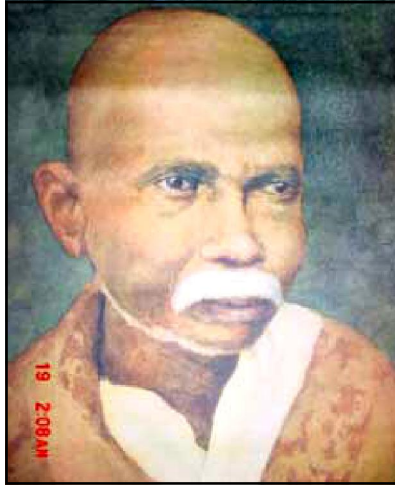


Pathani Samanta : The Great Hindu Astrologer

Prabhukalyan Mohapatra

Pandit Samanta Chandra Sekhar Harichandan Mohapatra, locally known as "Pathani Samanta", was the illustrious author of "Siddhanta Darpan"- a systematic record of his life-long relentless work composed in beautiful metrical Sanskrit verses. "Siddhanta Darpan" is an astronomical treatise in elegant Sanskrit verses, developed and improved upon the 'Surya-Siddhanta' and the 'Siddhanta-Siromani' of the past. This magnum opus of Chandra Sekhar, the last and best book that worth to its name is really a mirror of India's astronomical knowledge.

A Hindu orthodox by nature, Chandra Sekhar, with his traditional background alone studied the subject of astronomy, observed the movements of planets through naked eyes and was able to reach the approximate reality as founded by scientists with the aid of modern equipments. He was an outstanding mathematician of high order and engaged himself in the field of mathematical calculations known as 'astronomy'. In 'Siddhanta Darpan' poetry and mathematics are in tune with each other which stands as a specimen of his genius. By sheer efforts



and perseverance, this last and foremost orthodox Hindu Siddhanta writer could rise above his environment and left an indelible stamp of his genius on the history of Indian astronomy. His ability in the preparation of "Manyantra" (measuring instrument), "Golyantra" (spherical instrument) and "Surya-Ghadi" (Sun dial to measure the time) proved him to be a good architect with engineering skill. He had also interest in the preparation of fire works with knowledge to launch the same to a particular height.

India is a nation of ancient culture and tradition. It reached the zenith in all spheres at one time when most of the so called advanced nations of to-day were not discovered. Indian astronomy is nearly as old as the Vedas. As a science, it rose to its peak in the days of Aryabhata in the 5th century A.D. Indian

astronomy of the Hindus is a mere curiosity to the scholars of West, because they know very little about our traditional mathematical astronomy as that does not come under the mainstream of astronomy which originated in Babylonia and evolved through the Greeks and Europeans.

Hence neither the scholars of the West are fair enough to assess the merit of our system nor are we sincere to project ourselves sufficiently in order to establish our wit and wisdom before the so called advanced world.

Chandra Sekhar recorded all of his findings in 'Siddhanta Darpan', a small book with about 2500 verses (24 chapters) in Sanskrit language entirely written on palm-leaves. Will Durrant was amazed to find this great Hindu scholar writing treatises on mathematics even in verses. This invaluable contribution of Chandra Sekhar to the astronomical science, 'Siddhanta Darpan' was written on 12th April 1869 and completed in all respect by 12th November 1892. Out of its 2500 verses (slokas) 2184 are his own. The composition and structure of the verses indicate his extra-ordinary genius and deep knowledge in Sanskrit. The verses are highly ornamental and orderly. They flow like a running stream unchecked, un-controlled, un-restricted and unbridled. The contents of 'Siddhanta Darpan' look amazing and un-imaginable as the achievement of a single mind. Chandra Sekhar observed, verified and corrected all that was known to the Hindu astronomers for thousand of years. Even on many occasions he has gone beyond them to discover new phenomena, formulations and came out with predictions which as per his claim will remain valid for at least next ten thousand years. In the field of observational astronomy, very often, he has given new methods of calculation. At the end of his treatises he has furnished the calculations of an almanac which has been named as "Kautuka Panjee". Among those who applied their brain and mind for the improvement as well as development of 'Panjika', the name of Chandra Sekhar figure in a very eminent position. A glorious personality by virtue of his high academic attainments,

scholarly approach to the problems and moral effulgence, Chandra Sekhar no doubt shines best in the history of "Panjika-Samskara". In 1876, the almanac computed according to 'Siddhanta Darpan' found recognition in the temple of Sri Jagannath and religious rites are calculated / determined as per the latest Siddhanta of Chandra Sekhar .

Nearly one thousand years before the birth of Chandra Sekhar no astronomer of repute had made any reformative study in the field of astronomical science. In order to know the exact longitude (grahasphuta of the planets) he took the help of Surya Siddhanta as his base book and innovated new method in each chapter of 'Siddhanta Darpan'. As moon changes its position more frequently than any other planet, it is very difficult to ascertain the exact longitude of moon. Hence, Chandra Sekhar innovated three principles, i.e. Tungatantra, Pakshika and Digamsa to know the exact longitude of moon. These three formulas expounded by him are very correct and they hold good in every respect. Likewise he had devised many new formulas for ascertaining the exact longitude of all the planets. His formulas regarding the solar and lunar eclipse are still invaluable objects in the astronomical treasury.

Completely unaware of the scientific and technological developments in the West, Chandra Sekhar had employed the traditional methods for astronomical measurements. He was well known in India and beyond for his accurate astronomical calculations, new theories about the planets, their movements which were based on observations made by his naked eyes or with primitive instruments designed by himself. So he is rightly called the second Bhaskara in India. Chandra Sekhar seems to be the last link in the long order of great Hindu astronomers like Aryabhatta,

Varahamihira, Brahma Gupta and Bhaskara whose genius blazed from places spread all over India scaling a time span of nearly 1500 years, with available systematic record from 5th century A.D. to the turn of last century. This continuous stream of genius appeared to have broken after Bhaskara for about seven hundred years and one sees the burst of the last glow in Chandra Sekhar.

The long traditional culture of 'Jyotisha' in Orissa for so many centuries was epitomized in Chandra Sekhar, who was honoured with the title of Mahamahopadhyaya' by British government in 1893 for his monumental work on Hindu astronomy known as 'Siddhanta Darpan'. He corrected the discrepancies in the astronomical calculations found in the annually prepared Almanac of Orissa.

Astronomy is a science in which observations go simultaneously with the calculations. Besides a thorough knowledge of motion of the stellar objects, it requires sufficient computational skill to tackle the vast multitude of big numbers. Chandra Sekhar was extraordinary in this respect who demonstrated a computational fit by providing tables with cores of data which poses a challenge even in this computerized age.

Chandra Sekhar had expressed his deep gratitude to all his predecessors in general and Bhaskaracharya in particular. He improved upon their calculations after careful observation of the planetary position. Like any other original research work his contributions are purely of intellectual interest in the field of mathematical astronomy. The present Oriya Almanacs are being prepared

as per the rules of 'Siddhanta Darpan' and they have stood the test of time in successfully predicting the eventful occasions like eclipses. He had broken the ice which blocked the path of progress in Indian astronomy for about a thousand years and mirrored the Siddhantas in modern perspectives which paved the way for future development. Our researchers today boast of degrees conferred on the basis of works which can hardly be compared with originality and innovations, but Chandra Sekhar had exhibited in a single chapter of 'Siddhanta Darpan' barring its stupendous tables called 'saranis'. His contribution to the field of Hindu astronomy is little known and assessed due to non-availability of a lucid Commentary explaining the intricacies of astronomical calculations involved in understanding the Sanskrit verses composed in elegant pendantic style.

'Pathani Samanta' alias 'Chandra Sekhar' was born in Khandapada, an ex-state of Orissa, in the un-divided Puri district of Orissa, on (the 8th lunar day of black fortnight in Pausa month of Saka era 1757) 11th January 1836 and his final departure from this mortal world was on 11th June 1904. As per his own prediction, he came all the way to Sri Jagannath temple of Puri to breathe his last.

Writer is a Bhubaneswar based freelance journalist, who lives in VR 3/2, Unit-3, Behind R.B.I., Bhubaneswar, Orissa. prabhukalyan_mohapatra@yahoo.co.in

The Sacred Basil (Tulasi)

Dina Krishna Joshi

Ocimum sanctum the sacred basil is the great heritage of holy plants that India has bookmarked for spiritual seekers of the world. Tulasi must be considered the National Holy Plant of India as she has the greatest influence that has directed the masses of India towards that characteristic way of life with a spiritual background which is the hallmark of India's great and glorious spiritual culture, the envy of all the world's nations.

The power of Tulasi and the benefits she can give to her devotee is well documented in the "Sri Tulasi Kavacham" embedded in the Tulasi Mahatmya part of Sri Brahmanda Purana and also in the classical prayer of Pundalika known as the "Tulasi Stotram". Taking the clue from the Atharva Veda, Tulasi has been eulogised in Srimad Bhagavatam, the Kurma and other Puranas, and various spiritual and religious texts. Tulasi has become the most popular plant among the people of India.

Folkuse & Custom :

The popularity of *Ocimum sanctum* among the people gave her the name Vrinda in the language of the elites. All folklore relating to the plant are of very ancient origin and may be more ancient than the Vadas. Urban civilizations rose on river banks in regions lying between equatorial and temperate climates. Endemic

malaria became rampant in these areas. So malaria, in competition with plague must have taken a heavy toll on these early human settlements. It is possible that the mother species of Tulasi was a marsh plant which grew in the waterlogged areas of river banks where our ancient civilization was born. Malaria being endemic in these areas, the locals soon found that this plant could ward off malaria both by its presence, its fragrance and by therapeutic administration. It soon became a leading medicinal plant in folk use, It is interesting to note that many ethnic tribes of India have parallel mythologies regarding Tulasi as a holy plant and have special rituals associated with its use.

Myhological basis of origin of sacred basil :

There are more than one mythological version relating to the origin of the Tulasi plant. Both the masses and the educated elite have joined forces to build up this varied traditional mythology.

Books recite that Sri Lakshmi was born to Dharmadhwa's wife Madhavi. Her parents named her Tulasi. Being beautiful and virtuous, she was married to Vishnu. Vishnu desired her to cast off her body and stay with him in spirit. Her body then become the river Gandaki. Vishnu's body become the Saaligrama stone and resided in the river. Sri Lakshmi's hair grew into a plant, become the famous Tulasi, an object of worship.

There is also another version. Tulasi was the wife of Jalandhara, a water demon, who caused great suffering to people. Lord Vishnu had to abduct her to kill Jalandhara. Lord Vishnu then lifted the plant to higher level by placing her leaves on His head. It is also said that Vishnu abducted Tulasi to help Shiva kill the demon.

Another version recites that Sarasvati's curse once turned Lakshmi into a Tulasi plant and forced her to live on the earth causing Vishnu to come down from Heaven and stay near her as the Salagrama. That is why the Salagrama is to be found under the river Gandaki on the bank of which the Sal tree grows and also in the Narmada river from which many Brahmin communities migrated to South India later on. Salagrama being Bhagavan Vishnu's counterpart for Sri Lakshmi's Tulasi, this sacred stone, now considered to be an ammonite fossil, which is also eulogized in the Puranas.

Folk Therapeutics :

1. The earth round the Tulasi Plant is used as application in the form of a paste for massaging the body to counteract the effects on the skin of debilitating marshy environment. Famous Indian wrestlers have used it to come out victorious.
2. Tulasi leaves placed with water in a shining copper vessel overnight and partaken in the morning, activates a student's brain and increases concentration and memory.
3. Tulasi is used by Indian physicians in the treatment of mental weakness, such as loss of confusion, depression, melancholia, hysteria, migraine, headache and cerebral congestion etc.
4. Tulasi leaves, eaten as daily routine in marshy area, make one immune to fever. A few fresh leaves of Tulasi chewed and eaten with very little pepper, daily in the morning, on the empty stomach prevents malaria and helps to cure it.
5. Tulast is employed by Ayurvedic and traditional gynaecologists in regulating menstrual cycle in women. It is used to improve fertility both in the barren and in those who are unable to safely reach full term. At the commencement of the postpartum, it helps to regularize the lochia.
6. Tulasi is used to purify blood in blood poisoning and similar conditions, along with the juice of neem leaves.
7. As a common household remedy, it is found very effective in common household remedy. It is found very effective in common cold, laryngitis, tonsillitis, cough, influenza and its complications.
8. In bronchial asthma and respiratory allergic conditions, a pinch of pure turmeric powder mixed with honey and the juice of Tulasi is very effective.
9. It is useful externally and internally in relieving discomfort and pain associated with dental decay such as caries and chronic infective conditions such as pyarrrhea.
10. In alimentary disorders causing gastritis, flatulence, colic and dyspepsia, Tulasi is very useful to stimulate digestive secretions.
11. Seasonal arthritis triggered by humid weather is relieved by this remedy.
12. In pneumonia, physicians use it as *anupana* for specific remedies. In the preparation of Tribhuvanakirti Rasa; a classical Ayurvedic remedy that protects the lungs and clears congestion in the later stages of influenza, Tulasi is one of the juices used in herbally activating the preparation.
13. Regular use of Tulasi prevents pleurisy and also supports specific curative remedies used to treat the same.
14. Externally and internally, it is useful in palliating eye symptoms caused by conjunctivitis

such as redness, lachrymation, adhesive secretions and photophobia.

15. Tulasi cures dimness of sight. Its juice, regularly used as eye drops, prevents cataract formation. Here it is as efficient as the homeopathic remedy, *Cineraria maritime*.

16. It is very useful in itching and irritation of the ear and difficulty of hearing caused by *Vatakapha. Samsarga Dosha* which builds up as age advances.

17. Tulasi gives a glow to the skin when constantly used both internally and externally. It is a freely available cosmetic for women.

18. Fresh juice of the plant, steeped in honey, is a great pediatric remedy for cold and cough in children. Being mildly laxative, it also helps elimination tract of the phlegm.

19. Partaken with ginger juice after meals, Tulasi acts as a carminative and digestant.

Varieties of Tulasi

Ayurveda nighantus state that there are 7 varieties of Tulasi some of which are not obtainable. They might be found in remote forest areas, as some species of Labiate are, on the lower slopes of the Himalayas or in other mountainous regions. In India, the two common varieties of *Ocimum Sanctum* available are *Krishma Tulasi* and *Shweta Tulasi*, the former being preferred in rituals and both in medicine. There are many such classical remedies in the *Ayurvedic Pharmacopoeia* where Tulasi is either one of the main ingredients or used as an activator during preparation of a classical compound medicine.

Dina Krishna Joshi lives at Gayatrinagar, New Bus Stand, Junagarh-766014, Kalahandi (Orissa).



Hon'ble Chief Minister Shri Naveen Patnaik presenting Biju Patnaik Award for Scientific Excellence to Prof. Dr. Dipica Mohanty at Jaydev Bhawan on 15.12.2007.

Khairi Still Roars in the Woods of Similipal !

Gyanchand Mallick

It was an early November wintry dawn, we arrived the artists city Baripada and hired a Bolero and travelled straight 100 kms to the legendary Tigress Khairi project office in Jasipur on NH No.6. The entry permits and reservation confirmation were green signalled by the conservator. It was getting noon without the sun in the sky. It was quite dark and everything had become grey and shapeless. The weather went bad overnight, it had remained clear for a long time with masses of cranes flying across the open sky, then suddenly the wind began to blow, it grew cold and the sky filled with black clouds which set about shedding a fine sticky uninterrupted rain.



By this time we enjoyed the mouth watering delicious flavoured Deshi chicken in a road side Dhaba which flamed our instinct to discover the wild jungle. Remember this is the Similipal. One hundred one Royal Bengal Tigers hunting ground apart from this 102 deadly cheetahs, 700 shambars, herds of elephant, bears, hyenas, wolves, jackals, giant squirrels, barking deers, mugger crocks, reptiles, 23 species of birds and

many more covering 2750 sq kms in Mayurbhanja. It ranked 7th among India's 28 Biosphere reserve forest. It is famous for its natural wildlife, springs, mountains, cloud kissing peaks and waterfalls and areas around bristling with rich wildlife. It is exclusively a tiger reserve of India. Here the prey is haunted for food by the predators and carnivorous openly and we are venturing in to it. It is never a zoo.

