




# Bamboo: a strategic new resource for development

IFAD's pioneering support to bamboo development  
as an engine to improve rural livelihoods



## Bamboo value chains for income and food security

- Solutions for smallholder farmers and producers as businesses
  - Empowering rural women; supporting their roles in agriculture
  - Supporting country leadership for national development; addressing climate change
  - Capacity-building, empowering communities and organizations of poor rural producers
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## IFAD's pioneering support to bamboo development as an engine to improve rural livelihoods

IFAD has been a pioneer in supporting the development of bamboo as a strategic resource that improves the livelihoods of millions of rural people and communities. Over the past 15 years, a number of donors have supported this work through projects and activities of INBAR - the International Network for Bamboo and Rattan. IFAD's contribution is unique for its continued support of the demonstration of how bamboo can generate new income streams and a better quality of life for rural people, through creation of small businesses, social enterprises, women's and community groups.

IFAD grants (1997-2014) have focused on harnessing bamboo to improve rural livelihoods and reduce land degradation. This support has allowed INBAR to work with dozens of communities in rural India, the Philippines, Ethiopia, Ghana, Mozambique, Madagascar, Tanzania, Bolivia, Colombia and Ecuador. These 'action research' and development efforts have tested models for local livelihoods improvement, and created some 40-50 rural collectives and enterprises. The learning on this by INBAR and its partners shows how bamboo can be used to benefit many more bamboo resource countries.

### Grant funding - Progress of IFAD-INBAR partnership for bamboo development

**Planning phase:** scoping, analysis, baseline studies, consulting communities & government partners.

**Capacity Building & partnership phase:** enterprise set-up & technology transfer

**Action Phase:** Learning, field testing, potential for replication.

IFAD-INBAR grant projects (332, 518, 774, 836, 1037, 1177, 1375) have progressed from analysis and dialogue with partners, to enterprise pilot creation, technology transfer and field testing. More effort is now needed to understand the potential for replication and broader scaling-up of this work. This includes increased policy dialogue and presenting of 'packaged learning' (policy and technology packages) for IFAD and INBAR Members States. More than 50 bamboo resource countries can build on learning from these projects to create new rural income streams, jobs, increased household food security and reduced land degradation. Total IFAD investment est. \$6M; INBAR & partners matching funds secured, est. \$13M.

## Bamboo as a catalyst for rural income and food security

Today, after 17 years of IFAD support to INBAR, a number of social enterprises and local businesses created under the IFAD bamboo livelihoods grants have taken on their own life, contributing to people's well-being and improved rural economies. Some project activities have concluded. Some bamboo enterprises are functioning at a small level. And others demonstrate the potential to continue as healthy economic units – creating jobs and income for the long term.

### Results of IFAD investments in bamboo livelihoods initiatives

IFAD grant investments in bamboo development managed by INBAR have resulted in the creation of an estimated 50 enterprises and local collectives that generate an income from bamboo. The enterprises are operating today at various levels in the Philippines, India, East Africa and Latin America. These community enterprises are producing small household items and furniture, incense sticks, bamboo and household charcoal, construction materials for low-cost housing, and even electricity from bamboo and other agri-waste biomass.

An estimated 250,000<sup>(1)</sup> jobs have been created through these activities, bringing new income streams to rural areas near project sites and other locations. While these amounts are small compared to what is needed to bring 2.2 billion people out of poverty and achieve the new Sustainable Development Goals, the good news is that these IFAD investments in bamboo development provide a proof of concept of innovative ways to bring new income to rural communities. These are approaches that can work for more than 50 bamboo resource countries, across the world's tropical and sub-tropical belts.

The IFAD grants also allowed the creation of bamboo action research sites over the past decade in Asia, South Asia, Africa and Latin America. Many of these are still in operation at different levels, where local promotion of bamboo approaches for communities continues – for research, awareness raising, capacity building and demonstration sites.

Some Examples:

**For women - 150,000 jobs and five-fold wage increases.** In Tripura, India, a small investment of US\$10,000 to support women self-help group to organize and produce higher value added incense stick products has now grown to create 150,000 jobs. The strategy was to evolve this women's enterprise from a low-skill bamboo cutting activity, to integrate product creation, branding/packaging and marketing for local and national markets. The initial of one group has risen from \$17/day to five times higher for many of the participating women. Today the incense stick enterprises in Tripura generate revenue of over 17 fold increase between 2005 and 2008.

