

CIBART **communiqué**

Bamboo partnerships in action

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Let's strengthen the bamboo movement



Bamboo and rattan (cane) are important means for generating income and improving the nutritional status of over two billion poor and disadvantaged people. These natural resources also provide the basis for an expanding small- and medium-scale enterprise sector in Africa, Asia and Latin America. As such, bamboo and cane constitute excellent entry points for rural poverty-alleviation initiatives.

Bamboo benefits rural communities because it lends itself to agricultural approaches and can be grown on non-agricultural land. It is easily processed by simple tools because it splits linearly. Bamboo industrial development — by default — benefits the community because growing, harvesting, transportation and processing are all labour intensive. Bamboo growth also results in land protection and soil quality improvement, benefits agriculture and ensures food security. It provides several other incidental benefits such as significantly reducing fish feed costs to artisanal fisheries, and backstopping a range of sectors such as sericulture, fisheries, animal husbandry and agriculture and, importantly, housing.

The International Network for Bamboo and Rattan (INBAR) was formally established in 1997 as a multi-disciplinary network for addressing social, economic, policy, institutional and technical issues related to the development of bamboo and cane. However, INBAR has existed as an informal network since 1984. In order to help realize the benefits of bamboo for the rural communities in India, INBAR has facilitated the setting up of the Centre for Indian Bamboo Resource and Technology (CIBART) as an independent non-profit organization to promote the bamboo

sector in India. In turn, CIBART has set up daughter organizations in several states across the country, with backward linkages into the villages and forward linkages into technical and other development agencies at the national and international levels.

CIBART is just over a year old. Yet it has made inroads in policy, raising awareness, providing technical support, training and implementing projects. CIBART's core team of India-specific professionals, who have considerable experience in bamboo and cane development, work with governments, civil society and the community to make bamboo-based sustainable development a reality.

Bamboo is more than 'a poor person's timber'. It offers earthquake-proof housing. It reduces the impact of cyclones. It remediates degraded soil. It can be the resort you vacation in, the bed you sleep in, the lamp that lights up your book and the food you eat. All the time, benefiting the poor.

CIBART works through building networks and partnerships. CIBART has been visualized as a common shared platform for all organizations interested in working with bamboo.

CIBART Communiqué, a quarterly newsletter, is a step towards bridging the knowledge gaps, building relationships, forging partnerships and getting business for rural enterprises. We do hope that you will send in your comments, write in your experiences and join the effort to make bamboo-based sustainable development a reality.

We look forward to hearing from you.

I.V. Ramanuja Rao
Chairman, CIBART



Bamboo in India

The Bamboo Tradition

In the oldest sacred book of the Hindus, the *Rig Veda*, bamboo finds evocative mention, with an invocation for many bamboo clumps to be bestowed upon mankind. From birth to death, the divine grass is a close companion of every Indian, be it the cradle that rocks the baby or the bier on which cremation takes place. Even weddings traditionally take place under the bamboo pole. Bamboo has as many as 1,500 recorded uses from food and housing to a wide range of agricultural and industrial activities, in both rural and urban areas.



The Bamboo Economy

Bamboo in India generates 432 million workdays annually. Some 25,000 bamboo-based industries provide employment to about 20 million people. Of the 13.47 million tonnes of bamboo consumed, 11.77 million tonnes are used in construction, small and cottage industries, handicrafts, paper production, as wood substitutes and for domestic purposes. About 1.7 million tonnes of bamboo are smuggled out to neighbouring countries.

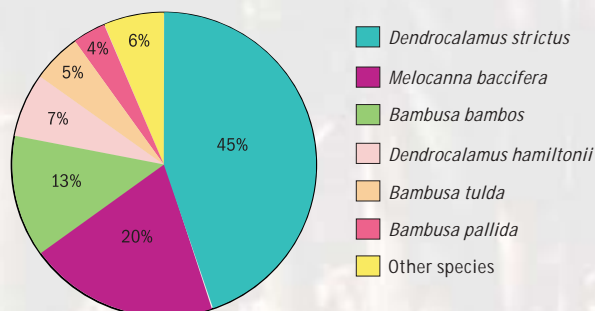
Commercial consumption of bamboo in the world is to the tune of \$10 billion (Rs 46,000 crore), which is expected to double by 2012. While the size of the bamboo economy in 2001 was \$444 million (Rs 2,043 crore), the market potential is estimated to be \$970 million (Rs 4,463 crore) with a projected annual average growth rate of 15-20 per cent. Based on current trends, it is estimated that the bamboo industry in India could grow to \$5.6 billion (Rs 26,000 crore) by 2015.

The Bamboo Potential

Bamboo can play a significant role in solving many of India's development problems. Recognizing bamboo's enormous potential worldwide, there has been an overdrive in R&D activities to find new applications for the plant. Already bamboo is generating energy in some places and acting as a wood substitute in paper and other allied industries. According to estimates, bamboo-based activities could easily generate 8.6 million additional jobs in India and thus enable 5.01 million families to cross the poverty line.

Currently there is a mismatch in demand and supply. At present the demand for bamboo is 26.9 million tonnes as against the supply of 13.47 million tonnes. A coordinated action plan could put this skewed equation right, especially given the wide availability of bamboo in India.

Species-wise distribution of bamboo in India



Bamboo at a Glance

Bamboo consumed in India

13.47 million tonnes annually

Number of species

136, including 11 exotic species, in 75 genera

Distribution

All over India except the Kashmir valley

Total forest area under bamboo

8.96 million ha (about 12.8% of total forest area)

Bamboo economy (2001 figures)
\$0.44 billion (Rs 2,043 crore)



The source for all figures is the Planning Commission report on National Mission on Bamboo Technology and Trade Development

Bamboo and the Environment

Protecting Earth's Health and Wealth

Call it green gold or nature's band-aid, bamboo is a great protector of the earth's health and wealth. It is a critical element in maintaining the balance of oxygen and carbon dioxide in the atmosphere. Carbon gets trapped within bamboo forests, thus reducing carbon dioxide gases. It also lowers the intensity of light and protects us from harmful ultra-violet rays.

Bamboo exists naturally on every continent except Antarctica. It has found a niche for itself in sea-level tropics and on 13,000 ft mountain slopes.

It is a cheap, abundant resource that is recyclable and can outgrow any other plant. A 60-foot tree cut for the market takes 60 years to replace, whereas a 60-foot bamboo takes just 59 days to replace.

