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Nepalese bamboo textiles

Bamboo Textiles: Introduction

Bamboo textiles are any type of cloth, garment or woven fabric that is made out of natural bamboo fibres. Natural fibres are identified by their air permeability, antibacterial properties, moisture release abilities, increased biodegradability, and apparent lack of release of any harmful substances, in comparison to many man-made fibres (Kozlowski, 2012)[i]. The increase in technology has turned the bamboo fabric into a resilient, soft fabric. The bamboo textile manufacturing process requires much less pesticides and fertilizers than traditional cotton processing; most bamboo textiles are considered "bamboo rayon" which is made from dissolving the bamboo pulp into its cellulose component and then spun into viscous fibres (Kozlowski, 2012)[ii].

Bamboo: The Plant

Bamboo

Bamboo (Bambuseae) is a perennial plant of the Poaceae grass family of the Bambusoideae subfamily (Crompton, 2006)[iii]. Bamboo grows in shoots and consists of a culm (the hollow shoot), the node (the connecting joint), and the internode (the section between the nodes). Bamboo is self-propagating because of the underground storage stems, known as rhizomes (Crompton, 2006)[iv]. Bamboo is considered one of the fastest growing plants in the world; as the plants are know to grow over 3 inches in one day, 30 days for a full height culm to grow, and it fully matures within 2 years (Meredith, 2009)[v]. Some species have been known to grow up to 100 ft in height. The root system is relatively shallow, as the roots do not reach more than 30 cm below the surface (Crompton, 2006)[vi].

Where/how bamboo is grown

More than 53 species of bamboo are found in Nepal (Bajracharya, Rajbhandary, & Das, 2012)[vii]. Because of the varying species, there is no concentrated growing region but most are found in the rolling mid-hill region, *Pahad* region, of the eastern half of Nepal, with altitudes between 800-4000 metres above sea level (AGTrade Nepal Canada, n.d.)[viii] *Bambusa nepalensis* and *Drepanostachyum annulatum* are found in natural uncultivated forests, whereas *Bambusa balcooa* and *Bambusa nutans* only exist when cultivated (Bajracharya et. all, 2012)[ix]. *Nepalensis* is the most commonly used type of bamboo to create textiles (Bajracharya et. all, 2012)[x].

Bamboo can be planted at any time of the year in moderately acidic loamy soil, with minimal soil cultivation to allow for air penetration (Meredith, 2009)[xi].

Planting bamboo can be very simple intervention to benefit hillside farmers. Most species of bamboo must be propagated through some kind of division; through the detachment of the separation of bamboo culms (Crompton, 2006)[xii]. The fallen flowering leaves from the shoots provide the necessary seeds that are able to get

recycled back into the soil (Crompton, 2006)[xiii]. Because of its horizontal culm root system, bamboo is an excellent crop to prevent soil erosion (Alam, 2011)[xiv].

Agronomic issues

Bamboo is extremely resilient; too much or too little water being among the few issues for improper growth, is virtually pest and disease free, and requires little to no chemical fertilizers (Crompton, 2006)[xv]. A simple intervention for hillside farmers would be to dig a shallow trench around the culm to increase to allow the correct amount of moisture to penetrate down to the roots (Meredith, 2009)[xvi].

Although bamboo grows relatively quickly in terms of other plants, 1-2 years to maturity, the adoption rate of traditional bamboo planting techniques is declining because of the increased food insecurity in Nepal (Hill, 1999)[xvii]. This is the reason bamboo planting is slowly declining because subsistence farmers cannot wait 1-3 years for the plant to mature to reap its benefits so subsistence farmers plant food crops instead of bamboo (Hill, 1999)[xviii]. A simple intervention, like a constant market in developed nations for Nepalese bamboo, would entice farmers to increase bamboo cultivation.

Bamboo: Textiles

Environmental Sustainability

In addition to its environmental regeneration qualities of carbon sequestering, bamboo shoots can release up to 30% more oxygen than other trees (Crompton, 2006)[xix]. Textiles that are made entirely out of bamboo are labelled as having environmentally friendly or health-enhancing qualities (Government of Canada, 2010)[xx]. Because bamboo textiles are organic and require such few pesticides, there is a market of consumers who are wiling to pay a higher price for this premium product. With proper forest management, the production of bamboo textiles would be perfectly sustainable (Hill, 1999)[xxi].

