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**FREE TRADE IN CHINA:  
The Challenge of Bringing Economic Growth to Rural Populations**

**Seminar Project Proposal**

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Contemporary Perspectives

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**Introduction**

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The globalization of free trade markets is evident and has changed the world's economic landscape. Under international pressure many countries have recently opened their markets to the world and seen incredible economic growth results. Such growth has led to a new generation of industrialization and modernization.

China is in the midst of such a transformation. Rapid urbanization and construction are leading China into a precarious situation where rural, lower class citizens and the environment are being ignored in the frenzy to make up the development gaps between China and the Western world.

No more can this disparity be seen than in the small cities and towns displaced by the Three Gorges Dam project. The government is building a dam across the Yangtze to provide for the exponential growth of buildings and energy needs. Unfortunately this program forces the rural population to abandon their centuries old farms and move to the new cities being built by the government. This change leaves many people unemployed, homeless, and without the knowledge and tools to enter a skill based capitalist economy.

That is where education services come into play. A branch of the organization Center for Biodiversity and Indigenous Knowledge (CBIK) in New Wushan, one of the new replacement cities, would offer such services for local entrepreneurs. Local specialists would provide information, resources, and advice on business, industry, and construction.

## **Global Trend**

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Following World War II, the United States and United Kingdom proposed the establishment of an international trade body to the United Nations that was designed to avoid repeating the errors of the 1920's and 1930's. Negotiations concluded and the development of free trade began with the signing of the General Agreement on Tariffs and Trade (GATT) in 1947. The agreement was designed to "facilitate the ability of members to 'enter into reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the elimination of discriminating treatment in international commerce'" (Dardick). Initially the agreement benefited a select group of nations, the United States, Canada, Australia, and a group of five European countries. The socialist and communist countries of Eastern Europe and Asia did not wish to become members. They rejected the invitation stating the agreement would be an intrusion in their governmental decisions and was also viewed as a capitalist plot (The World).

Since its conception the General Agreement on Tariffs and Trade has held eight rounds of trade policy negotiations. The most recent negotiation resulted in the creation of the World Trade Organization (WTO) in 1994. The WTO operates under the guidelines of GATT and promotes its principles to new areas. Within the past twelve years the WTO has helped to reduce the tariff on industrial goods from forty percent to four percent and increased its membership to over one

hundred and forty countries (Bagwell). The WTO has significant influence on the world economy and plays the role of a mediator between negotiating governments. It is the duty of the WTO to seek an agreement that will achieve mutually beneficial changes for each country involved. Trade policies are established to reduce the power that a large country has over smaller countries and forces them to behave and cooperate under its commitment to the policy (Bagwell).

Historically free trade has provided a surplus of benefits to developed countries. However, with the expansion of market capitalism, developing nations are seeking the same rewards. Continuing trade under existing agreements and initiating new negotiations between developed and emerging economic leaders will provide the policies that will expand our global economy. Economists argue that free trade is the quickest way to fuel growth and alleviate poverty within a developing nation. However, trade is not enough to end the poverty and reduce the income disparities around the globe. Developing nations have recognized the importance of market driven policies, yet these policies will rely on strong government interaction if they are to be successful and beneficial (Wehrfritz). East Asia owes much of its economic rise to its government led and financed industrial strategies. A country must weigh the good and the bad of participating in trade. Export what you make well, but do not import what you already make at a low cost. The key to even the poorest countries success when entering into the global market will be the duty free/ tariff free access to American, European and Asian markets. Phased market openings will allow emerging nations to focus on the countries infrastructure and actively establish a booming national industry, a path China implemented as a means to enter the global marketplace (Wehrfritz).

## **Global Trend Focus: China**

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The effects of free trade on developing nations can best be exemplified by China's accession into the WTO in 2001. Previous to joining the WTO, China had been running on a centrally planned economy with out much growth and in the 1980's began to reform their economy into a more market-oriented system. China's government began these reforms in hopes of increasing productivity, living standards, and technological quality without causing the countries inflation, unemployment, and budget deficits to worsen ("CountryWatch"). To do this, China initiated agricultural reforms, which dismantled the commune system and instead introduced a system that gave peasants greater decision making in agricultural issues. The government also began to encourage nonagricultural activities, increased competition in the marketplace, and facilitated contact between Chinese and foreign companies. These reforms led to an average annual growth rate of 10 percent in industry and agriculture ("CountryWatch"). However, by the late 1980's, China's economy became agitated with increasing rates of inflation.

During this time period, China began its long, 15 year accession into the World Trade Organization. When China finally reached an agreement with the WTO on September 15, 2001, the government became obligated to cut tariff and non-tariff barriers, gradually end its protectionism of state-run industries, and open up sectors of their economy, like banking, telecommunications, and tourism that had long been off-limits to foreigners ("China Drops").