Bamboo can tolerate diverse soil moisture regimes, can heal degraded land, stop soil erosion and help in drought-proofing. Bamboo foliage acts as a shelter for the top soil against tropical downpours and cloudbursts, while the leaf litter helps in moisture conservation by forming a soft cushion on the soil.

Bamboo has an extensive underground root-and-rhizome system that effectively binds the top one foot of soil, critical for soil health. A single bamboo plant can bind up to six cubic metres of soil.

Bamboo forests nurture wildlife. Apart from the endangered panda, the most famous symbol of bamboo forests, many birds, monkeys and boars depend on bamboo shoots. Their very survival depends on this grass.

Before



After



Bamboo to the rescue

In two villages near Allahabad, rampant brick-mining degraded the land and devastated the environment. Bamboo was planted in large numbers to repair this damage. Within five years, the once barren land became green, the micro-climate improved and the water table level rose from 40 metres to 33.7 metres deep. This movement has now spread to 96 similarly affected villages in the area.

Bamboo and Livelihood Security

Friend of the People

Bamboo provides tremendous employment opportunities right from resource generation to resource use, from plantation and harvesting to primary processing and making end products.

The bamboo sector in India generates 432 million workdays annually. In India there are many communities such as the Gonds (population: 8.33 million), Baigas (370,000), Korku (100,000) and Basodes (1.1 million) that are wholly dependent on bamboo for their livelihood.

Among the 23 million involved in the handicraft sector in India — which is the second largest employment generator after agricul-

ture in the country — two million people work on bamboo-based crafts.

Microenterprises can be set up that make extensive use of bamboo in furniture, handmade paper, handlooms, charcoal, blinds, toothpicks, incense sticks, chopsticks and many more utilitarian products.

Supplying corrugated bamboo roofing sheets for 15,000 houses can create employment for 4,000 people for 30,000 humandays.

A tonne of bamboo creates 350 person days of work in the 'production by masses' sector whereas the giant mill sector gives us only 12 humandays.

Giving gainful employment



In Orissa, Gram Vikas, a non-governmental organization working with marginalized communities is making bamboo mat boards as an alternative to wood. The boards are used to make cupboards, furniture items and other accessories. The mat needed for making the board is woven by local artisans giving them employment. An Indian study estimates that if one quarter of plywood production in India is replaced by bamboo mat board, additional employment of about 66 million person days per annum would be created specially for rural women in mat weaving, virtually weaving money at home.

Multipurpose Bamboo

Bamboo and Energy

An Eco-friendly Alternative

Bamboo is a good substitute for fossil fuels in the form of charcoal briquettes. Experiments indicate that the charcoal obtained from bamboo is of good quality and can be used in industrial processes after activation.

Gassification with bamboo is a process in which a solid fuel is burnt at very high temperatures, between 700°C and 900°C, in the presence of a gassification agent such as air.

By this process, the energy present in the biomass is converted into a gaseous combustible, or chemical energy. Gas products are easier to handle. They can be used in combustion engines or gas turbines. The combustion is clean and less polluting.

The produced gas has a calorific value of 25-30 per cent of that of natural gas and is a valuable source of bioenergy for a variety of purposes.

Bamboo has a number of desirable fuel characteristics such as low ash content and alkali index. The heating value is higher than most agricultural residues, grasses and straw.

Besides, bamboo has high biomass productivity and is self regenerating. It can thus provide power on a sustainable and environment-friendly basis.

The net calorific value of bamboo is comparable or higher than other wood species like beech, spruce, eucalyptus and poplars and is in the range of 18.3-19.7 MJ/kg.



Bamboo shows the light

In Tamenglong district of Manipur, the Tamenglong Bamboo and Cane Development Centre (TAMBAC) is setting up a 100 KW electricity unit through a bamboo-based biomass gassifier. In this remote area where 60 per cent of the villages are non-electrified and where available, power supply is erratic, people at last see some light. Microenterprises too will be powered by bamboo-based units.

Bamboo in Infrastructure

The Best Building Block

Bamboo is one of the world's best engineering material and perhaps the oldest. It is used for making bridges, scaffolding, roads and embankments. Buildings made from bamboo survive earthquakes while concrete structures do not. Its ability to withstand vibrations helps in mitigating disasters.

The tensile strength of bamboo is 28,000 per square inch as against 23,000 per square inch for steel. Its load-bearing capacity is nearly double that of steel. What's more, bamboo costs just six per cent of the price of steel.

Traditional bamboo houses provide shelter to more than 10 billion people worldwide. In Ecuador, the NGO Vivendas Hogar de Cristo provides 70 bamboo

houses to the poor every day. In Ghana, a school building using bamboo has been constructed at 40 per cent of the cost of a conventional building.

In the Philippines, weekend retreats make extensive use of bamboo. Rising 12 stories tall, the three pillars of the 1987 Eucharistic Congress Tower were made from 200 poles tied together in a triangular section that tapers to a narrow spire. The tower has passed the test of gale-force winds.

The United Nations High Commissioner for Refugees (UNHCR) and the International Network for Bamboo and Rattan (INBAR) have designed a bamboo tent that can be used as a temporary shelter for refugees.



Quake-proof houses

Latin American houses that survived earthquakes became the model for the Zero Emissions Research Institute (ZERI) pavilion at an exhibition in Germany. The United Nations Development Programme (UNDP) is promoting low-cost houses across Latin America and Africa. In quake-hit Maharashtra and Gujarat, rehabilitation projects have used bamboo-based housing structures.

Bamboo and Handicrafts

Blending Tradition and Modernity

More than two million households in India sustain on bamboo-based handicrafts. The world over, the figure is about eight million. Many of the crafts reflect the mystic relationship of bamboo, people and culture. Ingenious skills revolve around slivering, weaving, stitching, splitting, layering, inserting, winding, stringing, and pinning and create hundreds of beautiful patterns, decorations and useful products.

Different geo-climatic regions support over a hundred different species which are shaped into artifacts appropriate for the area.

In India, *Dendrocalamus hamiltonii*, *Melocanna baccifera*, *Bambusa tulda*, *Bambusa vulgaris*, *Ochlandra travancoria* and *Dendrocalamus longispathus* are commonly used in handicraft. Elsewhere, species such as

Phyllostachys pubescens, *Ph. bambusoides*, *Ph. glauca*, *Ph. angusta* and *Ph. heteroclada* are used for making different woven articles.

