

Global Assessment of Bamboo and Rattan (GABAR)

The case for Mexico

Ladies and gentlemen

It is a real pleasure to be here in Mexico and to address the Third Mexico Bamboo Congress as the Director-General of the only inter-governmental organisation that deals with bamboo: the International Network for Bamboo and Rattan, or INBAR. INBAR supported the previous two Congresses, but this is my first opportunity to be with you. We currently represent 41 countries, and they are almost all countries that have natural bamboo and in some cases rattan. Surprisingly, Mexico is not yet a Member State of INBAR, but we hope this will change in the near future.

Our global Headquarters are in Beijing, China which is where I am based. We have four small Regional Offices, and our Regional Office for Latin America and the Caribbean is located in Quito, Ecuador. Representatives of the Government and Mexican technicians and researchers have been part of INBAR training workshops in China, Peru and Ecuador.

Bamboo and rattan are the world's most traded non-timber forest products (NTFPs), and they have become central to emerging economies around the globe, especially in the Tropical belt. Bamboos in particular serve as drivers for inclusive and green development given that they are fast growing and sustainable wood alternatives, have a great potential for carbon sequestration, and are viable resources for poverty alleviation and climate change adaptation.

We have asked Kew Royal Botanic Gardens in the UK to help us identify how many species of bamboo we have in the world, and their draft report lists more than 1600 different species. We will be able to give you a peer-reviewed conclusive list in a few months, and this will include the list of species in Mexico. I read on the internet that you have 37 species, and Kew Gardens will consult experts in this part of the world to make sure the report has the right information about Mexico.

The available global bamboo distribution maps and related reports are nearly 15 years old and may no longer be relevant. Moreover, much of the information gathered at the time was based on national statistics and institutional reporting, and not verified with field research. There are some interesting anomalies on the maps, illustrating the fact that information was based on reporting data, not on the actual situation. We therefore find ourselves in a situation where an up-to-date bamboo and rattan resources inventory is urgently needed.

Moreover, we need to determine what opportunities are available for the use and development of bamboo and rattan resources, so we can advise national, regional and global decision makers. With the rapid development of the industry, and a number of important innovative and new research findings, there is need to also review options for green development.

In order to produce a reliable, ground-referenced assessment of global bamboo and rattan resources, INBAR and its Members have embarked on a major inventory and assessment study, called the Global Assessment of Bamboo and Rattan (GABAR). The long-term goal of the programme is to provide basic data for decision-makers about the goods and services that bamboo and rattan can provide for socio

economic development and environmental protection. GABAR was launched at the World Forestry Congress in Durban in September 2015, with significant political and international support.

The inventory component of GABAR will involve remote sensing specialists to provide spatial data, taxonomists and field research teams from INBAR Members around the world, webmasters and information technology experts to translate the data into a searchable internet-based database. We are working closely with Tsinghua University in China, and hope to develop a user-friendly system that can be applied to all our Member States. This methodology will eventually also be shared with Mexico

The first thematic assessments of GABAR will include a peer-reviewed checklist of species and a report about the invasiveness of bamboo. We already have a synthesis report of bamboo for climate change, and we will produce a report about bamboo for construction, to be launched at HABITAT III in Quito in October. We will also publish a synthesis report about bamboo for energy which we will present in Marrakesh during COP22 of the United National Framework Convention on Climate Change.

National or sub-national resource assessments will take place this year in China, Ethiopia, India, Jamaica, Kenya and Uganda. Other national GABAR initiatives are planned for the coming years, often through domestic budget support. All of this will be coordinated by the INBAR Secretariat within its Headquarters in Beijing China, and through our Regional Offices in Africa, Latin America and Asia, and overseen by a small Steering Committee representing INBAR Members and key partners.

The detailed scope of the GABAR initiative is now being defined, but its main outputs will be a comprehensive assessment of the opportunities and challenges for the development of the bamboo and rattan sectors in the Global South, combined with recommendations for policies, plans and strategies for more effective management and use of bamboo and rattan resources.

What does this mean for Mexico? We hope that Mexico will use the overall umbrella of GABAR to carry out its own national inventory and assessment. We would welcome an up-to-date report about the species composition of bamboos in Mexico, the distribution of the major bamboo areas, and the density of plantations and forests. The only information that I could find is an old map from FAO.

