



**2004**

**Annual Report**

**INTERNATIONAL NETWORK FOR BAMBOO AND RATTAN**

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# Message from the Chair and Co-Chair

Over the past year, 2004, INBAR continued to progress towards becoming a mature intergovernmental international development organization. In this regard, we note with satisfaction that the 8th Board Meeting and the 4th Council Session of INBAR addressed strategic forward-looking issues and reviewed progress towards the production of a new long-term strategy to take account of new realities and new challenges and to guide INBAR's development in the coming 10 years. INBAR's Council gave formal consideration to membership fee formulae in order to secure the full effectiveness of INBAR's role as an International Commodity Body. Also, the membership base of INBAR continued to expand to 29 member countries with both Nigeria and Madagascar joining INBAR.

On the program side, 2004 saw further gains by INBAR in support of achieving the Millennium Development Goals (MDGs). Through its thematic programmes in ecological security, livelihood development, economic development and outreach, INBAR developed 12 new TOTEMS (technology transfer models) and the number of TOTEMS totaled 39 by the end of 2004. The International Bamboo Building Code, the first of its kind, was developed by INBAR in collaboration with the Eindhoven University of Technology of the Netherlands, and approved and published by ISO in July 2004. This has had the effect of making bamboo a globally "legal" building material, a development of inestimable importance to hundreds of millions of poor people throughout the world. With regard to the MDG of sustainable development, INBAR concluded a four-year long joint study with UNEP-WCMC to quantify the distribution of bamboo species around the world and implemented field projects demonstrating the sound environmental, as well as economic and social benefits of bamboo and rattan. This has also contributed to enhancing the reputation and visibility of INBAR throughout the international community.

INBAR's Board of Trustees again wishes to take this opportunity to acknowledge the support from all its donors. We note with gratitude that the Canadian International Development Agency (CIDA) signed its first grant agreement of Can \$ 500,000 per year for 3 years with INBAR, that the Governments of the Netherlands and China both renewed their financial commitments, and that the International Fund for Agricultural Development (IFAD) is currently giving serious attention to renewing its grant agreement with INBAR. The Board is grateful for the support and cooperation provided by all its member countries and for the excellent services offered by the Host State. Finally, the Board also wishes to express its gratitude to the European Union, the Common Fund for Commodities and other multilateral and bilateral donors for their financial and project support in the past year.

During the coming year, INBAR aims to complete and promulgate its new long-term strategy and to complete membership fee arrangements. We are confident that these will build a secure and sustainable INBAR and will catalyze further success stories in meeting the challenges and fulfilling the INBAR mission.



*Dr. Keith Bezanson*  
*Chairman*  
*INBAR Board*



*Prof. Jiang Zehui*  
*Co-Chair*  
*INBAR Board*

## Director General's Overview



Dr. Ian Hunter, Director General



Bamboo Parisal boat, Tripura, India



Women's Self Help Group weaving handicrafts in Tripura

INBAR's mission is to alleviate poverty through the mechanism of bamboo and rattan-based development. INBAR contributes to the Millenium Development Goals (MDGs) through poverty reduction, increased environmental sustainability and, through its bamboo buildings programme, improved living conditions for slum dwellers and improved facilities to deliver health and education.

At its 2004 meeting the INBAR Board discussed at some length what it is that makes INBAR different and valuable. They concluded that INBAR's key difference is its ability to work at the junction of village-based livelihood development and larger scale, private-sector driven industrial development utilising the multi-faceted partnerships implied thereby. They decided that in future INBAR should concentrate its activities along these two axes.

The tools that INBAR uses to carry out it's goals are illustrated in the following pages and include:

- Direct intervention in the form of a network of development projects distributed throughout INBAR member countries
- Indirect intervention through advising, sponsoring or assisting projects.
- Awareness raising in order to stimulate independent activity
- Demonstrations, training and technology transfer in order to increase capacity in member countries.
- Action research to develop new applications for bamboo and rattan, or to customize transferred technology to local species.

### *Development projects*

The number of development projects with which INBAR is directly involved has increased year by year.

INBAR's projects in Tamenglong, Tripura and Uttaranchal in India contain similar components and focus on resource and small business development, institutional capacity building and market linkages. As an example in 2004, the project in Tripura, working with the Tripura Bamboo and Cane Centre, a local NGO, has established six more community bamboo and rattan nurseries, planted over 150,000 bamboo seedlings, and trained 31 self help groups (SHGs) in technical and financial matters. These SHG's now involve over 22,000 beneficiaries. Nine formal trainings on product prototyping, six on SHG leadership, ten on community organization and management, six on bamboo propagation and management and one on process flow costings have been provided, and many more informal trainings have also been run. Sharing of project results and goals has been done by meetings with government officials and ministers. Communities are now exporting 20,000 slivers to Mumbai and 10 tonnes of agarbatti (incense) sticks to Coimbatore every month. Prototype bamboo fishing boats have been constructed, and new designs of knife and slicing machines, and agarbatti stick-making machines have been produced and are in use.

In Ecuador INBAR's work on the bamboo component of the Fondo Ecuatoriano Canadiense (FECD) co-funded project is benefiting male and female members of 688 households in 32 communities via the propagation, cultivation, management, primary processing and commercialization of Guadua bamboo. In the two years of INBAR's work, households with their own natural stands of Guadua

have increased their mean incomes from 499 to 1423 USD, whilst those without their own Guadua have increased from 477 to 986 USD.

INBAR has also successfully completed its work in the GTZ co-funded Indo-German Changar Eco-Development Project in Himachal Pradesh, India and the IFAD co-funded Indigenous and Afro-Ecuadorian People's Development Project (PRODEPINE) in Ecuador.

The CFC-INBAR Project "Market development of bamboo and rattan products with potential" (2.0 million USD) received its first authorised payment from the CFC in autumn 2004. The project is implemented in three least-developed countries: Bangladesh, Nepal and Myanmar. The innovative project idea is to merge traditional knowledge with the modern furniture design (including pack-flat concept) and to build supply chains to the international markets. The project also aims at launching pilot certification of the bamboo resources and products needed by the developed international markets. Another CFC-INBAR Project "Market based development with bamboo in Eastern Africa -Employment and Income Generation for Poverty Alleviation" (2.5 million USD) was approved by the CFC Board in late 2004. The project addresses Millennium Development Goals and focuses on Africa. The project's main strategy is to bring innovative technologies from Asia to Africa in order to develop local production and international trade for sustainability.