Except in the nodes, bamboo fibres run straight. A single human hair can pass through the pores between fibres. The traditionally woven baskets are of elliptic, rectangular and octagonal shapes, and of very fine workmanship. Sometimes as many as 120 thin threads can be woven in a width of 3 mm. Artists bleach and strip the bamboo and then add colour to the handicrafts.

Before the invention of paper, sculptured bamboo slips were used for writing and carrying messages. The bamboo culms and roots must be fumigated and thoroughly dried before being sculptured. It should be 3-4 years old and free of insects.



Bamboo and Products

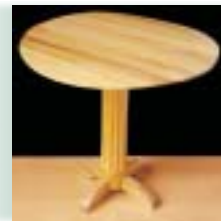
The Plant with a Thousand Faces

There are over 1,500 documented uses of bamboo. From A-Z, bamboo products adorn every letter of the alphabet. Thanks to R&D, newer applications are being found by the day.

- A Activated charcoal, acupuncture needles, alarms, alcohol, anchors, antenna supports, aphrodisiacs, arrows and arrow tips, ashtrays, awnings.
- B Baby carriages, bagpipes, barrels, baskets, beads, beanpoles, beds, boat hoods, boats, bolts, bookcases, boxes, bracelets, bridges, brooms, buttons.
- C Candlesticks, carts, chairs, chopsticks, clothes racks, colanders, combs, cooking vessels, chicken coops, couches, cradles, crates, crosses, cups, curtains.
- D Dams, desks, diesel fuel, dolls, dry cells, dustpans, dykes.

- E Eggcups.
- F Fans, fishnets, fish poles, flagpoles, flooring, flowerpots, flutes, fodder, food, fuel, furniture.
- G Gabions, garments, gates, grain, grain storage, graters, greenhouses, guns, gutters, gypsy vans.
- H Hairpins, hampers, handles, hats, hay and forage, hedges, helmets, hen houses, hinges, hoops, hookahs, house plants, houses.
- I Incense sticks, insect cages, irrigation waterwheels and pipes.
- J Jackets, jars, jewellery, joss sticks.
- K Kiosks, kites.
- L Ladders, ladles, lamps, lampshades, light bulbs, lofts, looms.
- M Mahjong tiles, Matting, mattresses, medicines, musical instruments.
- N Nails, napkin rings, needles, net floats, nets, netsuke.

- O Ornaments, oyster cultivation.
- P Packaging, paper cutters, paper pulp, pegs, pen and pencil holders, pins, pipes, plates, poles.
- R Racks, rafts, raincoats, rakes, rattles, rayon, rings, river bank protection, roofing, ropes.
- S Scaffolding, scales, scarecrows, shades, shovels, shuttles for weaving, sieves, sticks, stilts, stools.
- T Tables, tallies, tea houses, tea strainers, tea whisks, tents, tiles, towers, transport.
- U Umbrellas.
- V Valiha (musical instrument).
- W Wagons, walking sticks, walls, water jugs, water storage, wheelbarrow, windmills.
- X Xylophones.
- Y Yurts.
- Z Zithers.





Bamboo in the News

Fatal Flowers

Several species of bamboo in northeast India are flowering and dying. Flowering management strategies need to be formulated to minimize adverse socio-economic impact

Ratan Lal Banik*

It's a once in a 30-45 year phenomenon that people don't look forward to. Most of the bamboo species found in the Indian subcontinent exhibit gregarious flowering characteristics – that is, a majority of the plants in the population flower simultaneously after a specific period of time and then die. In regions where livelihoods depend on bamboo, this has a great socioeconomic impact in addition to disastrous effects on the ecology.

In northeastern India, *Melocanna baccifera*, *Dendrocalamus hamiltonii* and *Schizostachyum dullooa* have recently started flowering and dying simultaneously. Predictably, there is a lot of concern and strategies are being formulated to minimize the impact of flowering on the region. It appears that two distinct, big populations of *M. baccifera*, one with 30-35 years and another with 40-50 years of flowering cycles, exist in the India-Bangladesh-Myanmar region. But some small populations of the species seem to exhibit longer (60, 65 years) or shorter (10- 13, 19-21, 22-23, 25 years) flowering cycles.

Why does a bamboo die when it flowers?

A flowering bamboo clump does not die until all the vegetative buds (leaf buds) are transformed into flower buds. The water demand of the bamboo and its upward movement becomes markedly restricted during flowering time due to absence of leaves and as a result the plant dies. In explaining the mysterious flowering of *Phyllostachys bambusoides*, Soderstrom and Calderon (1976) hypothesized that all the members of a bamboo species 'know' when the flowering time is at hand, thanks to a genetically imprinted 'alarm clock'. It is believed that an internal physiological calendar might set the timing of seeding or ripeness to flower in bamboo (Janzen, 1976). Some experiments with precocious flowering in *B. tulda* at Bangladesh Forest Research Institute, Chittagong (Banik, 1980) suggest that the internal calendar for flowering in bamboo could be a genetic trait.



In most northeastern states, next to agriculture it is bamboo-based economic activities that generate a large amount of employment. Large-scale death of bamboo forests due to gregarious flowering creates an alarming shortage of bamboo resources and can cause the following problems:

- 1 Localized famines: Excessive accumulation of bamboo fruit brings on a rapid increase in the rodent population, which begins to devour grain and stored food as well.
- 2 Damage the ecosystem: The largescale death of bamboo species disintegrates the underground rhizome net, creating serious problems for soil binding and water conservation. This, in turn, reduces agricultural productivity. Siltation in river beds and denuded hills also create unpredictable flood in the plains.
- 3 Affect Wildlife: Some animals, like monkeys, porcupines, buffalos and wild boars depend on tender bamboo shoots and young rhizomes for their food. Flowering and death of bamboo results in food scarcity and has an adverse effect on their health and survival.

If managed properly, bamboo flowering can however be turned into an advantage. Diversified livelihood opportunities for the indigenous people can be created and the disturbed hill ecosystem can be speedily rehabilitated. Some ways of using this crisis as an opportunity include:

- 1 Using the seeds disbursed effectively: Earlier, seeds obtained from gregarious flowering were wasted. But now, some foresters in the northeast, especially Tripura, have been raising plantations with the currently available seeds of *M. baccifera*, *D. hamiltonii* and *S. dullooa*. The Tripura Forest

Department has started joint forest management (JFM) with the people of the area to raise plantations in the hills.

