of Physics, Bhubaneswar. Founder President of Samanta Chandrasekhar Amateur Astronomers' Association. He can be contacted at satpathy@iopb.res.in



# WOMAN OF SUBSTANCE

Spunk. That's Manorama Mohapatra for you. Academician, writer and champion of lost causes – endangered Odisha wildlife, suffering girl child, corrupt bureaucracy, starving village child and widow hopelessness. This is an interview with her by Dr. Pravas Acharya

## Important accomplishments

- President of Red Cross Blood Bank
- President of Odisha Sahitya Academy
- Convenor of Samaj Relief Committee
- Founder President, Loksevak Yuva Mandal, running schools for slum dwellers

## Important positions

- President, Nari Seva Sangha
- President, Radhanath Rath Science College (Khuntuni)
- State President, Akhil Bharatiya Seva Dal
- State President, Radhanath Rath Trust

**Q** You hail from a celebrated family. In what way was your family a foundation for what you achieved in life?

**A** Interest in higher education and sensitivity to suffering was the legacy of my parents. However at a professional level, my father, a man of principles, refused to exercise his influence for personal or family benefit. I had to fight my own battle. But I had his blessings for all I ever ventured to achieve.

**Q** Could you throw some light on your educational background?

**A** I studied in Ravenshaw Girls' High School and as soon as I completed matriculation my father married me to Padarabinda Mohapatra, an IFS officer. However, a deep desire for knowledge had been stoked and the result was that 13 years later, when most people in my position would have been preoccupied with their family responsibilities, I actually enrolled in Sailabala Women's College for higher studies. And this does not mean that I had no responsibilities – I was a mother of four! I topped the pre-university examination in the state, completed my Masters degree in

Economics and when anyone would have thought that I would return to a humdrum existence, I joined as lecturer in the legendary Ravenshaw College.

**Q** The big question: how did you reconcile domestic and education responsibilities?

**A** Simple. I had to rear children, cook food, complete household chores and then leave for college. The result was that often when I would complete household chores and it was time for class, hardly any time would be left to eat or change into a fresh sari. There were a number of times when I would be the butt of jokes in class due to the stains of turmeric and spices on my clothes.

**Q** How much did your husband contribute towards your education?

**A** In fact, I credit all my post-marital achievements to him. He was a wonderful person who always encouraged me in whatever I did. My academic achievements were always given precedence over his personal comfort, which was uncommon in the society of our times. Without his encouragement and generosity, I could not have dared step out in those conservative days.

**Q** You commenced your career as a lecturer at Ravenshaw College.

**A** The big idea was not to teach but to teach differently. I taught economics through literature and social illustrations, which was something completely unheard of in those days. The result was that the students loved it. And it was not all smooth sailing: I encountered cat-calls in classes but once students discovered the personal touch, the problems declined and transformed into an asset when I took them as part of an NSS relief unit to flood-hit villages.

**Q** Gradually your interest turned towards community welfare.

**A** Community welfare is in my blood. We were brought up in an environment of philanthropy. Eminent freedom fighter Pandit Gopabandhu Das was my father's mentor. Besides, being editor of *The Samaj* (largest circulated Odisha daily), my father shouldered the moral responsibility of ploughing the newspaper's profits into social welfare (as desired by Gopabandhu). So I saw my role at Ravenshaw College as an extension of this philosophy: I was handed responsibility of the NSS unit, which brought me in touch with thousands of volunteer-students.

**Q** As editor of the largest circulated Odia daily, *The Samaj*, what was your focus?

**A** I was editor of *The Samaj* from 1998 to 2007. Issues of women and the plight of common people were my focus during the period as I shouldered the legacy of Pandit Gopabandhu Das; recognised for his compassion, selfless service, patriotism, strength of conviction and objective reporting.

**Q** You are an eminent Odia poet with nearly 45 books and scores of awards to your credit. How did your literary journey begin?