It was raining frequently, muddy impassable roads came, the puddles and mud on the roads delayed our movements. As we approached the jungle my heart beat pounded. I was thrilled at the tallest sal forest it

seemed as if they welcome tourists by waving the dense branches in a chorus, Champaka sprinkling the sweet stupefying fragrance and especially the chilled kaliani wind fanned us. Though an afternoon but it was dark and tearing the forest in the mud and slippery Kacha path we reached Gurguria and Kaliani check gates only watching the woods through the closed glass doors with eyes wide open and mouth shut in search of a

wild beast. Our utter silence broke when the driver rushed the car to a trench and tried with gears but in vain .It was as dark as midnight and also a bit frightening to go out into the dark but the driver Hari opened his door and we ours. Suddenly, a brisk wind pierced through the doors and trembled us and I shoved my hands under my armpits for warmth. The wild crickets buzzing created a Ramsey's horror. I helped the driver in lifting the tyres from the ditch and some inspected the road ahead to Joranda .But the untimely rain damaged the newly morum patched road and we avoided any further risk and returned back on the advice of an A.D.V.O to Ramatirtha, another two hours place. What a pity after travelling 25kms in 90 minutes in the dense woods is clearly seen in our faces. With a disappointment we reached the crocos breeding sanctuary at around 8pm. The night watchman guarded us to the beautiful bungalows. We felt the severest cold and my teeth went numb. Thoroughly chilled I entered the room and lit the firewood in the kitchen. Locked inside the bungalow we enjoyed card games gossiping and sipping. Making our predictions wrong, again it downpoured, it was so heavy that we shivered with cold. Praying God for a shinny and bright morning we went to bed taking 2 blankets each from the almirah kept for the tourists and visitors. Everything was dark and gloomy beyond the rain spattered window and the rustling over the roof continued. It was nightingales trill and warble, the chirps of peacocks, drungo, and orical in the jungle awakened us and amazingly it was a very shinny morning. That Advo lit a cigar and fingered me to follow him and put the packet in the pocket. I let my feet down in the freeze floor dressed hastily walked through the wet sparkling meadow feeling clean fresh breeze and wild aroma, reached the bloodstained breeding house. I saw the dead muggers in the glass jars and huge mugger crocodiles lying opened mouth in the sun in a

caged pond and some new borns and some tortoises also. The A.D.V.O showed me the ancient temple Ramatirtha named after Lord Rama. Here the foot prints of Him are worshipped on the bank of the river Khairi named after the legendary tigress Khairi. And on the way back to bungalow he advised not to drink the stagnant water to escape from malaria. We left the place after a very hot photo session to Nawana, a very beautiful spot where wild creatures move freely. It was around noon in the lonely forest we reached a curly muddy and slippery path at 20km ph with second gear but in the mud our tyres dipped completely and it was impossible to move an inch ahead. Again the same task pushing, lifting and inspection of the path and the same result we avoided the sure risk, the rain bathed morrum is not baked completely. What a sorrow, our face faded after covering miles in the core but the smart Advo again turned the wheels towards Chahala another core spot and assured for a better halt .It was the then Mayurbhanja Maharajas haunting place. Beautifully decorated three cottages encircled by trench to escape elephant herds and flowery gardens almost seem as if an Island. Though our earlier two spots were undiscovered but we were excited by our successful venture. And it is pleasant to discover for yourself new places and to be thrilled by uniqueness. And also we were fortunate to spend a night in the Royal Villa .The Ranger and the guards informed us about the deer and elephant herds regular visit to the very nearest spots. We all anxiously waited for the evening. We witnessed the marvellous Sun sinking down behind the sal and a few dears and peacocks grazing in the pasture. It was the twilight we all laughed at Mrs Das wishes. She had a wish to halt at Chahala and it became true. It was a romantic and wonderful experience to judge the real jungle and wild animals roaming. At the approach of evening

we could guess of heavy cold we wore jackets and mufflers, here the temperature goes down to 3degree celcius, waves of cold wind really shivered us. It was getting dark, we were locked inside the cottage and switched on the solar light but in the dim wavering light hardly one could see and read. After waiting patiently in a single door cottage the ranger hurriedly knocked the door and informed us of elephants presence in the salt lick spots near the trench. We quickly wore boots and drew jackets and rushed silently near the trench, an unknown fear ruled over the hearts because the guards had shown us the smashed and damaged walls of the rest houses. They occasionally cross the trench in search of food. We could hear the snores, it sounds like a running motor car. It is guessed as if they were three in number and were some meters away from us. Suddenly the largest land animals war like huge trumpets trembled and panicked us .It was so terrible that Mrs Muna and Mrs Rath caught hold my both shoulders each and unbalanced me and at this everybody laughed at them. But the ranger warned not to laugh loudly the tuskers may go away smelling any danger. It was really awesome and wonderful to hear and see the herds trumpet and snoring in a torch focus. Simultaneously we could see hundreds of deer eyes twinkling above the reeds in fear. These were so audible and terrible that the jungle would tremble even the shrilling of crickets had stopped and taken shelter. The cracking of tree trunks, breaking of branches all started in a rush and in no time a furious battle broke out in between them. Guessing the noises we could move our wide opened eyes hither and thither but hardly said anything. To this the ranger described that they may be fighting for superiority or mating may be for salt licking. It continued almost for an hour. The silence of the darkest Amavasya night is only

broken by the war like trumpets. The ranger assured us of other herds to come by night.

It was exactly 9 pm in my Regalia we came back talking to the cottage. All were seen holding the mufflers and jackets in their hands as if were warmed up in the severe cold. Then the ranger and we sat in the royal dining table for the supper prepared by the cook in the lanterns focus ,it was hot, spicy, delicious and mouthwatering. All gathered in the Royal Sal Villa busy in talking and laughing about tuskers. All of a sudden the vigilant guard came gasping and informed us of the presence of another herd in the nearest salt lick spot and we all at a time rushed with torches to the nearest trench and saw some snoring tuskers in a dim focus rushing towards the dense jungle in a queue. Then also twinkling eyes were seen above the reeds. The excited and pleasant night passed by under the royal roof. The winged species, orical, drungo, peacocks, were pretty busy in their job and as usual awakened us. The wintry milky dawn enveloped with thick fog as if seemed the land wore a white bed sheet of frost, looked amazing. To our wish to take a morning stroll in the woods the ranger advised a guard to guide us. To our mounting joy we all with jackets and shawls crossed the trench and entered the jungle. Under the huge sal trees and deep, light green leaves and walking over rotten red and yellow leaves. We could witness the huge footprints and dung cakes of the elephants and pug marks of deer and its jamun like dungs, we saw the salt lick spots, where the mammals regularly visit to fulfill their iodine deficiency.

On our way back to home the ranger in a friendly gesture said this is a biosphere reserved woods the flora, fauna, animals, birds, insects are reserved in an echo system. There men never lift a fallen tree, it is totally left to dump for the natural habitat of flies. He says they don't clean the jungle

and salvage the timbers. The perennial streams always provide water to the dry, moist and semi evergreen Sal forests and rivers like Khairi, Deo, Pansia, Palpala, etc. of Similipal. Though, as a ranger he has been in the jungle for long 20 years but has never seen an R.B.T except once but hears the roars and collects the pug marks for counting.

It was 11 in the morning, bright complete sunshine in the moor but in the jungle darkness and cold, only in a few places the ray falls like cinema projectors and the rays pierce through the dense woods and touches the ground in a straight line. The splashing of Barehipani waterfall the gurgling of streams are all an exceptional example of scenic beauty as if seems a heaven's garden. Those few nights, everything seemed full of significance and of a secret attractive meaning even the sal jungle was attiring itself in rime and seemed to be expanding before my very eyes.

Khairi, almost 6 feet and weighs two quintals with yellow and black stripe skin, brought



up by Late Padmashree, Sarojraj Choudharry when she was of some days, near a riverbed lying almost dead. Her relationship with Choudharry is a legacy. Khairi has a special appearance in the heart of Indians. Khairi was the centre of attraction of world wide tourists. She was a beautiful example of R.B.T. Her physical appearance was tremendous, walking purposeful and many more. Interestingly, Mr Choudharry had to share his bed with Khairi, and her friends a bear, a huge python and a dog.

In a sorrow plight, the Khairi Project came to an end. It is heard; she suffered from deadly rabies and died, but Choudharry in grief ! After a few years.

Gyanchand Mallick is a reporter in a Oriya Daily. Resides in Badagada Brit Colony, Bhubaneswar.

Rojalin Mohanty, the Odissi Dancer attending the Indo-Japan cultural function to facilitate bilateral understanding and co-operation.

Global Warming and Hazardous Eastern Coastal Belt

Dr Prafulla K. Mohanty

Dr Sanjaya Narayan Otta

Greenhouse Effect

The atmospheric cover around the earth acts like a window glass pane. It allows most of the solar radiation to enter right up to the earth's surface, but does not allow a substantial amount of long wave radiation emitted by the earth to escape into space. The out going long wave infrared radiation is absorbed by the greenhouse gases normally present in the atmosphere. The atmosphere radiates part of this energy back to the earth. This downward flux of radiation, called greenhouse flux, keeps the earth warm. Thus, the atmospheric greenhouse gases forming a blanket over the earth, control the escape of heat from the earth's surface to outer surface (Fig.1) so as to keep it warm and hospitable. This phenomenon is referred to as greenhouse effect. The name is derived from the fact that inside a glass enclosed greenhouse, temperature is warmer than outside. Such greenhouses are used for growing plants that require higher temperature for growth. The mean annual temperature of the earth is about +15°C. However, in the absence of greenhouse gases in atmosphere, the earth's mean temperature would drop sharply to about -20°C. This capacity of the atmosphere to keep the earth warm depends upon the concentrations of greenhouse gases. The excessive increase in concentrations of these gases in the atmosphere would retain more and

more of the infrared radiation, resulting in enhanced greenhouse effect. The consequent increase in the global mean temperature is referred to as "global warming". The intergovernmental panel on climate change (IPCC) periodically assess the atmospheric abundance of greenhouse gases and its possible impact on climate and related issues (Hardin, 1968; Edwards, 1969; Moncrief, 1970; Odum, 1970; Woodwell, 1970 and 1978; Toon and Pollack, 1980).

Green House Gases

The main natural greenhouse gases are water vapour, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur dioxide (SO₂), ozone (O₃) and chlorofluorocarbons (CFCs). Carbon dioxide is the most abundant greenhouse gas in the atmosphere. This has been largely the result of fossil fuel burning, deforestation and change in land use. The largest sources of methane in the atmosphere are natural wet lands, rice paddies and livestock. Drilling, venting, biomass burning and coal mining also release methane. Nitrous oxide is released by the oceans, forest fire, burning of grass land and natural oil and by bio-decomposition of nitrogenous fertilisers. Large quantity of sulphur dioxide is produced during smelting of metals such as iron, copper, lead, zinc and nickel. Burning of

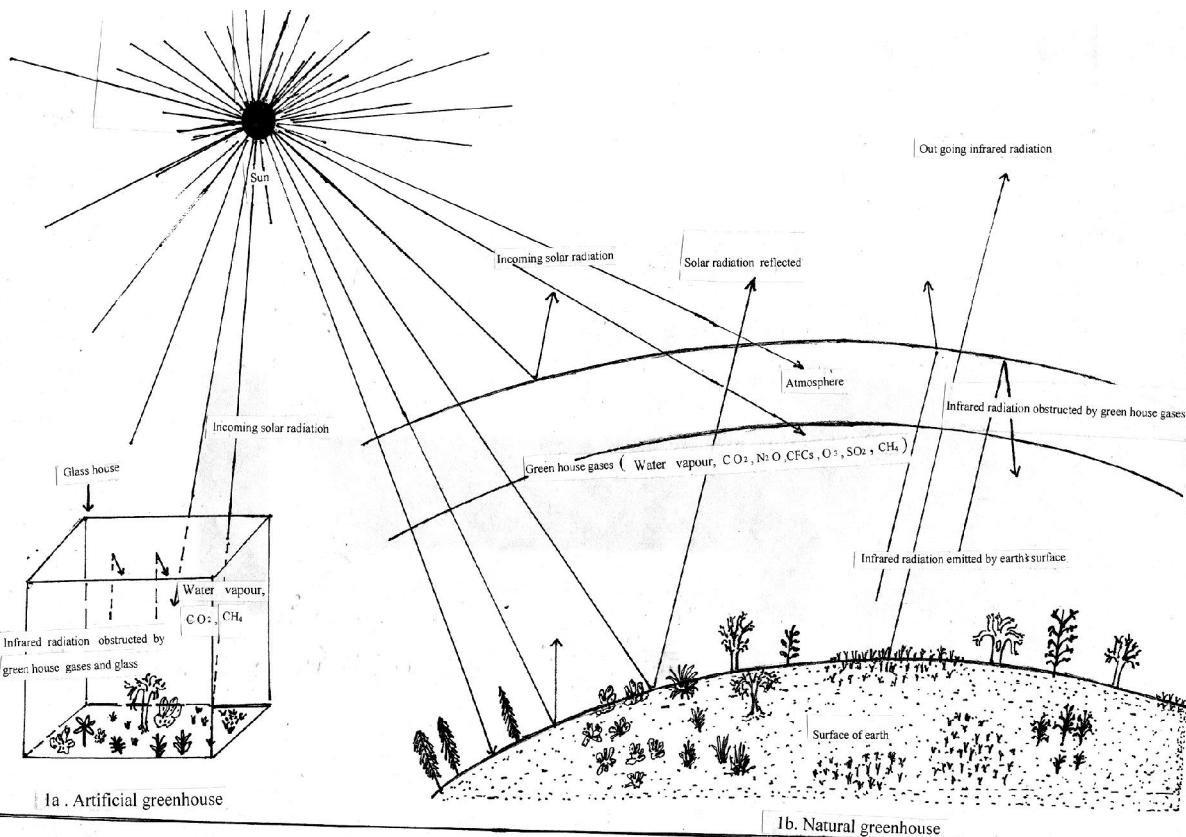


Fig. 1. The greenhouse effect : a. Artificial greenhouse b. Natural greenhouse.

fossil fuels also produces sulphur dioxide. The concentration of ozone in the atmosphere increases due to the formation of photochemical smog. Such pollutants are formed in solar radiations. Major sources of CFCs are leaking air conditioners, refrigeration units and propellants in aerosol spray cans. Other sources are jet plane emissions which contains chlorofluorocarbons.

Global Warming

The consequent of increased concentration of carbon dioxide and other green house gases, the temperature of earth has risen by 2.5°C since the industrial revolution, 1°C in the last 50 years and 0.3°C every ten years from now (Edward,1994). The rise in atmospheric temperature has been confirmed by Inter-governmental panel on climate change (IPCC).

The average atmospheric temperature of 1997 is higher by 0.43°C over the average from 1960 onwards. It is also estimated by the climatologists that the earth surface will warm by about another 3.5° over the next century if emissions of greenhouse gases are not reduced. This rise in atmospheric temperature is not uniform. It is slight in tropics, moderate in middle latitudes and maximum in polar regions (World climate programme or WCP, 1988). Already 2^o-4^oC rise in temperature of Alaska Permafrost has been recorded.

Effect of Greenhouse Gases

The increasing abundance of greenhouse gases in the atmosphere is responsible for the changes in global climate. Due to global warming various changes on the earth are noticed. Ice free



Fig. 2. Noticeable change in sea ice of the Me Clure strait in the Canadian Arctic Archipelago (ESA,2007)

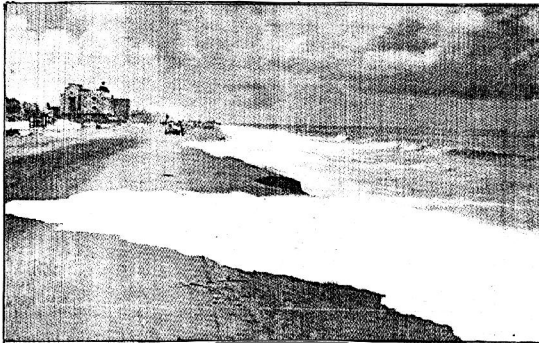


Fig.3. Sea water flows over public road of Puri coastal belt



Fig.4. Damaged public road of Puri coastal belt

season has increased by three weeks. There will be melting of glaciers and ice caps causing unprecedented floods, soil erosion, destruction of crops, property and lives. Greenland ice has melted between 20-100cm during 1993-98 (NASA) and sea ice has shrunk in the Arctic to its lowest level since satellite measurements began 30 years ago (European Space Agency or ESA, 2007) and present images show "fully navigable" route between the Atlantic and the Pacific (Fig.2) due to which major shifts are noticed in rainfall and climatic zones . The possible results are wiping

off of middle latitude forests, drying up of several lakes and increased coastal upwelling. Already the sea level has risen by 15cm in the past century. If the trend continues, there is a danger of submersion of large land areas of earth.

Present disturbance of sea at coastal belts of different districts of Orissa such as Ganjam, Puri (Figs.3&4), Jagatsinghpur and Kendrapara is believed to be the consequence of global warming. Frequently sea water inundates beach and overflows over public roads, private and government buildings which are located near the beach. Human life, huge properties and crop fields are at danger due to disturbed sea water. So measures should be taken by the government of every country to control the alarming situation.

Suggestive Measures for Global Warming :

It is realised that the global warming has significant impact on animal, plant, human life, property, agricultural productivity, fisheries, forestry etc. which would affect the economies of the countries. The main culprit of the increased global warming is higher amount of green house gases. In order to mitigate the concentration of different greenhouse gases to cope with global warming, the following strategies need to be adopted.

- (1) The greenhouse gas emissions need to be reduced by limiting the use of fossils fuels such as petrol and diesel etc.
- (2) The alternative renewable sources of energy namely solar energy, wind energy, ocean thermal power energy, ocean wave and tidal power energy, geothermal energy and bio-energy need to be harnessed and utilised in place of fossil fuels.
- (3) The vegetation cover, particularly the forests need to be enhanced for greater photosynthetic utilization of CO₂.

- (4) The use of nitrogen fertilizers in agriculture need to be minimised or stopped for reducing N₂O emissions.
- (5) The substitutes of Chlorofluorocarbons must be developed and used as coolants or refrigerants.
- (6) The use of hanky spray perfumes needs to be stopped very strictly by the public.
- (7) Afforestation in the entire coastal belt needs to be strengthened to protect human life, public properties and soil erosion.
- (8) People's awareness and participation is required to check air pollution by keeping themselves refrained from the use of the substance which ensures emission of greenhouse gases.

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Dr Prafulla K. Mohanty is working in P.G. Department of Zoology, Utkal University, Vani Vihar, Bhubaneswar - 751 004 (Orissa). E-mail - prafulla.mohanty @ yahoo.co.in

Dr Sanjaya Narayan Otta is working in Department of Zoology, Biju Pattnaik College of Science and Education, Jayadev Vihar, Bhubaneswar - 751013 (Orissa).



Hon'ble Chief Minister Shri Naveen Patnaik inaugurating the Platinum Jubilee Gallery and Library at State Museum on 29.12.2007. Shri Surjya Narayana Patro, Minister, Energy, Information Technology, Culture and Shri Gopinath Mohanty, Commissioner-cum-Secretary, Culture, Information & Public Relations are also present.

Gopinath Temple at Kakudia

Ratnakar Mohapatra

The temple of Gopinath is situated at the village Kakudia, which is exactly located near the road from Pipli to Jatani on the right bank of the river Daya in Puri district. This dilapidated temple is a magnificent specimen of the Ganga art of Orissa.¹ The temple complex originally consisted of two structures such as Vimana and the Jagamohana. Though the Vimana or main Deula is available, its front Jagamohana seems to have collapsed long ago and it has gone out of existence.² The temple is made of sandstones locally called as Baulamala Patharas. It faces to east.