Different self help groups (SHG) residing in the hills can be encouraged and trained to raise bamboo nurseries near the flowered area. Training may be given in seed collection, processing and storage, seed sowing, germination, nursery management and transplantation.

Members of JFM and SHG need to be employed for controlling weeds, fire protection and preventing grazing to assist in

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seedling survival and successful establishment of natural regeneration. They could raise mosaic plantation with a mixture of two or more flowering populations of *M. baccifera* so that these will flower at different intervals and all the clumps will not die together, causing resource shortage.

2 Harvesting dead bamboo from inaccessible areas: According to estimates, the present flowering in *M. baccifera* could result in 26 million tonnes of dead bamboo. Of this only 10 per cent will be found in accessible areas. Efforts should be made to harvest dead bamboos from the inaccessible areas.

3 Maximizing utilization of available huge dead culms: Very often it has been seen that bamboo stored for long periods tends to rot as it is vulnerable to attack by microorganisms. They may be protected through prophylactic treatment by spraying diluted preservatives like sodium pentachlorophenate (1 per cent solution), Boric acid+Borax (1:1) 2 per cent solution.

To utilize the huge quantities of available culms, small scale industries for producing *agarbatti* sticks, chopsticks, toothpicks and pencils, for example, can be set up. This will help indigenous people earn some cash.

Tapping global markets

January 2004 saw the launch of a project titled *Marketing of community bamboo products in Europe*. The joint project by the International Network for Bamboo and Rattan (INBAR), International Fund for Agricultural Development (IFAD) and the Italian government aims to market products made by rural communities from Ecuador, India and Tanzania, to start with, in Italy and subsequently all of Europe.

South-based communities and designers will work with European designers for cross learning. Market niches suitable for South-produced bamboo products will be identified and South-North production-marketing linkages that benefit the rural smallholder will be formed. A bamboo exhibition will be held in Europe.

INBAR has been running bamboo-based development projects for almost five years. Finding affluent overseas markets for the products produced by rural communities could give these projects a big impetus. Already, in CIBART's project in Tamenglong, Manipur, some communities have established links to European markets via a trade fair.

In IFAD's rural poverty report, considerable attention is given to markets, because the rural poor must have access to markets to sell their goods and also to access inputs, assets and technologies, consumer goods, credit and labour. Marketing — creating an image, defining the target group and showing how the products fit — is also vital.

World Bamboo Congress

'Bamboo for Integrated Development' is the theme of the VIIth World Bamboo Congress being held in Delhi from 27 February to 4 March, 2004. Organized every three years, the conference that has in the past been held in the Philippines, Mexico, Japan, Indonesia and Costa Rica, comes to India for the first time. The seven-day event will be the largest and most focused gathering of researchers, buyers and sellers of bamboo products in the history of such events.

Hotel Ashok, the venue of the Congress, will see researchers and policy makers discussing the latest trends and technologies in issues related to bamboo and development, while a concurrent expo at

India's largest fair grounds, Pragati Maidan, will showcase innovative bamboo-based products.

Bamboo can play a significant role in solving many of India's problems such as unemployment, providing shelter and food security. The conference is expected to throw up some interesting solutions using bamboo.

At the same time, the versatile plant will also provide many a lighter moment as music played out on bamboo-based instruments will regale the crowds. The Congress is a collaborative venture between the World Bamboo Organization and the Indian government.



Bamboo for
Integrated Development

The CIBART Story

OUR ACTIVITIES

- Raising awareness
- Extension
- Community sensitization and mobilization
- Action plan preparation
- Project implementation
- Policy research and analysis
- Advocacy
- Research and development
- Bamboo resource generation
- Infrastructure development
- Product development and design
- Bamboo construction
- Training (capacity building)
- Consultancy
- Setting up enterprises
- Marketing

Important bamboo species addressed by CIBART

Bambusa balcoa
Bambusa bambos
Bambusa nutans
Bambusa tulda
Bambusa vulgaris
Dendrocalamus giganteus
Dendrocalamus hamiltonii
Dendrocalamus strictus
Melocanna baccifera
Schizostachyum dulloa
Thyrostachys oliverii



Species that will be additionally addressed include *Dendrocalamus asper*, *Dendrocalamus latiflorus*, *Phyllostachys bambusoides*, *Phyllostachys pubescens*, *Guadua angustifolia*

The Beginnings...

Subsidies, handholding, spoonfeeding — that's the route that development projects in India typically take. The idea was to do something out of the ordinary — empower the rural communities in bamboo- and cane-rich areas in such a manner that within a year they would start thinking like businessmen and businesswomen. To usher in a culture of market economics and let that dictate rural development. To set up community-based venture capital funds that would catalyze entrepreneurship.

Thus was born CIBART — the Centre for Indian Bamboo Resource and Technology — a not-for-profit, networked organization incorporated under Section 25 of the Companies Act, 1956. Set up as an independent body by the International Network for Bamboo and Rattan (INBAR) in December 2002, CIBART comprises enthusiastic professionals from diverse backgrounds.

The aim of CIBART is to achieve environmental security, livelihood security and economic development through the sustainable use of bamboo and rattan (cane). Given India's rich bamboo resources and the people's natural affinity to this grass, there are immense opportunities. CIBART will help actualize this untapped potential by guiding and training communities to set up bamboo-based enterprises.

CIBART takes a practical approach to development issues using technology. If the Internet brings communities in remote outposts face to face with experts in many countries, then GIS helps it identify bamboo rich areas and map out policies and action plans accordingly. Progress of projects can be monitored at the click of a mouse.

CIBART's promise is to service communities at their doorstep. Which means it brings experts, resources and tools together in their backyard. For instance, Filipino design experts, European buyers and African bamboo scientists have been linked to remote regions of the country and some had a direct interface with communities that have had limited contact with even urban Indian visitors.

Before venturing into any state, CIBART ensures that all the backward and forward linkages are in place. In each state, CIBART sets up an independent daughter organization that will professionally manage bamboo and cane activities. The majority shareholders in this company are the community. This local organization has extensive linkages down to each village, backed by field technical resource centres at the sub-district level. And, at the other end of the chain, links with buyers as far away as Europe are established.