### *Environmental sustainability*

Gaining an accurate understanding of the quantity and location of bamboo resources is a first step towards promoting national bamboo development, and also has implications for trading of carbon credits under the Kyoto protocol. INBAR has been aiming to integrate bamboo resource data into existing resource assessment systems, and now works with UN-FAO to do just this. A study by INBAR and UNEP-WCMC has highlighted the plight of much of the world's bamboo biodiversity, and the broader threat its loss would cause for ecosystems. The role of bamboo in reducing soil erosion has often been advocated but there is very little hard data to back it up. We report on work in Chishui that quantifies the reduction of erosion due to bamboo plantations on steep slopes in southwest China.



Sea of bamboo, Anji county, Zhejiang, China

### *Technology transfer*

In order to service its field projects and those of other organisations, INBAR applies considerable effort to identifying and documenting technologies which can be used for teaching others in new skills. Two such examples are documented in this report. INBAR runs several training courses of its own during each year and facilitates others. As INBAR has grown and learned through feed-back from its training courses it has developed and formalized its training components until it is ready to begin out-sourcing its knowledge to other providers. In 2004 INBAR formed a link with the Commonwealth of Learning and Indira Ghandi National Open University in India to facilitate distance learning, based on its information.

### *Bamboo buildings*

INBAR's bamboo building activities have always been important. In 2004 a long-term project of



A prototype bamboo house designed and constructed by Bamboo Technologies in Hawaii, U.S.A.

INBAR's to obtain international building codes for bamboo came to fruition. This is important because without such regulatory protection architects and engineers are reluctant to use a natural and inherently variable material such as bamboo. INBAR firmly believes that bamboo-based buildings have a major contribution to make to the Millennium Development Goals relating to health and education - by providing inexpensive buildings where such services can be delivered. In 2004 INBAR was therefore delighted to be able to collaborate with a Japanese Embassy Grant to complete a prestigious school building in China.

INBAR has, over the last couple of years, begun to monitor the impact of bamboo and rattan based development on poverty alleviation. Last year we reported on work done in the Philippines and in Ecuador. This year we report on work done in China. From the studies we have done it does indeed seem that, provided there is an enabling policy and regulatory environment, development based on bamboo and rattan can lead to rapid increases in living standards and snow-balling industrial development.

Rattan is a component of many of our projects in India, but is a slightly more niche plant than bamboo with fewer uses, and does not grow in Latin America. As a result INBAR's MDG-relevant rattan-based development portfolio has grown somewhat slower in 2004 than its bamboo-based portfolio. INBAR has been working on remedying this, and one new rattan-based project has already been approved at the time of writing.

## Making a difference for small bamboo producers - Jhony Moreno, Santa Rosa community

IFAD (FECD-INBAR) pilot bamboo project, Ecuador

Jhony's relatives have their roots in the Sierra, or mountains, and they came to the coast more than 40 years ago. Jhony still lives in the same community in which he was born 35 years ago, Santa Rosa de Toachi, together with his wife, four children and his mother. Jhony's main source of income is cattle, and he produces annual crops and some coffee, cacao and bananas. Due to rising costs, cattle rearing is not so profitable, and the low prices of coffee, cacao and banana can hardly justify the efforts made in their production. Most of Jhony's brothers and sisters have left Ecuador for Europe in search of better lives.

In recent years, Jhony has focused on the production of *Guadua angustifolia* bamboo, covering around 6 hectares of his property. Initially, he was trained within the framework of the INBAR project and in the San José farm of Hogar de Cristo. Subsequently he started improving the *Guadua* splitting techniques himself, sharing his knowledge with other farmers and improving the efficient production of splits.

Nowadays, Jhony commercializes his own *Guadua* and the revenues he received during the one and a half years that he has been working have enabled him to build a house. His farm has turned into a spotlight of demonstrations, training workshops and exchange opportunities between farmers and experts alike. He has developed a very efficient technique for handling the manual splitting machine, by classifying the culms by diameter prior to processing and by using two operators instead of one. He has been contracted by other communities to assist in the management of *Guadua* stands and the production of splits. Through an organization called UNASD which is responsible for the commercialization of *Guadua* splits, shares

of 9000 splits are divided among *Guadua* producers in the region where the project partner NGO CEDERENA is active. In 2004 Jhony was given three of these shares, each resulting in comparable levels of profitability. Producing *Guadua* splits is now his most secure source of income, as the figures show (US dollars):

Activity	Guadua	Milk	Maize	Yucca	Banana
Total revenues	2241	1971	263	341	383
Total costs	1542	1971 (±)	309	603	392
Net profit	699	0	-46	-262	-9



"The first time I sold splits I contracted people and paid them per day in instead of per product, and I almost did not cover my expenses. Now I pay them per product, which is much more efficient."



"Guadua is like banana, the plant will never lack offspring. The time will come that I will be able to confront the intermediary and demand a just price, because *Guadua* is running short."

# Poverty Alleviation Through Bamboo And Rattan-Based Development

INBAR's mission is to reduce poverty through stimulating bamboo and rattan-based development. INBAR has therefore carried out several studies in recent years in areas where development has been successful in reducing poverty in order to learn lessons that can be applied elsewhere. In 2004 Professor Zhu and Else Yang reported the results of their study in Lin'an county in China. Lin'an county has developed a large bamboo shoots industry which has had a marked effect on incomes of the rural population. Lin'an was a very poor county in the early 1980's with annual per capita income less than \$50 and a large imbalance between rural and urban incomes. In 2002, this figure had increased to \$654 and the imbalance had decreased as a result of the burgeoning bamboo industry.

Lin'an has specialized in the production of edible bamboo shoots. Processed bamboo shoots are sold to international and domestic (especially North China) markets. The total annual production of fresh shoots is 135, 250 tons, 40% of which is processed by local factories. Additionally 60, 000-80, 000 tons of fresh bamboo shoots are now bought in from neighboring counties and provinces for processing in Lin'an. Currently processed bamboo shoots from Lin'an account for approximately 20% of the total production in China and Lin'an has become the largest bamboo shoot processing centre in the country. The bamboo shoot industry and other bamboo-related sectors have now become the main sources of income for the local farmers.

In 1983 there were 1,867 ha of shoot-use bamboo plantations in Lin'an and farmers planted shoot species bamboo around their houses to supply food for their own families. In 2002, there were over 20, 000 ha of shoot-use plantations. This increase had been achieved partly by substitution for other land uses and partly by intensification of land use.