China's entrance into the WTO has immensely benefited the country's economy. The accession has allowed China to increase its long term growth prospects through an increase in its economic reform process, an increase in competition, and improvement in its foreign economic relations. Since 2001, China's economy has continued to grow at an average rate of 10 percent

per year, which is the highest growth rate in the world. The country's economy is the fourth largest in the world with a GDP of about 2.25 trillion US dollars in 2005 ("CountryWatch").

Though China has economically benefited from the opening of its country's trade barriers, socially there has been little improvement. While the industrialized cities of China and some of its residents have experienced the positive effects of free trade, the rural sections of the country have experienced the negative effects. Though the number of people living below the poverty line in China has been reduced from 200 million in the 1980's to less than half of that by the 1990's, today there is still a significant amount of Chinese living below the poverty line and 10 percent of China's 1.3 billion citizens are illiterate ("CountryWatch"). With little education and little skill other than agriculture, the peasants of rural China have few options to better their lives. The agricultural industry of China brings in little income these days, and small-scale, rural industry now has to keep up and compete with the growing manufacturing plants set up after the accession into the WTO (Lew).

The industrialized cities on the coastal and river regions of China are looking better and better to peasants looking for a break. Even if they cannot find a skilled job, the unemployment benefits state workers receive in the cities is about 200 Yuan a month, which is not much less than what many peasants earn from hard labor. Tens of millions of peasants are on the move from rural areas to the major industrialized cities, like Beijing and Shanghai, looking for any opportunity available (Lew). Not only does this mass exodus leave the countryside abandoned and useless, but it also causes tensions with the existing city workers. The majority of workers in the city have had some form of education or skill that used to allow them to earn higher wages. But now, due to worldwide competition, companies are looking for more unskilled workers that will accept low wages and few to zero benefits, like the plethora of peasants

entering the cities (Shah, “China’s Entry”). The majority of global industries are centered around outsourcing to the cheapest labor force in order to offer consumers the lowest priced merchandise. However, this pressures newly industrialized nations, like China, to offer the lowest wages and the lowest standards of work conditions in order to draw in businesses. In the end, the manufacturing company profits as the often uneducated and unskilled laborer suffers from inhumane conditions and wages (Shah, “Public”).

Another major problem caused by the mass migration of millions of peasants, is the creation of slums and shantytowns in cities like Beijing. Since the Communist Party took control of China in 1949, the government has abided by a system of identity cards that at birth tie an individual to their hometown. If an individual did not have a local identity card, city police would send the individuals back to their hometown (Simons). Until recently, individuals who migrated illegally to the cities would be cut off from social services, such as, schools, welfare, and local job markets. However, China’s accession to the WTO has altered the previous urban policies. Now, migration into urban areas like Beijing is encouraged by the government because migrant workers can work without benefits and for low wages in the city (Simons). The Chinese government has even gone as far as to open up public education for the previously illegal migrant’s families. This change in policy has helped to create the new slums of Beijing, which like impoverished third world areas around the world, spread crime, disease, and rebellion throughout the city (Simons).

China’s rapid economic growth has also led to negative impacts on the country’s environment, due to poor planning, rapid building projects, and mostly unmonitored manufacturing processes. China is now facing a plethora of environmental crises, such as water and air pollution, which in turn results in health problems for an extensive amount of

communities. As of 2004, China was listed by the World Bank as having 16 of the world's 20 most polluted cities ("Special Report"). China's water resources are among the lowest in the world and are mostly concentrated in the south, which causes the north and west sections of the country to experience regular droughts. Almost half of China's population of 600 million live in communities where the water supply is contaminated by waste, due to the government's inadequate investments in supply and treatment infrastructure. So even in areas where water is available, it is highly likely that it is not safe to drink ("Special Report"). Not only are the citizens of China being harmed by this environmental crisis, but China's economy is being affected. Currently, China is spending 16% of their national GDP on new construction. China is using 54.7% of the concrete made worldwide, 36.1% of the steel, and 30.4% of the coal (Pearson). This globally unprecedented amount of construction is depleting the resources of China and the world, which is driving up the cost worldwide. According to the World Bank, pollution is costing China an annual 8 to 12 percent of its \$1.4 trillion GDP in direct damage, such as acid rain and its impact on crops, medical bills, missed work from illness, disaster relief for floods, and the implied costs of resource depletion ("Special Report").