**A** I started writing in school and my first poem was published in *The Prajatantra* daily (edited by Dr. Harekrushna Mahatab, former Governor of Maharashtra), which was an irony considering that Prajatantra competed with *The Samaj* edited by my father. The reason I sent my poem to Prajatantra was because my father did not want to promote his children through his newspaper. The result was that I delivered my debut speech in the Prajatantra Bishuva Milan function, an annual programme arranged by Prajatantra.

When *Juara Jeunthi Uthe* (Where the Tides Originate), my first revolutionary poetry collection, was published in 1960, I was inspired to write short stories, articles and poetry. This was the result: 45 books comprising *E Pruthibi Sarasajya* (anthology of short stories), *Band Gharara Kabata* (Odia translation of R.L.Stevenson's Treasure Island), *Bana Rajara Katha* (children's literature), *Samasamayika Russiya Kavita*, *Ardha Nariswara*, *Baidehi Bisarjita*, *Ame Sabu Niraba Darshaka*, *Uttara Niruttara*, *Amari Bharata Mata*, *Band Gharki Kiwad* (Hindi), *Paika Ki Awaz* (Hindi), *Manorama Mohapatra Kavita* (Bengali), *Achhinda Masa Chhinda Daudi* and *Samaya Purusha*.



**Dr. Pravas Acharya** is a freelance writer, social activist and audio-visual communicator. He teaches Journalism in the Department of Development Journalism and Electronic Communication, Utakal University. He can be reached at dr.pravasacharya@gmail.com

**Q** How were these books received?

**A** If felicitations and honours are any measure of creativity, then I have been conferred a number of awards: Bishuva Award in 1959 for Poetry by Prajatantra Prachar Samity to Odisha Sahitya Academy Award in 1984, Soviet Land Nehru Award in 1988 and Critic Circle Of India Award in 1991 for journalism. The most rewarding experience was how a village lady held my hands and started weeping, saying that my 'Chhinda Masa' (Torn Month) was really the story of her life.

**t**HE FACES OF young boys between the age of five and 12 are being painted. They are dressed as girls in colourful saris and ornaments, then led to a stage where a guru with *gini* (cymbals), singer with harmonium and *mardal* (drum) player wait. The simple orchestra pipes up; the boys break into dance. The acrobatic movements performed to rhythm show pre-puberty flexibility; the boys toss, twist and turn with ease in response to music. The crowd marvels. Then applauds.

What the audience has seen is no ordinary dance performance. This is a living tradition in the Puri district of Odisha. A history stretching back a few hundred years. Gotipua – the predecessor of the largely visible classical dance called Odissi.

#### ... And then the invasion

Gotipua's importance may have been largely restricted to this activity but for an important interruption – the Afghan invasion and influence in the centuries that followed.

This then is the story of a dance presentation that has survived five centuries.

During the early Vaishnava period that followed Chaitanya's time, the Gotipua dance was a prominent vehicle that highlighted the *sakhi bhaav* of the Vaishnav philosophy, wherein a female attendant offered oneself to Krishna.

discontinued, especially the dance of the *maharis* (female servants of God) performed outside the temple premises.

The temple priests responded with speed: they trained boys to perform during landmark festivals (*Jhoolan jatra* and *Chandan jatra*) instead. The result was a convenient balance: while the prerogative to dance inside the temple continued to remain with the *maharis*, the *sahi pilla* (boys) functioned as their substitutes outside it.

Gradually, something else happened: *akhadas*

**Gotipua is a dance form that emerged in the shadow of the landmark Puri temple, its appeal endures mainly in villages around this temple town where groups belonging to the Dimidisena and Raghurajpur villages have acquired repute.**

(gymnasiums) were commissioned in each Puri street to create a network of able-bodied young men to protect the temple and town from invaders on the one hand; the training of boys in dance commenced on the other. A specialisation in the arts was now being given the same importance as martial art.