The authors of the study identify a combination of factors as being critical to the rapid development:

- A change in government policy to enable small farmers to respond to market demands.
- Access to finance.
- A fruitful combination of practically-based research and application.
- Technology transfer and training.
- Close linking of enterprises and farmers.

This enabling regulatory and policy environment seems to have been very important.

A particular feature of bamboo-based activity is the significant role that women play in it. The percentage of women employed in bamboo shoot cultivation, sales and marketing and processing varies between 40% and 60%.

The authors describe in detail several villages and towns in Lin'an. For example Gaohong town started to develop shoot-use bamboo plantations from 1990. The area of plantations increased from 167 ha in 1989 to 711 ha in 2002 and the production from 418 tons to 6670 tons, with the result that incomes from shoots increased 13.2 times in the same period. In 2002, the mean income per household generated from bamboo shoots was 8754 yuan (US\$1060, or US\$289 per capita) with a small amount of additional income from bamboo culms and leaves. In 2002, 50.7% of all households had incomes from bamboo shoots of over 10,000 yuan (US\$1211).



Farmer's new houses built in the valleys of Lin'an County, Zhejiang, China



Production of bamboo shoots, Anji county, Zhejiang, China



Producing bamboo furniture, Accra, Ghana



Bamboo handicrafts producers in Doryumu, Ghana

The percentage of income generated from bamboo shoots had increased from 19.1% in 1990 to 32% in 1994. It soared to 70.6% in 1996 and this meant that the farmers had more money invest in other sectors, such as industry, transportation, commerce and trade. But after 1998, despite the continuing rise of bamboo shoot-derived incomes, its proportion of the per capita total net income has been gradually declining. This suggests that bamboo shoot industries played important roles in boosting the development of other sectors, and that the economic infrastructure of the rural areas has gradually been improved.

### *Income generation with bamboo in Ghana*

Two communities in southern Ghana are now producing and selling bamboo products as a result of INBAR's work with CARE International, the Bamboo and Rattan Development Programme of the Government of Ghana (BARADEP) and the Bamboo and Rattan Network of Ghana (BARNET). The project trained communities in Assin Nsuta and Doryumu in growing and management of bamboo, and in the production of handicrafts. Local non-bamboo trained artisans also provided training on how to develop a marketing niche by making the products identifiable as Ghanaian. INBAR linked the communities into markets in the capital, and currently they have regular orders for the sale of their handicrafts at an outlet in Accra.

### *Developing the bamboo component of integrated projects*

INBARs involvement in the broad-based World Bank and IFAD-funded Indigenous and Afro-Ecuadorian People's Development Project in Ecuador concluded in 2004. The project aimed to conduct institutional strengthening of disadvantaged people's organisations, provide rural credit and improve access to natural resources. INBAR worked with the implementing organisations PRODEPINE and FONAKIN to provide specific technical assistance on bamboo production and processing to two communities. INBAR provided technical training in bamboo plantation management in the Wawa Sumaco community, and in the production of a range of different bamboo products in the Talag community. Training in aspects of financing and business management provided crucial business management skills for prospective bamboo artisans. The Talag community subsequently exhibited its products at the Agricultural Artisans Trade Fair in Napo, and successfully signed several contracts with buyers.

INBAR's two year work in the Indo-German Changar Eco-development project in Himachal Pradesh was also concluded in 2004. INBARs bamboo development activities developed capacity to cultivate and manage local bamboo species, formed, trained self help groups, trained in processing and handicrafts, provided tools and equipment, developed a product-marketing strategy for different regions, helped build capacity of the implementing partner NGO Vishwamitra, trained trainers in production management, process flow and budget control systems and linked producers into markets. The project produced recommendations for future activities that are now under consideration by project funders.



1. Bamboo products fair, Napo, Ecuador



2. Training in Guadua management, Ecuador

3. Training on material selection  
4. Handicrafts training, Peepalkoti, India



# Environmental Sustainability

In 2004 INBAR concluded a four year-long joint study with UNEP-WCMC to quantify the distribution of bamboo species around the world. One authoritative source stated that there are 1575 species of bamboo world-wide, but since that statement was made new species description has been ongoing and the current total may be nearer to 2000. The INBAR - UNEP-WCMC study covered 1400 species in total including most of the woody species. It is thus the first truly comprehensive study of the distribution of bamboo in the world. The first joint publication covering bamboo species in the Asia-Pacific region came out in 2003. The second publication covering Africa, Madagascar and the Americas was released in 2004 and was highlighted at a special event in May 2004 at the Royal Botanic Gardens, Kew, England.

Of the nearly 2000 bamboo species, INBAR has categorised a mere 2% as high priority because of their commercial importance. These few species have become domesticated and are widely planted both within and without their original natural range. The remaining 98% exist as part of the forest ecosystem to which they belong and are just as much at threat from continuing deforestation as any other forest species. Perhaps the most valuable outcome of the joint study was the realization that a high proportion of bamboo species (45% in the Asia Pacific region) are confined to ranges of less than 20,000 km<sup>2</sup> - the criterion for inclusion by IUCN on its Red List of endangered species. Some 250 woody bamboo species have less than 2000 km<sup>2</sup> of forest (an area the size of London, UK) remaining within their ranges.

Several very rare birds and animals depend on bamboo for their survival. The report identifies unique and endangered species, whose fates are intimately linked with those of bamboos, in every region where bamboos occur.

- In Asia these include the red panda and Himalayan black bear, and perhaps best known, the giant panda.
- In Africa, mountain gorillas depend on bamboos for up to 90% of their diet in some seasons. The survival in the wild of the mountain bongo depends on conservation of the bamboo thickets to which it migrates during the dry season.
- In Madagascar, the critically endangered greater and golden bamboo lemurs depend on bamboo for much of their diet, and the rarest tortoise in the world, the ploughshare tortoise, is also intimately connected with bamboos.
- In South America, the spectacled bear, the mountain tapir and many endangered bird species are connected with bamboo in the Andes, Amazon and Atlantic forests.

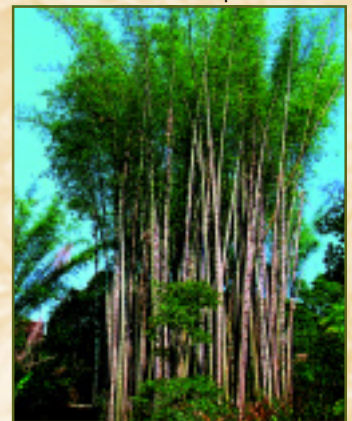
This joint study represents the first step towards planning and implementing conservation and sustainable management of bamboos in the wild.