On the basis of this fundamental information, you will be able to make choices for green development and to decide where bamboo can play a role for future policy decisions. For example, a bamboo inventory will allow you to determine the carbon flux and stocks of the bamboo forests, which will help to define the relevance of your bamboo resources for climate change mitigation.

The mean annual increment of Carbon for a Moso bamboo plantation in central China is more than 5 tonnes per hectare. INBAR worked out that over a period of 60 years, a well-managed bamboo plantation will have created an aggregated carbon stock of approximately 300 tonnes of Carbon per Hectare, compared to less than 180 tonnes of Carbon per Hectare for a Chinese fir tree plantation. The main reason is that a fir plantation is clear-felled every 30 years, while bamboo continues to

grow. However, the model assumes that bamboo is harvested regularly, because if bamboo is not harvested, the culms deteriorate after say 10 years, and the CO₂ is released.

While these results are encouraging, we should keep in mind that the research was focusing on bamboo and fir plantations in temperate climate. The tropical bamboos in Mexico will have much higher rates of carbon sequestration, and bamboo could therefore play a key role in your Intended Nationally Determined Contribution (INDC) to the Climate Change Convention and in your national report to COP22 in Marrakech later this year!

INBAR has worked with the Chinese State Forestry Administration to develop a methodology to measure carbon capture in new bamboo plantations and existing stands, and when the global carbon market becomes more lucrative, this opens opportunities for extra income. We would be very happy to introduce this methodology in Mexico.

Many bamboo species can be used to control erosion as they have extensive root systems, and the canopy helps to intercept rainfall. Strategic planting of bamboo may help to stabilize slopes and prevent small-scale earth-movement. Research in China showed that erosion under a Moso bamboo canopy is 4.7 times lower than in a sweet potato field. This will not be the same for clumping bamboo, but I expect that erosion under *Guadua* is also less than that experienced on agricultural land.

Several countries have policies or guidelines to promote the use of bamboo to curtail erosion; Rwanda has a policy that calls for planting of bamboo in 5-metre corridors along small rivers; in 10-metre corridors along big rivers, and in 50-metre corridors along lake shores. The Philippines has informal guidelines that say that bamboo and mangrove species shall be: “used as reforestation crops, particularly on river banks and in coastal areas, to control soil erosion and as buffers against wave action”. Other countries are following these examples, and bamboos could help Mexico control erosion along its water ways and slopes in this way as well.

At a larger scale, bamboo can also be used to restore eroded or degraded lands as grows quickly, it grows well on problem soils and steep slopes and can form an effective windbreak. INBAR has experience in India where we helped to restore 85,000 hectares of devastated land in Allahabad through the introduction of bamboo. In China, the Sloping Land Conversion Programme (sometimes called Green for Grain) has restored 29 million hectares of degraded agricultural land during the past two to three decades. This includes 3 million hectares of bamboo forests.

Most bamboo species are ready for use within a period of 4 to 7 years, and therefore the return on investment in bamboo plantations is relatively high, compared to tree forest plantations that generally take much longer to reach maturity. If there are areas of unproductive, barren land in Mexico you may want to consider the possibility of growing bamboo to restore the productivity.

Another study that would be helpful is to define the best use of your bamboos once they are cut. One of the most important benefits of developing a bamboo industry is that it can provide employment for many people who can tap into a growing demand for sustainable products. Bamboo harvesting is

labour-intensive, and can be done by farmers with little training, and with simple tools. Bamboo is typically cut by hand, and transported by cart or truck.

In the Andean Region, the revenue from 1 hectare of Guadua bamboo is more than USD 900 in the first years of harvest, and through proper management this can increase to USD1550 per hectares after a number of years, making it highly competitive with other commodities, such as banana, cocoa and coffee, which are also more vulnerable to climate change, pest and disease.

Similar income is obtained from sale of bamboo poles by farmers in Guizhou Province in southern China. But, during a recent visit, I was told that in addition to the revenue from selling bamboo poles, bamboo shoots are sold as a delicacy on the local market. This generates additional income of up to USD 1,200 per hectare. Double revenue from a single crop!

Once the bamboo culms are cut, they are the raw material for a large variety of products. China claims that there are 10,000 different uses of bamboo, ranging from simple handicrafts, to modern furniture and interior design pieces. China is by far the world's largest supplier of bamboo goods, and Mexico does not show on this graph. The total value of the domestic market of bamboo and rattan products in China was USD20Billion in 2012, and we estimate it is nearly USD32Billion at present. China predicts an industry of nearly USD50Billion by 2020. While this may not be a realistic goal for Mexico, there is no reason why you cannot develop a healthy domestic bamboo industry.