This prioritisation had an interesting effect. Gradually, the boy dancers emerged as catalysts in spreading the Vaishnava cult, performing to songs woven around the Radha-Krishna theme. More than that, boys began to be employed or patronised by rich *zamindars* from coastal Odisha; a number of them became professionals who travelled to perform at public functions. Gotipua found social acceptance and respect.

#### The art world

And gradually the art evolved. It refined, added, adapted – and corrupted. What was once an art form responding to the call of the divine, was now a small industry dedicated to training boys in dance and song at one end – the only 'formal' training in dance in Odisha in the first half of the last century – and a conspicuous tendency to 'play to the gallery' in exchange for remuneration at the other. What had once started as a response to a need to escape Afghan censure was now a full-fledged commercial occupation.

This does not mean that the dance lost its intrinsic characteristic. Even as the *gotipua* referred to a single

boy (*goti*-one, *pua*-boy), the dance was usually a duet – one boy acting as the narrator and the other as his friend. Over the decades, this two-act presentation extended to a group supported by a vast repertoire comprising pure and interpretative dance categories.

#### The rigorous training

The specialisation did not come easy. Since gotipua was woven around acrobatic body movements, the development of a flexible body was the prime objective, inevitably achieved through oil massages coupled with physical discipline. Add to this training in *nritta* (rhythmic dance) and *nritya* (interpretative dance) *basic chowka* (symmetrical position of bent knees) *tribhangha* (triple body flexions) postures, hand gestures (*parija*) and possible variations (*bohula*).

If this dance form addressed young boys between five and 12 years, then the training was similarly customised: the gotipua masters developed mnemonics that could be easily grasped by young students (the average age of a gotipua dancer is between five and 12 years). For instance, the *pataka* gesture (open hand with stretched fingers) was taught as *eka chappura maribi* ('I will give you a slap'); the *kartari* (index and medium finger opened as a pair of scissors) as *nakka kattidebi* ('I will cut your nose'); the *kapittha* (index finger bent over the stretched thumb) as *Kanna moridebi* ('I will twist your ear') and *ardhachandra* (thumb of the *pataka* hand

stretched out) as *galare dhaka dei bahara karidebi* ('I will throw you out by holding you by the throat').

#### The Odissi link

Which brings us to the big question: what makes gotipua important?

This then is the answer: the dance form represents an important element in the development of Odissi; since all legendary gurus responsible for the revival of this dance form over the last few decades were gotipua practitioners when young. As a result, without gotipua's latent contribution, Odissi may not have survived the challenges of time and emerged popular today.

**The foundation on which Odissi dance was built**

# gotipua

By Dr. Ileana Citaristi



Picture by Mr. Ashok Panda



*Italian by birth, author Ileana Citaristi holds a Doctorate in Philosophy with a thesis on 'Psychoanalysis and Eastern mythology'. An Odissi dancer of repute and a Padmashri awardee, she is exploring Indian dance after years of experience in European traditional and experimental theatre. Ileana has been living in Odisha since 1979. Her mentor in the Odissi dance style was the renowned Guru Kelucharan Mohapatra. She can be reached at ileana5@hotmail.com*



Ravi Kumar receiving the Arjuna Award from the President of India, Smt. Pratibha Patil

### Ravi Kumar, weightlifter

Born on 24th April, 1988, Berhampur

Gold winner at the Commonwealth Games 2010 with a record lift of 321 kg

Arjuna Awardee in 2011

# WORTH THE WEIGHT

A conversation with Ravi Kumar, Commonwealth Games gold medal winner for India

**a**T THE BHUBANESWAR airport, a young man dressed in grey suit stands unrecognised at the check-in counter. But his face seems distinctly familiar. Suddenly it flashes. His elated face had made front page news in all Odisha and national papers a short while earlier.

The timid face exudes a beaming smile, almost with embarrassment, as one extends one's hand to congratulate him. Other faces turn around and a few venture

forward to join in.

Who is this man? Ravi Kumar, the 2010 Commonwealth gold medalist.

The Arjuna Awardee in 2011.