Architectural Features of Temple :

Vimana :

The Vimana or the main Deula of the temple is a Pancharatha Rekha Deula and its height is about 55 feet from the surface of the temple complex. The temple rises over a low basement of 1 feet in height and it is pancharatha in plan. Particularly interesting is the manner in which the nisha shrines from the part of the temple walls, rather than being constructed in front of the Parsvadevata niches, so that they appear as projecting porticos with four ornately carved pillars supporting a *pidha* roof, possibly the only free standing pillars in eastern Orissa to be decorated as pillars rather than pilaster or *pagas*. The Vimana has four vertical divisions such as *pistha*, *bada*, *gandi* and *mastaka*.

The *pistas* of the deula measures approximately 36 inches high, rests on a plain Upana. The walls of the *pista* are decorated with a *pabhaga* of three ornately carved mouldings, a *jangha* with *khakhara* mundis flanked by *alasa kanyas* and spaced virala or jagrata motifs with each (motif) appearing suspended in front of diamond shaped perforations (*banka jail*) and a *baranda* of two mouldings separated by the recess filled with jail perforations. The niches of the *mundis* house *sakshadanai* motifs or images of single seated figure. All the decorative elements are slightly eroded by nature. Makara mouth shaped gargoyles are fixed to vacate the excess water from the interior of the sanctum on the both northern and southern sides central niches of the *pistha*.

The *bada* of the *vimana* is *panchanga* type i.e. having five fold divisions such as *pabhaga*, *tala jangha*, *bandhana*, *upper jangha* and *baranda*. The base of the *bada* on the top of *pistha* measures approximately 15 feet 6 inches square with the porticos projecting out an additional 6 feet.³ The *bada* has an abbreviated Saptaratha plan with *pagas* of varying width. The thin *anuraha* is squeezed between the *anuratha* and projecting *raha* porches and is not fully developed. The *pabhaga* also consists of the conventional mouldings of *khura*, *kumbha*,

patta, kani and *basanta*. The lower mouldings of *pabhaga* are decorated with a horizontal ridge on the *kumbha* and a *kirita* design on the centre facet of the *khura*. The upper three mouldings of the *pabhaga* are finely relieved with scroll works, creepers, flowers motifs and perforated jail works. The *jangha* is divided into two stories by a series of five horizontal mouldings, which joined together by a vertical band of scroll work at the centre of each *paga*. Each story of the *jangha* is 34 inches in height.⁴ The *pagas* are multi-faceted with a *mundi* carved on the centre facet. The *mundis* of the lower story are crowned by large Vajra Mastaka motifs, rather than Khakhara *Mundis*. In some cases these motifs are flanked by hamsas (gees) rather than atlantid *gana* figures as standard on earlier temples. The niches of the *kanika paga* of *tala jangha* are relieved with *pidha mundis* on which the Dikpalas are housed with their respective mounts and directins. The other niches of the *anuratha* and *pariratha pagas* are filled with *alaskanyas*. They generally assume a relaxed pose under a meandering creeper and sometimes are provided a diminutive attendant. Among the more popular poses are those with one or both arms uplifted above the head and one leg partially lifted and placed against the creeper for balance. There are only a few of these images surviving in the *anuraha* recesses of the upper *jangha* and they are badly damaged. The *anuraha* recesses between the *raha* and *anuratha paga* are relieved with the *virala* motifs on the lower *jangha* and the *alaskanyas* motifs on the upper *jangha* in conventional design but the recesses next to the *pariratha* are filled with scroll works or geometric patterns. The upper *jangha* *kanika* niches are housed with the consorts of Dikpalas with their respective mounts and directions. The presence of Dikpalas with their female consorts, a main feature indicating its contemporarily with other Ganga temples of Orissa.⁵

Projecting Porticos :

A notable feature of this temple is the provision for porticos in front of the niches for the *parsvadevata*. The *raha pagas* are designed as projecting porticos with four pillars supporting a roof, the back set of pillars engaged into the walls as a frame for the *parsvadevata* niche. The pillars rest on a low *pistha*, placed on top of the main *pistha* supporting the temple, which approximates the height of the *khura* moulding of the *pabhaga*. R.P. Mohapatra has referred that the projecting porticos supported by four pillars in front of the *parsvadevatas* rather than small shrines standard on most temples at that times.⁶ The pillars have a *pabhaga* of five mouldings at the base, 26½ inches high, which extend up to the top of the *pabhaga* of the walls. The base of the pillar is 17½ inches square while the shaft, *triratha* in design, is 16 inches square with the centre facet on each side.⁷ It is relieved with scroll works and the off sets with Vanalata. Near the top of the shaft is a projecting *kirtimukha* masks dripping festoons of pearls. The capital consists of a cushion of two horizontal mouldings crowned by a splayed *pheni* and multi-faceted *basanta*. On the two insides of the free standing pillars and the front of the engaged pillars flanking the *parsvadevata* niche, is a projecting panel filled with an atlantid on the cushion of the capital and a large lotus rosette above. The *bhara rakshakas* or atlantid *ganasi* carved on the pillar capitals are all quite similar and assume a bent-knee pose, simulating running, with one leg pointed down and the other up. The ceiling of each porch is decorated with a lotus medallion with two rings of radiating lotus petals. The roof of these porticos, presumably of *pidha* design, has not survived except for the lintel and fragments of *pidha* mouldings at the back which are engaged into the wall. The *parsvadevata* niche is framed by two recessed bands of scroll work and a lintel above

with Gaja-Lakshmi enshrined in the *dvara-lalata bimba* panel. Over the lintel is an architrave decorated with a frieze of elephants. The *pabhaga* beneath the niche consists of a *khakhara mundi* flanked by a *naga-nagini stambha* on each side.

Parsvadevatas :

According to the opinions of the local people, all the original Parsvadevatas of the temple were stolen by miscreants. Recently, the new Parsvadevata images have been installed for the worship of the devotees. The images of Varaha, Narasimha and Trivikrama (Vamana) are being worshipped as the side deities of the Gopinatha temple. The four-armed image of Varaha has been installed on the southern side central niche as the Parsvadevata of the main presiding deity. His four hands display *sankha, chakra, gada* and *padma*. An image of Prithvi is depicted on the upraised right arm of the deity. The image of Narasimha has been installed on the western side central niche of the *bada*. His upper two hands display conch and disc and the other two lower hands are taking out the entrails of Hiranya Kashyapa, the demon king. The two handed image of Vamana has been installed on the northern side central niche of the *bada*. His left hand displays holding an umbrella (parasol) on his head and the right and holds a mace or gada. He is depicted as the standing posture on the double petalled lotus pedestal. All the Parsvadevata niches are richly relieved with scroll works, flower medallions, a frieze of elephants and creepers etc.

The *baranda* of the *bada* consists of eleven horizontal mouldings which partake of the *paga* divisions. The top moulding is exquisitely decorated with the animal (elephants) processions. The sculptural embellishments of the *bada* and female figures in graceful poses, are

characterised by the exuberance and profusion so characteristic of the Ganga epoch.⁸

On the front facade, due to the greater width of the entrance portal, measuring 7 feet 6 inches, the *bada* has a *pancha ratha* plan though only the lateral flanks of the *anuratha* are decorated with mundi, designs as the front of the *paga* is obfuscated by the projecting entrance.

The curvilinear superstructure is surmounted on the *gandi* of the *vimana*. It is a *pancha-ratha rekha sikhara* which displays five pagas or pilasters to outwards. At the base of the *gandi* is a cluster of *angasikharas*, one above the outside *anuraha* recess as well as each paga, which are staggered in height as well as size and recall the experimental programs of early of 11th century temples including the Rajarani.⁹ With their multiple facets the *angasikharas* are like wise rounded, projecting like turrets and replace the barandis rather than overlaying them and being contained within the *paga* outlines. The *angasikhara* on the *kanika paga* extends up three *bhumi* divisions terminates at the 2nd *bhumi*. There is a second *angasikhara* on the *anuratha* above the eliminated *pariratha*, which extends up to the middle of the fourth *bhumi*. At the base of the *raha*, above the portico roof, there is an alignment of three *angasikharas* with centre one slightly larger. Above this is a larger *angasikhara*, flattened with a Gaja-kranta projecting out from its base. On the front *facade*, above the entrance, this projecting Gaja kranta is placed above this *angasikhara* so that it appears higher up on the *gandi* in standard fashion. The *gandi* above these *angasikharas* at the base is Pancha-ratha in plan, the thin *pariratha* being eliminated, with the Kanika disposed on two, planes, the corner rounded and projecting as on the Lingaraja temple.¹⁰ The Kanika paga is divided into ten *bhumis* above its *angasikhara* by *bhumi amalas* with each *bhumi*

having five *barandis*. The *barandis* are devoid of decorations except for their multi-facets on the projecting corner. The *anuratha paga* consists of superimposed flat *barandis* extending the height of the *gandi* with a plain band running vertically up the centre. The *raha* above the Gaja kranta is decorated similarly but with three vertical bands. The *bisama* partakes for the *paga* divisions but it is otherwise devoid of ornamentation. Dopicchha lions have been projected in the *beki* above the *kanika pagas*. The four armed male deities are seated in *padmasana* above the *rahas*. The placement of four armed deities rather than Garuda as standard on most Vaishnava temples, it suggests that the temple may originally have been dedicated to Siva.¹¹

The *mastaka* of the *vimana* consists of *beki*, *amalaka sila*, *khapuri*, *kalasa*, *ayudha* (*chakra*) and *dhvaja*.

The sanctum preserves the image of Gopinatha as the presiding deity of the temple. The image in the sanctum is a modern work. According to the opinions of the local aged people, the original image of Gopala was stolen sometime back and placed in a temple near Sakhi-Gopala.¹² In its place brass idols of Radha and Krishna are being worshipped. The height of the deities are approximately 2½ feet.

The sanctum has one doorway towards the east. The decoration of the doorframe is partially intact with the *dvarapalas* being housed in Vajramundis at the base of the jambs. The *dvarapalas* are badly mutilated, only the head of the terrifying guard intact, though enough remains to suggest they are in a relaxed pose with one arm crossed in front of the body resting on their weapon as on the Sun temple of Konark. It is not possible to identify if the weapon was a trident or mace. The three jambs above the *dvarapalas* are decorated with the standard *kutilla*, *gelbai*, perforated jail

works, flower medallions etc. The doorway lintel of the sanctum is partly broken and an image of Gaja Lakshmi is finely carved on the centre of it. The image seated in *padmasana*, and displays two full blown lotuses in hands over which the elephants seen standing to perform the *abhiseka* by pouring sacred water from the pitchers held in their tanks. The Navagrahas are finely carved on the architrave above the doorway lintel. The *graha* figures are in a row in *yogasana* pose display conventional attributes in hands. Each *graha* inserted in a niche with trefoil shaped root.

The masonry steps are provided for approach towards the sanctum. There is a Garuda pillar installed in front of the *vimana*. The figure of Garuda, the conventional mount of Vishnu indicates that the temple was dedicated to Vaishnavite deity i.e. Gopinatha.

The sculptures of the temple are mostly damaged and the *gandi* of the temple shows cracks. But whatever remains shows the love of the artist for details and minute decoration. There is no any boundary wall around the temple complex.

Date of the Temple

Most of the scholars of art history accept that the Gopinath temple of Kakudia was constructed during the Ganga period of Orissa history. Prof. K.S. Behera has referred that the temple of Gopinath can be assigned to the 13th century, perhaps a little earlier than the Konark temple.¹³ R.P. Mohapatra has mentioned that the consistency of decorative programme characteristics of temples constructed during the Ganga period when final florescences of architectural activity achieved a landmark in Orissa.¹⁴ Prof. T.E. Donaldson has referred that the temple is dated to the second-half of the 13th century A.D.¹⁵ On the basis of architectural features, the construction period of the temple can

be tentatively assigned to the 13th century A.D. Probably it was built by the Ganga ruler of Orissa. The temple has been declared protected monument by the Department of Orissa State Archaeology.

Conclusion :

Thus, it is known from the above discussion that the temple of Gopinath is one of the best specimen of the Kalinga School of Art. This temple is noted for its elaborate scroll works exemplify high quality of craftsmanship. From the cultural point of view, the temple has not been so important but from the architectural point of view, it is one of the standard temples of the Ganga period in Orissa history.

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7. T.E. Donaldson, Op Cit, p. 644.
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Ratnakar Mohapatra is an Junior Research Fellow (ICHR), Sambalpur University, Sambalpur.



Shri Debasis Nayak, Minister, Information & Public Relations, Sports and Youth Services reviewing the progress of Spots Infrastructures in a high level meeting on 28.12.2007.

Rise and Fall of Buddhism on Daya Basin

Dr. Saroj Kumar Panda

River Daya which originates from the river Kuakhai at Balakati near Hirapur (famous for Chausathi Yogini temple) has a south western course of about 45 miles. It flows through Uttara, Dhauli, Kakudia, Aragarh, Beguniapara, Pandiakera, Balabhadrapur and finally discharges into Chilika lake.¹ On its course, Daya is joined by the Bhargavi river, the Gangua Nalla, the Malaguni river, the Luna river and many smaller drainages from Khurda sub-division.² Two important Buddhist vestige, whose traces are found today on the Daya basin is highlighted in this paper.

Buddhism in Orissa flourished during the early Christian era independent of the Kusan patronage. In fact, till the coming of the Bhaumakar dynasty in the 8th century A.D., notable Buddhist rulers were not known to have thrived here more on popular support than on any court patronage. Magnificent monasteries adorned with superb images of Buddha and Bodhisattvas developed in course of time in various parts of this territory. Those areas became the centres of religious life of the people for many centuries. It was in these monasteries that people thronged on many occasions to worship the images and uttered unnumbered prayers before them. These monasteries were the seats of culture and education in the country. Erudite scholars and

teachers used to impart here both religious and secular instructions to people. These teachers were greatly loved and respected by the simple country folk for the blessed hopes they gave to their afflicted hearts. In course of time some of these monasteries grew up into famous university centres. As torch bearer of the Buddhist culture these centres attracted pupils and scholars from far and wide.³

The development of Mahayan Buddhism in Orissa may be studied through the historical growth of these monastic institutions and through the activities of the sages and philosophers of this religion. The Nagarjuni Konda inscription engraved during 14th year of the Mahariputa Virapurasadatta, testifies to the development of some Hinayanic strongholds at Tosali, Palura, Hirumu, Papila and Puspagiri by 3rd century A.D. Besides this, great Mahayanic institutions soon raised their heads at Bhora Saila, Tamralipti, Chelli-ta-lo, Viraja, Ratnagiri and many other places.⁴

Bhora Saila :

A very famous Buddhist monastery that developed by the 4th and 5th century A.D. in Orissa was at Bhora Saila which was the abode of the famous dialectician Dignaga. Dignaga, the disciple of Vasuvandhu was once invited to take the chair of chancellorship in the University of

Nalanda. During his short period of stay at Nalanda, he expounded several *sutras* and composed some logical and dialectical *sastras*. But very soon he had to come back to the sylvan retreat Orissa - the famous Bhorasaila - where he set himself to the task of edifying the Buddhist epistemology. It was here that Dignaga built the superstructure of Buddhist logic. On the foundation of Vijnanavada metaphysics, laid down by Asanga and Vasuvandhu, Dignaga completed his great work 'Pramana Samuchaya'. This work revolutionised the Indian thought in the contemporary period. It was also in this monastery that the Sankhya philosopher Iswarkrishna defied Dignaga and was decisively defeated by the later in a series of metaphysical combats. Acharya Dignaga is ever remembered in the cultural tradition of Orissa. The village Delang in Puri district is named after him as it was associated with his missionary activities.⁵

From Delang upto the vicinity of Bhubaneswar there is found a group of low hills, the notable among which are known as the Vindhswari, Saanla, Paanra, Bani Vakreswar, Jamuna Jhadapada, Aragarh and the Dhauli. All these hills are honeycombed with caves. A large number of Buddhist monks resided in those hills upto the late medieval period.⁶

Bhorasaila can be identified with Bindheswari hill, presently better known as Biswanath hill.⁷ One can find the images of Kshetrapal, Astika, Jagatkaru, Haraparvati and a few other broken sculptures in the shrine of Devi Bindheswari on the hill top behind the main temple of Biswanath. There is a small rock cut cave, sufficient to hold a man, still existent on the north side of the hill. A large piece of rock is lying near it which indicates the pre existence of the main cave, whose roof has later collapsed. A large rock cut sculpture of Varaha Vishnu at the foot of the hill also commemorates this hill as the 'Bhora-Saila' of Buddhist fame.⁸

Aragarh :

Aragarh otherwise known as Airagarh is situated north of the river Daya in Haripur Gram Panchayat of Delang Block. The Aragarh hill is 256 feet high from ground level, and stretches over 3 K.Ms. from east to west.⁹ On its top (eastern side) there stands a two storied, flat roofed Buddhist Chaitya (temple). The backside of the Chaitya has been closed by a masonry wall, two sides fitted with grilled stoned windows measuring 21" X 20". The front remains wide open for entry into the inner chamber. Its four pillars are carved with *nagakanyas* and *gajasimha* motifs. In the upper chamber, Buddhist icons were worshipped. The ground floor was for mendicants. They practised yoga and lived there.

