

Brianna Jackson
McCutcheon High School
Lafayette, IN
Bangladesh, Factor 6: Sustainable Agriculture

Bangladesh: A Golden Opportunity Through Crop Innovation

A plant's roots dig deep into the ground so the plant can establish itself and solidify its place in the large, expansive landscape. Irrespective of the environmental changes, the roots remain strong and constant to provide rigidity, nourishment, and life to the maturing plant. This is the case for the culture of Bangladesh; founded in agriculture despite the ever-changing demands of the 'above-ground' world. The assault of mankind, both in sheer number and consumption of natural products, has largely impacted the established 'root's of Bangladesh ("Agriculture"). Agriculture, specifically subsistence farming, has been fundamental for Bangladesh families for so long, and there is no indication that this pattern will ever cease: "More than 70 percent of Bangladesh's population and 77 percent of its workforce lives in rural areas. Nearly half of all of Bangladesh's workers and two-thirds in rural areas are directly employed by agriculture, and about 87 percent of rural households rely on agriculture for at least part of their income" ("Bangladesh: Growing the Economy").

Daily life for the people of Bangladesh is catered towards agriculture and the topography follows a similar pattern. Fertile valleys, expansive plains, and long coastlines consume the geography of Bangladesh. However, underneath the distinct features lies the perfect concoction for valuable farmland or communal downfall. The fertile valleys have the potential to yield high quality crops but will be rendered useless if traditional, inefficient farming techniques persist. The expansive plains and long coastlines provide a medium for a devastating monsoon season and calamitous flooding. Luckily for the people of Bangladesh, these climatic shocks are predictable, thus making them manageable. Natural disasters and agriculture are nothing new in Bangladesh- and neither is food insecurity. With a country deeply reliant on agriculture, economic prosperity is just out of reach and there still remains a pervasive and persistent amount of hunger ("Political Economy of Hunger"). A country as impoverished and resource-deprived as Bangladesh requires a not only sustainable but also dependable solution. Due to the structure and properties of jute, which subsequently affects the jute industry, this crop has the potential to yield a societal change.

The main questions that arise are: what is jute and how can it be utilized in order to bring stability to Bangladesh? Jute is a fiber that is produced from the flowering plant *Corchorus*. The fibers are produced in the inner bast tissue, protected by the woody part of the plant's stem. A jute plant is identifiable by its small, yellow flowers and light green leaves that taper to a point. A less observable characteristic, but equally as defining, is jute's long tap roots that dig deep into the soil (Augustyn). These roots provide stability to the plant, but jute itself has the potential to bring stability to Bangladesh's economy.

In fact, jute has already been extremely influential in Bangladesh's economy, starting when Bangladesh won its independence in 1971. The jute industry has continued to contribute to Bangladesh's GDP by 12% and ensures 10% of the country's employment (Jahan 3). Due to its highly pivotal economic role,

jute earned the nickname ‘the golden fiber’ (Rahman). In a modern sense, Bangladesh is the second leading raw jute producer after India. Two-thirds of Bangladesh’s raw jute is processed across 74 jute mills into various products including hessian and canvas cloth, bags, geo-textiles, and various decorative items (Jahan 14). Jute is primarily used in bags; however, the expansion of innovative jute products could yield a vital boost in Bangladesh’s economy.

This expansion could begin with Bangladesh creating an extensive research plan to design and develop a wider range of jute products. By diversifying the amount of available products on the market, the various applications will ensure economic growth and create more job opportunities (Jahan 31). The innovation of certain jute products through the expansion of pre-established industries, such as nursery bags and geotextiles, is made possible through their environmental efficiency. For example, traditional nursery bags are made of polyethylene; however, these bags are not biodegradable so they have to be removed once the plant has matured. The jute bag alternative is not only biodegradable but also not harmful to the soil (Jahan 11). This product has the potential to yield a large amount of profits and, if further developed in Bangladesh, create job opportunities. Furthermore, jute geotextiles are used in land reinforcement applications, specifically river embankments and hill slopes, to prevent soil erosion (Jahan 10). Designating more research towards the jute geotextile industry would not only allow for the sale of another product, thus more income, but would also provide a better alternative to synthetic geotextiles. These synthetic geotextiles are composed of polyethylene, polypropylene, and polyester, all of which are non-biodegradable polymers (“Technical Assessment of Jute”).

The competition between synthetic and jute geotextiles is part of a larger debate: natural vs synthetic fibers. While jute production was on the rise, the jute industry faced its first obstacle: the introduction of synthetic fibers. The natural fiber industry was overtaken by synthetic fibers, specifically polypropylene, because of its cheaper prices, constant level of production, and availability. It wasn’t until environmental concerns arose, thus the idea of ‘green marketing’, that the jute industry has been on the subsequent increase. The idea of green marketing refers to the selling of products based on their environmental benefits, often categorized by phrases such as “eco-friendly” and “recyclable” (Vos). Jute’s benefits are exemplified by this new marketing practice: “to manage the carbon emission sustainably, the importance of biodegradable polymers and replacement of reinforced materials to renewable materials is increasing. Jute composites are safe, biodegradable and renewable” (Jahan 10). The jute industry reaps instantaneous economic benefits for Bangladesh, but its structure and properties create lifelong environmental and ecological advantages. These advantages are what define jute as not just an immediate fix but rather a multi-generational, sustainable solution.