Economic Impact on Women & Children

Bamboo entrepreneurship is part of a key instrument for the development of the socio-economic status of subsistence and poor farmers in Nepal, as bamboo comprises the majority of the livelihood for poor Nepalese (Bajracharya et. all, 2012)[xxii]. Because of the renewability and sustainability of bamboo, textiles are almost biodegradable (Waite, 2013)[xxiii]. Although the creation of bamboo textiles are considered a cottage industry, a continued market would be beneficial as there is a projected net return to labour of 50-100 Nepalese rupees a day or Rs. 9,500 per year/hectare if managed at a national level (Hill, 1999)[xxiv].

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EXPORT POTENTIAL

Any type of bamboo textile can be considered a niche product because of the small labour market and the organic processes of production. As the textile industry is looking for new organic fibres to supply sustainable clothing, bamboo textiles are a great alternative (Kozlowski, 2012)[xxv]. Encouragement and development of these bamboo cottage industries can have great potential in providing poor farmers with additional income (Bajracharya et. all, 2012)[xxvi].

To get any product certified, including these textiles, the individual growers or the Government of Nepal must apply for organic accreditation by a Certification Body under the Canada Organic Regime's *Organic Products Regulations* (Government of Canada, 2009)[xxvii].

Producers of bamboo textiles need grant programs to get their product into the international market. The International Fund for Agricultural Development (IFAD) provided $9 million in agricultural and forestry aid to Nepal since 2006 to improve agricultural techniques and market potential of subsistence farmers (International Fund for Agricultural Development, 2014)[xxviii]. The Bill and Melinda Gates Foundation hash announced nearly $200 million in new agricultural grants to poor farmers to develop new measures toward sustainable growth, increased farm productivity, and the fostering of new agricultural practices (Bill and Melinda Gates Foundation, 2014)[xxix].

Despite the great opportunities of bamboo textiles, there are some threats to its emergence in the international market. Ways to make bamboo fibre stand out from textiles like "organic cotton" or natural fibres like hemp, or flax, and how to further decrease the amount of chemicals used in the manufacturing process are needed (Kozlowski, 2012)[xxx].

Word Count: 251

References Cited

AGTrade Nepal Canada. (n.d.) *Get Started: Introduction to Nepal.* Retrieved from http://agtradenepalcan.weebly.com/get-started---learn-about-nepal.html

Alam, S.M. (2011). BAMBOO. *Pakistan & Gulf Economist, 30, 27*. Retrieved from http://go.galegroup.com.subzero.lib.uoguelph.ca/ps/i.do?action=interpret&id=GALE%7CA260796045&v=2.1&u=guel77241&it=r&p=AONE&sw=w&authCount=1

Bajracharya, M. Shakya., Rajbhandary, S., & Das, A.N.(2012). *Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur*. Nepal Journals Online, 22(2), 11-18. Doi: http://dx.doi.org/10.3126/banko.v22i2.9195

Bill and Melinda Gates Foundation. (2014). *Agricultural Development*. Retrieved from http://www.gatesfoundation.org/What-We-Do/Global-Development/Agricultural-Development

Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.

Government of Canada. (2010). *Bamboo Labeling and Advertising*. Retrieved from http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03193.html

Government of Canada. (2009). *Organic Products Regulations, 2009*. Retrieved from http://laws-lois.justice.gc.ca/eng/regulations/SOR-2009-176/

Hill, Ian. (1999). *Forest Management in Nepal: Economics and ecology*. World Bank. http://dx.doi.org.subzero.lib.uoguelph.ca/10.1596/0-8213-4480-3

International Fund for Agricultural Development. (2014). *Grants.* Retrieved from http://www.ifad.org/operations/grants/index.htm

Kozlowski, Ryszrd M. (Ed.). (2012). *Handbook of natural fibers* (Vol.1). Cambridge: Woodhead Publishing.

Meredith, Ted J. (2009). *Timber Press Pocket Guide to Bamboos.* Oregon: Timber Press.