A Kunda (54" X 50" X 42") carved out of muguni rock is found 4 feet west of this Chaitya. A broken Buddhist icon of 42" X 21" is also found in this place. Another broken icon of 2 feet X 2 feet, made of igneous rock is lying south of this Chaitya. As many Buddhist icons are found here and there on the hill top of Aragarh, it confirms this place as a great stronghold of Buddhism.¹⁰ The site and images of Aragarh dates back to 10th or 11th century A.D.¹¹

Buddhist monuments of Haripur :

During the year 1954, four remarkable Buddhist icons of Vajrayana faith were recovered from the paddy field of Aragarh village. The villagers of Haripur removed them to their Bhagavataghara for worship. These images measuring 2 feet in height are excellently carved with characteristic features of the Somavansi period.¹² Five stupas were also collected from the same place and preserved in the same village.

The description of the figures are as follows :

First Figure :

The first figure of the group is three headed and six armed. The three hands of right side display arrow, sword and thunder bolt. The hands on the left side represent bell, shield and a mudra. The lotus pedestal is flanked by *gajasimha* motifs. A devotee in kneeling position is found below the lotus pedestal. The top most part of the slab contains a Dhyani Buddha and garland bearing *apsaras*. It can be identified with Manjusri and worshipped as Kamadeva of Hindu religion.¹³

Second Figure :

The Second figure characterizes with three hands, six arms, a third eye on the forehead and a Dhyani Buddha Statue at the top. The three hands on the right side display thunder bolt, rosary and spouted vessel. One of the left hands is broken. The other two hands hold a lotus across the chest. The lotus pedestal is supported by *gajasimha* figure. Below the pedestal are seen a heap of offerings, kneeling devotees and a hero in full battle order. Two flying *apsaras* holding garlands in their hands are honoring on the arial region. This image is known as 'Abalokitasvara'. It is also regarded as the God of heroic people.¹⁴

Third Figure :

The third image carved seated crossed-legged on a multi pillar lotus pedestal has four hands, of which the right two display Vajra and fruit like object. The left hands placed over the left lap. On the other side of the lotus pedestal are found *gajalaxmi* figures. The *prabhagamandala* behind the head is flanked by flying *apsaras* holding wreathes in hands. The pedestal, like other figures contain kneeling devotees and heaps of offerings. This image is known as 'Baudhahara' and worshipped as destroyer of ignorance and source of knowledge.¹⁵

Fourth Figure :

The fourth and last figure of this group is carved seated in a lotus pedestal with a well decorated *torana* in the background. Of his two hands, right one is placed over the thigh and the left display Varada mudra. Among other decorations, one can notice flying *apsaras* with garlands, *jatamukta* over the head, *upavita* on various parts of the body and devotees amidst heaps of offerings. The lotus pedestal as usual is supported by *gajasimha* figure on either side. This statue is identified as 'Buddha' and worshipped as God who is omnipresent.¹⁶

Among the five stupas recovered so far, four are circular made of hard stone. Each of these pillars consist of five folds, narrowing gradually from bottom to top. The seventh pillar has seven folds and that also narrowed down from bottom towards top.¹⁷

Hinayanism and Mahayanism prevailed side by side in Orissa, though the later had predominance over the former. During the 7th and 8th century A.D. tantric Buddhism emerged as a dominant force in Orissa.¹⁸ Tantrism also claims the status of the fifth Veda among the ancient religious literature of the Hindus. The philosophy of tantrism in both cases of Hinduism and Buddhism is almost the same as also their mystic practices to achieve the ultimate goal of absolute non-duality. Orissa was one of the main centres of Saiva, Sakta and Buddhism tantrism in the medieval period between the 7th and 11th century A.D.¹⁹

In the political front, with the ascendancy of the Bhaumakaras, the Mahayan Buddhism came into prominence in Orissa. In the middle of the 10th century A.D., the central authority passed away from the hands of the Bhaumakara dynasty to those of the Somavamsies. As the Somavamsi rulers were leaning towards Brahminism, Buddhism received a setback. The rulers spread

Saivism in cost of Buddhism. The Gangas who came in quick succession also adhered to Brahminism. If any credence is to be given to traditions, then it has to be believed that Buddhism were prosecuted during their rule.²⁰

The decline of Buddhist monasteries on Daya basin during Ganga period is known from the following description of Madalapanji :

“Madan Mahadev, the Ganga king of Orissa who ruled for 15 years during 12th century A.D. had established his capital at Sahajapari Grama (now under Delang P.S.). Once he along with his queen decided to arrange a Test between the Brahmins and the Bauddhas to prove superiority of any one religion. The test was conducted in the royal court. Without the knowledge of both the sect, a snake was kept inside an empty earthen pitcher. Then the pot was covered and placed before them. At first the Bauddhas were asked about the matter inside the earthen pitcher. They replied ‘snake’ in it. Then the Brahmins were asked the same question. They replied ‘ashes’ inside the pot. When the pitcher was opened, ashes were found within it. In fact, the Brahmins through *tantra* converted the snake into ashes. The Buddhists were defeated in this competition. The importance and dominance of Brahmins continued.²¹

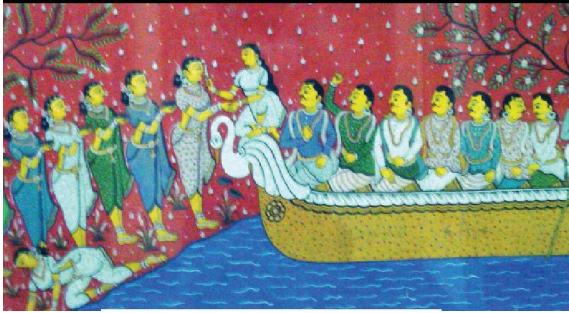
On fatigue, many Bauddhas jumped into river Daya to end their lives. Some others left the monasteries for ever in fear of behead by the king.²² By the way, the Buddhist stronghold over Bhorasaila and Aragarh declined. But the dying flame of the faith lingered in Orissa for several centuries more, that is, at least till the 16th Century A.D.²³

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Dr. Saroj Kumar Panda is the Principal in the Gadibrahma College, Delang, Puri.



TAPOI TRADITION IN PATTI PAINTING

Orissan sea coast was the Indian gateway for overseas expansion to South East Asian countries from early time to late medieval period. Successive waves of cultural and trade traits went through the various port towns of the sea coast. The influences are now discernible in the traditions, place names, literature and architecture of South East Asia. The people of Kalinga were the pioneers of Indian colonization in Indian archipelago. The Bay of Bengal was called Kalinga sea in the past. The Bay was known to have been dominated by Kalingan ships. The Arjya Manjushri Mulakalpa mentions that the islands in the bay of Bengal were known as Kalinga *dresu*. This testimony is also amply corroborated by the early Greek geographers who have mentioned about three Kalingas such as 1. Prachi Kalinga, 2. Gangaridae Kalinga and 3. Maga Kalinga. Pliny who flourished in the 1st century A.D. writes that Prachi Kalinga extends from Godavari to Subarnarekha river on the sea coast. Madhya or Gangaridae Kalinga from Subarnarekha to mouth of Ganga river and Maga Kalinga spreads over the South east Asian countries such as Burma, Indochina and Indonesia. According to Megasthenes (3rd century B.C.) the length of Kalinga coast was 700 miles spreading over the Prachi and Gangaridae Kalinga. Apparently the Maga Kalinga was the colonial empire of Kalingan people. At that time 'Parthali' was the capital of Kalinga as described by Megasthenes. However Ptolemy refers to

State Museum and Maritime Heritage of Orissa

Dr. C. B. Patel

Tosali as the Capital. Tosali is found mention in the Asokan edict of Dhauli. At Sisupalgarh near Dhauli the remains of the ancient capital city of Kalinga has been brought to light. Coins and pottery of foreign make have been recovered from excavations. The 'Parthali' of Magasthenes is identical with 'Tosali' of Ptolemy. The other name of Ekamra Kshetras, Bhubaneswar 'Prastari' is seemed to have been derived from its laterite (Makada Pathar) stone quarry. In Pali language 'Ra' takes the form of 'La' so the Greek writers have written Prastari as Parthali. From the discussion it is clear that Kalingan empire extended from Ganga in the north up to Gomati Ganga (Godavari) in the South with its capital at Bhubaneswar having a farflung colonial empire in South-east Asia.

Orissa State Museum

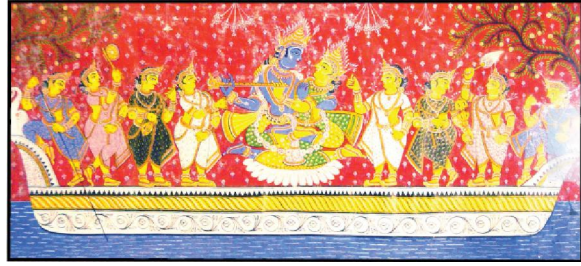
Over the years, with a humble beginning, State Museum has grown into a multipurpose institution of ancient heritage. More than 56,000 rare antiquities including maritime artifacts ranging in date from ancient time to contemporary period have been displayed. State Museum, Orissa is an institute of inestimable international efflorescence. Spread on the lap of a medieval fortification near Kalpana square, this premier Cultural and Historical organisation is the epitome of Orissan civilization through ages. Its magnificent majestic manifestation is marvellous like that of its humble inception. Being the prolific product of the global

trend of museum movement of modern period, it was the brain child of a host of historians and connoisseurs like Sri William Jones, Prof. Ghanashyam Das, Prof. N. C. Benerjee, Dr. H. K. Mahtab, Kedarnath Mohapatra, N. K. Sahoo, K. C. Panigrahi, P. Acharya and B. V. Nath.

Archaeology Gallery

Archaeology Gallery of museum is famous for rare sculptures of Buddhist, Jaina, Saiva, Vaisnava and Sakta pantheon. The exhibits spread over three spacious halls, in the ground floor. The subject matters cover a long time span of 3000 years representing the flourishing plastic, artistic, sculptural and architectural trends and traditions of Orissa. The fragmentary Asokan pillar, bell capital, lion, the Buddha, Amoghasiddhi, Jaina Tirthankaras, Krishnavishnu, Kaliyadalana, Tantric figures of Chamunda, Manasa and six-headed Kartikeya images etc. attract the tourist from far and near for their superb workmanship and philosophical symbolism. In fact, archaeology gallery is the repository of sculptural grandeur of Orissa. Two ancient stepped wells of the museum complex are fabulous and thrilling sights. Transportation of elephants in a ship noticed in one of the beautiful sculptures of Orissa State Museum has been preserved in the Archaeology Gallery. This not only indicates the great maritime traditions of ancient Kalinga but also reflects the exportation of elephant to the far away countries. The panel is dated to circa 9th/10th century A.D. Ancient Orissa was famous for good variety of war elephants for which Orissan kings were called Gajapatis. The transportation of elephant in ship speaks of the volume of the ship and ship making technique and the maritime activity. The big iron anchors now found in the gallery testify to this glorious maritime tradition.

In the Archaeology Section we find various types of Roman pottery, Mediterranean pottery, Chinese celadon ware, Roman amphora, broken



terra-cottas, beads and bangle pieces etc. which were associated with maritime tradition of our State. Roman bulae and various coins associated with foreign trade are some of the prize collections of State Museum.

Art and Craft

In Art and Craft Section bewildering variety of Orissan handicrafts of exuberant artistic excellence find place together with bronzes from 8th century A.D. The royal insignia and sceptre of princely states of the gallery are effluent exhibits. The bell metal, docra art works and other folk art items of the gallery are unique. The ship design made up of horn in the Art and Craft Section highlights the glorious maritime activities of ancient Kalinga and its ship building technology of the past. The ship designs are also found in the filigree works of this section. In the medium of bronze also we find ship and boat designs along with other items of export to south-east-Asia like lamps, beetle, beetle nut cutters, ornament boxes and coin boxes etc. in various shapes and designs.

Palmleaf Manuscripts

Palmleaf manuscripts comprise twenty seven sections like Veda, Tantra, Darsana, Silpa Sastra, Abhidhana and Ayurveda etc. Palmleaf, bamboo leaf, handmade paper, old paper, manuscripts of ivory, bhurja bark and kumbhi bark etc. in various shapes like garland, fan, fish, sword, rat and parrot along with different types of stylus, express illustrated manuscripts of coloured and monochrome variety are excellently

presented. Manuscripts of Gitagovinda, Usha Harana, Ushavilasa and Chausathiratibandha (64 erotic postures) and different style of cover designs of palmleaf manuscripts are of special tourist interest. The maritime activities of ancient Kalinga are also found in some illustrated palmleaf manuscripts of Orissa State Museum. The best examples are found in the four illustrated palmleaf manuscripts. Usavilasa shows the glorious maritime traditions of ancient Kalinga in the folios of painted palmleaf. In one folio we find Radha riding boat with gopis. In another painting we notice kings making boat/ship riding with their full retinues. The paintings also show the drapery and ornamentation of the boat rider and the different artistically designed boat and ships. The most important palmleaf painting of State Museum is the sea voyage depiction of Sanghamitra and Mahendra to Simhala i.e. Ceylone in the 3rd century B.C. for propagation of Buddhism. Here we find a specially designed royal ship with flying *dhvaja*.

The Patta Paintings gallery with depiction of Ravananugraha, Tadakabadha and Kaliyadalana scenes along with contemporary paintings are connoisseur's delight. The folklore of ancient Kalinga is reflected in the Patta paintings of Orissa. The story of Sadhabas, Krishna Leela which depicted the story of Radha and Krishna are found in patta paintings of the museum. In one painting Radha and Krishna are found in amorous dalliance surrounded by *gopals* and *gopis* in a beautifully designed ship. The attires of boatmen and *gopaganas* are brilliantly discernible in the patta painting. We also find a consummate depiction of Tapoi tradition in the patta painting. The arrival of Sadhavas in boat, their reception by their wives and the plights of Tapoi has been excellently executed by the artist on the canvas.

Sadhavas of Orissa

The term Sadhava has been derived from the sanskrit word 'Sarthavaha'. Sadhavas were

rich and enterprising. Through individual effort and cooperative guilds, they were carrying out internal and external trade. Numerous legends and traditions like episode of Tapoi have grown up in Orissa about the Sadhavas and their thrilling adventures. They were famous for their sea-faring activities in the Bay of Bengal. Even they have named the Bengal sea as Kalinga sea. Sometimes, the Kings were also associated with them in trade activities. On completion of collection of commodities they were celebrating Laxmi puja on Kartika Amabasya day. Thereafter they were loading the same in the ships and starting out on trade voyage on Kartika purnima day. With the help of northern wind the ships were sailing to Java, Sumatra, Bali, Borneo, Siam, Srilanka and China. To commemorate this tradition, today we celebrate Baliyatra festival on Kartika Purnima. This fact has been mentioned by Ptolemy as well. They were carrying out their trade in the South Eastern countries till the month of Chaitra and returning to home with ships full of wealth and imported materials. On the occasion of their homecoming the festival of Pana Sankranti was known to have been celebrated in Orissa. Even now the tradition continues.

Ancient Ports of Orissa

Trade and cultural activities were known to have been carried on through the four chief port centres of Orissa, namely Chilika, Konarka, Puri and Tamralipti. Of these, Chilika was the foremost seafaring centre. Palura, profusely referred in the various literary works and foreign accounts was an important exit point to South-east Asia on the southern part of Chilika. It is now located in Ganjam district. Trade activities were known to have been carried on through this international port till medieval period. Recent archaeological survey and explorations have brought to light immense wealth of past materials testifying to the prosperity of the port towns in

bygone ages. Manik-Patna (35.5 latitude and 94.5 longitude) on the bank of Chilika was another famous port town. The recent excavations carried on under the auspices of Orissan Institute of Maritime and South-east Asian Studies has revealed the cultural connection of this site with the outside world since early period. The discovery of Roman pottery and amphora has established trade contact of Kalinga with Roman world. This fact has also been corroborated by the account of Roman historian Gibbon. The find of Chinese celadon ware confirms the trade activities of Kalinga with China. The recovery of Cylonese coin bearing the legend Srimad Sahasamalla ascribable to 11-12th century A.D. gives evidence of Orissa's association with Srilanka till late medieval period. The discovery of terracotta animal figures of Indonesian fabric points to our cultural connection with Indian Archipelago in ancient time. From the discussion it is apparent that hectic trade activities were carried on through the Chilika lake. In the Brahmanda Purana it has been referred that thousands of ships were floating in the Chilika Lake.

Konarka on the bank of Chandrabhaga was also a very famous port town. Ptolemy has referred to this in his account as Kannagar i.e. Konanagar. There was another port at Puri variously described in ancient text as Charitra, Chelitalo and Adamos. Similarly on the Kalinga sea coast Tamralipti was also a famous sea faring centre. Apart from the coastal port towns, there were some important inland port towns on the bank of Mahanadi river. Sambalpur ancient 'Sambalaka' on the bank of Manada i.e. Mahanadi was a famous trade metropolis as described by Ptolemy. The diamond mines of Sambalpur was world famous. Through river Mahanadi diamond and other semi-precious stones were exported to foreign countries.

The slightly greenish verdure of the Sambalpur diamond emulating the lustre of a sirisa

(mustard) flower was very attractive and valued precious all over the world. Tusra on the bank of Tel river was also a famous inland port town. It is located in Bolangir district of Orissa. The Tel river has been referred to in Buddhist Jataka stories as Telavala river. Trade activities were carried on through this river during rainy season. Similarly Suktimatipura i.e. modern Sakma in Bolangir district was an important metropolis. It was located on the bank of Suktimati river i.e. present Suktel river. The recent discovery of 325 silver punch marked coins (now in Orissa State Museum) on the Suktel valley corroborated this trade activities. Both imperial and local varieties of coins are found in the collection that was recovered from Lokapada 4/5 K.M. down Suktimatipura i.e. Sakma in Bolangir district. Commodities were thus collected from Kosala region through internal trade through the river routes. From Tamralipti, through Damodar Rupnarayan and Ganga rivers, trade activities were carried on through boats right up to Hastinapura. Through Brahmani, Baitarini and Salandi rivers trade transactions went on in Utkal region. The commodities of Balasore region were imported and exported through Subarnarekha river. Thus there was an organized network of internal and external trade work in ancient Kalinga.