This is a conversation with him:

#### Getting started

I was a student athlete (shot put, discus throw, 100 mts race, among others) who realised that since I wasn't good with studies, I would need to look for non-academic means

to earn a living. I embarked on body building in 2003 and a year later, a senior suggested that I try weightlifting. This is how I got into the sport. Until 2007, I was in Odisha and then moved to Army Sports Institute, Pune, where I am being trained as per international standards.

#### Initial success

I participated in the Junior Asian Championship in 2007 where I won silver and two years later won the gold at

the Senior Commonwealth Championship in Malaysia. The big moment was when I broke five records at the Commonwealth Games, 2010.

#### Background

I come from a poor family in Berhampur. My father wanted me to earn well so he wasn't supportive of my getting into weightlifting. If I had stuck with a government job through the sports quota – which was my dream at one time – I would have

made Rs. 5,000-7,000 at best. So my first decisive step was to leave home. My mother wasn't very happy and said 'Tumko jo marzi mein aaye woh karo' to which I replied 'Main aapko kuch banke dikhaunga'.

#### My routine

I rise at 5:30 am and reach the ground for training by 6:15 am. After breakfast at 8:00 am, I relax and cool my muscles. At 9 am, I commence power exercises and continue until noon. I rest and lunch until 1:30 pm and then cool off till 4 pm. From 4-6 pm, I undergo rigorous training. It is only after 6 pm that I have time for studies. I am trying to graduate through distance edu-

cation from Odisha Board. The problem is that competitions often clash with my exams.

#### Improvements

Of late our government has started supporting more than what it used to in the past. We were only given national standard dietary supplements and now we are given German supplements.

#### Areas that need immediate attention

What Odisha desperately needs is a decent sports centre.

the success rate. There are also scientists dedicated to each sport who analyse performance and training, leading to scientific improvement.

#### The big moment

Easily the Commonwealth Gold in Delhi in 2010. When I won the medal, everyone was screaming. It was crazy! The moment gives me goose bumps. My first thought after winning was 'Thank god, at least I have made my parents proud.' That was the first time my family came to cheer me.

#### On doping

Out of 100 cases, 80 do it knowingly. I would only advise my juniors to stay away from

weightlifter, and Mohammed Zakir Asdulla, the Indian weightlifter, are my idols.

#### The other big moment

On 22nd July 2011, I was resting after training when I received a call from a media person saying I had been selected for the Arjuna Award. I thought it was a joke but started receiving more messages. I called my mother to tell her and considering that it was her birthday, this was the best gift I could give her.

#### Some thoughts

Cricket is my biggest enemy. Why do we call hockey our national game? Weightlifting is almost dying in India. We

## THE OTHER BIG MOMENT

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doping because a lie doesn't remain hidden for long. And once caught, one's career is gone.

#### Suggestions for Odisha

We need an indoor stadium to start with. The state can collaborate with SAI to provide basic facilities. We need good coaches. No one can expect to stay at home and have the normal diet and make it big in sports. One needs determination, focus, diet and training.

Before CWG, I had won elsewhere but my achievements went unnoticed. I had won a silver and gold in two

train for years but our judgment is only based on those final six minutes.

#### My ideal

Halil Mutlu, the Turkish



Ravi Kumar being awarded the gold medal at the Commonwealth Games 2010

## What is the connection between Australia, Odisha, poultry and farmers?

The unlikely answer is the emu.

The emu is a flightless bird originating from Australia - the second-largest in the world after the ostrich - with an estimated height of 1.8m and weighing up to as high as 59 kg.

This connection between a continent on the one hand and an Indian state on the other would perhaps have never been made had it not been for a random trip to Andhra Pradesh by an anonymous Odisha farmer called D. Mohan Reddy in 2005. "I was visiting a friend's farm when he referred in passing to an emu," says Reddy. "He told me a few words in passing about the bird and then said something that bowled me over. He said that emus were like gold."

Gold. The word would haunt Reddy on his journey back to Odisha. Gold. The word would keep evoking a vision of investment safety. Gold. The word would keep recalling the image of high returns.