Waite, Marilyn. 2013. "SURF Framework for a Sustainable Economy" Journal of Management & Sustainability. Volume 3, issue 4. http://www.ccsenet.org/journal/index.php/jms/article/view/27508/20344

[i] Kozlowski, Ryszrd M. (Ed.). (2012). *Handbook of natural fibers* (Vol.1). Cambridge: Woodhead Publishing.
[ii] Kozlowski, Ryszrd M. (Ed.). (2012). *Handbook of natural fibers* (Vol.1). Cambridge: Woodhead Publishing.
[iii] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[iv] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[v] Meredith, Ted J. (2009). *Timber Press Pocket Guide to Bamboos.* Oregon: Timber Press.
[vi] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[vii] Bajracharya, Rajbhandary, & Das, 2012
[viii] AgTrade Nepal Canada. (n.d.) *Get Started: Introduction to Nepal.* Retrieved from http://agtradenepalcan.weebly.com/get-started---learn-about-nepal.html
[ix] Bajracharya, M. Shakya., Rajbhandary, S., & Das, A.N.(2012). *Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur*. Nepal Journals Online, 22(2), 11-18. Doi: http://dx.doi.org/10.3126/banko.v22i2.9195
[x] Bajracharya, M. Shakya., Rajbhandary, S., & Das, A.N.(2012). *Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur*. Nepal Journals Online, 22(2), 11-18. Doi: http://dx.doi.org/10.3126/banko.v22i2.9195
[xi] Meredith, Ted J. (2009). *Timber Press Pocket Guide to Bamboos.* Oregon: Timber Press.
[xii] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[xiii] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[xiv] Alam, S.M. (2011). BAMBOO. *Pakistan & Gulf Economist, 30, 27*. Retrieved from http://go.galegroup.com.subzero.lib.uoguelph.ca/ps/i.do?action=interpret&id=GALE%7CA260796045&v=2.1&u=guel77241&it=r&p=AONE&sw=w&authCount=1
[xv] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[xvi] Meredith, Ted J. (2009). *Timber Press Pocket Guide to Bamboos.* Oregon: Timber Press.
[xvii] Hill, Ian. (1999). *Forest Management in Nepal: Economics and ecology*. World Bank. http://dx.doi.org.subzero.lib.uoguelph.ca/10.1596/0-8213-4480-3
[xviii] Hill, Ian. (1999). *Forest Management in Nepal: Economics and ecology*. World Bank. http://dx.doi.org.subzero.lib.uoguelph.ca/10.1596/0-8213-4480-3
[xix] Crompton, David. (2006). *Ornamental Bamboo.* Oregon: Timber Press.
[xx] Government of Canada. (2010). *Bamboo Labeling and Advertising*. Retrieved from http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03193.html
[xxi] Hill, Ian. (1999). *Forest Management in Nepal: Economics and ecology*. World Bank. http://dx.doi.org.subzero.lib.uoguelph.ca/10.1596/0-8213-4480-3

[xxii] Bajracharya, M. Shakya., Rajbhandary, S., & Das, A.N.(2012). *Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur*. Nepal Journals Online, 22(2), 11-18. Doi: http://dx.doi.org/10.3126/banko.v22i2.9195

[xxiii] Waite, Marilyn. 2013. "SURF Framework for a Sustainable Economy" Journal of Management & Sustainability. Volume 3, issue 4. http://www.ccsenet.org/journal/index.php/jms/article/view/27508/20344

[xxiv] Hill, Ian. (1999). *Forest Management in Nepal: Economics and ecology*. World Bank. http://dx.doi.org.subzero.lib.uoguelph.ca/10.1596/0-8213-4480-3

[xxv] Kozlowski, Ryszrd M. (Ed.). (2012). *Handbook of natural fibers* (Vol.1). Cambridge: Woodhead Publishing.

[xxvi] Bajracharya, M. Shakya., Rajbhandary, S., & Das, A.N.(2012). *Socio-economic impacts of bamboo enterprises in the Mid-hills of Nepal: A case study on Pahari community at Badikhel Village, Lalitpur*. Nepal Journals Online, 22(2), 11-18. Doi: http://dx.doi.org/10.3126/banko.v22i2.9195

[xxvii] Government of Canada. (2009). *Organic Products Regulations, 2009*. Retrieved from http://laws-lois.justice.gc.ca/eng/regulations/SOR-2009-176/

[xxviii] International Fund for Agricultural Development. (2014). *Grants.* Retrieved from http://www.ifad.org/operations/grants/index.htm

[xxix] Bill and Melinda Gates Foundation. (2014). *Agricultural Development*. Retrieved from http://www.gatesfoundation.org/What-We-Do/Global-Development/Agricultural-Development

[xxx] Kozlowski, Ryszrd M. (Ed.). (2012). *Handbook of natural fibers* (Vol.1). Cambridge: Woodhead Publishing.