### **Case Study: Three Gorges Region and Wushan**

No rural area has been harder hit on every level than the region overturned by the construction of the Three Gorges Dam, the largest dam project in the world (Lin-Liu). New Wushan is part of a group of new towns constructed to replace 365 villages (1.2 million people displaced) destroyed by the newly constructed dam on the Yangtze. These new towns exemplify the government's ideal of modern China and the forces changing rural life in China. The new twenty-five billion dollar dam will allow more ships to reach New Wushan and bring tourists to

the huge reservoir. Many think New Wushan has the best chance of actually benefiting from the upheaval (Lin-Liu). This project has forced the already poverty stricken residents to start over again. Many don't have the skills or information necessary to overcome this physical and physiological upheaval.

This much debated project is supposed to solve many of China's current development problems. It will create water power for much of the nation's growing urban centers and industrial production. This would replace the polluting coal power that is often used in China now and are responsible for much of the pollution in major cities. China's coal supplies are already strained and applications for new plants are continually submitted (Wonacott). This also addresses the problem that China currently cannot keep up with the amount of electricity currently demanded. Many new neighborhoods often experience periodic blackouts that make production unreliable and daily life challenging ("China..."). Another important factor is flood control that would protect area residents from frequent damage to buildings and crops. The higher water levels also make the area accessible for larger vessels and open the area to more business opportunities (Lin-Lui). Although the Yangtze is navigable, the Three Gorges region is particularly shallow and turbulent, which has limited access by large vessels (Ebrey). The forced modernization also offers better living conditions for many relocated citizens who had been living without any modern conveniences (Lin-Lui).

As many benefits as there are to energy production and commerce, the social and environmental impact on the Three Gorges region where the dam is located and the Yangtze River as a whole is astounding. The new lake flooded many cities, towns, and farms; completely changing the landscape and ecosystem balance. The dam was closed on June 1, 2003 and quickly reached its set height of 443 feet on June 15<sup>th</sup>. In fifteen days Old Wushan and other

villages, fields, and cultural sites were under water. Much more has been and will continue to disappear in the following years to reach the 130 foot additional rise by 2009 (Eckholm). The destruction was vast and spared little. Buildings were bulldozed and the rubble sent to landfills, with little evaluation of what might be salvaged and reused (Lin-Liu). The environmental and health impact of all these things is still not clear, but dead animals and trash began floating on the surface of the new lake after it was formed (“China...”). It is important to reduce such impact and protect from industrial pollution; especially since the government hopes to turn New Wushan and the new lake created by the dam into a tourist destination. There is a concern that the new lake will not have a strong enough current to keep the clear mountain water that would attract tourists. Many fear instead a stagnant lake that will collect all the local pollution (Lin-Liu). There is also concern that silt will build up behind the dam; rendering it ineffective against the flooding it is meant to protect. There is no clear answer as to how all these factors will impact the aquatic life; particularly the fish that area residents rely on for food (Hessler). The State Environmental Protection Administration (often considered the weakest in Chinese government) already requires environmental impact assessments, but enforcement is infrequent and false reports are common (Wonacott). There is also serious concern for the relocated cities. Many have been moved above the riverbanks to the steep, landslide prone hills. The government solution of reinforcing loose banks with concrete may not protect buildings that are supported by columns and jut out from the hillside (Lin-Lui). One landslide has already forced the evacuation of one apartment building (Hessler).

This project has already displaced millions of people, including Old Wushan’s 50, 000 residents, and forced the construction of entirely new cities including 580,000 person New Wushan (Lin-Lui). Many of these resident’s families have lived in these locations for

generations. The flooding caused by the dam destroyed cultural, religious, and ancestral sites; not to mention the homes and farms flooded. The cultural history found in the Three Gorge region is rich and varied: Stone Age tombstones, a third century fortress, 1,300 year old calligraphy on limestone cliffs above the river, and Qutang's gateways (Shapera). All have been destroyed; left only as a memory for future generations. This massive displacement has been twenty years in the making; since the project was initiated in 1986 (Eckholm). For those twenty years the area was left untouched and unimproved since it had already been earmarked for destruction. That left over a million people ignored so that construction could continue (Hessler). Although nominally the government provided relocation aid for the region's residents, some did not get compensation because they did not own land and many have found it difficult to pay mortgages on the new housing (Lin-Lui). Some were even forcibly moved to other parts of China; sometimes entire villages (Hessler).