So when Reddy returned to his village Pitatali, 30 kms from Berhampur, he resolved to extend his blueprint into reality with an initial investment of Rs 300,000. For a farmer with modest means, Mohan Reddy was quietly confident that this

time round, he would do more than scrape through a thin profit.

### Solid rationale for funds

This was the basis of his logic that Reddy explained to his bankers who funded him.

- The emu is not a high-cost bird; it feeds on roots, fruit and herbage. The cost of maintaining a single bird is not more than Rs 14 a day.

- The emu is broadly disease-resistant, immune to bird flu, and lives to be around 40 years.

- The emu grows from 10-inches at birth to 6ft and around 50 kg with correspondingly growing yields in terms of meat, skin and oil.

- The emu starts laying eggs from two to three years and continues to do so until 26 to 35 years - a productive life span.

- The emu's meat is 98 per cent fat-free, selling at over Rs. 400 per kg, coupled with low cholesterol, while its oil is considered to be effective in arthritis, pains (muscle and joint) and injuries.

With this simple understanding, Reddy's Mahalaxmi Emu and Agro Farms embarked on something that had never been experimented before in Odisha. The rearing of a bird considered native to an

alien continent.

### The funding arrives

Rishikulya Gramya Bank appeared interested; it disbursed Rs 15 lacs to Mohan Reddy; National Bank for Rural and Agricultural Development (NABARD) funded half the interest. Emboldened, Mohan Reddy invested in an incubator and hatchery to breed emus on his 12 barren acres.

Fifty days later, Mohan Reddy exulted. The first home grown chicks emerged. Odisha's first emu farm was a reality. Neighbouring farmers watched with curiosity. If Mohan Reddy could pull it off, it would help liberate their destinies from a complete dependence on the vagaries of rain.

They were to be pleasantly surprised. Mohan Reddy cashed his first two-month emu chick for Rs 6,000; besides, an egg weighing up to 800 grams fetched him Rs 2,500 ("powerful aphrodisiac").

The farmers began to do the math. If Mohan Reddy could generate his first revenue within the quarter, if he could do the same across 200 chicks, if a female emu could lay 20-25 eggs a season, if he could plug potential losses through disease-free rearing and if he could optimise his costs, then there was hope on how to survive a challenging agricultural

existence. "If we sell only the eggs we will earn 25,000 rupees a year per bird, but if we go for hatching, each chick can give you a net profit of 80 thousand to 1 lakh a year," explains Mohan Reddy.

### A buyback arrangement

A few years have passed since Mohan Reddy's tentative beginning. For someone who was apprehensive about his clientele, Reddy now has a buyback arrangement with companies in Dindigul, Hyderabad and Vijayawada, providing him with the confidence to scale his business. The result: Mohan Reddy's farm now comprises a few hundred emu chicks and a few dozen emu pairs. What started as a tentative initiative is now a

successful enterprise.

### Training others

So what is the next step? Reddy says, "After my success, many people across the state are interested in learning about emu farming. I am training them and I have enough eggs and emus to supply them. There is a huge demand for this bird and there is scope for a lot of people to grow."

The result: a few hundred farmers in Odisha have taken to emu farming as emu breeders have emerged in Chhatrapur, Aska, Bolangir and Tangi.

"People now ask me whether I earn Rs 10 or 15 lakhs a year. I tell them my target is Rs 50 lakh a year. When

people in Andhra are reaping gold out of emu farming, why can't we do that in Odisha?" says the man who accidentally entered the business one day when he ventured deep into rural Andhra Pradesh.



Dr. D. Mohan Reddy runs Mahalaxmi Emu and Agro Farms in Pitatali, Ganjam

The story of how a daring experiment to raise emus on Odisha's farms is transforming destinies

# farm gold

# “Cinema



IS MORE THAN ENTERTAINMENT. IT CAN BE A GREAT SOCIAL AWAKENING TOOL.”