The environmental benefits of jute are expansive; however, the most notable of these advantages include its antiseptic and antibacterial properties, biological efficiency, and biogas emissions. Antiseptic and antibacterial properties allow jute to not require additional pesticides (Jahan 20). In a country like Bangladesh where resources and technology are not guaranteed, and things like pesticides are considered luxuries, it is reassuring to have a self-sufficient plant. Jute is considered a biologically efficient plant because it can be utilized as a renewable energy source. For example, wood plants and trees mature in 10-14 years and yield 8-10 tons of wood per hectare; whereas jute matures in 4-5 months and yields 20-40 tons of dry stem per hectare (Jahan 10). Jute’s biological efficiency ensures that profits would not only be steady but also frequent. These profits could be designated towards food- further providing food security.

In addition to growing quickly, jute is co-grown with other crops, typically rice, thus providing fertilizer and nutrients to the next set of crops (Hossain). Biogas, or fuel from the degradation of organic matter without oxygen, is used in many rural households in Bangladesh (“Frequently Asked Questions”). Jute, specifically jute mills, might be an important gateway for the people in rural Bangladesh to have easier access to this fuel:

“Methane rich biogas can easily be obtained from jute caddis- a lignocellulosic waste of jute mills by anaerobic fermentation. Alkali pretreated jute caddis produces biogas steadily. By eliminating the problem of hard scum formation, biogas production from jute caddis should be an excellent technology for jute mills for producing energy from waste like jute caddis along with a valuable byproduct- a plant nutrient rich bio manure, in an eco-friendly manner.” (Banik 751).

In other words, jute caddis can generate biogas so that it is low cost and powerful- and this technology can generate capital or directly benefit the rural residents in Bangladesh.

The environmental and societal benefits of the jute industry are undeniable; however, like any crop industry, there are a plethora of threats that, if left unaddressed, will lead to the ultimate downfall of production. The most blaring threat to jute- and all crops in Bangladesh- are seed inconsistencies. Presently, the lack of jute seed regulation have caused farmers in Bangladesh to resort to using seeds from India where “the quality seeds are not adequate for sufficient jute production and there are technical problems in preserving the seeds...using these seeds, the quality of jute has been decreased which will ultimately affect the market, as market is focused on quality products” (Jahan 23). Jute produced in Bangladesh is known to be a higher quality due to geographical location; however, if Bangladesh does not improve seed regulation this reputation will be lost. The jute industry in Bangladesh will not survive if the quality continues to decrease. Luckily for Bangladesh, there has been extensive research on seed banks in underdeveloped countries, creating an ideal blueprint that just needs to be implemented.

This ideal blueprint is dynamic- meaning that it will take time to incorporate and adjust accordingly to Bangladesh’s needs. Seed banks, also referred to as seed huts, are places where “a group of farming households take joint responsibility for looking after seeds and genetic resources that they collect and propagate on behalf of the community” (Vernooy 63). Seed banks are not only beneficial in terms of providing safe, high quality seeds to farmers, but they also build human and social capital. These seed banks provide a place where farmers can come together, converse, and gain a sense of comradery in the community. Organizations such as Growing Hope Globally have been building seed banks in third world countries; however, there are immense, long-lasting effects of their presence in the community. For example, the establishment of grain banks in Cameroon came with something equally as important: training. This training, which consisted of organizing farmer groups, is essential for sustainability, local control, and leadership development. Cameroon and Bangladesh are facing similar obstacles, such as food insecurity being intensified by climatic shock and refugees putting pressure on local communities, so a solution has the potential to be applicable to both countries (Nodem and Carroo). In Cameroon, training the youth, restoring the community, lowering prices for farmers, and building better storage facilities caused many positive changes. These changes include an increased capacity to handle shocks, more available food, and sharing family income (Nodem and Carroo).

With the establishment of better regulated seed banks, along with proper training, Bangladesh will be able to designate more resources towards expanding the jute industry. By broadening the jute industry, thus

diversifying the range of products and creating more job opportunities, there will be more economic prosperity. With this economic boost, there will be an increase in available funds to designate towards food security. Food security is vital in Bangladesh because unemployment and poor land access have further isolated and made Bangladesh vulnerable to hunger-related issues. An increase in food security will decrease the amount of people suffering from caloric deficiency and ensure that their proper dietary requirements can be met. In a country with a high rate of malnutrition- especially in children- food security is no longer a goal but rather a requirement (“Bangladesh: Hunger Relief”). Bangladesh might have roots deeply reliant on agriculture, but in a changing world it has become necessary for these roots to expand. Hopefully with time and the expansion of the jute industries these roots can provide the basic necessities that the people of Bangladesh have been deprived of.

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