CIBART has a global outlook, yet one that addresses local needs. It is for the communities, but is market driven and businesslike. For CIBART, the community is the primary beneficiary, market the goal and the production of craft and manufactured goods using industrial approaches the means.



growing presence



... A Year Later

Barely a year has passed since CIBART took shape. Within this short span, it has made its presence felt in five Indian states and laid the ground for working in others. The idea is to eventually address all the states where bamboo is found (that's practically all of India, barring the Kashmir valley).

Wherever it implements projects, or plans to do so, CIBART sets up a local organization to manage bamboo- and cane-based activities. An example of how CIBART works can be seen in Tamenglong district of Manipur, which is bamboo rich but has a difficult terrain. In May 2003, the Tamenglong Bamboo and Cane Development Centre (TAMBAC) was born. The community ownership of the organization is already 51 per cent, which will go up further as the livelihood development project launched in 69 villages moves towards completion (see page 10).

Similarly, the Tripura Bamboo and Cane Development Centre (TRIBAC) has been formed in Tripura and has made speedy progress (see Page 12). Similar organizations are currently being incorporated in Arunachal Pradesh, Chhattisgarh, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Uttarakhand.

CIBART has also conducted a *'Bamboo sector development policy study in Orissa'* and organized a state-level policy workshop (see page 16). This workshop should open the way to sustain-

able livelihoods for the poverty-stricken tribals in the state.

Machinery to deal with various bamboo species and product requirements like agarbatti sticks, pencils made out of bamboo and other products are being designed/adopted.

Awareness raising and training programmes are an ongoing feature of CIBART's activities and have been conducted in Manipur, Tripura, Orissa, Uttarakhand and Himachal Pradesh. In Tamenglong, environmental protection activities have been initiated and an interface between designers, buyers and the rural communities created. Charcoal and briquetting enterprises have already taken shape and the ground laid for infrastructural development like setting up gassifiers to produce electricity, bamboo housing and community facilities, bridges and so on.

A Bamboo Product Design and Development Centre has been set up in Dehradun with the Uttarakhand government's support, and a training workshop for artisans conducted at the Forest Training Academy, Haldwani.

Using INBAR's network through CIBART, communities in rural Himachal Pradesh, Maharashtra, Manipur, Tripura and Uttarakhand will be able to access markets in Europe.

If year one saw CIBART taking firm root, year two should see it spreading its network.

OUR APPROACH

- Community-focussed
- Evolutionary, rather than revolutionary
- Process, rather than project-oriented
- Businesslike, with an eye on the bottomline
- Development of backward and forward linkages from the rural resident to the global players
- Servicing the community at the doorstep
- Respecting traditional knowledge, skills and practices and building on these
- Setting up community venture capital funds
- Setting up design interface between international designers and rural artisans
- Bridging the digital divide by using technology to modernize traditional skills and for planning, monitoring and evaluation (GIS, Internet)
- Adopting industrial approaches
- Setting up daughter organizations to professionally manage bamboo-based activities from resource generation to production enterprises
- Networking state and district level bamboo organizations and enterprises in a federated mode

Turning The Tide *A bamboo and cane-based livelihood generation project that aims to generate jobs even as it addresses infrastructure development issues*

Project area	4,391 sq km
Target villages	69 villages
Target Population	112,000 (100 per cent scheduled indigenous population)
Implementing agency	TAMBAC (set up by CIBART)
Ownership	Community owns majority 51% share (to go up further soon)
Project duration	3 years
Funding	\$1.1 million (Rs 5 crore) Ministry of Rural Development, State Government of Manipur and INBAR



Tamenglong, situated at a height of 1,290 metres is a hotspot of biodiversity. The area is rich in bamboo and cane. Yet, the local communities had failed to take advantage of this rich resource and continued to practise *jhum* or shifting cultivation. Development has bypassed this remote district with more than 60 per cent of the villages not getting electricity.

The Tamenglong Bamboo and Cane Development Centre (TAMBAC) was set up by CIBART in 2003 to address the livelihood concerns of the people. This three-year project is supported by the Ministry of Rural Development, Government of India, Government of Manipur and INBAR. Additional technical support is provided by INBAR.

The aim is to develop the region using bamboo and cane. The traditional skills of the local communities in bamboo-and cane-based activities will be enhanced by design inputs as well as partial mechanization so that market needs can be addressed efficiently. Community-based enterprises will be set up. Electricity needs will be met by bamboo biomass gassifiers.

This project will result in a paradigm shift in the way bamboo is currently being used. The 50,000-100,000 bamboo culms that are burnt while preparing *jhum* fields will be used to generate income, light up homes and power enterprises.

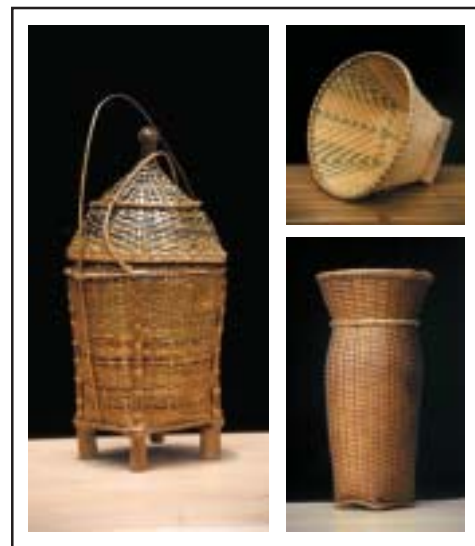
Activities and achievements

Several steps have been taken to ensure community participation, build capacity, generate bamboo resources and develop enterprises. Village-level bodies have been set up for developing linkages between the community and TAMBAC. Training has been imparted for raising nurseries, planting bamboo, curing cane to improve its

quality, and making bamboo charcoal and activated charcoal. While bamboo charcoal can be used for heating and cooking, activated charcoal finds extensive use in water purification and the pharmaceutical industry.

GIS surveys for baseline monitoring are complete. This GIS platform will help in planning project activities as well as in setting up units. Given the difficult terrain of the district, the technology will make it easier to monitor activities.

An innovative approach was used to assess the traditional handicraft skills of the community. In May 2003, a design competition was organized where the communities exhibited their best bamboo- and cane-based products. They were also introduced to design and value-addition inputs as well as simple tools that would not only help increase the value of their product but also reduce drudgery and increase efficiency.