Says Nila Madhab Panda, prominent Odia film director, who made the popular film *I am Kalam*

#### Rewind

I was born in Dasharajpur (Sonepur district) in Odisha where my father was a farmer and mother a housewife. The reality is that the family earnings were too meagre to support my education. The result was that I walked 8 km a day to school. It was a big jump from there to IIM Bangalore and when in that city, a friend and I resolved that we would change the world – through cinema!

#### Power of cinema

You may run endless campaigns to enhance awareness in India, but the only way you can do so effectively is through films. If you want to communicate social issues, don't lecture at a rally, simply sing your way through films. This makes it imperative for films to showcase real

issues like compulsory primary education. A two-minute line in a film can transform destinies.

#### The *I am Kalam* idea

*I am Kalam* is based on a child's dreams and the importance of educating underprivileged children. In a way, it is about my struggle. My school didn't even have a proper building but that never stopped me from dreaming. So the film celebrates the human spirit succeeding over the odds. This film is relevant because our children are growing up in game parlours, not parks. How many children dream the big dream today?

#### Odia cinema

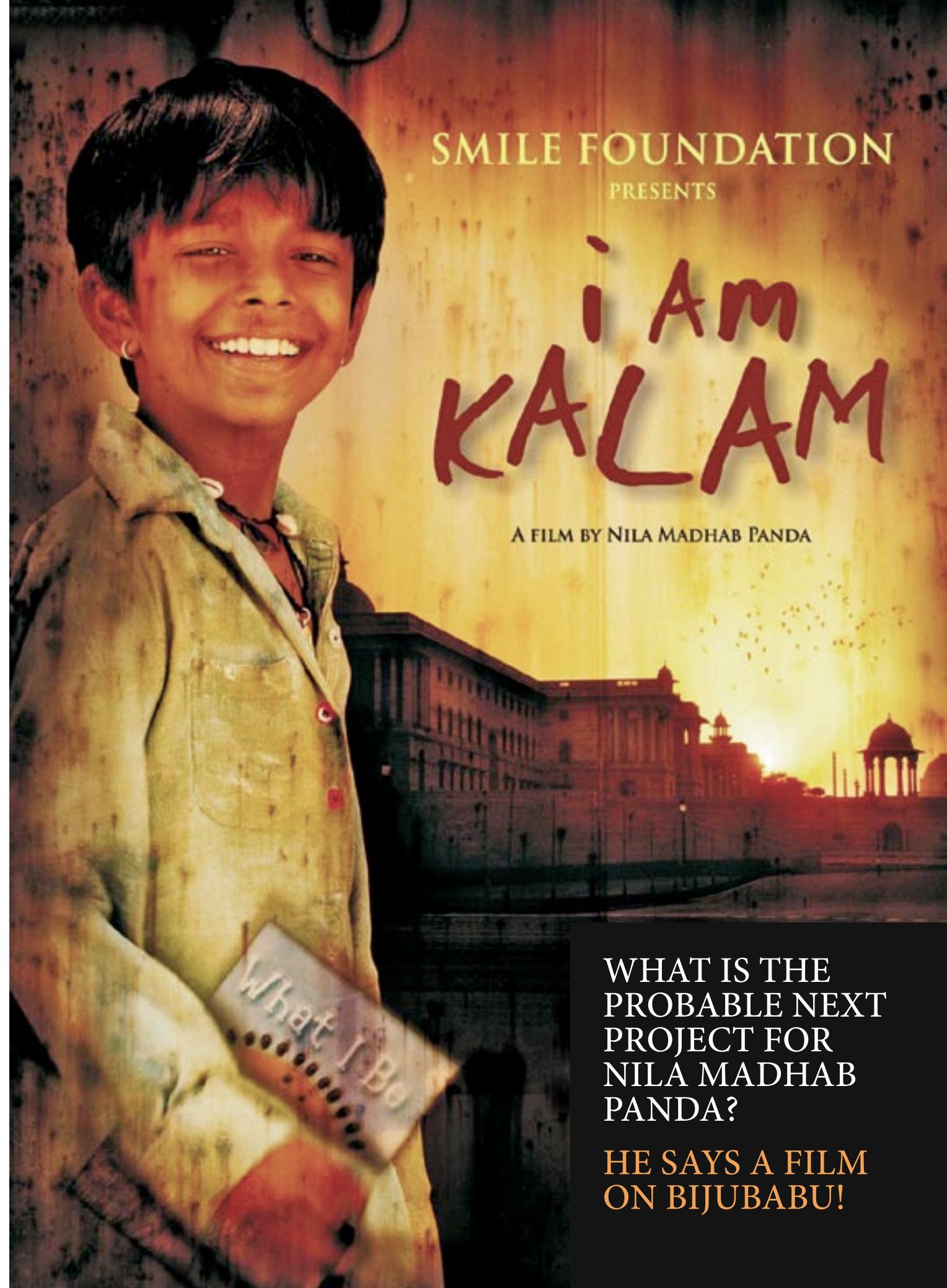
Odisha is one of India's most culturally versatile states whose beauty has not been addressed by the state's film

