NGP China study tour, June 2015

Sustainable intensification and the role of bamboo

A New Generation Plantations think piece

newgenerationplantations.org

NEW GENERATION PLANTATIONS platform

Introduction: why sustainable intensification?

Forests and trees are essential to life – they clean the air, store vast amounts of carbon that help offset climate change, purify water, and support wildlife. In addition, more than 1.6 billion people worldwide depend directly on natural forests for their livelihood, food, fuel and shelter. Almost half of the Earth's original forest cover is gone, much of it removed within the past three decades.

The need to end deforestation and manage forests sustainably is widely recognized. WWF is calling for zero net deforestation and forest degradation by 2020. The Consumer Goods Forum, which represents 200 of the world's biggest manufacturers and retailers, has committed to driving deforestation out of supply chains by 2020; a number of leading global banks have signed the Soft Commodities Compact to support this goal. Major international initiatives such as the 2014 UN Declaration on Forests, the 2010 Aichi biodiversity targets, REDD+ and the post-2015 Sustainable Development Goals aim to end forest loss.

But the pressure on forests continues to grow. World population is projected to pass 9 billion by 2050, and as incomes rise so do consumption demands. This will see increasing competition for land for crops and livestock linked with deforestation, such as beef, soy and palm oil. At the same time, WWF's *Living Forests Report* projects that annual harvesting of wood from forests could triple by the middle of the century to meet increased demand for timber products, paper and bioenergy.

The paradox we have created is that the more we advance on development, the more we fail on sustainability.

The New Generation Plantations (NGP) platform is a response to this. NGP sets out to demonstrate that well-managed plantations in the right places can help to meet rising demand for wood-based products, while sparing natural forest, restoring degraded landscapes and supporting local socio-economic development.

Efficient plantations attempt to do more with less: to maximize fibre production and shared value, while minimizing the need for land, water and chemical inputs. Bamboo plantations have the potential to be a promising part of the solution. Extremely fast growing, bamboo also plays an important role in Chinese culture and offers opportunities for farmers and rural communities.

The plantation sector in China

China leads the world in forest plantations. Over the last 25 years (1990-2015), the country has planted 37 million hectares of trees in an effort to combat erosion, desertification and climate change, restore degraded land, grow its timber industry and improve incomes for rural communities. China is on track to meet its target of increasing forest cover to 23% of its landmass by 2020. The country's current planted forest area is 79 million hectares, the largest in world.

China's forest plantations produce 64 million cubic metres of industrial roundwood annually – third in the world after Brazil (132 million m^3) and the US (102 million m^3), according to a 2014 FAO assessment. Nevertheless, the country has a large timber deficit. China's imports of logs, woodchip and pulp are equivalent to around 10% of all wood harvested globally. Imports grew by nearly 16% each year from 1997 to 2012, and demand continues to rise (RISI, *China's Timber Outlook 2013*). The country also imported 30 million tonnes of recovered paper in 2012 to be recycled into paper and paperboard.

China's plantation sector will, then, continue to grow in importance over the coming decades. We must, of course, be careful not to equate monoculture plantations of alien species with native forest. Examples exist in China, as elsewhere, of plantations replacing native forest, and of poorly planned plantations in the wrong places. Applying NGP principles will enable China to maximize the social, environmental and economic benefits of its afforestation efforts.

The China Green Carbon Foundation (CGCF), part of the Chinese government's State Forest Administration, is an NGP participant. CGCF has received over US$100 million in donations from businesses, organizations and citizens worldwide to offset carbon emissions through afforestation projects. It currently manages over 80,000 hectares of carbon plantations, which also aim to provide other co-benefits for people and nature.

79 MILLION HECTARES

CHINA HAS THE LARGEST AREA OF PLANTED FOREST IN THE WORLD

China and bamboo

Bamboo has a unique importance in the culture and ecology of China. Of the 1,200 species of bamboo found around the world, China has more than 500. In Chinese culture, bamboo is known as one of the “Four Noble Ones”, along with plum blossom, orchid and chrysanthemum. These four plants also represent the four seasons. Bamboo is also one of the “Three Friends in Winter”, along with the pine tree and the plum blossom. It has come to symbolize such positive traits as modesty, toughness and uprightness.

Bamboo has been used in myriad ways throughout Chinese history. The American traveller William Edgar Geil (1865-1925) observed in his book *A Yankee on the Yangtze* (1904):

> *A man can sit in a bamboo house under a bamboo roof, on a bamboo chair at a bamboo table, with a bamboo hat on his head and bamboo sandals on his feet. He can at the same time hold in one hand a bamboo bowl, in the other hand bamboo chopsticks and eat bamboo sprouts. When through with his meal, which has been cooked over a bamboo fire, the table may be washed with a bamboo cloth, and he can fan himself with a bamboo fan, take a siesta on a bamboo bed, lying on a bamboo mat with his head resting on a bamboo pillow. His child might be lying in a bamboo cradle, playing with a bamboo toy. On rising he would smoke a bamboo pipe and taking a bamboo pen, write on bamboo paper, or carry his articles in bamboo baskets suspended from a bamboo pole, with a bamboo umbrella over his head. He might then take a walk over a bamboo suspension bridge, drink water from a bamboo ladle, and scrape himself with a bamboo scraper.*

Ink Bamboo by Wang Fu (c.1362-1416), a painter and poet during the Ming Dynasty. Bamboo paintings are an important motif in Chinese art.