The Village Design Competition in Tamenglong brought out the creative best of the local communities

Seeking New Opportunities

This project aims to develop sustainable livelihood opportunities and environment protection using bamboo

Project duration	April 2003 - December 2004
Funding	INBAR \$33,660 (Rs 16.2 lakh)
Institutional support	Uttaranchal Bamboo and Fiber Development Board, Government of Uttaranchal

The newly formed picturesque Himalayan state of Uttaranchal is in dire need of development and employment options. The environment is fragile. The Himalayan mountain ranges and hill slopes are the youngest in the world, still growing and hence unstable. Increased deforestation has resulted in land erosion. Landslides are common in the region. The state is also prone to natural disasters like earthquakes and flash floods.

Of the state's 8.47 million population, about 38 per cent is below the poverty line. Some 20 per cent belong to lower castes and tribal communities that are socio-economically backward. Out of 0.91 million families, 0.79 million families depend on agriculture. But the available agricultural land is unable to sustain this large population.

At the same time, the scope of heavy and large industries is limited due to environmental restrictions. However, small and household enterprises are prevalent throughout the state, which offer more livelihood opportunities than capital-intensive industries.

The state is currently implementing massive bamboo plantation programmes. At present, in Uttaranchal, 0.85 million hectares of the total forest area of 3.46 million hectares are bamboo forests. The idea is to increase the bamboo cover.

The main bamboo species found in the state is Ringal (*Arundineria sp.*), which is a small bamboo, varying between 3 and 25 metres in length and occurs in clumps of 10-12 culms. The other significant species found here include Dev Ringal (*A. falconeri*), which is a preferred species among the artisan community as it splits evenly and cleanly, Gol ringal (*A. falcata*), Tham ringal (*A. spathiflora*) and Jumra ringal (*A. johnsaressis*).

Given the unique characteristics of the state, bamboo offers solutions for generating livelihoods as well as for infrastructure development and disaster preparedness. Uttaranchal has been plagued by severe earthquakes and bamboo houses offer a quake-proof solution. Bamboo can also be used in schools and other community buildings.



Activities

Within a span of six months, CIBART and the state government have initiated several steps. Artisans, government officials, non-governmental organizations and the industry have been sensitized through awareness workshops on the potential of bamboo and the impact of design interventions on bamboo products. Links with communities working with bamboo have been established. A Bamboo Product and Design Development Centre has been set up in Dehradun. Institutional markets for bamboo-based products are being explored.

The Uttaranchal Bamboo and Fiber Development Board has been formed by the government and a nodal officer appointed to coordinate activities. Large-scale plantation activities have been launched. Bambusetums have been set up in three different sites. The Forest Training Academy at Haldwani is providing infrastructure for training programmes as well as for setting up a workshop for product development and prototyping.

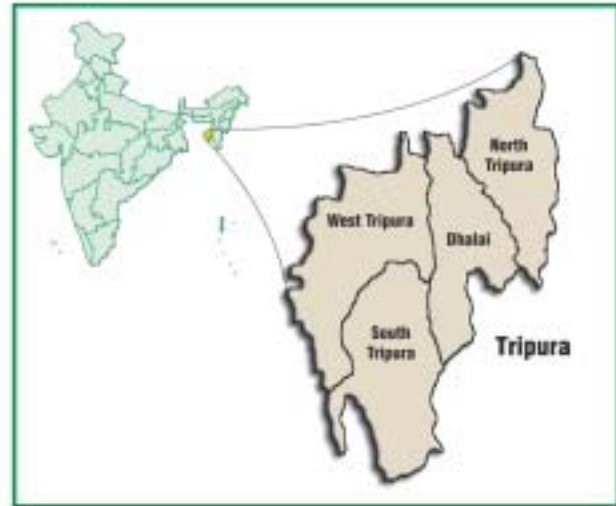


Local craftsmen at work

Moving Beyond Handicrafts

A project that aims to grow the state's domestic economy through its rich bamboo resources

Project area	4312 sq. km
Target villages	51 gram panchayats
Target population	105,000 (covering North Tripura, Dhalai and West Tripura)
Funding	\$1.5 million (Rs 7.5 crore)
Bamboo species	26 varieties
Total forest cover	10492 sq.km
Bamboo forests	2,397 sq.km
Plantation	109 sq.km
Homestead	590 sq.km (Every house has one clump)



Located in Northeast India, Tripura is remote. Poverty levels in the state are high. The state is however rich in several natural resources like bamboo and natural gas. And the government is more than willing to make the bamboo economy grow.

Tripura is one of the few Indian states to have a defined bamboo policy. Backed by the traditional usage of bamboo at the rural level, the state is ideally placed to grow its economy using the grass.

Some 26 species of bamboo are found in Tripura. About 1.2 million tonnes of bamboo, amounting to eight per cent of the total bamboo harvested in India is harvested from the state. Total bamboo resources available in the state is 14 million tonnes.

Since May 2003, a project that aims to bring economic development by using bamboo has been operational. The project aims to utilize the bamboo resources of the state for economic growth, employment generation, livelihood creation and environmental protection within a cash economic framework.

The project is being implemented by the Tripura Bamboo and Cane Development Centre or TRIBAC, which is supported by CIBART. In order to implement the project, TRIBAC has been set up as an autonomous non-profit company under the Company's Act. To get the project moving TRIBAC has adopted a community-based industrial approach that is market driven. The total cost of the programme is \$1.5 million (Rs 7.5 crore).

To start with TRIBAC is drawing on the strengths of the state. In Tripura, skills in handicraft development are legendary. The largely tribal population weave magic out of bamboo. Technical support from INBAR and other

institutions will ensure that these communities make products of standardized quality to meet the challenges of the international market.

In Tripura, there is a very high acceptance of the use of bamboo in housing. As a result, the state's people are naturally skilled in building with bamboo. The strategy is to turn the Indira Awas Yojana (IAY) housing activity into a cash economy that meets poverty alleviation objectives and employment/livelihood generation by integrating it with the Swarnjayanti Gram Swarozgar Yojana (SGSY) programme.

The IAY is a Government of India programme that addresses the issue of rural housing. The SGSY is a programme formed by the merging of several Central government self employment schemes. Now, it is a more holistic package since it covers aspects like organization into self help groups (SHG), training, technology, credit, infrastructure and marketing.