In order to highlight the rich and glorious maritime tradition of Orissa, State Museum is planning to set up a maritime museum in a ship-shaped double storeyed building amidst the restored ancient moat complex in side the museum premises. All the maritime artifacts will be preserved and displayed in the gallery in order to attract more tourists and visitors and to disseminate our maritime heritage all over the world.

Dr. C.B. Patel is the Superintendent of Orissa State Museums, Bhubaneswar, Orissa.

Bauxite Reserve in Orissa and its Utilisation

Er. Suryanshu Choudhury

Bauxite deposits of Orissa are of diverse percentage. It is the main source of aluminium which is the second most abundant metal element in the earth crust after silica. The deposits are of lateritic type and owe their origin to in Situ chemical weathering of Khondalites and Charnockites, and more specifically Khondalites.

Bauxite is a naturally occurring, heterogeneous ore composed chiefly of aluminous oxide minerals as gibbsite ($\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$), the trihydrate, bohemite, diasporite ($\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$) and monohydrates etc. Major impurities in bauxite are iron oxide, silica, aluminium silicates and titanium oxides. Free moisture in crude bauxite as mined, may range from 5 to 30%. Other aluminium resources for future include kaolinitic clays, nepheline syenite, anorthosite and alunite. Bauxites are typically classified according to their intended commercial application: abrasive, cement, chemical, metallurgical, refractory, etc. The bulk of world bauxite production (approximately 85%) is used as feed for the manufacture of alumina via a wet chemical caustic leach method commonly known as the Bayer process. Bauxite is mainly mined for production of alumina by the Bayer's process which has remained practically unchanged since its discovery in 1888.

Occurrence :

The important deposits of bauxite are associated with the Eastern Ghat Super group of rocks which form the major component of the East Coast Bauxite deposits. The deposits are of lateritic type and owe their origin to in situ chemical weathering of khondalites and charnockites, and more specifically khondalites, the garnet-sillimanite-graphite gneisses and schists and their variants. The other deposits smaller in dimensions are residual products of lateritisation of metavolcanics as in Dholkata pahar of Keonjhar district and similipal complex.

The major bauxite deposits of Orissa occur as a very gently undulating blanket, capping the parent rocks on plateau tops in this unique bauxite province and constitute as integral part of lateritic profile, at elevations of 900m to 1400m above MSL. Bauxitisation is more pronounced in the case of Khondalites. A generalized profile of the ECB deposit is as follows:

- Soil
- Laterite
- Aluminium laterite/bauxite
- Lithomarge/kaolinite
- Unaltered khondalite

The similitaneous assemblage of rocks are equivalent of Dhanjori group and lie above the eroded surface of BIF bearing Gorumahisani group and Singhbhum granite. These rocks include ultramafics, alternating layers of metavolcanics and sedimentary quartzites, gabbro-anorthosite suite, granitic suite intruded by the Amjori sill belonging to newer dolerite suite. Both ultramafics and metavolcanics are lateritised giving rise to nickeliferous laterite and aluminous laterite respectively.

The Dholkata bauxite deposit of Keonjhar district, Orissa, has developed on the metavolcanics of tholeiitic basalt composition. The weathered profile reveals five distinct altered zones, such as topsoil, laterite, bauxite, lithomarge and altered metavolcanics. The mineralogy of different zones studied in a representative pit shows the association of major mineral constituents like gibbsite, goethite, hematite, kaolinite, limonite and quartz. Gibbsite is the most dominant one followed by goethite and hematite in the bauxite zone. The geochemical study of all weathering zones indicates the geochemical affinity of the elements Ni, Th and U for laterites and Cr, Zr and Hf for bauxites to occur in high quantities. Trend surface maps predict the bauxite zones in the different levels of the deposit. If the zones having Al_2O_3 35-40 % are blended with high grade ores, the deposit may prove to be a potential one¹.

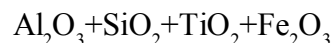
Ore Characteristics :

The bauxite ore is very hard and massive in the top and moderately hard and spongy below. The pale buff to creamy white coloured bauxite is mostly of high grade and is recorded mostly on surface. Bauxite, pale pink in colour and with a clayey appearance, has been found to occur towards the lower part of the bauxite zone. Crystalline, cryptocrystalline and dense gibbsite

occur in varying proportions. The porosity and moisture contents are highly variable. Specific gravity ranges from 2.1 and 2.5. Bauxite derived from khondalite retains the continuity of the structural features like foliation and schistosity of the bedrock whereas those from the charnockite are massive with irregular surfaces and relatively dull earthy look. Further, there is a distinct morphological contrast between the two types. The bauxite overlying charnockite are relatively flat whereas those on the khondalite are highly jointed with several sets of intersecting joints often resulting in filling of lateritic materials. Bauxite over khondalites and charnockites exhibit massive of spongy and vermicular textures. Outlines of relict silimanite and garnet are discernible even to the naked eye in bauxite derived from the khondalite gneisses. Bauxite derived from shale show crude sub-horizontal stratification produced by the alternate layering of the ferruginous and aluminous minerals probably due to compaction of the weathered mass. The bauxite zone also contains small lateritic patches and cavities filled with ferruginous materials. Bauxites of different types like massive and disintegrated, spongy, cellular and oolitic are seen over metavolcanics¹.

Formula,

Typical Available chemical composition,



Purities available from 98% (industrial grade) to 99.999% (high purity grade). The suitability of bauxite for alumina production depends upon the mineralogical form, the quantity of reactive silica and extractability by the Bayer's process. The East Coast Bauxite deposits are predominantly gibbsitic and 90-95% of total alumina is extractable at low temperature and pressure thereby entailing lower consumption of caustic soda for digestion. The alumina content vary from 45% to 48% and silica ranges from

less than 2-3%. The other constituents of East Coast Bauxite deposit of Orissa include 20-25% haematite include goethite, 3-5% kaoline and 2-3% anatase including rutile.¹

Reserve :

The total reserves of bauxite in the world are estimated at 23.2 billion tones. The total recoverable Indian reserves as on year 2004-05 are placed at 3076 million tones and total reserves in Orissa are estimated to be 1,530 million tones (source: Directorate of Mines & Directorate of Geology, Bhubaneswar).

Among all the districts of Orissa, Koraput which occupies two mining leases with an area of 4,647.17 Ha of mining area is the major bauxite bearing district in Orissa and produces 98.82 % of the state's total production followed by Rayagada (one mining lease occupying 1,388.7 Ha of mining area) and Sundergarh (Four mining leases occupying 419.4 Ha of mining area). Major Bauxite reserves are concentrated in the East Coast Bauxite deposits of Orissa are shown in Fig.1.

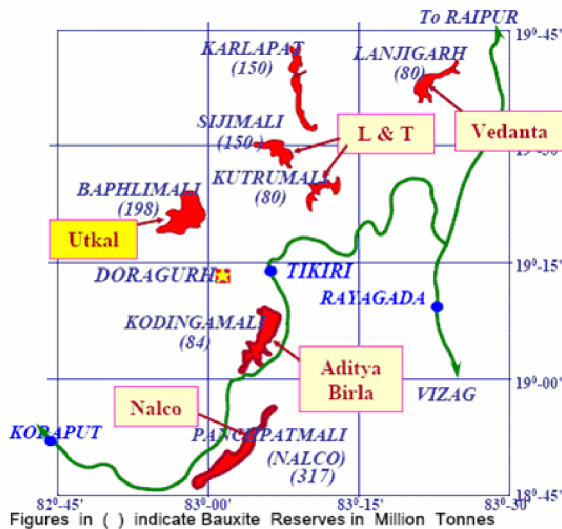


Fig. 1

Mining :

Out of all the Bauxite mineralization areas in Orissa, Panchapatmali deposit of Koraput district bears the largest single deposit of world. National Aluminium Company(NALCO) a company fully owned by Government of India has developed a mechanized open cast mine for annual production of more than 4.5 million tonnes. The Rs.2400-crore National Aluminium Company Limited (NALCO) was born on January 7, 1981 with technical collaboration agreement with Aluminium Pechiney of France. The multi-unit, multi-locational company, NALCO came up with bauxite mining capacity of 24 lakh tonnes per year, an alumina refinery to produce 8 lakh tonnes of calcinated alumina per year and a 2.3 lakh tonnes per year smelter plant. NALCO holds a mining lease of Panchpatmali deposit covering an area of 7,204.74 hectares. Along with the other mining Companies HINDALCO, INDAL, Larsen and Tourbo, Sterlite Industries etc².

Industrial uses and Specifications :

The mineral bauxite constitutes the most important ore of aluminium, which is used widely in the modern industry. Bauxite is used in the manufacture of alum, aluminous sulphates and other chemicals. It is also used in the preparation of artificial abrasives. Bauxite is widely used in the manufacture of refractory bricks, which are utilized as lining materials in furnaces and kilns. By virtue of its containing a number of colloidal constituents, the mineral bauxite finds extensive use in the purification of petroleum. About 1 tonne of Alumina is produced from 3 tonnes of Bauxite and about 1 tonne Aluminium is produced from 2 tonnes of Alumina. More than 90% of the bauxite produced in the world is consumed for production of alumina. Other applications are as refractories and abrasives where bauxite is used in calcinated

form. Minor quantities of bauxite are utilized in production of iron and steel, cement, ceramics, chemicals and ferroalloys.

India was dependent upon imports of Aluminium metal till 1988. With the commissioning of NALCO's plant in 1988 a sea change took place and the country which was a net importer of Aluminium became self-sufficient. Consequently, the Aluminium Control Order which regulated supplies and prices of indigenous Aluminium were withdrawn on 1 March, 1989.

Conclusion :

In the mineral map of India, Orissa occupies an important position both in terms of deposit and production. The mineral deposit of the state is not only vast but also equally diverse. With the given natural resource endowment, growing demand for Aluminium and its alloys, economic opportunities and scope for exports, Orissa can produce Alumina at internationally competitive prices. Aluminium has significant industrial and economic importance for Orissa, as this is the one metal for which the state has abundant raw material. Aluminium metal can also be produced competitively with the latest technology coupled

with cheaper energy arrangements in Orissa. The greatest scope for value addition and employment lies in the development of down-stream Aluminium end-products like extrusions, rolled products, fabrication and finished items. Orissa can reap more benefit by this value addition given the low energy requirements and labour intensity of down-stream industries.

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Er. Suryanshu Choudhury is the Technical Support Engineer, Surpac Software India Pvt Ltd, Bhubaneswar



Shri Debasis Nayak, Minister Information & Public Relations, Sports and Youth Services inaugurating the 18th Annual Conference of Orissa Working Journalists Union on 28.12.2007. Sri Devi Prasad Mishra, Minister, Excise and Tourism is also present.

Jiankata Plates of Nettabhanjadeva

*Dr B.K.Rath
Raghunath Rath*

A set of three copper plates was discovered in 1986 at village Jiankata, near Purunakataka in the Baudh sub-division of earlier Phulbani district of Orissa. The set was discovered while a plot of land was being dug by labourers. The set was found kept buried inside an earthen pot covered with a lid. The copper plates were collected by Sri Banamali Dehuri of Purunakataka, who is the present owner of the plates. Sri Dehuri was kind enough to lend the plates through Sri Raghunath Rath for decipherment. The editors are thankful to Dr.(Smt.)S.Tripathy, Epigraphist, Orissa State Museum for her kind help in decipherment of the text.

The copper plates are of smaller dimensions, each measuring 14.2 cm x 7.9 cms, the average thickness of each plate being 0.2 cms. A round hole with a diameter of 1 cm is cut into one end of each plate and a ring having a diameter of 7 cms and depicting a standing lion is shouldered to the ends of the ring.

All the three plates contain writings on either side. But the obverse of the first plate and the reverse of the third plate, being the outer sides of the set, are very much eroded and the writings on these two sides have become illegible. The writings on the rest portions of the copper plate contains only two indistinct lines of inscription on its upper part. The reverse of the same plate has

eight lines of inscription. The second plate has seven lines of inscription on each side, out of which the outer side has indistinct lines of writing. In total there are forty lines of writing out of which ten lines are badly eroded and difficult to read and edit.

The script used for the writing of the inscription is old Nagari which was prevalent in ancient Orissa during the 10th-11th centuries A.D. and can be compared with the script used in the inscriptions of Maharaja Nettabhanja II Prthvialasa in particular and the copper plate charters of the Bhanja kings of the Vanjulvaka in general.

The language used is Sanskrit. Some of the letters have been very carelessly scribed so that some letters look identical. One finds the usual errors in spelling due to the influence of the local pronunciation.

Orthographically there are some errors. There is no distinction between letters *ya* and *ba* as found in *Vivudha* for *Vibudha* (line 7). *Virahmana* for *Brahmana* (line 14), *Vahuhi* for *bahubhi* (line 29) etc. Besides, the vowel *i* is replaced by *I* as in *iat* for *Jati* (line 16).

The inscription records the name of Paramamahesvara Maharaja Nettabhanjadeva as the donor of the copper plate record. The donor

of the copper plate record. The donated village is mentioned as Sosenvirasruna grams of Tulasrnga visaya. The place of issue is not clear. But the name of the place ends with the reading Kottadhistanat. The donee is referred to as Bhatta Harideva of Kausika Gotra and Chandoga Carana and as son of Bhatta Damodara. The record is described as a rent free holding and mentioned as *Karadhama Varilitya*, in lines 21-22.

In the inscription the doner Maharaja Nattabhanjadeva is described as Bhanjakulanvayodbhava or as belonging to the Family of the Bhanjas. We know of several copper plate inscriptions recording the names of several copper plate inscriptions recording the names of Nattabhanja. According to the data given in these inscriptions scholars have identified five Nattabhanjas belonging to the Family of the Bhanjas. They are respectively Nattabhanja of Baud Plates, Nattabhanja alias KalyanaKalasa of Komanda and Bettasera copper plates, Nottabhanja alias Prithvikalasa of Orissa State Museum and Daspalla Plates (son of Silabhanja).

First Plate : Obverse

Samvat 4 - dra su di 10 3

First Plate ; Reverse

1. Svasti I Sapunyo Khinjale svada vibhira Ke
2. Chita lamblhtah svetimanam digdhastitya
3. subhasah ksavidura gamaneh Komala go
4. tala mnatya - dimsa pancha vyatikara sudhi
5. hitta dha sumah bhupalaih Yaidabhipraja
6. davah Svapadahichalita eduvah Yamepa
7. dhre II Vividha Vivudha Dvija Vanijana Panka
8. Lat Dhetripara Kottadhistanat

Second Plate: Obverse

9. sphuradamala prabha bhasvari Krta Bhanja raija chu

10. runi tarati kulah Ksititala vimala Bhanjaku
11. la samudhavah paramamahesvaro mata
12. Pitir padanudhyato Maharaja Sri Ne
13. tya bhanja devah kusali I Tulasr
14. naga Visaye brnhamansampujya mahasa
15. manta Valadhikarta dandanayaka danda

Second Plate Reverse

1. Pasika prasadina schatabhata balava Jati
2. Yan- Yatharha manayati Samadisati
3. Chanyat - Vidita mastu bhavatam metadvisa
4. Yo Sambaddha Soseddhirasrnga grama
5. Scaturaghata sima Paricchinnah
6. Sarvabadha Parihrutah Karadana ba
7. rjitata dharasalila Samyasratyadidevam

Third Plate : Obverse

1. Yasya Yasya yada bhumi stasya tasya tada
2. phalam // mabhuda Phalasankah para datteti
3. Sca Parthivah svadanatphala Manatyam Paradatta
4. Nu Palanam (Sasthivarsa) Sahasrani Sva
5. rge modati bhumidah (akse) pti ganumatta
6. Ca neih tanyeh narake baset (iti) Kamala dala
7. mbu Vindulolam Sriyamanucintya manusya jivitam

Nettabhanja II alias Tribhuvanakalasa III of Orissa Museum Plates (son of Rayabhanja and grandson of Prithvibhanja) and Nattabhanja, (Mahamandalesvara) son of Ranabhanja and grandson of Vrihad Nattabhanja of Jurada and Bhanjanagar Plates. But it is difficult to identify Nattabhanja of our copper plate with any one of the above. The invocatory verses usually found in Bhanja records of both Dhritipura and Vanjulvaka are different from the present condition. The geneology is totally absent and the epithets also differ. Instead of Bhanjakula malatilaka we have Bhanjakulanvayodbhava found in this record.

From Palaeography and the size of plates this charter can be compared with the Orissa Museum Plates of Nettabhanjadeva and we identify Nattabhanjadeva of our copper plate tentatively with Nettabhanjadeva alias Prthvikalasa of the OSM & Daspalla Plates. As seen earlier Nettabhanja alias Prthvikalasa is described as son of Vidyadharabhanja and grand son of Sri Silabhanja. But again while Nettabhanja of our copper plate is described as Paramamahesvara, Nettabhanja alias Prithvikalasa is described as Paramavaisnava. This again is difficult to explain. We hope further research will throw more light on this tentative identification.

Regarding the place names found in the record we have a word ending with letters Kottadhistanat. As per the description in the copper plates the donee is granted the village Sosanvirasrnga grama in the Tulasrnga visaya which is referred to in the Baud Plates of Ranabhanjadeva, of the year 58 also. All the three place names are difficult to identify.

Raghunath Rath lives at Panasapadi Sahi, At/Po-Baliguda, District Kandhamal.

Dr. B.K. Rath is Retd. Director, Orissa Project, State Archaeology, Bhubaneswar.



Hon'ble Chief Minister Shri Naveen Patnaik presiding over the Tribes Advisory Council meeting at Secretariat on 28.12.2007. Shri Chaitanya Prasad Majhi, Minister, STs & SCs Development, Minorities and Backward Classes Welfare and Shri Golak Bihari Naik, Minister, Fisheries & Animal Resources Development, Textiles and Handlooms are also present.