Today, bamboo is still used for many traditional handicrafts, but many new markets are emerging: from plywood, flooring and furniture, to textiles and paper, to charcoal and even laptop casings and computer hardware. It is also grown for its edible shoots and to make drinks and vinegars.

China's bamboo plantations cover a little over 6 million hectares. Nearly three-quarters of this is mao bamboo, a giant native species which can grow to 28m; this is the main species used in the Chinese textile industry, and also produces edible shoots. In 1981, the country's industrial bamboo production was valued at RMB 400 million (US$64 million); by 2013, the annual productive value of the bamboo industry was over RMB 167 billion (US$27 billion). The China Bamboo Industry Development Plan, formulated in 2013, suggests China's bamboo industry output will reach RMB 300 billion (US$48 billion) by 2020, and could employ 10 million people.

Most of China's bamboo is grown by smallholders, as part of mixed landscapes: along with horticulture, other forestry and eco-tourism, it has the potential to play an important role in rural development. The SFA predicts that bamboo products will make up at least 20% of farmers' income by 2020.

THE GROWTH OF THE CHINESE BAMBOO INDUSTRY

1981

US$64 MILLION

2013

US$27 BILLION

2020

US$48 BILLION

The market view:

Kimberly-Clark's commitment to sustainable alternative fibres

Edward "Skip" Krasny, manager of the Kimberly-Clark Corporation's Sustainable Forestry Programs, discusses the company's interest in bamboo and alternative fibres.

Kimberly-Clark understands the importance of forests and the pressures they are under. The company also anticipates increased competition for wood fibre from one of its key sources, the Canadian boreal forest.

At the Rio+20 United Nations Conference on Sustainable Development in June 2012, Kimberly-Clark announced its vision to significantly reduce its forest fibre footprint, including a goal to transition at least 50% of wood fibre sourced from natural forests to alternative sources by 2025. In 2014, just under a quarter (24%) of the virgin fibre used by the company was sourced from natural forests. Kimberly-Clark continues to strongly support sustainable forestry through its sourcing of Forest Stewardship Council (FSC)-certified wood fibre where those materials are needed but at the same time the company is aggressively exploring high-potential alternatives to the traditional fibre sources used in the industry, while maintaining its quality standards.

As global demand for the world's remaining natural forest resources increases, identifying, developing and using rapidly renewable and sustainable fibre alternatives will be essential to conserving the world's natural forests and to growing our tissue businesses. Equally importantly, the initiative will also help insulate the company from continuing volatile price fluctuations in the world fibre market.

Kimberly-Clark's initial focus is on plants such as bamboo that make efficient and sustainable use of land and resources and do not displace food crops or lead to the loss of natural forests. As a very early step in a broader research initiative, Kimberly-Clark commissioned a life cycle assessment (LCA) to help inform the company of potential environmental benefits and/or impacts of using alternative natural fibres. In addition to the traditional impact areas studied in LCAs, the study provided analysis on issues such as scale of land use, impacts on biodiversity and biogenic carbon accounting.

Kimberly-Clark worked with scientists at the Georgia Institute of Technology (GIT) to assess the environmental impacts of several alternative fibres, as well as the conventional fibre options of Northern Bleached Softwood Kraft (NBSK) fibre derived from primary boreal forests in Canada and recycled fibre derived from waste paper. The alternative fibres evaluated were bamboo, wheat straw, giant cane *(Arundo donax)* and kenaf. One key finding was that bamboo appeared to have less impact than NBSK on most indicators with a significant benefit in land use due to its rapid renewal rate – three years for regeneration, as opposed to 70-150 years for northern softwood trees.

In 2012, the company entered into a first-of-its-kind development agreement with Provitro Biosciences (formerly Booshoot), which is exploring the manufacturing of tissue products containing fibre derived from Booshoot's proprietary bamboo propagation technology. Provitro Biosciences has delivered tens of thousands of bamboo starts to be grown in Kimberly-Clark pilot projects throughout the southeast United States. The trials are designed to prove the viability of several species of giant bamboos, as a scalable and sustainable tree fibre alternative.

In the interim, Kimberly-Clark has sourced commercially available FSC-certified bamboo from China and introduced several products in the consumer and business-to-business tissue markets to assess consumer awareness and interest in alternative fibre products. Andrex Eco bath tissue, which contains 10% bamboo and 90% recycled fibre, was launched in the UK in 2012. In 2014, Kimberly-Clark Professional introduced several tissue products which contain 20% bamboo in North America as well as several tissue products containing 20% wheat straw fibre, an agricultural by-product. K-C has also recently introduced paper towels and bath tissue in Australia containing 20% bamboo.

While Kimberly-Clark realizes that meeting its aspirational goal to significantly reduce its use of fibre sourced from natural forests will be challenging, the company remains committed to working with key stakeholders to develop alternative natural fibres, such as bamboo, to meet its future fibre needs.

Points for discussion

The market for bamboo looks set to grow as rapidly as the plant itself. Bamboo has the potential to supply high yields of fibre in a relatively small area, provide ecosystem services like carbon sequestration and erosion control, and support rural development.

During this study tour, we'll be asking:

- How can China's plantations, including the bamboo industry, increase production sustainably? What are the challenges and the opportunities?

- How can growing demand for alternative fibres help to deliver benefits for farmers and communities? And do carbon markets have a role to play?

- What are the implications of increasing plantation productivity in China for fibre demand and markets worldwide?