In a matter of 10 months of entering the state, TRIBAC has undertaken several activities. The TRIBAC office has been set up in Agartala, three field coordinators and 70 village community organizers have been recruited and some 154 SHGs have been formed. Awareness generation programmes are a regular feature: around 350-400 forest officials have been trained.

TRIBAC has already started functioning in business mode. Some 40 tonnes of *Muli* (*Melocanna baccifera*) seeds were supplied to the Government of Uttaranchal. Direct contact with *agarbatti* manufacturing units are being made.

Transportation is a big problem in the state. So TRIBAC is exploring the possibility of using alternate and more economical transportation means like waterways. Machine tools specially designed for working with *Muli* are being tried out.

Development by Design *Small design interventions and the use of simple tools in bamboo-based craft has resulted in sustainable livelihood options for the local communities*

Project area	439 square km
Total Population	137,000
Number of villages	593
Population growth	0.9% p.a.
Average Land holding	0.74 ha
Livestock population	80,000
Total households	28,000
Household size	4.8 persons
Funding	GTZ – \$30,500 (Rs 14.6 lakh) INBAR – \$18,000 (Rs 8.6 lakh)



Compared to the remote northeastern states, Himachal Pradesh is fairly accessible and well connected to the Capital, New Delhi. Yet, there are many areas in the state which are badly underdeveloped. Changar, situated in the northwestern part of the state, is one such region. Here, INBAR is working on the GTZ-funded Indo German Changar Eco Development Project, which is being implemented by HPEDS (Himachal Pradesh Eco-Development Society).

The aim of the project is to bring about an improvement in the living conditions of the rural population through the sustainable management of bamboo resources. The unique thing about this project is that it is very strongly design led, so much so, that it is literally 'development by design'. The philosophy behind the project is that design interventions, combined with the use of industrial tools as well as training the local artisans on products that suit contemporary needs, will bring about the desired change in the region.

Initially, the project focused on the Doomna community — the bamboo working community of the area. The Doomnas are not traditionally the growers of bamboo but procure it from their 'Jajmaans', who are the 'zamindars' or landowners. In return, they make utilitarian products for their 'Jajmaans', for which they are given grain during the harvest season. Stagnation in demand from their Jajmaans forced the Doomnas to turn to alternate livelihood options in the cities. This not only affected the family/community nucleus in the area, but impacted all the traditions of the area, including the rich craft heritage, leading to a loss of indigenous knowledge.

There is thus a definite need to introduce vocational options to the youth, especially those that incorporate alternative, sustainable Non Timber Forest Produce,

since timber is a fast diminishing raw material in the hill state. Bamboo can play a very important role in providing a natural resource and a viable livelihood option to the people here. INBAR's role is to provide total technical support in the areas of resource, design and development, and market linkages that would promote eco income generation activity by involving the local communities.

Activities

Individual craftspersons and craft groups have been identified and trained to produce products designed for absorption by the existing, immediately accessible and potential markets. To give a small example, design interventions have resulted in planters being made out of bamboo for the use of forest officials. Initially skeptical about the strength of these planters, the forest officials are pleased that they can even stand on them. The identified villages will be helped to set up industrial handicraft units. The initial steps towards this have already been taken with the formation of self-help groups. Skill training and capacity building programmes have been conducted and the artisans taught the art of selecting, splitting and strip making, interlacing, forming, tool handling and the use of jigs as well as treatments and finishes.

While design is the medium for change in this project, related activities have been going on side-by-side. For instance, on the resource generation side, planting material of *Melocanna baccifera* has been brought in from Tripura. The local communities have also been trained in plantation, propagation, harvesting and management.

The Bamboo Players

A Worldwide Network

INBAR was, ironically enough, set up by an agency from a country that is not exactly known for its bamboo resources. The Canada-based International Development Research Centre joined hands with the International Fund for Agricultural Development to set up the network that today has a worldwide presence with 27 countries from Asia, Africa and Latin America and the Caribbean as its members. INBAR connects governmental and non-governmental bodies and the private sector. Its mission is to use bamboo and rattan to provide sustainable development solutions.

Recognizing the importance of bamboo in the Indian context, INBAR has helped set up CIBART as an independent organization devoted to developing the bamboo and cane sector in India.

Expanding in India

INBAR was incorporated in 1997 as an international organization with its headquarters in Beijing and evolved out of a network started in 1984. This network has touched people's lives in remote areas across the length and breadth of India. After all, vast resources of bamboo and rattan, found in almost all the states, make India one of INBAR's prime destinations.

In India, INBAR plays different roles that include

- outreach
- livelihood development
- research and advocacy
- capacity building
- ecological and environmental security
- networks
- linkages with experts
- technological and financial means.

While implementing projects INBAR has ensured that bamboo gets a strong foothold in India. From resource analysis and technology development to market potential; from drafting favourable policies to linking bamboo and rattan solutions to many national programmes such as poverty alleviation, forestry, ecological and urban development, INBAR believes in fusion of the past and the present, by building on existing resources and knowledge and by using modern technological developments. For instance, the use of GIS will not only help the network plan its projects better but also assist in monitoring and evaluating the projects.



Cane and Bamboo Technology Centre, Guwahati

The Cane and Bamboo Technology Centre (CBTC) was set up in Guwahati, Assam with the aim of identifying and disseminating technologies for economic enhancement of craftspeople and small and medium-scale entrepreneurs and also to enhance the skills and quality of goods produced in the cane and bamboo sector in the northeast. Another important aim is to strengthen the capacity of existing institutions through networking and by linking them with specialized institutions in India and abroad. The United Nations Development Programme (UNDP) has committed around \$1.4 million (Rs 644 lakh) for the technological upgradation and networking of the Cane and Bamboo Project. The project aims to upgrade the skills of entrepreneurs, trainers and craftspeople to achieve the widest possible dissemination of the technologies and skills needed for managing and marketing bamboo resources. Partnerships with INBAR have been developed for strategic and specific technical inputs.

National Mission on Bamboo Applications

The growing realization that bamboo can be a low-cost solution has spurred the setting up of a National Mission on Bamboo Applications.

Launched by the Planning Commission, the Mission has formulated an action plan using bamboo as a key component in the national effort to generate employment and mitigate environmental degradation and strengthen bamboo based industrial development including handicrafts.