The Maritime Trade of Ancient Kalinga

Pabitra Mohan Barik

Kalinga the ancient name of modern Orissa had engaged in commercial and trading relation with south-east Asian countries. From the beginning of 6th century B.C. and till the end of the medieval period Kalinga had established her maritime trade. The ports of ancient Kalinga are spread along 700 km of coastline. The merchants of Kalinga carried on their business through the major rivers like Subarnarekha, Baitarani, Brahmani, Mahanadi, Rushikulya, Vansadhara and Nagavali. Kalinga had built up her maritime trade relation with Sumatra, Java, Bali, Borneo, Burma, Malaya and Shyam. The Kalinga merchants were using another trade route to the south-westwards along the east coast to Singhala and Lakshadweep on the west coast of India in the Arabian sea. The Kalinga merchants named Sadhabapuas used a number of ancient ports like. Tamralipta now Tamluk in the Midnapore district. The port Tamralipta was affected by the Ganga silt and died. It is now several kilometers inland from the shore. An important historic event is associated with this port that was great Buddha emperor Ashok's daughter Sanghamitra sailed from here to the east coast and reached in Singhala. They propagated the ideology and inner philosophy of Buddhism. Another port which was used by the Kalinga sailors was affected by the silt of Rushikulya. The port Palur had died naturally. According to well

known scholar of Buddhism Hiuen-Tsang's record he left India by sea route from Palur Port, in his return Kalinga sailors helped him. There were number of ports in Kalinga which played vital role for maritime activities.

The ports like Balasore, Chandbali, Dhamara and Gopalpur in present Orissa were used by the Kalinga Sadhabapuas for the purpose of commercial activities. Many historical records related to maritime trade of ancient Kalinga which are available now enrich our cultural activities. Ptolemy, the famous Greek Geographer of second century A.D. also described in his work about trade marts on Kalinga coast. The Chinese Pilgrim Hiuen-Tsang who visited Orissa in about 630 A.D. in his account has mentioned the territory and named it 'udu-ihā' and was limited to the valley of Mahanadi and lower course of Subarnarekha undivided district of Cuttack, Sambalpur, Balasore, and Portions of Midnapore district were in that period in Odradesh. Kalinga had also established her empire in present Malayasia, it happened in 8th century A.D. known as Sailendra empire. According to the Arabic sources the Sailendra Empire also exercised its power in Cambodia and Assam. The fame, prosperity and capability of Sailendra Empire continued through out 10th century A.D. Sadhabapuas of Kalinga used to go to Bali in the

country boats and used to take advantage of the N.E. monsoons which normally starts from November. The sailors of Kalinga were starting their voyage generally on the holy day of Kartika Purnima. Maritime trade of ancient Kalinga not only prospered the State but also established the cultural, economic, and religious relations among the people of south-east Asia. Kalinga Sadhabapuas used to spread our glorious tradition, belief and philosophy. Kartika the month is very holy for the people of Orissa. From the religious point of view the month has great importance. The people of Orissa observe the day Kartik Purnima very actively for remembering their glorious past. Kalinga Sadhabapuas were starting their journey for maritime trade in sea specially on Kartik Purnima because during that period the sea is calm and quite. In past the development and prosperity of Kalinga entirely depended upon Sadhabapuas. By maritime trade the economic stability of Kalinga was maintained. The maritime trade of Kalinga was the symbol of capability, power, brave and boldness. Kalidas the great poet of India wrote in "Raghuvamsa" that the people of Kalinga were brave and he also described in his famous work that the King of Kalinga was the king of sea. In his book "History of Orissa", the famous historian Hunter has narrated that there were number of ports in

Orissa. Among them the prominent ports were Subarnarekha, Chamua, Baleswar, Chhaudamani, Dhamara, Chandabali, Lachhanapur, Puri and Tamaluk. Dhamara and Chandabali were regarded as the gate way of Kalinga. Chandabali and Dhamara two important ports of ancient Kalinga had highlighted our political, economic and cultural life. The British officer Mackdanet Saheb had inaugurated the port Dhamara on 18th March 1858 and also another port named Chandabali was inaugurated by him on March 28, 1881. Kalinga Sadhabapuas used to go to Bali island from Mahanadi mouth of Cuttack. For that memory every year on the day of Kartika Purnima Bali Yatra festival is being observed. This festival shows our greatness. The maritime trade of ancient Kalinga had brought high reputation and praise for our territory. From 11th century A.D. the maritime trade of Kalinga declined due to political unrest and other factors. The maritime trade of ancient Kalinga of that period is the pride of Orissa. The people of Orissa realise that remarkable events related to maritime trade on the holy day of Kartika Purnima.

Pabitra Mohan Barik is a Lecturer in History in the S.H. Mahavidyalaya, Madanpur, Khurda.



*Hon'ble Chief Minister
Shri Naveen Patnaik
presiding over a high level
meeting on development of
irrigation potential in the
State at Secretariat on
24.12.2007.*

Epithets of Goddess Mahalaxmi

Dr. Dibakar Mishra

Now we can see that there is no end of the ways for getting the heaven's blessings by the man at different times in different works, provided the same sincerity is present in all the times, taking the above blessings together we can make it a supreme unit to call as "Goddess Mahalaxmi".

Our ancestors and also done the same by giving many epithets to the Goddess which are self descriptive. Some of those are described below in short.

1. Mahalakshmi : She is connected with "Mahat Lakshana" i.e. noble characteristics.
2. Lokamataa : World Mother. She is the mother of all the people of the world distributing affections and nourishment equally to everybody.
3. Ramaa : Beautiful. She likes to be connected with the beautiful (Ramya) nature (Prakruti) of human life.
4. Pankajabasini : 'Pankaja' is lotus which comes out of the mud 'Panka' and the Goddess likes it very much to settle on this, for which, She is called 'Pankajabasini'. The cause of selecting the lotus for settling on it is to teach the world that, though it is born from the dirty muds, still it can be blessed for its cleanliness, softness, beauty, purity, splendour and fragrant disseminating qualities. Hence one should not be disheartened for its bad

family background only, but try to be clean in habits, pure in heart and noble in behaviour.

5. Padmalayaa : Here 'Padma' is lotus and 'Alaya' is adobe. Goddess Laxmi has selected "Padma" for Her "Alaya" for which She is called "Padmalayaa". In true sense 'Padma' is compared with clean and sacred heart and the Goddess always wants to make this pure heart her abode. In other words the man with clean heart can get the blessings of Goddess Mahalaxmi for ever.

6. Kamalaa : 'Kamal', the flower, being very soft, sacred, pure, clean, splendid and fragrant disseminating; has been liked very much by the Goddess Mahalaxmi; for which She is known as 'Kamalaa'. This gives the indication that the man who seeks blessings of Goddess Mahalaxmi should become like a flower.

7. Chanchalaa : The Fickle Goddess. Her movements being very fickle (Chanchal), She immediately leaves the man whose character starts to become impure.

8. Chapalaa : The unstable Goddess. She leaves the men like lightning (Chapalaa) who starts to become impure, immoral, deserter, proud and arrogant.

9. Ksheerabdhi Tanayaa : Daughter of Ocean. 'Ksheerabdhi' is Ocean and 'Tanayaa' daughter. She is Ksheerabdhi Tanayaa, because She was

produced from Ocean when its water was churned out for nectar to make the persons immortal. She appeared before the world being ornamented with precious gems and jewels giving indications that the Ocean is the treasure of gems and jewels from the time immemorial.

Men Blessed by the Goddess

According to "Hitopadesha - Mitralava", "Goddess Laxmi blesses the man who is industrious and of very promising character. It is the version of the cowards that the wealth is given by Fortune. So discard the fortune and achieve success through your own efforts. If the success is not achieved after all of your efforts, then find out, there must be some faults some where."

Men Debarred from Blessings

The persons not industrious, who are devoid of duties, lazy, coward, desperated, selfish, jealous, tempted, irritable, greedy, envious, despotic, mean, hypocritic, cruel, tyrant, thief, liar, ungrateful, incontinent, inhuman, too much miser, deceitful, crooked, unruly, notorious, stupid, impudent, sinful, devilish are debarred from blessings of Goddess Mahalaxmi.

Mythology of Mahalaxmi (Mahalaxmi Purana)

Outwardly Mahalaxmi Purana contains a very beautiful story of Lord Jagannath, Balabhadra and Goddess Mahalaxmi, in which Mahalaxmi was driven out from the temple (Srimandir) by the two Lords with the allegation that She frequently visited the cottages of very low class people, who were untouchable ones and without being purified enough entered the temple palace to cook food and feed the two Lords. They gave her much insultations calling bad names to Her father and drove out, after disornamenting Her, with caution not to keep steps in temple premises in future.

The bride Mahalaxmi, even after being so much tortured begged apology to the Lords, but they turned deaf ear to Her prayer and closed the temple door mercilessly, while going back She cursed them to suffer for this injustice and inhuman behaviour by not getting food to eat till they repent for their misdeeds and request Her to serve the food for them.

Mahalaxmi ordered the 'Betals' to take away all the belongings of Srimandir including food stocks, grains, jewels, clothes, golden cot in the dread of the night, when the Lords would be sleeping and dry the water source completely so as to make non-availability of a drop of water in the morning.

The Betals worked strictly according to the orders of their Mistress and the two Lords Jagannath and Balabhadra became street beggars, begging alms from door to door, but were mercilessly driven out by all the citizens taking them to be thieves from their robust health and appearance having no resemblance with beggars.

They adopted all possible means of begging but were not successful in getting alms continuously for twelve years and suffered from starvation. At last they reached the door of an aristocratic house on the sea shore in the guise of Brahmins and begged for to eat, which was actually the house of Goddess Mahalaxmi, built by 'Viswakarma' in the boundary of 'Varun's kingdom.

Mahalaxmi, being aware of all the facts, asked the two Lords through her maids, that they were 'Chandal' by caste, the most untouchable persons of the society; and how the two brothers, being Brahmin by caste, would take meals in their house. The two brothers decided to cook foods themselves if all the commodities like rice, vegetables, firewood and utensils would be supplied to them by the Mistress of the house and accordingly they made their request.

Goddess Mahalaxmi arranged supply of everything to them what they needed and at the same time prayed to the Wind God to blow violently, so that the wood would not burn to heat the water and turn black creating heavy smoke and trouble to the two brothers by causing flow of tears from the eyes. They tried one after the other to keep the fire burning, but failed to achieve the success. The elder brother, out of rage, took a piece of wood in his hand, and giving a strong blow to the earthen pot, broke it down into pieces.

Now the two God brothers, finding no other alternative to save their lives, requested the maids to tell their Mistress that they were prepared to take meals in the house, even if they were Chandal. The heart of the Goddess was immediately melted with those surrendering words and out of joy she cooked many things instantly for the Gods and got those served through the maids. From the mode of preparation of different delicious foods and from the style of serving the same, the two brothers recognised well the Mistress of the house to be none other than the Goddess Mahalaxmi. They begged excuse for their faults with repentance and took Her in a procession to the Grand Temple accepting all the terms and conditions brought by the Goddess against untouchability, inhumanity, high handedness, casteism and many other points.

From that day since, the people of all castes and creeds, starting from Brahmin to Chandal, began taking of foods, cooked in Srimandir, together without slightest hesitation and the Mahalaxmi Puja was continued to be performed in each house, in the month of 'Margashira' every year.

But when we would go deep into the subject, we would find in it some burning problems of the society. When the men forget their duties and responsibilities, leave work, become lazy,

pleasure-seeking, fond of voluptuous eating, sleeping for unlimited period, would cause the production to go down and finally become nil. For the result of this the people would suffer from starvation and go on begging from door to door. But this would not solve any purpose unless the people become active the start work again leaving idleness, luxury, voluptuousness and dilatoriness.

Similarly adherence to casteism, untouchability, encouraging slavery, misbehaving the servants and oppressing the women folk and house-wives would weaken the society and destroy the family life. There would be no prosperity in the land unless these ugly habits are completely uprooted and removed. In the first instance when poverty spreads in the land, we say that Laxmi has left the place or She was driven out by the men owned Her. In the second instance when men become active again to flourish the land with prosperity we say, Laxmi has returned back to the place or the persons concerned have brought Her back after begging apology for their faults.

Now going through the above story of the mythological script some doubts arise in the mind. Out of these the first one is being "Patitpaban", the uplifter or saviour of downgraded people, how lord Jagannath along with his brother objected Mahalaxmi to visit the houses of those people.

The second one is being the feeders of the whole universe, how the two brothers became beggars visiting door to door to collect food. The third one is what happened to Devi Subhadra during this long period of twelve years who was their beloved sister, residing with them in the same temple.

The correct answers which are the inner meanings of this mythology are furnished in the ensuing stanzas.

In the present theme of the story the three deities represent three classes of people to give emphasis on the subject and make it acceptable by the common man to build their characters in the way of examples and teachings given in it. Here Lord Balabhadra represents the most powerful landlords who forget their idealism and responsibilities of getting the crops produced in the lands, they became addicted to luxury, spend time in idleness and enjoyments, become glutton in eating of delicious foods, tyrant towards servants and labourers treating them as slaves, oppressive towards the holy housewives taking out their rights to raise voice against injustice and highhandedness, adherent to casteism and allergic to untouchability not even to touch the shadows of the untouchable persons in dream.

Lord Jagannath represents the Headmen of the society who gradually become toys in the hands of the powerful landlords and fail to express their independent views, though they are capable enough to distinguish between rights and wrongs and can also save the situation from going bad to worse, if raise voices strongly in time. But they become silent observers of the things so happen as they do not want to take pains to stand against the views of the Landlords losing all comforts of life provided for them.

Goddess Mahalaxmi represents the good and pious house-wives of the aristocratic families, who are very affectionate and sympathetic towards the servants and labourers and help them at the time of distress. The dependents and their family members regard them very much addressing as 'Maa' (Mother) or 'Laxmi Maa' (Holy Mother) and put forth all of their difficulties before them without the knowledge of the house masters which either the Landlords or the Headmen do not prefer.

Now to discuss the subject matter of the story we can name the landlords as 'Baladeva' but not 'Balabhadra' or 'Balarama'. The meaning of 'Bala' being the 'bullock, strength' and 'Deva' being the 'master' or 'Owner' the word meaning of 'Baladeva' becomes 'the powerful landlords'. Similarly, we can name the 'Headmen of the Societies' as 'Jaganath' but not 'Jagannatha'. Here 'Jaga' is 'people', 'society' and 'Natha' is 'Head'. So 'Jagannatha' is 'Samajapati' or 'Head of the Society'. As the housewives of the aristocratic families were being called as 'Maa' or 'Laxmi Maa', we can gladly call them as 'Maa Laxmi' but not 'Mahalaxmi'.

Now Sri Baladeva, being addicted to luxury spent his time and wealth lavishly in voluptuousness, debauchery, voracious eating (it is mentioned of his taking 56 pauties of cooked rice at a time), and then having snoring slumber till the foods taken are digested. As the common men of the society always use to follow the foot prints of their superiors, they all followed the same path and became luxuriant, careless and pleasure-seeking. The result was complete inactiveness and idleness prevailing everywhere. The housemasters had got no attachment to their families and what they earned they spent in merriment, pleasure-trips, voluptuous eating and gambling outside, neglecting their wives, children, to suffer from starvation at home. If any objection was being raised by the housewives they were being mercilessly beaten, misbehaved and illtreated.

But Maa Laxmi, who had Herself been victimised, could realise well the conditions of Her dependents, even if they were untouchable ones. She used to visit their cottages very frequently and help them to the extent, it was possible. She advised the women folks to bring their family members to the correct path by way of good behaviour, simplicity and cleanliness in spite of

their tyranny towards them. She devised some way and methods for introduction in each family; so that all of the members would automatically be forced to be guided by Her methodised principles in the name of 'Mahalaxmi Puja' and 'Sudasha Brata'. The procedures of their institution were so scientifically and hygienically framed that those would automatically correct the habits of all the family members to become active, energetic, broadminded and able to achieve a very good moral character and success in life.

While telling about Mahalaxmi Puja she has advised not to become idolater to worship the idols in the temple, but to convert one's own cottage into temple by way of cleaning, decorating and purifying it by own labour and then to worship the food grains, obtained from the fields, which is according to Her the Goddess Mahalaxmi Herself. She has not emphasised on reciting hymns (mantras) or exhibiting hand poses (Mudras) but to offer things with emotion (Bhava) and devotion (Bhakti) in the heart and mind. It has been mentioned of Her attending the cottages of 'Sadhavani', the house of Sadhava (the merchant) and 'Chandal' (the sweeper). In doing so She has given indications that apart from the cultivations, prosperity can also be achieved through merchandise and the untouchable persons have also got equal rights to worship Gods, provided they should become neat and clean in physique, dress and habits.

The instructions given by Maa Laxmi to achieve 'Mahalaxmi' are very educative for the males and females both to convert their cottages in to heaven on earth. From Her teachings on human behaviour it is evident that a house wife can easily convert her housemaster into 'Purusottam' (Godly Man) and a housemaster can also convert the housewife into 'Goddess Laxmi'.

In case the house master has already gone astray, he can also be brought into the way if a housewife is resolved to do so; provided she should be prepared to stand boldly on her foot, even if, violent storm would start to blow against Her. She has also proved this in Her own life by bringing two most powerful and proud Lords of the time to the correct path. The female folks, who are acquainted with this mythological story can not take decision to end their valuable lives by way of committing suicide at the time of blowing such storms in their lives.

Now the facts, when came to the knowledge of 'Baladeva' that Maa Laxmi is frequently visiting the cottages of untouchable persons and entering the Grand Palace without being purified enough, He induced Lord Jagannath to divorce Her immediately. But Jagannath remained silent over the matter though He was neither against the untouchability nor had got any objection for the activities of Maa Laxmi. Still He could not oppose as He had got no courage to do so and stand against the wills of a most powerful Lord like Baladeva. Now the two Lords drove away Maa Laxmi after mistreating, misbehaving and disornamenting Her and even scolding to Her innocent father. When Maa Laxmi, prayed them to excuse Her, they closed the palace door turning deaf ear to Her prayer. This infuriated Maa Laxmi to curse them to suffer for their misdeeds by becoming poor and not getting food to eat for complete twelve years till they surrender to Her with request to serve food for them.