## Global bamboo forest resources assessments

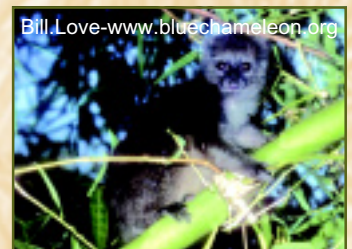
UN FAO has conducted global Forest Resources Assessments (FRA) since 1947 every 5-10 years, providing the ultimate source of global forest statistics, including forest cover, stock, species distribution and ownership. Although bamboo was often implicitly included in the national reports there has been no consistent data on the global bamboo forest cover. INBAR is currently working with FAO on incorporating bamboo into the general FAO FRA framework, including remote sensing



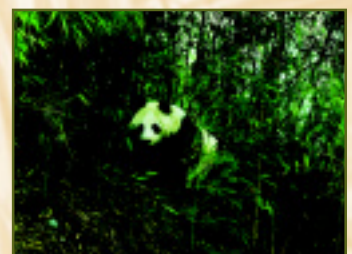
Launch of the UNEP-WCMC/INBAR bamboo distribution report



*Dendrocalamus giganteus*, widely distributed in Southeast Asia



In Madagascar, three species of Lemur (*Hapalemur spp.*) live on bamboo



Many animals, including the Giant Panda (*Ailuropoda melanoleuca*), depend on bamboo for their survival

methods. A joint FAO/INBAR Workshop was held in Bangkok from 23-26 Nov. 2004. Three pilot studies on bamboo forest resource assessment from China, India and Indonesia were reviewed and validated at the Workshop. The Workshop has also approved a format for the Bamboo Thematic Report and issued a resolution, and FAO has included the Bamboo Thematic Study in the agenda of the FRA. The next joint FAO/INBAR Workshop on bamboo resources assessment will be held in Beijing on May 9-11 2005 to review and validate countries' reports on bamboo resources and chart future actions.

### *Quantifying soil erosion in bamboo plantations in Chishui, China*



Measuring soil erosion under a bamboo canopy

To prevent large scale soil erosion by the farming of steep lands, China is implementing a policy of returning steep lands to forest cover. In Chishui region, Guizhou province, 7000 ha. of farm land has been converted into bamboo plantations. These are not only intended to reduce soil erosion but also serve as a source of raw materials for rural bamboo businesses.

As well as providing livelihood options with bamboo at its demonstration project there, INBAR is also quantitatively monitoring the environmental impact of bamboo on soil erosion and water conservation. The studies aim to quantify the impact of bamboo compared to agricultural crops and have shown that during the observed rainy season in 2004 there was no significant difference in surface runoff between 3 year-old bamboo plantations and farming lands, but that the average erosion due to rainfall on farmland (450.0 kg/ha.) is 7.43 times that in bamboo plantations (60.57 kg/ha.). The average sediment concentration in farmland runoff (28.29 kg/m<sup>3</sup>) is 9.84 times that in bamboo plantations (2.87 kg/m<sup>3</sup>). The results shows that the conversion programme is significantly reducing soil erosion.

### **Training in Craftsmanship - Mastercraftsman Surendralal**

INBAR-CIBART-UBDFB, Uttaranchal, India



Thirty-seven year-old Surendralal is an artisan from a village called Kiruli, some four km off the road from Peepalkoti, in the middle Himalaya of Chamoli district, Uttaranchal. Apart from his bamboo skills, his enthusiasm to learn and improve is heartening. He belongs to the Rudiya community, a community that has traditionally worked with the locally available bamboo species, called Ringal. Ringal is a reed-like bamboo with short internodes approximately 8 inches long, narrow, conical in shape and gradually tapering to a sharp point.

Surendralal makes all traditional, needs-based utensils like solta, dalla and ghasiya baskets. He supports his wife and three children by earning his living from selling these products in neighboring villages and local haats (markets). He was one of the most enthusiastic participants during the 7-day 'Ringal Design Workshop' organized and technically supported by the Centre for Indian Bamboo Resource and Technology (CIBART) with the help of SFCID, a Peepalkoti-based NGO, the Uttaranchal Bamboo and Fiber Development Board (UBDFB) and the Forest Training Academy, Haldwani. Held between March 19-24, 2004, the workshop emphasized better finishing and improving production quality. His willingness to explore, experiment and to adapt to new ideas and processes inspired many amongst the group during the workshop.

As a result of this workshop Surendralal was invited to train other artisans in surrounding villages as a master trainer. There are many Surendralal's spread across India. All they need is a little support.

# Improving The Living Conditions of Slum dwellers And Providing Facilities For Health And Education



Building for better living

Bamboo is one of the most versatile building materials in the world. It has been estimated that perhaps one billion people live in houses made partly or entirely from bamboo. There are two key problems that INBAR needs to address. One is the quality, durability and fire-resistance of bamboo houses. The other is the image of bamboo solely as a “poor man’s timber”. While that image neatly substantiates the role bamboo housing has in poverty alleviation it can lead to perverse behaviour on the part of those whose standard of living rises a little. They aspire to avoid the label of “poor” by rejecting bamboo and building weak-structured concrete houses on sites that are too unstable to support them.

At the very top end of the market

the revolutionary Colombian architect Simon Velez has used very complicated bamboo structures to build large, expensive houses. The problem lies at the junction between the very poor and the slightly less poor.

During 2004 INBAR was working with the grassroots NGO “Viviendas del Hogar de Cristo” in Ecuador to bring simple houses utilizing a proportion of bamboo in their construction to slum-dwellers in Ecuador. INBAR has however, in 2004, also attempted to show that bamboo has a role in better quality housing and in public buildings.

One key constraint in the use of bamboo for buildings has been a lack of building codes such that architects and engineers can work with it without fear of malpractice claims.