Of course, you have Guadua, and this can be used to erect monumental buildings such as the ones designed and built by Colombian architect Simon Velez, by architect Jorge Moran from Ecuador or by Joerg Stamm who is with us here. One key challenge is that often architects, designers and engineers do not use bamboo as a material of choice, and this is partially due to the fact that there is a lack of standards. INBAR has helped to establish several ISO construction standards during the past years, and last year a new ISO Technical Committee for Bamboo and Rattan was established. This new committee, ISO TC296 has its Secretariat with the International Centre of Bamboo and Rattan (ICBR) in China, and INBAR is providing support to ICBR. The first meeting will take place in April this year, and TC296 has 12 Participating and 20 Observer Countries, but Mexico is not yet amongst them. If your standards authority was part of the discussions, you would have direct influence over future developments of global bamboo standards.

Despite the fact that millions of people in Latin America live in houses made from bamboo, there are restrictions in the use of bamboo for modern construction if it is not incorporated into your national building code. Only a few countries have made bamboo part of their building regulations, such as Colombia and Peru. You may want to discuss this with your Ministry of Agrarian, Territorial and Urban Development, and make amends to the building regulations in Mexico.

Unlike the majority of Latin America countries, China is using its main bamboo species to primarily produce engineered bamboo composites. Chinese Moso bamboo is particularly suited to this type of construction material, and engineered bamboo flooring and paneling can be found in many modern construction projects, such as the roof of Madrid Airport or the floors in the Clinton Presidential Library in Little Rock, Arkansas, USA.

Bamboo can also be an important source of energy for the household or even for large scale industrial production. INBAR has tested the suitability of bamboo charcoal in India, Ethiopia and Ghana, and found that the calorific value is similar to that of frequently used charcoal from wood, while bamboo charcoal in Ethiopia is nearly smokeless and produces no smell. I understand that most of the bamboos in Mexico belong to the genus *Chusquea*, and the stems of these bamboos are solid. This would make it particularly suitable as a source of charcoal, and there must be a lucrative market for fuel for barbecues in Mexico City and across the border with USA.

An entrepreneur in Indonesia is using bamboo as a means to provide energy for local communities on Siberut Island. Electricity is produced through gasification – a process that involves burning biomass in special units that power an electricity-generating turbine. The initiative plans to generate approximately 14-50 kilowatts (kW) in small hamlets, and up to 100-300 kW in medium-sized villages. During the start-up phase the small-scale generators are supplied by harvesting wild bamboo. But, large-scale use of this rural technology will require a stable and reliable supply of quality bamboo. The solution: properly managed bamboo plantations that provide a year-round supply of biomass energy. The initiative encourages communities to grow bamboo themselves, supplying bamboo cuttings to small-scale power generators in exchange for electricity – a concept called “Listrik Gotong Royong,” or ‘working together for electricity.’

Bamboo can also be used at an industrial scale, and a German research institute claims to get more miles out of bamboo energy than out of comparable other energy sources. Industrial-scale bamboo energy initiatives are under way in Japan and Kenya, and even in Europe bamboo is considered as a source of renewable energy. Is bamboo energy an option for Mexico?

Many bamboo fibres are excellent raw material for pulp and paper. I have recently visited a paper mill in China that produces 200,000 tonnes of pulp per year, using more than 800,000 tonnes of local bamboo. The raw material is harvested by small farmers, who deliver the cut culms to the side of the road. Communal trucks transport the culms to village collection points where they are chipped into small pieces. The factory collects these pieces in large trucks and takes them to a dump site outside the main production facility. This is the largest paper mill in the world that uses only bamboo, but smaller enterprises could be established in Mexico with the resources you have available.

GABAR will help to define the most promising commodity development, and will guide the policy makers to decide on appropriate green development options. I hope this brief presentation has given you a better idea of the Global Assessment of Bamboo and Rattan, and the opportunities this could provide for Mexico. We would be particularly pleased if your government would decide to join INBAR as a Member State, and ratify the INBAR Establishment Agreement Treaty, so we can work together to carry out a detailed assessment of the opportunities for green development with bamboo.