When the most-affectionate, pious and active Laxmi Maa left home, who was everything for the poors, for the servants and labourers, they all quitted their Masters' house immediately after the departure of the Holy Mother. Now acting as 'Vetals' they caused destructions to the

management of their Lords' palace and took away all the belongings and food stocks in the dread of night. At the day break when the Lords got up from slumber, they saw no servant in the palace no belongings and food stock. Even they did not get a drop of water to wash their face.

Now realising their wretched conditions, the Lords decided not to show their faces in the society and went out in guise of 'Yogi' in quest of food, which they did not get anywhere due to much wretched condition of the state for want of production. In the long run they adopted the work of begging going from door to door but each time they were driven out with caution not to beg, but to work and earn food. But they were so unfit for any work that they could not even protect a handful or corn-flake, donated by someone in their hands, which easily flew away when wind blew.

On the other hand, Maa Laxmi being driven out from the Grand Palace, got a palace built immediately on the sea shore in the jurisdiction of God Barun by the help of Her dependents, ex-servants, labourers, merchants, sweepers and tenants as if the things were done by 'Vishwakarma', so suddenly. The tenants without depositing the crops of the lands in the Grand Palace supplied sufficient foods and clothes to the Maa Laxmi's palace. In addition to that the dependent workers were kept engaged in collecting oceanic products including gems and jewels for oversea trades through 'Sadhavas' from which sufficient wealth was being received for maintenance of all the people depending on Maa Laxmi and distribution of cooked foods daily to the beggars irrespective of castes and creeds in the palace premises.

Now the two Lords being under starvation for complete twelve years came to know of the distribution of foods in the palace premises on sea shore and they reached there in the guise of

Brahmins to take food. But when they were told by the Mistress of the house; who had already recognised the Lords in disguise; that she was 'Chandal' by caste, they tried to cook foods themselves with the materials supplied to them. But there also they failed to achieve success and at last surrendered themselves to the donor, even though she was 'Chandalini', requesting food from her hands. Maa Laxmi immediately prepared many types of delicious foods in Her hands and got them served to the Lords till they were satisfied fully. Now the Lords knowing well that the house-mistress, pretended to be 'Chandalini' to front the Brahmin pretenders; was none other than Maa Laxmi; they begged appology for their misdeeds and misbehaviour and received Her with honour to take back to the Grand Palace in a grand procession. They agreed to all the terms and conditions brought by Maa Laxmi to remove casteism and untouchability fully from the land, treat all men equally and allow all to take meals together.

Like this, the most powerful and proud Lords were punished for their misdeeds and misbehaviours being compelled to suffer from starvation for complete twelve years, roaming as street beggars and Maa Laxmi with honour spent these years leading most prestigious life giving shelters to so many due to Her purity of mind and heart, high thinking, activeness and courageousness. Hence this mythology of 'Mahalaxmi' should be studied in detail by all men and women and be guided as per the instructions laid down in it, to get peace and happiness and achieve success and wealth in life.

Dr. Dibakar Mishra lives at A-82, Nilakantha Nagar, Nayapalli, Bhubaneswar-751012.

Life of a Lanjia Saora - a Case Study

Pradyot Mohapatra

The following is a case study of a key informant of Tidasing village, a village close to Lanjia Saora Development Agency (LSDA) at Seranga in the district of Gajapati. The study had been made a decade ago during a fifteen day period in February-March 1997; but the author believes that it is relevant even today as throwing light on many of the facets of life of the Lanjia Saora.

Our key informant is Gulsan Raita. He is a cultivator; he practices both the cultivation of the plain land and that of hill slopes (*bagada*). Apart from that his subsidiary activities include animal husbandry, horticulture, mat weaving and broom making.

The economic activities of Gulsan Raita are subsistence oriented; it is reflected in his food consumption and the observance of festivals. He takes cooked rice mixed with water (known in Oriya as *pakhala*) in the morning. This is taken along with a little bit of tamarind and chilly. Lunch and dinner are a little heavier. He consumes the products obtained from slash and burn cultivation along with rice. Not to become too scientific, we give the names of minor millets, beans and other vegetables as the Saora names them: *jana*, *mandia*, *kandula*, *ganga*, *khosala*, *ganthia*,

jhudunga, *baragudi*, *kauria*, *baila*. Apart from these self-produced items he buys from the market cooking oil, onion, potato, salt. On special occasions he consumes meat, fish and a curry prepared from jackfruit. He also consumes home grown fruits such as mango, pineapple, lemon, jackfruit, tamarind and banana. (Banana is so cheap that one of my guides arranged a whole *kandhi* for Rs.12/- only; in the interior twenty lemons sell for Re. 1/- only and tamarind is also very cheap.) Mango and tamarind are available in plenty and about them the Saora says in Oriya that "*tike beshi miluchi*" (it is available in plenty).

Lanjia Saora festivals also reflect the subsistence nature of his economy. The grain offering ceremony is held in the month of February for one day. On this day funds are raised for the local church, and everybody contributes and participates. The fruit offering ceremony is held in the month of June at the church and everybody participates. But the most important ceremony is Christmas which is observed for seven days both at home and at the church.

Apart from subsistence agriculture, the next most important economic activity for the Lanjia Saora is the construction of his house. New houses

are required for newly wed Saora couples. In the construction of a house, members of the birinda or the extended family help. The Lanjia builds his bungalow with a mixture of both old and new construction materials. Traditional materials are preferred for the structure, walls: new materials are required for the roof and the floor. The preference for traditional materials is owing to lower costs; otherwise, new material is preferred for all purposes. Indira Awas Yojana, which uses modern construction materials, is the preferred choice over houses using traditional construction material. Many Saoras have been rehabilitated in a colony near the LSDA office. These are pucca houses. Annual maintenance expenditure on houses comes to around Rs.200/- to Rs.300/- For wall, stone, mud, straw, and wood are used. For roof straw is the second choice. It is used if asbestos sheets are not arranged. Floor is made of earth, beaten to level it. The structure is made of wood. The materials are available locally. The universal Lanjia Saora design is to construct two rooms. There is a main room, and behind it is another room used for cooking. There is a loft in the cooking room used to store food grains. Household articles are stored inside the house. However, agricultural tools are stored in a corner of the cowshed located outside the house. Gulsan Raita is a Christian and therefore there is no place for the traditional family god in his house.

The next most important thing for a Saora is health. Malaria, TB, typhoid, and dysentery are the main diseases. Cold, cough, and fever are the minor diseases. Some persons are said to have died after a prolonged fever of 6 to 9 years. The cause of such fever is unknown. Gulsan Raita's father Jenari Raita is said to be 70 years old.

Treatment for diseases is available at the Christian hospital at Seranga, Home of New

Hope. The government had carried pulse polio immunization programme in January 1997. Gulsan Raita spends about Rs.500/- yearly on medical expenses.

Marriage, kinship, and inheritance of the Christian Saoras are as follows. The age of marriage nowadays is higher than they were in the past. In the past boys used to marry at the age of fifteen and girls at the age of twenty. Now-a-days boys are married at about the age of twenty and girls at about the age of twenty-five. As Gulsan Raita is a Christian, there is no caste system in his village. The marriage is either negotiated or takes place by mutual consent. Individual preference in the choice of mates predominates. Widow marriage though allowed is rare. The pastor of the church conducts the marriage. Traditionally there was a preference for cross-cousin marriage; it is not the preferred choice at present. Whatever be the form of marriage, it is always considered legitimate. Household property such as land, house, and household articles are inherited by sons; all Sons have equal right in parental property. Married daughters have no right in their father's property. Widows have a right over their husband's property and women after divorce enjoy property rights. After divorce, the children stay with the father; the mother stays in a separate room.

The Lanjia Saora observes certain rites and rituals. After puberty girls are not permitted to do religious activities during the period of confinement. Meeting of couples is held on the second day after marriage. Women in pregnancy are not allowed to do heavy work. There are certain restrictions associated with child birth: after the birth of a male child, the mother is required to

stay away from the church for sixty days; after the birth of a female child, eighty days. No special ritual is observed after cremation. No animals are sacrificed. The faster of the church does the minimal rites. Christian Saoras have distanced away themselves from medicine men and traditional priests. The yearly expenditure on rituals is considered low. Apart from contribution to the church on special occasions, on every Sunday they contribute some amount to the church which varies from Rs.2/- to Rs.10/-.

Development intervention in the Lanjia Saora area has included family oriented benefits apart from the infrastructural facilities such as electricity, road, water etc. The Lanjia needs loan for consumption purposes, repayment of old loans, agriculture, marriage, disease, and house improvement. The Saora needs loan for many

purposes; but, he gets little. The State Bank of India located at Seranga is the chief source of loan. Apart from that, there is a non governmental organization named Khirndi Multipurpose Development Society at Parlakhemundi that provides loans to them. The rate of interest on loans is around 12%. The term "subsidy" is almost familiar to every Saora in that area. However since the government provides loans for productive purposes only, they depend on private moneylenders for loans to meet consumption purposes. (The report is based entirely on fieldwork.)

Pradyot Mohapatra is a Formerly Research Fellow, National Institute of Social Work and Social Sciences (NISWASS), Bhubaneswar.



Hon'ble Chief Minister Shri Naveen Patnaik with Orissa winners on the occasion of 60th Man and 23rd Woman Senior National Weightlifting Championship-2007 at Bhubaneswar on 23.12.2007. Shri A.U. Singh Deo, Minister, Works, Housing and Shri Debasis Nayak, Minister, Information & Public Relations, Sports & Youth Services are also present.

Children's Literature for Child Welfare

Prof. Jagannath Mohanty

Need and Importance of Children's Literature:

Importance of children's literature for the development of their personality cannot be over-estimated. Most of us are still under the impression that the child is a man or a woman in miniature, he has the same interest and attitude, likes and dislikes though in a smaller degree. We often consider his psychological and emotional needs and conditions according to his size or measure. That is why, instead of providing special facilities for him, we compel him to adjust with our needs and conditions. We forget to realize that the child has its own emotional and mental needs and problems, which are different from adults both quantitatively and qualitatively. We should cater to his special needs and conditions without imposing on him/her our own desire and liking.

Children's literature is a healthy means of satisfying their psychological and emotional needs and has therefore a claim for a separate status on its own merit. We cannot just take any book as suitable for them. Juvenile literature is an important means of developing the potentiality of the young in the right lines. It provides the facilities for their cognitive, co-native and effective development i.e. improvement of knowledge, skills, interests, values and attitudes.

Research findings have shown that language skills are essential for children's achievement even in mathematics, social science, biological and physical sciences. Besides the psychological development, their emotional development can be adequately ensured by providing suitable books and journals. Children's writing habits can be developed for acquisition of new knowledge and understanding of the world within and around them. Research studies have also indicated that good books for the child can reduce the juvenile delinquency, violence and antisocial activities of children.

But unfortunately children's books are not properly developed and distributed, and children cannot get their mental, psychological and emotional food for their all-round development. Adequate care is not taken for writing, publishing and distributing suitable books among children. The society in general and parents in particular are not aware of the importance of books for their child. The Government both at Centre and States also are quite slow in recognizing the value of children's literature and do not take proper interest in the development of children's literature

2. Attempts for promoting Children's Literature:

Just after Independence, the Government of India with a view to encouraging good books

for children, introduced national competitions under the Ministry of Education, then through the NCERT. Now it is not at all taken up. Some State Governments also started such competitions for encouraging writers in regional languages, but these attempts were not adequate, as these competitions are now not at all organized at the national level and not at all organized in many States at present.

Another useful means of promoting children's literature is through various organizations both at the national and State levels. Of course, international organizations like UNICEF, IBBY, IYL & ACCU etc. are there but these are beyond the reach of most of the children's writers at the national level. NCERT has been organizing national competitions and holding some seminars at the time of prize giving ceremony and this also only occasionally. That is why, there is much to be desired from this organization. AIJLC is an old national organization. Its activities are still limited. AICLF is a new organization aiming at improving children's literature at the national level and has not so far acquired the all-India representation. Similarly, AWIC is a national organization having its members mostly from Delhi and some from other states. It is very active but its activities are mostly limited to Delhi or Delhi based. The BBKS is also working at the national level and giving felicitations to the writers of various states. But it has not yet assumed true national character being limited mostly UP and few neighbouring states. There are also state level organizations in some states organizing programmes as and when they find it convenient. On the whole, no national organization has so far elevated to the status of all-India eminence.

3. Present Effort:

It is heartening to note that under the auspices of the Indian Council of Child Welfare,

a new organization a new Forum was set up particularly for promoting Children's Literature in the country. This may be named as a "National/ Indian Council for Literature" (NCCL/ICCL) and it must have an all India representation with the following objectives.

- (i) To hold meetings and conferences of writers, publishers and artists for discussing the issues concerning Children's books and journals.
- (ii) To organize workshops for writing suitable books and illustrations for children.
- (iii) To organize national seminars for discussing the problems of children's literature.
- (iv) To conduct status and surveys for identifying problems and to know the status of Children's Literature in various states.
- (v) To encourage writers, artists and also publishers for developing suitable materials for children through felicitations and awards for their achievements and good work.
- (vi) To publish materials as models at the national level to be translated into different regional languages.
- (vii) To bring out a journal as a mouthpiece of the council.

Lastly, the required infrastructure according to resources available may be planned and developed to realize the above objectives through various programmes. Particularly, proper representation of all states need be made in the management and programme planning. Adequate monitoring and follow-up should be made of all the programmes implemented.

Prof. Jagannath Mohanty lives at 2935, Gouri Nagar, Bhubaneswar.

Agricultural Development in Orissa

Prof. S.K. Sahu
R.K. Nayak

Orissa is the tenth largest state in area (15.57 mha), which accounts for 5% of the geographical area and 4% of the population (36.8 million as per 2001 census) of the country. The state has 47 agricultural districts encapsulated in 13 agricultural range under 30 revenue districts there are 34 lakh farm families distributed in 6234 gram panchayat and 51,349 villages. The rural areas are dominated with 85% population. Agriculture provides 65% of the total work force belonging to cultivators and agricultural labourers and contributes 26% of the net domestic product of the state. The average size of the holding is 1.30 hectares. Maximum number of farmers are under marginal (<1 ha) category followed by small farmers are low compared to marginal, small and semi-medium category. The percentage of poverty line in Orissa is higher compared to the country. However poverty of the state has been reduced progressively from 70.07% during 1977-78 to 47.15% in the year 1999-2000.

Land and Soil

The state has four physiographic zones i.e.

- (i) Coastal plain
- (ii) Central table land
- (iii) Northern plateau and
- (iv) Eastern ghat

Based on soil and climate, it is further divided into ten agro climatic zones namely (i) North western plateau (ii) North central plateau (iii) North eastern coastal plain (iv) East and south eastern coastal plain (v) North eastern ghat (vi) Eastern ghat highland (vii) South eastern ghat (viii) Western undulating (ix) West central table land (x) Mid central table land

The soils of the state are broadly divided into 8 groups such as (i) Red (ii) Laterite (iii) Mixed red and black (iv) Mixed red and yellow (v) Black (vi) Coastal alluvial (vii) Brown forest and (viii) Coastal saline. Nearly 70% of the soils are acidic and have low to medium in nitrogen and phosphate and medium in potassium. Deficiencies of secondary nutrient like sulphur and of micronutrients like boron and zinc have been recorded in some parts of the state.

The state has a cultivated area of 62 lakh hectares, out of which 27 lakh ha is high land. 19 lakh ha in medium land and 16 lakh ha are lowland.

Climate

The state enjoys subtropical climate characterized by high temperature, high humidity, medium to high rainfall and short and medium winters. The normal rainfall of the state is 1451.2 mm out of which 80% is received within June to

September. Orissa is the most disaster prone state of the country. The state suffers from natural calamities like flood, drought and cyclone occur almost every year. The state experienced three bad years in succession, drought in 1988-89, super cyclone in 1999-2000 and again drought in 2000-2001 which were the main causes of upsetting agricultural economy.

Crop coverage and crop production

Foodgrains consist of cereals and pulses. The area under foodgrain production of Orissa over last 7 years almost remains unchanged of 67 lakh hectares. The foodgrain production of 63 lakh tonnes in state during 1999-2000 has increased to 76 lakh tonnes during the year 2004-2005 and likely to increase 82 lakh tonnes by 2005-2006. The productivity of 937 kg/ha of foodgrains has increased to the tune of 1224 kg/ha by the end of this year. Production and productivity of cereals of the state showed higher trend than pulse crops.

Among cereals rice is the principal food crop of Orissa occupying 42 lakh hectares during Kharif and 3 lakh hectares in Rabi. The Kharif paddy includes 8.5 lakh ha of highland, 18 lakh ha of medium land and 15.5 lakh ha of lowland. The entire Rabi rice is irrigated. Entire Rabi and 33.44% of Kharif rice cover the high yielding varieties. The productivity of rice is 1.6 t/ha as against national average of 2.1 t/ha. There is a great fluctuation in production and productivity of rice in the state due to abnormalities in weather situation. Maximum rice production of 71.5 lakh tonnes could be obtained during 2001-02 was due to favourable and normal weather condition. In other years rice production fluctuated between 32.4 to 69.4 lakh tonnes. Similar to the productivity between the years of 1999-00 to 2001-06 varied from 7.59 to 15.61 q/ha. The year 2002-03 was the most abnormal year for lowering production and productivity.

Coarse cereals like maize and ragi, small millets like bajra and jowar and little millets such as swan, kodo and kangu are grown in tribal districts. There is no appropriate yield increase of these crops because of poor adoption of improved technology. Important pulse crops grown under rice fallow with available residual soil moisture are pigeon pea, green gram, black gram and horse gram. Production and productivity of these crops are not encouraging due to aberrant weather, soil acidity, non-adoption of high yielding varieties and neglect in phosphate application. Attempts are initiated through central sponsored schemes for improving production and productivity.