**New income for 5000 women in rural areas.** In Tanzania, bamboo has improved the lives of several thousand people and is also being used by these communities to reverse land degradation. Probably the best example of this IFAD rural livelihoods investment is the result achieved by INBAR, where 100 bamboo nurseries were created, some 1000 people received training in a specially-created Bamboo Training Center, and micro-enterprises were set up. These activities created new income streams in several rural areas, where communities today produce crafts and desks for local schools. Charcoal briquette production and selling that generate income and slow deforestation employs 5,000 women, many of them single mothers, who now have stable incomes. To improve women's access to other types of bamboo production jobs, the processes were modified for bamboo furniture and construction materials.

**Bamboo construction – 2000 jobs for affordable housing.** In Ecuador, IFAD bamboo grants have sparked a number of public-private partnerships that make furniture, flooring, crafts and construction products. These models have now also been shared with neighbouring regions in Northern Peru, with some 2000 people now employed in value chains and enterprises that produce housing that is affordable and resistant to earthquakes and floods. This housing reduces risks to climate change and transforms coastal and peri-urban areas with better quality homes for low-income communities.

**Biogas for local electricity and charcoal – \$50,000 revenue per year.** In India, IFAD grant financing through INBAR has created a joint enterprise owned by an NGO with 70% shareholding by women's groups and technical partners that run a bamboo/biomass unit producing electricity for the village and bamboo charcoal for use and sale. Yearly cash revenue totals some \$50,000 for combined production, with other benefits such as power for irrigation pumping

**Linking national policy to value-added bamboo production – an institutional market for 1.16 million school desks.** INBAR was instrumental in facilitating and informing the policy dialogue that resulted in Executive Order E0879 that requires 25% of all school desks in the Philippines to be made from bamboo. This was made possible by a new process pioneered by INBAR's project partner 'InHand-Abra' for producing laminate bamboo, a material that allows production of sturdy, low-cost furniture that can be made in a small workshop without specialised machines – ideal community producers across the country.

<sup>(1)</sup>An estimated 250,000 jobs directly created by the projects and indirectly by follow-on activities by partners and organisations continuing after project closure (from reports).

# Bringing bamboo benefits and value chains to rural communities in IFAD Member States

*Empowering rural populations, new solutions for income and national food security*

*The bamboo rural value chains piloted under the past bamboo livelihoods grants build on the IFAD strategy to deliver 'Learning, Leveraging and Scaling-up'. INBAR proposes to extend these value chains to many more countries, in a strategic partnership with IFAD that will scale-up bamboo innovations to benefit large groups of rural producers.*



Potential distribution of bamboo within existing forest cover. (Source: Bamboo & Rattan in the World.)

A proposed strategic partnership between INBAR and IFAD will aim to deepen learning from past work, to refine and deliver bamboo 'policy and technology packages' that will deliver improved livelihoods. INBAR will work with countries to review bamboo-based options and integrate them in national strategies for rural development and food security. These livelihoods tools strengthen IFAD loan packages to Member States – delivering value chains that can be scaled-up to increase village income and food security in many locations.

The partnership will target four result areas:

- **Policies.** Support to national bamboo policy development.
- **Bringing bamboo technologies to scale.** Creating policy and technology packages, scaling-up with partner countries.
- **Testing new bamboo innovations.**
- **Increasing knowledge sharing,** South-South learning and dialogue

## Policy support and bamboo value chains for countries

An enabling policy environment is the key to effective markets. The partnership will build on INBAR's expertise in support to countries in crafting national policies (current experiences include Ethiopia, Ghana, Rwanda, India, Nigeria, Philippine, Viet-Nam) or integrating bamboo strategies in existing rural development, agriculture or forestry policies. INBAR can support countries in consultations on policy and investment for bamboo development, presenting options for value chains and business models that benefit rural communities.

## Support countries to select and scale-up bamboo business models and value chains

Bamboo value chains can boost income and support food security in many IFAD Member States. In these activities, INBAR will continue its efforts to create useful tools that countries and development agencies can use to and select appropriate value chains, and support to select and put in place high-potential approaches. Work in progress at INBAR is refining learning for: small enterprise creation; technology transfer of bamboo cultivation techniques; producing small goods for local market and high-value items for export; small-scale electricity and charcoal production; rapid reduction of land degradation; cellulose production, etc.