About \$543 million (Rs 2,608 crore) has been set aside for the project under which 2 million hectares of bamboo plantations will be readied, technologies developed, planting material transferred, training in handicraft provided and trade and market development activities carried out.

Bamboo and Cane Development Institute, Agartala

During the 10th Five Year Plan, the Indian government has targeted cane and bamboo as thrust areas since bamboo is being heralded as the timber of the future. Keeping this in view, the Bamboo and Cane Development Institute (BCDI), Agartala has been upgraded with consultancy from the National Institute of Design (NID), Ahmedabad. The institute, which was acting primarily as a training centre for artisans/entrepreneurs, is being restructured to make it more broad-based to serve the needs of the cane and bamboo crafts sector in the field of product innovation, technology and process innovation, market innovation and development, information technology services, knowledge management and resources and training and field extension services. The Tripura government has allotted 3.54 acres of land, free of cost, to construct the building of the institute.

Community Corner



Pourekiam, a talented craftsman from Tamenglong, Manipur, is probably the only man in the area who makes hats. In his mid 40s, this craftsman from the Zeliangrong Naga tribe takes 10 days to make a single hat. He sells each hat for Rs 1,000. That means an income of Rs 36,000 in a year. Among his customers are many politicians of the region and even foreigners, who have fallen in love with the texture, weave and finish of his hats. As one of the acknowledged craftsmen of the area, taking part in the design competition organized in the area recently by TAMBAC was inescapable. Not surprisingly, he walked away with one of the top honours in the competition.

He weaves magic with just two simple indigenous tools — a knife and a sickle-shaped tool. TAMBAC will provide tools for him where he can cut down on the manual labour that he puts in to make slivers. Perhaps now he will take five instead of 10 days to make a hat.

Ask him and he says it just takes two days to learn this art. After all, he has imparted his skills to a few around him who have shown interest. But nothing can take away from the sheer experience of his magical fingers and the rapt concentration with which he works.

What will he do if the new tools improve his efficiency and bring in more income? Invest more in his beloved craft, of course.

Bamboo Trivia

Did you know?



A grove at Hiroshima in 1945 at ground zero survived the atomic blast and within days sent up new shoots. One species of bamboo has been known to grow over four feet in 24 hours. New shoots emerge from the ground with the diameter they will have at their mature height, which will be attained within 60 days.



Thomas Edison successfully used a carbonized bamboo filament in his first experiment with the light bulb.

Bamboo shoots are a good source of thiamin, vitamin B6, and potassium. One cup of cooked bamboo shoots contains 14 calories, 0.3 gm fat, 1.2 gm dietary fibre and 1.8 gm protein. Canned bamboo shoots can be added directly to stir fries; they are pre-cooked and need only to be heated. Fresh bamboo shoots should be boiled until tender, then husked and cut up.

Stir-fried Mushrooms and Bamboo Shoots

Serves 4 to 6

Ingredients

1 can bamboo shoots, rinsed under hot running water and drained
8 - 10 black mushrooms, soaked in hot water for 20 minutes, stems discarded, cut in half
1 clove garlic, finely chopped
1/2 cup chicken stock
2 tablespoons soy sauce
1 teaspoon dry sherry
1 teaspoon sugar
1/2 teaspoon salt
1 teaspoon cornstarch dissolved in 2 teaspoons water
Oil for stir-frying



Directions

Prepare the vegetables and mix together the cornstarch and water into a paste.

Heat wok and add oil, drizzling it around the sides of the wok. Stir-fry the garlic, bamboo shoots and mushrooms on high heat for approximately one minute. Add the salt, sugar, soy sauce, sherry, and the chicken stock. Bring the mixture to a boil and allow to simmer. Add cornstarch mixture to thicken. Garnish with cilantro if desired.

Finding Solutions at Home ORISSA POLICY WORKSHOP

The recommendations of a two-day workshop on 'Bamboo Sector Development in Orissa' held on 28-29 January 2004 in Bhubaneswar recognized the role of bamboo in poverty alleviation in the state and that if at all bamboo was to be used as a tool for social and economical development, several bamboo-related policies would need revamping. The workshop was the result of a report prepared by INBAR and CIBART in December 2003, which looked at policy implications for promoting successful bamboo-based livelihoods for the poor. These included policies that would promote access to bamboo from forests, homestead bamboo cultivation, allow the felling of green bamboo needed by artisans and bamboo shoot harvesting, among others.

The purpose of the workshop was to formulate an action plan to find technological, economic, institutional and employment opportunities using bamboo. Organized by CIBART, INBAR, the Indian Plywood Industries Research and Training Institute, Bangalore and the Forest Department, Government of Orissa, the workshop was inaugurated by Chief Minister Naveen Patnaik. It was attended by some 70 participants that included government officials, industries, non-governmental organizations, donors, scientists and artisans.

Orissa is known for its poverty levels and natural disasters. In 1999-2000, 48.01 per cent of the population in rural areas was below the poverty line. Though there have been several poverty alleviation programmes funded by the state and central government, few of these have tapped the natural wealth in the state — namely bamboo — or the natural bamboo skills that the tribal populations here possess.

The state has 30 districts and 23 forest divisions and all of them have bamboo. Scheduled Castes (SC) and Scheduled Tribes make up 16.20 per cent and 22.21 per cent of the population respectively. The scheduled area covers nearly 45 per cent of the state. About 70 per cent of the SC and ST population are forest dwellers who depend on the forest for their livelihood needs.

Bamboo has proved to be a sustainable livelihood option for the rural community in the region where it can grow. China, for instance, has demonstrated that bamboo has the power to build the rural economy and sustain it. In Orissa, the community, the forest department as well as the state administration correlate bamboo so strongly with paper that hardly any other use — except handicrafts — is associated with it. Even in the paper industry, a stalemate between the paper manufacturers and the government has resulted in manufacturers shifting to other resources like eucalyptus, cutting the percentage of bamboo in pulp to less than 20 per cent.

In 2002, INBAR had also prepared a market assessment report that looked at sustainable livelihoods options by broadening the use of bamboo technologies. According to this report, the total market opportunity for various segments is Rs 606 crore with raw bamboo requirements of 645,000 tonnes over a period of five years.



Ranjan Panda

For Orissa's poor, skilled in bamboo craft, the grass could bring salvation

Readers are invited to send their feedback to this issue at indira@inbar.int. Readers are also invited to share their bamboo experiences and contribute short articles for publication in future issues.

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