Many rural residents were forced to move into the new cities built to relocate flooded out residents. These modern cities, specifically New Wushan, are unfamiliar to them. Traditional bay house has been replaced by high-rise apartments. Old Wushan's village alleys lined by market stalls and outdoor restaurants have been replaced by New Wushan's boutique lined boulevards (Shapera). For many of these Chinese even their trade has been rendered useless. Farmers forced to move into the cities must now find a new way to pay for their new lifestyles. Two worlds (rural and urban, traditional and globalizing) are being thrust together. One visitor, Todd Shapera, remarked "I watch retired men in Mao suits play cards, as young women - who might just have wandered off New York's Madison Avenue - stroll by" (Shapera). New city development is often overcrowded and undersized. Residents lack the basic resources they need

to live comfortably in this new environment because New Wushan's master plan is so focused on serving the projected tourism industry rather than residents.

The government is making efforts to redirect and boost the region's economy that has been so drastically altered. Tourism, however, can not support New Wushan on its own. Many of the new storefronts still sit empty, while neighboring upscale stores lack customers that can pay such high price tags. Many of these residents don't even have jobs since the government has been more focused on construction than creating jobs (Lin-Liu). Unfortunately, the designer boutiques that line the new streets and cruise boats can not support the number of unskilled laborers left jobless by this project. Some residents have tried to take advantage of the new economy, but lack the knowledge to fully engage the unfamiliar system. One man lost all his compensation funds in a bad coal investment. Farm families that were relocated to other regions to continue farming often found other obstacles. Many did not speak the local dialect and land was still limited. Never the less, many are inspired by the new economy that may finally allow them to better their own life in a real way, rather than trying to achieve an abstract communist ideal touted by the government (Hessler). To take action on this new found hope, rural residences must gain access to the resources they need to make the necessary changes the government continues to ignore.

### **Group Proposal – New Wushan Resource Office For Entrepreneurs**

Due to the creation of the Three Gorges Dam and the subsequent relocation of the surrounding communities, the government has begun to develop new cities in the once rural area. One such emerging city is New-Wushan, a river town where the Chinese government is initiating an ambitious, yet somewhat unrealistic approach to modernization. In hopes of creating a

booming tourism industry in Wushan, the government has taken a more westernized approach to the businesses in this area, with stores that sell designer clothes and laptops (Lin-Liu). However, these new businesses do not accommodate the residents of Wushan, who mostly come from an agricultural background. Many residents are finding it difficult to make a living in this tourist driven area.

Therefore, we propose to establish a branch of the Center for Biodiversity and Indigenous Knowledge (CBIK) in Wushan to help the community adapt to China's growing market economy. CBIK is a non profit organization focused in southwest China, which explores alternative development approaches by working directly with indigenous communities to enhance their livelihoods through maintaining cultural and biological diversity. The organization, which was established in 1995, includes more than 100 members; such as research professionals, development practitioners, and resource managers; from China and various developed nations ("Who We Are"). Currently CBIK is working on a variety of projects to benefit southwestern China. The main projects that are in progress are the Watershed Governance Program, the Community Livelihoods Program, and the Indigenous Knowledge Program ("What We Do"). The Watershed Governance Program is a project that promotes a method for the integrated management of China's land, water, forest, and other natural resources that promotes conservation and sustainability in a reasonable way ("Watershed"). The Community Livelihood Program was set up to address the importance of local communities and cultures in the creation of sustainable development ("Community"). Lastly, the Indigenous Knowledge Program focuses on the impact of the socioeconomic changes that communities in China are faced with and the knowledge that these communities have about plants, animals, ecosystems, and their uses ("Indigenous").

While maintaining the vision of CBIK, the Wushan branch will work hand in hand with the community in an effort to smoothly make the transition into modernity through the merging of modern technology and indigenous knowledge. Since, New-Wushan is a recently formed city, it has yet to face the social and environmental problems that have plagued the eastern cities of Beijing and Shanghai. Consequently, our branch will focus on the transition of this community into modernity through the promotion of sustainable practices, in hopes of lessening the negative effects of modernization on the community's society and environment. The existing CBIK branches focus on bridging the gap between modern and indigenous lifestyles through environmental and cultural sustainability within communities; our branch will additionally bridge the gap with sustainable economic practices. The promotion of sustainable practices will also address the issue of unemployment in Wushan through the creation of a sustainable niche industry, which will embrace the talents and knowledge of this rural area.

Our branch of the Center for Biodiversity and Indigenous Knowledge plans to work with the Wushan community in three key areas of sustainable development. The first area that our professionals will focus on is sustainable business practices. This will be done by creating a business plan that will focus local industry and business on products and services that are culturally relevant and necessary to its consumers. This in turn will create a strong, stable local economy that will help residents earn better wages and live a more comfortable lifestyle.

The next area of sustainability that our branch will concentrate on is the development of a sustainable niche industry in Wushan that will allow residents to produce these relevant products and services. The niche industry that will be created will be the local manufacturing of sustainable textiles and apparel. This industry will be beneficial to Wushan because it will

encompass China's rich history of textile art and production and Wushan's agricultural background.