## *Bamboo building codes*

The ISO bamboo building code has been developed and promoted in collaboration with the Eindhoven University of Technology in the Netherlands. The first International Bamboo Building Code has now been approved and was published by the International Standard Organization (ISO) in mid 2004. The Code consists of three documents: (1) ISO 22156 “Bamboo - structural design”, (2) ISO 22157/1 “Bamboo - determination of physical and mechanical properties. Part 1: Requirements”



Poor quality housing in Guayaquil



House by Hogar de Cristo, Guayaquil, Ecuador

and (3) ISO/TR 22157/2 “Part 2: Laboratory manual”. All three documents are available from the ISO webpage <http://www.iso.org>. The Bamboo Building Code dramatically improves the international and national business and legal environment for bamboo housing construction. The Bamboo Building Code makes bamboo a “legal” building material. It provides a legal basis and protection for architects and developers and it enables bamboo homeowners to obtain mortgages and insurance. INBAR will continue working on introducing national building codes on the basis of the approved international standards for bamboo buildings.

### *Prototype hybrid house in Guayaquil, Ecuador*

The use of bamboo for housing has gone through evolutionary changes from very traditional simple styles to modern designs and construction methods. Systems of construction are diverse and depend upon the place of its origin. The differences are generally visible in the wall systems, of which there are ten widely used types. In order to demonstrate these different construction systems, INBAR ran a project to construct a hybrid model bamboo house in Guayaquil, Ecuador, in the framework of an EC co-funded project. The housing project was jointly implemented by INBAR’s Latin America Regional Office (INBAR LAC) and the Catholic University of Guayaquil. The main features of the project were: 1) Inclusion of all 10 different types of bamboo walls in a single house; 2) direct involvement in the construction process by approximately 50 students from the Faculty of Architecture at the Catholic University, giving them hands-on experience of designing and building bamboo houses; 3) Handing over of the finished house to a poor family who had been living in a Hogar de Cristo house for the last 15 years.

### *Village capacity building on bamboo housing, Ecuador*

Although, the use of bamboo in the construction of houses is very common in the rural areas of many countries, knowledge of preservation and proper construction techniques is limited among the local people. Generally, bamboo is only a small proportion of the total building materials utilised and this is mainly due to the poor image it has amongst villagers who prefer other materials if they can afford them. In order to build knowledge on proper bamboo housing techniques, and to illustrate the potential of bamboo as a housing material, in the framework of an EC co-funded project, INBAR LAC and CEDERENA, an NGO in Ecuador, jointly conducted a village capacity building programme on bamboo housing for villagers in El Rosario, Ecuador from July 8 to 13, 2004. The objective of the programme was to provide hands-on training to the villagers on different types of bamboo housing. A total of about 20 villagers from El Rosario and nearby villages participated and together constructed a 3 m x 4.5 m model house.

### *Pingbian school, China*

In 2002 INBAR formed a partnership with WWF-China design energy efficient houses by linking energy saving designs with the use of bamboo and bamboo panels as part of the building materials.



Constructing the framework of the hybrid house



Opening ceremony



Many hands make light work

1. Laying bamboo matboard as roofing sheets
2. Laminated bamboo roof trusses
3. Bamboo wall panels



Two Chinese architects were sent to BEAR Architects of the Netherlands for training in energy efficiency, and they subsequently designed three buildings for Yunnan province in the southwest of China - a primary school, a traditional house and a small hotel.

INBAR helped to mobilize financial support (US\$75,000) from the Japanese Embassy for the construction of the primary school in the village of Pingbian. INBAR and the Research Institute of Wood Industry of the Chinese Academy of Forestry provided technical assistance and the school is now completed and in use. Bamboo plywood panels and bamboo laminated beams were used for the roof trusses, sheathing boards and wall panels of the building. The opening ceremony was held on 12 October 2004 at Pingbian.

### ***Bamboo housing training, Nepal***

INBAR has launched a bamboo eco-housing project in Nepal. The Global Environmental Facility's Small Grant Programme (GEF/SGP) and INBAR support the project financially. The project is being implemented in Kanchanpur district in the Western Terai region of Nepal. The main target group of the project is "Kamaiya" recently freed bonded labour. The project includes components of bamboo housing, bamboo based enterprises, energy production and resource rehabilitation. RES Nepal, an NGO, is the main implementing agency for the project. INBAR provided an in-house training on the production of pre-fabricated bamboo houses at the premises of Himalayan Bamboo in Hetauda who will supply 18 pre-fabricated houses by the end of April 2005 to the targeted community.

### ***Bamboo housing training workshop in Bangalore, India***

INBAR, CIBART and the Indian Plywood Industries Research and Training Institute (IPIRTI), organised a training workshop on bamboo housing from January 5 to 30 2004 at IPIRTI Bangalore, India. Nine participants from India, Tanzania, Sri Lanka and INBAR were trained on bamboo preservation and bamboo building construction, using both the IPIRTI systems and the Latin American bahareque wall system. Details can be found at <http://www.inbar.int/housing/IPIRTI%20training.htm>.

### ***Bamboo housing in Tamenglong, India***

In order to transfer technology on bamboo housing to the rural areas of India, some demonstration bamboo houses have been built in the project "Rural development with bamboo and rattan in Northeast India", implemented by CIBART and the Tamenglong Bamboo and Cane Center (TAMBAC). To make the bamboo more acceptable in the rural areas, a 350 square feet project office building was built using IPIRTI and bahareque wall systems and a conference room was built using the same system. Houses are now being constructed in Tamenglong, and TAMBAC is being contracted to produce similar houses in projects in Konkan and Uttaranchal, and privately in Maharashtra and Jharkand. Details can be found at <http://www.inbar.int/housing/India-housing.htm>

### ***Bamboo buildings in Tanzania***

Two bamboo demonstration buildings are being built in Tanzania - a collection-supply depot/workshop and a school teacher's house. The project is being implemented by Isongole Bamboo Society, a project group and working partner of INBAR.



Constructing wall panels of bamboo on wooden frameworks in Nepal



The finished house before plastering



Installing the uprights, Bangalore, India



Prototype office building, Tamenglong, India



Preparing the framework for plastering, Tanzania

# Capacity Building And Transfer of Technology

A key part of INBAR's activity concerns the transfer of technologies in order to raise the general capacity level in the bamboo and rattan sector worldwide.

## *Tropical bamboo propagation manual*

This manual describes seven methods of propagating tropical bamboo species. All information is kept as practical as possible. Chapter 1 provides a general introduction of the bamboo plant, with a sequence of pictures and descriptions on bamboo morphology and life-cycle. Here some of the terminology is explained that reappears further on in the manual. Chapter 2 describes several physical characteristics of bamboo culms that change with ageing, and that are therefore useful for estimations of a culm's age. Culm age estimation is required for the implementation of bamboo propagation methods. Chapter 3 addresses several aspects of bamboo nurseries, important for bamboo growers. Chapter 4 is the core part of this manual, describing the implementation of seven propagation methods in detail. General information on each of these methods is provided, as well as a "Step by Step" sequence of pictures, illustrating their implementation. The last section of this chapter shows of list of high-value bamboo "Priority Species" and their commonly applied propagation methods.