Major oilseed crops grown in the state are groundnut, sesame, mustard, sunflower, niger and safflower. These crops are normally taken in uplands in Kharif and in river beds and rice fallow during rabi. Except groundnut production and productivity of other oil seeds are not encouraging. Fluctuation in area and production is due to unfavourable weather condition, inadequate use of chemical fertilizers, problem in marketing and non remunerative prices.

Efforts are being taken to increase the productivity through compact area, location specific approach by providing minikits, conducting demonstrations, supply of seed treatment chemicals, Rhizobium culture, gypsum, micronutrients, farm implements at subsidized costs.

Jute, mesta and cotton are the three important fiber crops grown in the states. Jute is cultivated in coastal districts, mesta is taken in inland districts and cotton is grown in KBK districts. The area of jute and mesta are shrinking due to introduction of polythene and problem in marketing. Since 2001-02 attempts are for improvement of these crops through central

sponsored schemes. Area production and productivity of cotton is now stepping ahead due to provision of technical assistances and marketing facilities.

Cultivation of sugarcane in the state is gaining popularity due to establishment of seven sugar industries at various location. Area, production and productivity of sugarcane are increasing progressively due to availability of quality seeds and availability of technical skill among the farmers.

Seed

Use of quality seed alone will increase the productivity by 15%. Emphasis has been given on replacement of certified and high yielding seed on mass basis. Seed multiplication is organized through Orissa State Seed Corporation and registered Seed growers. The state is now self sufficient to meet the demand of certified paddy seed. Distribution of certified paddy seed and non paddy seed to the farmers has raised to the level of 1,54,873 qt and 69.483 q respectively by the current year. However the maximum amount of total seed (3.29,760 q) had been distributed during the year 2001-02.

Irrigation

Irrigation potentials created from all sources in the state is 39.31 lakh ha. having the gross irrigated crop area of 27 lakh ha which is 41% of cultivable area and 68% of potential created. Out of 62 lakh ha of cultivable land, the area under irrigation were 18.5 lakh ha in Kharif and 8.5 lakh ha in Rabi.

Fertilizer

Fertilizer, a key input for agriculture contributes 10-15% of productivity of different crops. Nitrogen, Phosphate and potash are the three main nutrients used by the farmers.

Compared to other states consumption of fertilizer in Orissa is not encouraging. However, there is a progressive increase in fertilizer consumption over the years. Total fertilizer consumption in state during 1991-92 of 196.03 thousand tones showed an increase of 355.30 thousand tones during 2004-05. By the same time fertilizer applied 19.96 kg/ha during 1991-92 has been increased to 43.0 kg /ha during 2004-05. District wise, there is great fluctuation in fertilizer consumption. Maximum consumption 106 kg/ha was recorded in district Balasore. Whereas at the same time, minimum consumption of 3 kg/ha had been reported in district Kondhamal.

Groundnut farmers usually apply gypsum @ 2.5 q/ha which increased groundnut yield by 10-15 per cent. The use of micronutrient fertilizers like zinc sulphate and borax is increased in intensive rice and vegetable growing areas of the state.

Plant Protection

Adoption integrated pest management (IPM) has been given due thrust for increasing crop productivity. Seed treatment, crop sanitation, use of bio-control agent and conservation of beneficial insect and pathogens are the components of IPM. The concept of IPM emphasizes conservation and augmentation of natural enemies of pest such as parasite, predator and pathogens for control of harmful insects and diseases of crop. There are seven bio-control laboratory in the state including one from Government of India, those rear, multiply and supply adopted parasite and pathogens to the farmers.

Farm Mechanization

Farm mechanization play an important role for timely operation of agricultural activities for increasing production and productivity. There is

a good trend in the use of tractor, power tiller and sprinkler by the farmers. There is an increase in sale of tractor from 143 to 900 nos and power tiller from 783 to 2100 nos. from the year 1999-2000 to 2005-06.

Farm Credit

Processing of inputs by the farmers is augmented through farm credit. Field staff of Director of Agriculture help the farmer in supplying forms and creating awareness for easy availability of loans from banks.

Horticultural Programme

National Horticultural Mission (NHM) has been initiated in Orissa science 2005-06 under the Directorate of Horticulture with the following objectives :

- (i) Doubling of horticultural products to prevent their import and rather attempt to export.
- (ii) Creation of market facilities for horticultural products.
- (iii) Transformation of technology at the door steps of farmers.
- (iv) Improvement of cashew cultivation.
- (v) Encouraging private sectors to adopt horticulture as profession.
- (vi) Emphasis in production of organic vegetables.
- (vii) Establishment of adequate numbers of cold storages to prevent damage of horticultural Products.

As per the mandate, plantation of high yielding genotypes of mango, cashew and banana had been taken up. Cashew orchards of 130 ha have been rejuvenated. Targeted area on floriculture for rose, tuberose and gladiolas has

been achieved. Training on improved horticultural technologies to the farmers, both inside and outside have been imparted as per target. District level exhibitions and shows for horticultural products have been conducted. Programme on cultivation of ginger, and turmeric for 3200ha and medicinal gardens have been initiated. Proposal for establishment of button mushroom units, cold storage biotechnology laboratories and plant health care units are under active operation. Development of rural marketing and establishment of new wholesale horticultural market at Bhubaneswar, Sambalpur and Berhampur are under consideration.

Watershed Development

Watershed is a geo-hydrological unit wherein the water drains into a common point. Watershed management aims at :

- (i) Harmonious development and management of soil and water resources within the natural boundary of the watershed;
- (ii) To develop and produce sustainable crops, vegetations, livestock etc for equitable sharing of benefits among the communities living within the watershed;
- (iii) Harnessing and conserving land and water through sustainable natural resources and
- (iv) Restoration of ecological balance.

Watershed development programme currently are implemented through centrally sponsored schemes such as;

- (i) Drought Prone Area Programme (DPAP)
- (ii) Integrated wasteland Development programme (IWDP)
- (iii) National watershed Development Programme for Rainfed Area (NWDPPRA)

- (iv) River valley projects (RVP)
- (v) Rural livelihood Tribal Area Project for KBK Districts (RLTAP for KBK, Dists) and
- (vi) Western Orissa Rural Livelihood Project (WORLP)

All the above mentioned watershed projects work under the Orissa Watershed Development Mission (OWDM) in 8 KBK districts and 22 non KBK districts.

The activities of the watershed projects are as follows :

(i) Drought Prone Area Programme (DPAP)

This Project is operating in 47 blocks of 8 districts such as Bolangir, Sonapur, Kalahandi, Nuapada, Baragarh. Boudha, Dhenkanal and Khandhamal. This watershed covers 1145 micro watershed projects covering 58130 ha out of which 17,426 ha have been treated during 2004-05. During 2001-06, 30,000 ha has to be treated.

(ii) Integrated wasteland Development Programme (IWDP)

This programme is being implemented in 23 districts except Puri, Jagaisinghpur, Bhadrak, Kendrapara, Boudha, Kandhanmal and Nuapara. There are 822 micro watershed projects covering 436130 ha. During 2004-05, 1800 ha in 500 watersheds have been treated by utilizing an amount of Rs.1,253 lakh. There is a programme for treatment of 35,000 ha during 2005- 6.

(iii) National Watershed Development Project for Rainfed Area (NWDPA)

This programme is implemented as a component of central sponsored project for micromanagement of agriculture. There are 212 micro watersheds of which 59 are in KBK

districts with an area of 33,315 ha and 153 watershed are in non-KBK districts with an area of 104,929 ha for treatment. The broad objective of this project is for management of agricultural productivity and production of biomass on sustainable basis and restoration of ecological balances in rainfed areas through watershed approach. This project will continue during 2005-06 with treatment of 5555 ha,

(iv) River Valley Project

This project aims at treating degraded catchment areas of multipurpose interest at reservoirs with appropriate soil and water conservation measuring to check silt flow into reservoir and to enhance the productivity of degraded land. This project is working in four catchment of Hirakud, Rengali Nandira, Machakunda-Silem and upper Kolab. The catchment of upper Indravati is proposed to included in this project. The project is implemented in 11 micro watershed covering an area of 18571 ha.

(v) Rural Livelihood tribal Area Projects for KBK District (RLTP for KBK Districts)

Under this project central assistance is made available for implementation of 314 micro watersheds of a total area of 167616 ha. This project includes the districts Koraput (84), Rayagada (66), Nabarangpur (60), Malkangiri (42), Bolangir (20), Sonapur (8), Kalahandi (16) and Nuapada (10), During 2004-05 and 2005-06, areas of 12,747 ha and 32,200 ha have been taken up for the treatment in the above mentioned districts.

(vi) Western Orissa Rural Livelihood Project (WORLP)

This project lunched since 2000-01 will cover 4 project districts such as Bolangir.

Nuapada, Kalahandi and Bargarh for 10 years. The project includes 290 micro watersheds of 150766 ha of land. The project aims to promote sustainable livelihood for the poorest of the project area.

All the above six number of Watershed Development Projects implemented in the state with 2795 numbers of micro watersheds with a total area of 14,92,627 ha., out of which 546754 ha have been treated.

Special Packages for Farmers

The Hon'ble Chief Minister, Orissa has announced the following special packages on 15th August, 2006, the 60th Independence Day of the country.

1. By 2008-2009 each Grampanchayat will have a sale's centre of seeds for purchase.
2. By the said time, under the plan of seed village, production of paddy and non-paddy seeds will increase amounting to 5 qts.
3. Seeds, fertilizers and agricultural implements will be sold through the highest committee of "Pani Panchayat"
4. Soil testing programme will be carried out in each block and soil health cards to farmers
5. Fifty percent discount will be allowed to the farmers of each block on preparation of compost as well as vermicompost
6. Farmers of each block will be deputed to the training institute of both inside and outside Orissa within four years to learn new technology
7. An advanced farmer from each GP will be awarded as "Farmer Friend" within coming three years
8. Within coming three years, saplings of mango, cashew and banana will be planted in 50,25 and 5 thousand hectares respectively availing 75% subsidy in each district
9. Provision will be created for drip and sprinkler irrigation for orchard crops at 50% subsidy in each district
10. Saplings of papaya, mango and lime will be made free distribution to the desired educational institutes alongwith 2.5 lakh farm families
11. Creation of 5000 onion preservation centers in districts of Bolangir, Kalahandi, Nuapada and Dhenkanal with 50% subsidy upto maximum of Rs.8000/-
12. Cultivation of marigold, tuberose, glabioli and rose will be encouraged with availing subsidy of 50% for small farmers and of 33% for large farmers
13. Beetlevine farmers of districts of Balesore, Bhadrak, Jagatsinghpur, Cuttack and Puri will be allowed subsidy upto Rs.10,000 for establishment of new mounts of beetlevine
14. Three large wholesale markets for marketing for horticultural products will be opened at Cuttack, Sambalpur and Berhampur village markets in 19 districts will be modernize for marketing of horticultural product
15. Contact farming facilities will be provided to the farmers at right price on crops of sugarcane, cotton and maize
16. Agricultural economic zone will be created in district Kandhamal for cultivation of ginger and turmeric
17. Discount on digging of fifty thousand new borewell and tubewell will be given to farmers by 2008-09

18. Digging of ten thousand farm ponds at 50% subsidy will be available to farmers below poverty line in districts of Bolangir, Sonepur, Boudh, Kalahandi, Nuapada Dhenkanal, Kandhamal and Bargarh. In respect of farmers belonging to scheduled caste and scheduled tribe the subsidy will be raised to 100%
19. Irrigation facilities upto 35% of agricultural land in each block will be provided within coming 5 years
20. "Kisan Credit Cards" will be given to all efficient farmers with coming years
21. Agricultural loan for Pisciculture will be provided to fish farmers for intensification of fishfarming
22. Aquashops will be created in each block for supply of fingerlings and other essential fishrelated materials. In this regard eagered enterprenures will avail 25% subsidy
23. Laboratories will be set up in each district for identification of animal disease and supply of preventive vaccines.

Professor S.K. Sahu and R.K. Nayak are working as Department of Soil Science & Agril. Chemistry, OUAT, Bhubaneswar-751003, Orissa.



His Excellency the Governor Shri Murlidhar Chandrakant Bhandare giving prizes at the 15th Festival of Disadvantageed and differencing able Children of Sahaya at Saheed Bhavan Cuttack on 17.12.07.

NEWS

NORWEGIAN SUPPORT FOR INFANT CHILD HEALTH CARE

Orissa's infant health care status all set to receive a shot in the arms. The State Health & FW Society in H&FW Department of the Government have entered into an agreement with United Nations Office for Project Services (UNOPS). It is a part of the Norway India partnership Initiative (NIPI) which has come forward for support in a big way. This Norwegian support aims at strengthening services provided under NRHM for improving women and child health care.

In presence of Sri Duryodhan Majhi Minister Health & Family Welfare, Mr Chinmay Basu, Principal Secretary, Health & Family Welfare Department and Vice-Chairperson State Health & Family Welfare Society and Mr Prasanna Hota, Director NIPI have signed an MOU. Mr lasse Bjorn Johannessen, Ambassador I/C of Norway to India was also present during this signing-in ceremony. This MOU will be in force till 31.03.2012.

NRHM aims at providing accessible, affordable, effective, accountable and reliable health care to all and in particular to the poorer and vulnerable sections of the population consistent with the outcomes envisioned in the Millennium Development Goals (MDG). Norway and India have agreed to collaborate towards achieving MDG 4 based on commitments of the two countries. The aim of the partnership is to facilitate rapid scale-up of quality child related health services that are equitable and sustainable in five high focus States of India including Orissa.

IMR in the State has dropped significantly. Norwegian support is only timely. The intervention will include increasing access to neonatal care and services. The initiative will take a set of steps to scale up quality of services rendered by ASHA workers at village levels by strengthening their support needs and referral requirements. Its special emphasis on child health planning and its implementation will be Block, District and region specific.

An important component of NRHM is to increase institutional delivery, the fresh initiative would emphasise on training health workers in home based newborns and child care. Though the institutional delivery in the State has risen significantly, the grey area continues to prevail through home based delivery that will be the focussed area. Block, District and State Project Management units are to be strengthened to ease out the increased load and will identify the gap in immunisation coverage among the targeted group and seek address that. Similarly skill enhancement of the nurses to support and manage the entire range of child health programmes will also be a part of this. This support will see

provision of flexible funds both at district and block levels for child health process to speed up decision making . The financial and administrative system too would be mobilised for improvement and increase private sector involvement in attainment of these goals will be high on agenda.

THE ORISSA URBAN POLICE ACT, 2003 COMES INTO FORCE IN THE TWIN-CITY OF BHUBANESWAR-CUTTACK UNDER THE NEW POLICE COMMISSIONERATE SYSTEM

Police Commissioner-designate Binay Kumar Behera told presspersons that under the Commissionerate system, which was being introduced in the State for the first time, all efforts would be made to keep criminals and anti-socials at bay and improve the traffic situation in both the cities.

The Commissionerate will have two urban police districts – Bhubaneswar and Cuttack – and each would be headed by a Deputy Commissioner of Police of the rank of Superintendent of Police. Both the districts will have sub-divisions each comprising some police stations, according to Behera. The Bhubaneswar police district will have five sub-divisions such as Capital and Kharvelnagar PSs; Lingaraj, Jatni and Airfield PSs; Khandagiri, Nayapali and Saheed Nagar PSs; Infocity, Mancheswar, Chandka and Chandrasekharpur PSs; and Badagada, Laxmisagar, Baliana and Balipatna PSs. Besides, there would be separate Deputy Commissioners for Headquarters, Crime, Traffic, Intelligence and Security, Training (Urban Police and Traffic Training Institute), and Armed Reserve (7th Bn. OSAP/ Urban Special Armed Police). For traffic, the Commissionerate will have a separate district for the twin-city with three sub-divisions such as Bhubaneswar, Cuttack and National Highway. The Mahila and Energy police stations will work under DCP Crime.

The endeavour of the police under the new system would be to emerge public-friendly by helping the common man. Any violation of these rules would attract fine up to Rs 1,000 or imprisonment up to 30 days if fine not paid. Among other things, the violations that would attract fine include:

1. Disregarding rules of the road, overtaking from the left, leaving vehicle or animal insufficiently tended in any street or public places, etc;
2. Driving vehicle or animal with timber, poles or other unwieldy articles through street or public place against regulations;
3. Cleaning/repairing vehicles or grooming animals on street, pavement or public place causing impediment to traffic or serious annoyance to residents;
4. Causing obstruction by keeping vehicle parked in street or public place for loading/unloading, taking up/setting down passengers, etc longer than necessary;
5. Causing obstruction to passengers, pedestrians and annoyance to people living in the vicinity by performances, etc;
6. Behaving indecently in public;
7. Obstructing or annoying passengers in the street or public places;
8. Committing nuisance in or near to any street, public place, etc;
9. Affixing bill, notice or other paper on public property without consent of authority;
10. Disorderly conduct at places of public amusement, etc.

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GOPINATH MOHANTY, I.A.S.
Commissioner-cum-Secretary

BAISHNAB PRASAD MOHANTY
Director-cum-Joint Secretary

SASANKA SEKHAR PANDA
Joint Director-cum-Deputy Secretary
Editor

BIBEKANANDA BISWAL
Associate Editor

Bibhu Chandra Mishra
Debasis Pattnaik
Sadhana Mishra
Bikram Maharana
Editorial Assistance

Manas R. Nayak
Cover Design & Illustration

Hemanta Kumar Sahoo
Manoj Kumar Patro
D.T.P. & Design

Raju Singh
Manoranjan Mohanty
Photo

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E-mail : iprsec@rediffmail.com
Visit : <http://orissagov.nic.in>
Contact : Ph. 0674-2394839

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