The final area of sustainability will be to exemplify and inform the community about sustainable architecture. Our branch will do this through education and design consultation on sustainable architecture for businesses, manufacturing facilities, and homes. Sustainable architecture will also be exemplified through the design of our CBIK facility. The principles of energy conservation, material conservation, space efficiency, and the creation of a comfortable work environment will all be applied. This will offer the community an example of sustainability and will help to illustrate the benefits of these practices.

### **Business Advising – Jason Dziama**

The key to developing a sustainable local economy in New-Wushan will be to center the local business and industry on a diverse mix of products and services that are culturally relevant and necessary to its consumers. On average income in the Wushan region is around two hundred and fifty dollars a year. With a strong, stable, efficient local economy, many residents living in primitive conditions will be able to live a more comfortable lifestyle, and in return boost business by spending within the community (Fackler).

The twenty five billion dollar Three Gorges Dam project has brought money to a region that would most likely never have been able to attract it other wise. The goal and responsibility within the CBIK Wushan branch is to establish a local business model that the majority of the region's low skilled citizens can follow and flourish by implementing its strategies. This model will help to provide residents an opportunity to raise their standards of living through sustainable business ventures and industry all while maintaining cultural ties.

A business becomes successful and sustainable when it offers its products or services to a market where there is a need for that product or service. Without a need, no one will buy a product, no matter how good it is (Hyypia). This issue arises in New-Wushan as relocated individuals find themselves on the newly constructed avenues of the modern city. Guangdong Road, New-Wushan's main street is lined with glittering new buildings full of upscale stores selling designer clothes and laptop computers. However, New-Wushan residents are struggling just to pay the monthly mortgage on their new comfortable apartments, "the price of a sweater at one of Wushan's posh, but empty stores" (Lin Liu)

The first step to creating a sustainable business is to determine what customer needs are present. The financial situation New-Wushan residents are currently enduring does not allow for much spending. Spending will be done by outside tourists. Chinese officials estimate that an annual twenty million tourists will flock to the Three Gorges Dam. New-Wushan will be the perfect stop for travelers on their way to the largest man made lake in the world (Lin Liu). The residents of New-Wushan will capitalize on the Dam project by using this expected tourism as a building block on the path to creating a sustainable local industry. Tourism along with foreign investment will bring an infusion of cash to the region providing the capital needed to implement the construction of area businesses in New-Wushan. The attraction of tourists to New-Wushan will be the depiction of life along the Yangtze River and business stops centered on New-Wushan's sustainable facilities that have been carefully developed by industry professionals of the CBIK Wushan branch and local contributors. At night New-Wushan's avenues will be flooded with patrons sifting through restaurants displaying woks filled with delectable locally grown vegetables and native game. Customers will be drawn to the city shops by the unique works of native artisans and locally manufactured goods, the perfect mementos of their visit.

New-Wushan will become a modern city with an initial focus on the needs of travelers exploring the surrounding beauty of the Three Gorges region. The view of the Yangtze River atop Mount Minshan is spectacular as it winds its way through the flooded temples and landmarks of Chinese history as described by Todd Shapera, Three Gorges visitor and contributor to the Far Eastern Economic Review (Shapera). Guided tours and vacation packages of the area are already providing the capital to support business centered on tourism. The Chinese government has also made efforts to redirect local production, converting an old cement factory to a souvenir manufacturer (Lin Liu). New-Wushan zoning has also set aside land for commercial use along with factories and government owned facilities (20% commercial, 15% industrial) (Lin Liu). Much of the commercial space will be devoted to tourism and related services. Easier access to New-Wushan will also boost the local economy. The Wushan County Tourism Bureau approved the construction of a seventy kilometer highway to promote cross province tourism in August of 2004. The completion of the highway will save travelers ten hours of commuting time by traveling by car rather than by ship (Wushan).

Though foreign direct investment (FDI) and venture capital have helped manufacturing industries throughout China, foreign companies have little interest in smaller scale local projects. China's dependence on foreign direct investment stems from the weakness of the country's banks and capital markets. As history repeats itself based on models seen in Japan and Korea, the mobilization of capital, labor, and raw materials will provide China's growth, not its productivity. The largest concern in China regarding FDI is that companies funded through outside investments will not make the profits necessary to pay back their debts (Restall). In our attempt to establish quality local businesses that will impact the community for years to come,

foreign investment will solely serve as a jump start to local entrepreneurs and industry by seeking investment opportunities in sustainable industrial facilities and local businesses. Through collectively working side by side with New-Wushan residents, CBIK business professionals help to transition the region into a leading model for sustainable business with the help of local tourism. Though foreign investment will help to establish and construct new facilities, CBIK industry professionals stress the need for building and operating sustainable and profitable industries through the careful evaluation of local needs and available resources. The realization of these goals will further interests in New-Wushan on a professional level, providing a useful model for sustainable business endeavors.