A page from the propagation manual

## *Hands-on training manual on Chinese style bamboo furniture*

Bamboo has a long history as a material for furniture making. This manual, jointly published with CIBART and the Uttaranchal Bamboo and Fibre Board, elegantly combines brief descriptions of the various steps in furniture making with clear and graphic pictures, illustrating the critical elements. Chapter 1 introduces the reader to the important aspect of raw material selection. Chapter 2 points out the importance of preservation methods to enhance the durability of bamboo furniture; both traditional and chemical methods are described. Further chapters deal with traditional and commercial drying techniques; the processing of culms such as straightening, removing outer nodes, sand filling, and cross cutting; the making of components; assembling and finishing; and additional design features. In the annex, additional information is provided on culm age estimation.



Pages from the furniture manual

## *Developing distance learning partnerships*

In October 2004, an MoU was signed between INBAR, CIBART, Indira Gandhi National Open University (IGNOU) and the Commonwealth of Learning (COL) to launch a distance learning programme on bamboo and rattan. IGNOU is a leading Central University for distance learning with headquarters in Delhi. COL is a Vancouver-based intergovernmental organization created by Commonwealth heads of State to encourage the development and sharing of open learning knowledge, resources and technologies.

Initially the awareness courses and certificate courses in bamboo and rattan will be offered for India. Subsequently these will be adapted to other Asian, African and Latin American countries through the linkages available at INBAR, IGNOU and COL. While the awareness course will set the foundation, the certification course will be a mix of compulsory and elective courses with the objective of successful bamboo and cane enterprise development.

## Appendix I: The Council

The Council is responsible for giving guidance to the Board of Trustees on general policy and strategy, and comprises all Member States who are party to the International Agreement Establishing the International Network for Bamboo and Rattan. All sovereign states that are members of the United Nations are eligible to accede to this Treaty, which remained open for signature until 6 November 1999. After 6 November 1999, the Agreement is open for accession by any state with the approval of the Council. The Council membership as of December 2004 comprised:

<b>Country</b>	<b>Official Name</b>
Bangladesh	The people's Republic of Bangladesh
Benin	The Republic of Benin
Bolivia	The Republic of Bolivia
Cameroon	The Republic of Cameroon
Canada	Canada
Chile	The Republic of Chile
China	The People's Republic of China
Colombia	The Republic of Colombia
Cuba	The Republic of Cuba
Ecuador	The Republic of Ecuador
Ethiopia	The Federal Democratic Republic of Ethiopia
Ghana	The Republic of Ghana
India	The Republic of India
Indonesia	The Republic of Indonesia
Kenya	The Republic of Kenya
Madagascar	The Republic of Madagascar
Malaysia	Malaysia
Myanmar	The Union of Myanmar
Nepal	The Kingdom of Nepal
Nigeria	The Federal Republic of Nigeria
Peru	The Republic of Peru
The Philippines	The Republic of the Philippines
Sierra Leone	The Republic of Sierra Leone
Sri Lanka	The Democratic Socialist Republic of Sri Lanka
Tanzania	The United Republic of Tanzania
Togo	The Republic of Togo
Uganda	The Republic of Uganda
Venezuela	The Republic Bolivariana of Venezuela
Vietnam	The Socialist Republic of Vietnam

## Appendix II: Board of Trustees

The 8th meeting of the INBAR Board of Trustees was held in October, 2004.

<b>Name &amp; Country</b>	<b>Board Position</b>
Keith Bezanson, Canada	Chair
Jiang Zehui, P.R. China	Co-Chair
Rodney Cooke, United Kingdom	
Ian R. Hunter, United Kingdom	Director General
Yoshiko Y. Nakano, Japan	
Romualdo L. Sta. Ana, the Philippines	
Josefina Takahashi Sato, Peru	
Ir. Surachmanto Hutomo, Indonesia	
Hubert George Iandstra	Canada

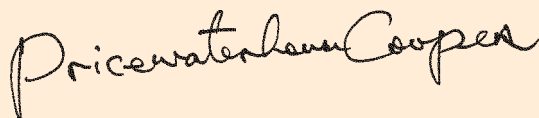
## Report of the Auditors

To the Board of Trustees of the International Network for Bamboo and Rattan:

We have audited the accompanying balance sheet of the International Network for Bamboo and Rattan ('INBAR') as of 31 December, 2004, and the related statements of activities, net assets and cash flow for the year then ended. These financial statements are the responsibility of INBAR's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with International Standards on Auditing. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements present fairly, in all material respects, the financial position of INBAR as of 31 December 2004 and of the results of its operations and its cash flows for the year then ended in accordance with the International Financial Reporting Standards.



PricewaterhouseCoopers

Beijing, PRC

20 January 2005

# International Network for Bamboo And Rattan

## Balance Sheet As at 31 December 2004 (in US dollars)

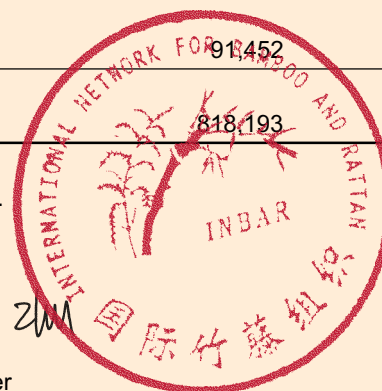
	2004	2003
<b>ASSETS</b>		
Non-current assets		
Capital assets (note 3):		
Automobile	71,937	71,936
Computer equipment	121,771	109,345
Furniture and equipment	151,628	134,740
	<u>345,336</u>	<u>316,021</u>
Less: Accumulated depreciation	234,680	220,266
	<u>110,656</u>	<u>95,755</u>
Recoverable deposits	16,070	19,635
Current assets		
Other receivable (note 4)	193,786	95,489
Cash and cash equivalents (note 5)	989,051	607,314
	<u>1,182,837</u>	<u>702,803</u>
	<u>1,309,564</u>	<u>818,193</u>
<b>NET ASSETS AND LIABILITIES</b>		
Net assets		
Restricted	927,564	541,623
Unrestricted	218,641	185,118
	<u>1,146,205</u>	<u>726,741</u>
Current liabilities		
Advance receipts from donor	-	-
Accounts payable and accrued liabilities	163,358	91,452
	<u>163,358</u>	<u>91,452</u>
	<u>1,309,564</u>	<u>818,193</u>

The accompanying notes form an integral part of the financial statements.