industry. How many films showcase Odisha? The problem is endemic: there is a dearth of theatres and viewers; Hindi films crowd regional cinema out. Besides, our films showcase the West; how many portray the diversity and versatility of the Odia culture?

#### Biggest learning

In three words: keep at it. The moment you feel you cannot go further, that's the moment that defines you as a loser. There was a time when I had no money to buy food, no place to stay and no money to pay someone to wash utensils. I never gave up because I always remembered that of every 100 people, 10 succeeded through perseverance. Hardships leads to success. You become a loser the moment you feel you have failed.

Nila Madhab has made 70 documentaries, short films, television dramas (two mega serials) as well as corporate and advertising films. *I am Kalam* won 12 awards (national and international) including the Best Feature Film Award at the Lucas International Film Festival in Germany and the Young Jury's Best Feature Film Award. The film was screened at a number of global film festivals. He can be reached at [nmp2020@gmail.com](mailto:nmp2020@gmail.com)



WHAT IS THE PROBABLE NEXT PROJECT FOR NILA MADHAB PANDA?

HE SAYS A FILM ON BIJUBABU!

# NALCO'S LIFE BEYOND ALUMINIUM



Mr. B. L. Bagra, Chair-  
man-cum-Managing  
Director, NALCO



**f**OR DECADES, NATIONAL Aluminium Company Limited (NALCO) established a reputation around aluminium alone. For decades, NALCO was typically an Odisha-home-grown story.

The time has come for positive changes

on both fronts. In a few years from now, NALCO will extend its avatar from a typical aluminium company to a diversified metals, minerals and power conglomerate. During this tenure, this Odisha-grown company also expects to emerge as a pan-national and

international organisation.

#### Bigger and different

The result: NALCO expects to emerge bigger and different.

The 'bigger' bit one can understand because it represents the extension of

existing strategy: plough accruals into production capacity, commission assets on schedule, produce more, generate a bigger cash profit and reinvest. This is what NALCO is presently doing: the company invested Rs. 3,600 cr in the first phase of its expansion programme,

"My vision for NALCO is that of a reputed global company in the metals and energy sectors," says B.L. Bagra, Chairman-cum-Managing Director. "We expect to achieve this position through business diversification, innovation and expansion leading to a distinctive competitive advantage and business de-risking."

increasing its various production capacity (details on the next page).

Thereafter, the company embarked on the second expansion phase at a cost of

Rs. 4,402 crore - upgrading the fourth stream of alumina refinery from 0.525 million TPA to 0.70 million TPA, bauxite mine capacity from 6.3 million TPA

## Expansion programme

Unit	Original capacity	After 1st phase	After 2nd phase
Bauxite mines	24,00,000 MT	48,00,000 MT	63,00,000 MT
Alumina refinery	8,00,000 MT	15,75,000 MT	21,00,000 MT
Aluminium smelter	2,30,000 MT	3,45,000 MT	4,60,000 MT
Power plant	600 MW	960 MW	1200 MW

to 6.825 million TPA for Rs.409 crore, smelter potline upgradation from 180 KA to 220 KA for Rs.1500 crore.