### **Sustainable Textile Industry Development – Lindsay Clum**

One of the main industry's that has infiltrated China and its economy is the textile and apparel manufacturing industry. As of 2005, China was responsible for producing 42 billion pieces of apparel a year, which makes the country the number one manufacturer of apparel in the world. In addition to apparel production, China also accounts for one-third of the world's fiber production and is the largest consumer of cotton in the world (Tucker). While taking part in China's cheap and immense labor force, this industry has contributed in negatively altering the country's environment and culture through such things as highly competitive employment and environmentally damaging manufacturing processes.

More specifically, manufacturing processes that are used by industries, including the textile and apparel industry, have led to high energy consumption and increased air pollution due to the use of coal to fuel plants. Another serious danger for air and water pollution comes from textile dyeing plants. These facilities harbor extensive lists of hazardous chemicals that if spilled

or released can cause serious problems for the environment, workers, and nearby communities. If any of the toxic chemicals used in the dyeing process are released into the environment, concentrations of these chemicals in the air can range from problems as small as an odor nuisance or as high as an immediate danger to life and health (Haroz).

It is impossible for our organization to single handedly end poor environmental and social conditions in China or to change existing companies' methods of manufacturing. Therefore, it is my intent to focus on educating and assisting the residents of Wushan on developing a sustainable textile and apparel manufacturing industry. This will benefit the community in two ways. First the creation of an alternate source of income beyond tourism will help to stimulate the local economy in Wushan. Secondly, creating a sustainable industry and lifestyle will help to curb environmental damage that has affected other manufacturing areas. As a fashion designer, I can offer the Wushan branch my knowledge of alternative, sustainable textile and apparel manufacturing. There is a long standing tradition of the art of textile production and dyeing that has been passed down from ancient civilizations to the current Chinese civilization, so in accordance with CBIK's mission to combine indigenous knowledge with modern knowledge, I plan to merge my knowledge of sustainable manufacturing with Chinese methods of agriculture and vegetable dyeing to offer businesses a plan of completely sustainable production.

Currently, China's economic growth is in danger of slowing and subsiding if the country stays on the same path it has been following since it entered the free trade market (Tucker). The country needs to lead its manufacturing industries in a new direction, such as sustainability, which will give China an edge over other newly industrialized countries beyond the low value, low cost manufacturing that is fueling China's economic boom (Tucker). Sustainable textile and

apparel production is an ideal direction to take because it is a fast growing industry that will also help to benefit China's environmental and cultural problems that are currently afflicting the Three Gorges Dam area. In 2005, the organic fiber industry was globally growing at a rate of 39 percent per year, which is immense compared to the 5 to 7 percent growth per year that the apparel industry faced. Additionally, there are 50 to 60 million people in the world that go out of their way to find and purchase environmentally friendly products (Lloyd). With continued education of designers and consumers on the benefits and effects of producing and purchasing sustainable products this industry is expected to continually grow. This means that the Wushan branch of CBIK will be educating the community on an industry that is in high demand, which hopefully translates into high profits for the developing area.

Since sustainable textile and apparel production is a new, high demand industry and Wushan is currently centered around tourism, the Wushan CBIK branch will merge tourism with manufacturing to help create more revenue for the local industry and community. This will be done by creating a "showcase" manufacturing plant, in which tourists and business professionals can tour the sustainable plant. Sustainable textiles and apparel is a growing field in which not many companies and factories currently exist. Therefore, it is our belief that there will be high interest in viewing and learning about sustainable textiles and apparel.

Sustainability is a concept that encompasses all aspects of manufacturing from fair labor to energy consumption to green products to green manufacturing to product life cycles. Fair labor is accomplished by not only providing workers with fair living wages, but it also provides exemplary working conditions that do not involve child labor or sweatshops (Lloyd). As fashion designer Euneika Rogers, a member of the No Logo organization of activists and artists who have aligned with the fair trade organization OxFam to help end third-world poverty, points out,

"...if the fashion industry -- an industry which takes in \$1.2 billion a year -- would make just one change in its method of production, it might mean that somewhere down the line a worker would be paid a fair wage...that one shift would have an enormous impact on sustainability," (Carrillo).