Approved on behalf of the Board:

  
Director General

  
Treasurer



## International Network for Bamboo And Rattan

### Statement of Activities for the year ended 31 December 2004 (in US dollars)

	PRC	IDRC	CIDA	DGIS	IFAD	DFID	EC	Others	2004	2003
Revenue										
Grants:										
Restricted (note 6)	-	-	-	580,646	207,690	36,120	428,787	552,714	1,805,957	1,797,406
Unrestricted	1,320,399	28,387	374,235	-	-	-	-	-	1,723,021	1,123,363
Interest income	-	-	-	-	-	-	-	3,258	3,258	2,304
Publication sales	-	-	-	-	-	-	-	5,622	5,622	921
INBAR Affiliate and Yellow page	-	-	-	-	-	-	-	6,757	6,757	4,973
Others	-	-	-	-	-	-	-	14,244	14,244	27,565
	1,320,399	28,387	374,235	580,646	207,690	36,120	428,787	582,595	3,558,859	2,956,532
Program activities										
Ecological Security	91,000	-	12,909	7,000	-	-	-	14,794	125,702	112,059
Economic Development	14,037	-	-	195,438	-	-	-	8,308	217,783	247,928
Livelihood Development	3,684	9,935	8,637	33,598	308,160	37,657	285,521	322,242	1,009,435	1,125,062
Outreach	88,242	-	16,744	193,644	6,528	-	-	7,650	312,808	473,018
	196,963	9,935	38,290	429,680	314,688	37,657	285,521	352,994	1,665,728	1,958,067
Management and administration										
Secretariat expense (note 7)	179,330	52,893	242,738	-	-	-	-	29,417	504,378	587,147
Board of trustees expense (note 8)	-	-	50,584	-	-	-	-	-	50,584	52,456
	179,330	52,893	293,322	-	-	-	-	29,417	554,962	639,603
In-kind expenses (note 9)	918,705	-	-	-	-	-	-	-	918,705	412,788
Excess of revenue over/(under) expenditures	25,401	(34,441)	42,623	150,966	(106,998)	(1,537)	143,266	200,184	419,464	(53,926)

## International Network for Bamboo And Rattan

### Statement of Net Assets as at 31 December 2004 (in US dollars)

	2004	2003
Beginning balance	726,741	780,667
Excess of revenue over expenditure for the period	419,464	(53,926)
Ending balance	1,146,205	726,741

# International Network for Bamboo And Rattan

## Statement of Cash Flow for the Year ended 31 December 2004 (in US dollars)


	2004	2003
Cash flows from operating activities		
Excess of revenue over/ (under) expenditure	419,464	(53,926)
Adjustments to reconcile excess of revenue over expenditure to net cash provided by operating activities:		
Depreciation	25,161	33,742
Gain on disposals of fixed assets	(472)	21,383
Interest income	(3,258)	(2,304)
Decrease/(Increase) in other receivable	(98,297)	(20,056)
Decrease/(Increase) in recoverable deposits	3,564	(8,368)
Increase/(decrease) in accounts payable and liabilities	71,906	(72,229)
Increase/(decrease) in advance receipts from donor	-	(298,824)
	(1,396)	(346,656)
<b>Net cash provided by operating activities</b>	<b>418,068</b>	<b>(400,582)</b>
Cashflows from investing activities		
Disposal of fixed assets	475	1,258
Purchases of fixed assets	(40,064)	(43,311)
<b>Net cash used in investing activities</b>	<b>(39,589)</b>	<b>(42,053)</b>
Cashflows from financing activities		
Interest received	3,258	2,304
<b>Net cash provided by financing activities</b>	<b>3,258</b>	<b>2,304</b>
Increase/(Decrease) in cash and cash equivalents	381,737	(440,331)
Balance, beginning of year	607,314	1,047,645
<b>Balance, end of year</b>	<b>989,051</b>	<b>607,314</b>

The accompanying notes form an integral part of the financial statements.

Approved on behalf of the Board:

  
Director General



  
Treasurer

# International Network for Bamboo And Rattan

## Notes to Financial Statements For the year ended 31 December 2004 (in US dollars)

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### 1. PRINCIPAL ACTIVITIES

'The International Network for Bamboo and Rattan ("INBAR") was established in Beijing, the People's Republic of China ("China") on 6 November 1997, by international agreement signed by nine sovereign nations ("the treaty"). Subsequently, the Head Office of INBAR was established in China under the terms of a Headquarters Agreement signed between the Government of China and INBAR. Up to 31 December 2004, number of nations acceded to the treaty is twenty-nine.'

'The mission of INBAR is to improve the social, economic and environmental benefits of bamboo and rattan. It supports and coordinates core programs in scientific research, technology generation and sustainable development programs, providing bamboo and rattan solutions for people and the environment.'

'INBAR is currently funded through support received from the Chinese government ("PRC") and by grants and contract support from Canadian International Development Agency("CIDA"), Directorate General of International Cooperation ("DGIS"), Netherlands and United Nations' International Fund for Agricultural Development ("IFAD") and other donors (note 6).'

### 2. ACCOUNTING POLICIES

The principal accounting policies adopted in the preparation of these financial statements are set out below:

#### Basis of preparation

The financial statements are prepared in accordance with International Financial Reporting Standards. The financial statements are prepared under the historical cost method.

#### Reporting currency

The financial statements are prepared in US dollars as INBAR is an international organization and its clients and donors prefer the use of US dollars in the financial statements as it is a global currency.

#### Foreign currencies

'Foreign currency transactions are accounted for at the average exchange rates which closely approximate to the exchange rates prevailing at the date of the transactions; which gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies, are recognised in the statement of activities.'

#### Capital assets

Capital assets are stated at cost less accumulated depreciation.

Capital assets used for projects were directly charged to the expenditure of program activities in the year when they were purchased. All other capital assets for administrative purpose are capitalized.