## Testing new bamboo-based innovations

New bamboo innovations have real promise for food security in rural areas, but need further proof of concept refining. In the proposed partnership, INBAR will work with countries to validate a range of new technical approaches, business models and value chains. For example: village-level electricity generation; growing bamboo as a source of on-farm perennial

animal fodder (improves performance of crop-livestock systems) and bamboo use for productive use of wastewater/grey water (adds value to dryland systems), and bamboo use for small-scale rural electricity generation. Appropriate funding methods for financing will also be validated – including micro-credit, crowd funding and public-private partnership models, already in use in some INBAR activities.

**Knowledge exchange, South-South learning and dialogues** facilitated by INBAR are at the centre of all these approaches, where countries evaluate and select approaches and bamboo value chains that suit their green development plans. Options range from low-entry cost, rapid job creation activities, to high investment high market value production serving export markets. Learning happens between Asia, Africa and Latin America, where each region has unique expertise to offer.

## Scenario for IFAD-INBAR bamboo development action

INBAR country action	IFAD Priority	Targeted outcomes
<b>Policy support and bamboo value chains for countries</b>	1,4,5	<ul style="list-style-type: none"> <li>• Policy makers in target countries learn from others.</li> <li>• National policies created in joint learning</li> <li>• Link policy to action plan</li> <li>• Investment plan attracts national, donor, private sector funds.</li> </ul>
<b>Support countries to select and scale-up bamboo business models and value chains</b>	1,2,3,4	<ul style="list-style-type: none"> <li>• Learning &amp; technology transfer between bamboo resource 'learning' countries and bamboo resource 'innovating countries'.</li> <li>• Review options, selection of value chains</li> <li>• Proof of concept</li> <li>• Scaling-up action plan</li> <li>• Creation of many new rural enterprises</li> </ul>
<b>Testing new bamboo-based innovations</b>	3	<ul style="list-style-type: none"> <li>• New research evidence produced with partner countries</li> <li>• e.g. Bamboo use for wastewater recycling (dry areas), electricity generation, perennial fodder (crop-livestock systems), innovative financing of rural businesses etc.</li> </ul>
<b>Knowledge exchange, South-South learning and dialogues</b>	2,3,4,5	<ul style="list-style-type: none"> <li>• New knowledge and learning products and services created and widely used as development tool</li> <li>• Actively promoted to all partners and global development community</li> <li>• On-line learning network active</li> </ul>

1. A natural resource and economic asset base for poor rural women and men that is more resilient to climate change, environmental degradation and market transformation;
2. Access for poor rural women and men to services to reduce poverty, improve nutrition, raise incomes and build resilience in a changing environment;
3. Poor rural women and men and their organizations able to manage profitable, sustainable and resilient farm and non-farm enterprises or take advantage of decent work opportunities;
4. Poor rural women and men and their organizations able to influence policies and institutions that affect their livelihoods;
5. Enabling institutional and policy environments to support agricultural production and the full range of related non-farm activities.

# Bamboo & Rattan: a world of innovative uses for the green economy

*The value chain for bamboo and rattan commodities and products starts in rural areas of the world's bamboo-indigenous countries. The economics of bamboo production mean that most goods made for the world market will be produced locally, creating increased income and jobs for these populations.*

Here are some examples of innovative economic activities:

**Community enterprise and small business.** There is a growing body of evidence and examples of bamboo use for new income-generating activities, bringing cash to poor rural and peri-urban communities. INBAR has facilitated the creation of a number of women-led enterprises in India that use bamboo to produce low-cost products that are bought by a year-round market demand – including matches, chopsticks, incense sticks, small household items, etc.

*Value Chain: Locally-created social enterprises use locally-sourced or planted bamboo to bring income to unemployed/underemployed and marginal populations, generating cash with low entry cost.*

**Rapid landscape restoration.** Bamboo grows to maturity in 3-7 years. A growing number of cases show how it can rapidly restore severely degraded landscapes in poor rural areas, returning life and productivity to the soil, and income to local communities. A recently-documented case in Allahabad India, tells of the rebuilding of rural livelihoods where 80,000 hectares of degraded land were brought back into productivity using bamboo as a pioneer species.

*Value Chain: Communities plant bamboo that rejuvenates land over five years, opening a range of new village-level economic activities – from farming of new crops, to fisheries and timber production.*

**Sustainable animal fodder.** Agricultural research is developing new varieties of forage and crops, or commodities such as barley for animal feed. Bamboo serves these same markets in areas where it grows or can be cultivated. Unlike food crops that have a seasonal growing cycle, bamboo is a perennial plant that requires less maintenance, very low inputs and provides a constant source of food for livestock.