The main function of creating a sustainable business is producing sustainable products. The production of sustainable textiles and products varies from company to company, but the basic concept of using raw materials instead of chemicals in production is a standard among all. Ingeo fibers, which is the world's first man-made fiber produced from 100 percent renewable resources, is a good example of how sustainable textiles are manufactured. Ingeo fibers are produced by using an abundant natural raw material like corn, but resources such as rice, sugar beets, sugar cane, wheat and sweet potatoes can also be used. Wushan is an ideal location to produce a sustainable material made out of corn or rice because it is located in an agricultural region of China where farmers cultivate these natural resources. This means that manufacturers would not have to ship the resources for production from other countries, which will save on production costs.

The raw materials are put through a process to reduce them to plant sugars, which are then fermented. The fermented sugars are then transformed into a high performance polymer called polylactide, which is used to produce the all natural Ingeo fibers ("How"). These fibers are woven into yarns and then fabrics just like a regular textile production process. A variety of products can be produced using this type of sustainable manufacturing, such as bottles, shrink wrap packaging, a variety of thermoform containers, all forms of apparel fabrics, non-wovens like diapers and wipes, mattresses, upholstery fabrics, carpet, and a variety of other products ("How"). Therefore, the textile industry in Wushan will be able to offer customers a diverse range of sustainable products.

Another important concept of sustainable products and production is the life cycle of the product. More sustainable decisions in production can be made by industries when they consider the product's complete cradle to grave life cycle by looking at the product's construction, use, possible re-use, disposal, and its effects on the environment. For example, the Carpet and Rug Institute (CRI) has exemplified this process by treating discarded carpet as a resource rather than waste. This forward thinking has led to the creation of things like deck wood and auto parts from recycled carpet (Peoples). After looking at a product's cradle to grave life cycle, industries have begun to design and produce cradle to cradle products. This concept means that the product is never disposed of, but rather put in a continuous loop cycle where the product is decomposed and reused in production (Peoples).

Although, not all textile and apparel products can have an endless life cycle like cradle to cradle products, there are still opportunities to promote sustainability. For Ingeo fibers, all natural resources are used in production, which means that their products can be decomposed without harm to the environment ("How"). Some organizations have begun to focus on converting old, non sustainable materials into new, fashionable products. One such organization is Carewear, which is an Atlanta based business that creates trendy apparel by using recycled clothes, run by designer Rogers. Carewear receives used clothing from thrift shops or charity organizations, which are taken apart and regenerated into new designs. Though Carewear's products are not part of the cradle to cradle concept, they still promote the sustainable concept of reuse, recycling, and environmental preservation and awareness (Carrillo). However, Wushan textile and apparel manufacturing will focus on creating only products that decompose or have a cradle to cradle life cycle.

Our CBIK branch will educate the Wushan area on textile and apparel sustainability by adhering to GreenBlue's Sustainable Textile Standards. GreenBlue is a non-profit institute that stimulates the redesign of industry by focusing on professional expertise to create sustainable practices ("Sustainable"). The Sustainable Textile Standards (STS) outline the requirements to create sustainable products that also meet high consumer quality needs. The Standards are as follows:

- All materials and processes are safe for human and environmental health in all phases of the products life cycle.
- All energy, material, and processes are derived from renewable resources.
- All materials are capable of returning to either natural or industrial systems, for example, biodegradable or cradle to cradle products.
- All stages of the products life cycle support the reuse and recycling of these materials.
- All persons involved with the production of textiles and apparel are treated fairly, work in humane conditions, and are given training to increase their skills ("Sustainable").

The effect that a few changes from the current textile and apparel manufacturing methods to a more sustainable plan can have on the environment and will hopefully have on the Three Gorges Dam area is astounding. For example, according to the carpet industry's Sustainability Report, which documents this industry's changes due to the shift to sustainability in 1990, there have been immense benefits. Although energy consumption and the release of green house gases by the carpet industry have not changed since 1990, there has been a 47 percent increase in production. The reduction of energy and water used in the production of a square yard of carpet has descended by 70 percent and 46 percent, respectively, in the past 16 years. The carpet industry has also reduced their mill waste by 85 percent since this time (Peoples). While sustainability offers vast benefits, it is sometimes difficult to convince the farmers that produce the raw materials and the manufacturers who produce the goods, to convert their current practices. For farmers, in order to produce organic cotton, they must take a 30 percent drop in

yield and in order to supply the raw materials for sustainable fibers, they must sell crops that could be used as food (Tucker). However, through our CBIK branch in Wushan, I hope to educate local businessman and farmers on the market need and long-term benefits of sustainability. Even if the local businesses and farmers of Wushan can only abide by a few practices of sustainability, these breakthrough life style methods will still make a positive impact on the environmental and cultural problems that are currently plaguing this community and the whole country of China.