One would have considered that for a company engaged in aggressive capacity expansion, there would be room for 'strategic consolidation'. But NALCO is clearly a company in a hurry. The company is planning a third expansion phase to raise capacities of various units after the second expansion round has concluded. As things stand, NALCO is scheduled for continuous work-in-progress across the foreseeable future.

There is a distinctive rationale for this. "NALCO is engaged in a continuous expansion programme," says B.L. Bagra, Chairman-cum-Managing Director, "with the objective to strengthen our competitive position as a leading aluminium manufacturer. Soon after the completion of the first expansion phase, the company completed its second expansion phase in June 2011 across various production segments and is now embarking on the third phase for an investment of more than Rs. 6000 crore which would enhance the alumina capacity to 29 lakh tones per annum, aluminium capacity to 5.7 lakh tones per annum and power generation to 1,700 MW.

### Multi-location footprint

The interesting point is that NALCO is one of the few companies to leverage its Odisha advantage and emerge as a multi-national giant. Because in addition to investing in Odisha, NALCO plans to commission a 1.4 million TPA alumina refinery in Andhra Pradesh (supported by bauxite reserves in Gudem and KR Konda with mining leases allotted in-principle). Besides, the company is engaged in discussions with the state governments of Odisha, Chhattisgarh and Gujarat to commission a 0.5 million TPA smelter-cum-power plant in one of the states as well as one in Indonesia.

### Different as well

What makes the NALCO story compelling is that soon it will no longer be only an aluminium story.

At one level, the company is exploring business opportunities in other mineral sectors like copper, gold, uranium and titanium. The company signed MoUs with Hindustan Copper Limited and Indian Rare Earths Limited related to diversification projects.

At the other level, NALCO plans to extend its significant competence in the commercial operation of power plants (thermal, hydel, nuclear and wind) with

the objective to create a robust revenue source. "This could be in the form of an independent power producer or even as an ultra mega power producer," says B.L. Bagra, Chairman-cum-Managing Director. "The company plans to develop a nuclear power project in Gujarat with Nuclear Power Corporation of India Ltd with an estimated project cost of Rs.11,450 cr. NALCO is also setting up a 50 MW wind power plant at Gandikota (Andhra Pradesh) and tenders are being floated for one more such plant. The company is also exploring opportunities to set up a solar power plant at a suitable location in India. Besides, the company is planning to come up with power plants in India either through participation in the bidding process or in JV with other companies with coal blocks. These initiatives will make NALCO a diversified metals, minerals and power conglomerate in a few years."

### NALCO and CSR

NALCO's success is not derived only from an increase in corporate production or profit but also an increase in regional prosperity.

The company is playing a significant role in improving socio-economic conditions in Odisha, comprising displaced family rehabilitation, local employment, income generation, infrastructure development, environment care and goodwill missions.

The company commissioned the NALCO Foundation and doubled its corporate social responsibility budget to 2% of its net profit. In line with this priority, the company allocated Rs. 21.38 crore for community development in 2010-11.

Clearly, NALCO is a company that looks ahead.

### NALCO's achievements

- The largest Indian aluminium company
- Asia's largest integrated alumina-aluminium complex (bauxite mining, alumina refining, aluminium smelting, casting, power generation, supporting rail and port facilities).



**Odisha**  
Scenic • Serene • Sublime



**Incredible India**  
India is more than you can imagine



**International Sand Art Festival**

Though short-lived, sand sculpture is an exquisite art form. Mythological references indicate the prevalence of sand sculpture in Orissa, dating back to 14th century AD. Now, it's a new addition to the repertoire of culturally and artistically vibrant Orissa.

Transient though, it leaves an indelible impression on the sands of time ...

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