'Depreciation is calculated on the straight line method to write off the cost of each asset, taking into account zero residual values over their estimated useful life as follows:'

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Automobile	5 years
Computer equipment	3 years
Office furniture and equipment	10 years

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## Other receivable

Other receivable are carried at anticipated realisable value.

## Cash and cash equivalents

Cash and cash equivalents is comprised of cash on hand and short-term deposits with original maturities of three months or less.

## Net assets and grants

Net assets are comprised of unrestricted and restricted amounts. Grants which can be used at the discretion of INBAR is classified as unrestricted net assets. Grants which are restricted by the donors for specific purposes or periods are classified as restricted assets.

Grants are recorded using the accrual method. All grants are included in unrestricted net assets unless specifically restricted by the donor or the terms of the grants.

## Taxation

INBAR enjoys the same exemptions as diplomatic missions in China according to the Headquarters Agreement between the Government of the People's Republic of China and INBAR. As such, INBAR is exempt from taxation in China.

## 3. CAPITAL ASSETS

	Automobile	Computer equipment	Office furniture and equipment	2004	2003
Opening net book amount	-	13,903	81,853	95,756	108,827
Additions	-	23,177	16,887	40,064	43,311
Disposals	-	3	-	3	22,641
Depreciation charge	-	11,393	13,768	25,161	33,742
Closing net book amount	-	25,684	84,972	110,656	95,755
As at December 31, 2004					
Cost	71,937	121,771	151,628	345,336	316,021
Accumulated depreciation	71,937	96,087	66,656	234,680	220,266
Net book amount	-	25,684	84,972	110,656	95,755

## 4. OTHER RECEIVABLE

Other receivable include the following:

	2004	2003
Donors	11,745	53,371
Advance to Suppliers	12,949	12,556
Advance to regional office/employees	169,092	29,562
	193,786	95,489

## 5. CASH AND CASH EQUIVALENTS

Cash and cash equivalents include the following:

	2004	2003
Petty cash	8,101	5,129
Cash in Bank	980,950	602,185
	989,051	607,314

## 6. RESTRICTED GRANTS-OTHERS

Restricted grants - Others are as follows:

	2004	2003
DGIS/DSI -Social and Institutional Development Department of DGIS	222,700	379,971
GTZ-Deutsche Gesellschaft fur Technische Zusammenarbeit, Germany	47,339	48,754
Common Fund for Commodities	200,000	28,000
British High Commission Accra	-	19,470
WWF- World Wide Fund for Nature	-	14,478
ITTO- International Tropical Timber Organization	-	11,638
TRADA Technology Limited	-	9,975
Lanexang Forest Resources Development Co. Ltd, Malaysia	-	5,963
Leiden University	-	5,509
The European Community for the Bamboo Thematic Network	12,556	5,058
The Nature Conservancy	34,979	4,997
Winrock international	-	3,803
UNIDO- UN Industrial Development Organization	7,506	-
Government of India	3,497	-
Government of Tripura, India	3,890	-
Member country - Myanmar	1,000	-
Wen Zhao Bamboo Charcoal Co. Ltd, China	7,260	-
World Agroforestry Centre (International Centre for Research in Agroforestry)	11,988	-
	552,714	537,616

## 7. SECRETARIAT EXPENSES

Breakdown of secretariat expenses are as follows:

	Chinese				2004	2003
	Government	IDRC	CIDA	Others		
Motor vehicle expenses	-	855	3,734	-	4,589	15,510
Training	-	24	31	-	56	995
Office	-	2,824	14,275	-	17,099	86,310
Depreciation	14,072	3,721	7,368	-	25,161	33,742
Printing and reproduction	-	-	-	-	-	2,154
Communication	8,718	-	-	-	8,718	12,552
Professional services	-	2,035	16,483	-	18,518	14,665
Financial expenses	-	203	4,059	-	4,262	1,720
Travel	-	206	18,000	-	18,206	18,399
Employee salaries and benefits	-	43,025	178,787	29,417	251,230	250,465
Rent and utilities	156,540	-	-	-	156,540	150,635
	179,330	52,893	242,738	29,417	504,378	587,147

## 8. BOARD OF TRUSTEES EXPENSES

Breakdown of Board of Trustees expenses are as follows:

	2004	2003
Conference and seminars	30,511	17,494
Professional services	-	1,050
Travel	20,074	33,912
	50,584	52,456

## 9. CONTRIBUTIONS IN-KIND

Contributions In-kind are from PRC Government and details are as follows:

	2004	2003
In-kind contributions for office rent and utilities	918,705	412,788
	918,705	412,788

## 10. CONTRIBUTIONS FROM PROJECT PARTNERS FOR INBAR PROJECTS

Some of the program activities recorded in INBAR's statement of activities for the period from 1 January 2004 to 31 December 2004 are jointly carried out by INBAR and its project partners. Besides INBAR's funding, such program activities are also funded by project partners. According to signed contracts, project partners' committed contribution to those program activities are set out below:

	2004	2003
GTZ (Hainan)-Deutsche Gesellschaft fur Technische Zusammenarbeit, Germany	73,116	108,461
Government of Hainan, China	20,020	38,169
EUT -Technical University of Eindhoven	7,650	25,200
DFID through TRADA	157,336	236,503
CRIWI-Research Institute of Wood Industry of Chinese Academy of Forestry	9,000	18,000
InHand Abra Foundation	1,245	3,295
ACIAR -Australian Center for International Agricultural Research	62,673	121,526
Central Queensland University	65,664	128,328
Department of Primary Industry and Fisheries of the Northern Territory Parks and Wildlife Commission	26,050	42,100
Chinese Government	30,000	50,000
Government of Chishui, China	-	6,000
Ministry of Science and Technology, China	26,618	18,149
UN Food and Agriculture Organization	22,255	9,453
FECD - Fondo Ecuatoriano Canadiense	56,353	111,383
Government of India	625,000	-
Government of Tripura, India	50,000	50,000
Government of Manipur, India	50,000	50,000
Government of Uttaranchal, India	66,667	66,667
Overseas Agricultural Institute, Italy	1,500	-
UNDP - United Nations Development Programme	7,250	-
Chuishui Bamboo Pulping company	187,305	-
Japanese Embassy	75,266	-
Ecuabambu	2,000	-
Faculty of Architecture, Ecuador	7,200	-
Ministry of Agriculture, Ecuador	2,100	-
Resource and Environmental Conservation Society - Nepal	9,100	-
UNDP Global Environment Facility Small Grants Programme	49,000	-
	1,690,368	1,083,234



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