*Value Chain: communities harvest from managed forests, or local farmers plant bamboo for year-round harvesting for livestock or selling a feed.*

**Low-cost, climate-smart housing.** In Latin America, the sector for bamboo housing, for low-income communities, such as low-cost (\$5,000) house kits, and for earthquake-proof dwellings are a part of local economies and certified in national building codes. Bamboo housing has wide applications for improving livelihoods in natural disasters or refugee situations, where rapid building with affordable materials is needed.

*Value chain: Locally sourced bamboo poles are transformed into housing kits for use by community organizations, disaster relief or government agencies.*

**Energy and biogas.** Bamboo holds huge promise for reducing deforestation for firewood production. Much of Africa's deforestation is due to harvesting of wood for daily cooking. Bamboo plantations can be harvested and converted to charcoal for home use. A growing research area is the use of bamboo charcoal and chips to power small-scale electricity generators that can produce biogas for local electricity, powering villages and communities that receive poor services or are off the grid.

*Value Chain: Local forests are harvested to provide bamboo for charcoal production; bamboo plantations are created to provide a local source of 'perennial' firewood; waste from bamboo factories is made into charcoal, creating profits from production waste.*

**Local industry.** In Ethiopia, for example, a growing number of local entrepreneurs are creating businesses to tap and expand the country's one million hectares of lowland and highland bamboo – creating jobs and generating income among rural communities and marginal economies. They produce products such as cellulose, charcoal, flooring and furniture. An entrepreneur in the Western Province has harnessed bamboo to create 1000 jobs in a remote rural area with no previous large-scale economic activity.

*Value Chain: local communities maintain forests in partnership with local industry, for products transformed locally and sold on the national market.*

**E-commerce: Linking villages to the global market.** E-commerce services, are being developed that work directly with villages to sell locally-produced goods such as furniture and household items directly to the world market. For example, villagers in Viet Nam are selling products directly to US consumers receiving a western price for their goods, bypassing middlemen and traditional distribution chain, which often exclude small players.

*Value Chain: internet and e-commerce companies work directly with village producers or individual families, offering bamboo and rattan products for sale on the world market.*

**High-design and value-added architecture.** Following the success of world-leading designs such as Madrid Airport, Wuxi Grand Theatre (China) or the Clinton Center (New York) more leading architects are specifying bamboo for innovative design products. In Europe, bamboo flooring is expanding in markets for high-value and durable interior design.

*Value Chain: Western producers establish facilities and train local Asian companies to produce goods for unique designs or standard products such as high-end furniture, flooring and the home-building market.*

**Industrial and engineered products.** Entrepreneurs in many locations, particularly East and South Asia, are creating new products for industrial use, such as pipes and conduits, filters and special engineered pieces used in heavy industrial processes. Several companies in China have perfected a bamboo screen for cooling high-temperature steam in power plants and heavy industry cooling towers. It replaces PVC screens, lasts three times longer (15 years) and is fully recyclable at the end of its lifetime.

*Value Chain: Sourced from community managed forests, new job creation for light industry to transform products in many locations.*

**Hardwood reduction/replacement.** Bamboo is a grass that grows to maturity in 3-5 years and can be harvested to produce high-quality non-timber products for global industries such as furniture and construction. Yet it shares the properties of popular hard and soft wood types. The big difference is that bamboo re-grows after harvesting, unlike trees that need re-planting.

*Value Chain: Well-managed bamboo forests can be expanded to produce timber resources that have similar properties to many soft and hardwoods.*

**Sustainable forest management.** Rattan is useful in plantation forestry, for example in combination with rubber, to provide diversified income. Sustainable rattan management also supports conservation as rattan needs trees to grow on.

**Rattan furniture.** In Indonesia, the Philippines and Vietnam, production of rattan furniture is big business, usually involving small-scale producers in a larger export-oriented production chain. In 2005, over 80,000 people in Indonesia earned their livings from processing rattan furniture alone. Innovative products designs and production systems help keep the market healthy – rattan furniture from certified rattan is now available in Europe.

*Value chain: Rattan canes are harvested by specialized harvesters for primary processing (splitting, preserving, bending) secondary processing (making, finishing furniture). Each transformation step adds value and generates incomes.*

## International Network for Bamboo and Rattan (INBAR)

The International Network for Bamboo and Rattan (INBAR) is an inter-governmental organisation with 40 Member States. It plays a unique role in demonstrating innovative ways of using bamboo and rattan to improve rural livelihoods, protect environments, address climate change and facilitate fairer pro-poor trade. INBAR connects a global network of partners from government, private and NGO sectors to promote a global agenda for sustainable development using bamboo and rattan.

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