### **Sustainable Facility Development – Kathy Kurtak**

The branch office of the CBIK will exemplify and inform its clients about the new paradigm of sustainable architecture and how that paradigm can help create goals and expectations for their textile production facility that further their business goals in an efficient and realistic way. (Although some commercial space has already been constructed, it is already earmarked for existing industrial uses. This means that a new textile factory would also need a new factory building.) These services would be provided in two ways. First, through design consultation and education programs for the Chinese entrepreneur building a new industrial facility. Second, through the actual design of our branch office to illustrate the practical impact of such design considerations. The New Washun CBIK Branch will provide information on all aspects of sustainability including energy saving features, simple measures to alleviate the need for expensive heating and cooling systems, material alternatives to reduce construction costs, minimizing pollution, creating a good working environment, and creating a flexible building that will serve the company as it grows and changes. Beyond basic information design

consultants would meet with the entrepreneur to guide them through this decision making process.

The consultants at the branch office will be sustainable design professionals from both China and Western, developed nations. These consultants will provide a balance and fusion in their approach that considers the benefits and possibilities in both high tech, modern solutions and passive, non-mechanized vernacular ones. CBIK will partner with China-US Center for Sustainable Development which provides collaborative efforts to encourage sustainable development in China. Such collaboration allows local architects and clients the benefits of international knowledge without the price tag (Pearson). The Center for Sustainable Development was started by a prominent sustainable architect in the US, William McDonough, and China's vice minister of science and technology, Deng Nan. This network links Chinese design professionals with resources and contacts from around the world that can help them explore sustainable solutions to their design problems

The application of sustainable principles to industrial facilities in this tourist destination will lead to further interest in the area. This is especially true in light of the government's new campaign towards universal sustainable development in China. The Chinese government has initiated this campaign as part of their preparations for the influx of international visitors traveling to China for the Beijing Olympics. Even though initiated as part of the Olympics planning the government's commitment is much deeper and longer term. They commissioned an international group of sustainable designers to design and eco-city, Dong Ton for 2005. The eco-city is meant to exemplify the potential to create self sufficient, non resource draining cities by applying sustainable design ideas ("Sustaining..."). The precedent shows the type of interest that could be generating by a sustainable industrial model in New Wushan. That also provides

an opportunity for government support and funding. Events such as the National Green Building Innovation Award and the International Intelligent and Green Building Technologies and Products Conference and Expo are all sponsored by the government and promote the exploration and implementation of green building techniques throughout the country (Libby). The government has also exemplified its intentions through policy changes. China is a member of the Kyoto Protocol and is requiring buildings to halve energy use by 2010 (Wilson). The CBIK New Wushan Branch and the factories themselves would become full size examples of how these ideas could be applied throughout China. There is potential for the Wushan Branch to become a host for small conferences and workshops that would bring more people to the region and add to the local tourism economy.

There is often a hesitance among clients to embrace sustainable design on completely ethical terms. This argument lies in the same vain as the communist ideal used to promote the dam project. Designing a new textile in New Wushan creates numerous advantages for the factory owner. This can be seen in two major ways: provide long term company savings, and improve relations with the employees, community, and international investors.

The first step in helping the client create a plan and set of criteria for the realization of their facility is to evaluate the site. It is important to look at the existing resources and climate, and how the local culture has already developed uses and solutions.

Many important design clues can be found in the history of Old Wushan's architecture. Traditional Chinese homes follow a bay system with a central courtyard. Column supported bays are an efficient way to build because they allow the building to expand or change as needed without challenging the building structure. Rooms can be rearranged using traditional screens as the needs of the space change. The integration of houses with courtyards reflects the Chinese's

long connection with nature and is often used as another, versatile outdoor room (Ebrey).

Courtyards are useful in a industrial setting because natural light can reach the work areas and workers can see outside the building. It has been shown that natural light and connection to what is happening outside greatly improve worker productivity and state of mind (McDonough).

Another traditional form, the raised seating area called the kang, is a practical building technique. The kang was raised so that had vents that drew warm air from the fire and heated the floor to provide a comfortable place to sit, work, and sleep during the winter; without heating the entire house. It also worked as cooling in the summer since vents could be opened to allow cool air to flow under the house (Ebrey).

Energy conservation will be evaluated and addressed along two strains. First the building should be designed to take full advantage of nature's energy resources. Sun light can be absorbed for heating and natural lighting. Cross ventilation can be carefully directed to maintain constant and comfortable temperatures throughout the day without using expensive and inefficient HVAC systems. By placing a courtyard in the center air can be drawn from the exterior of the building through the work space and out the courtyard. This is referred to as the stack effect. Layering the façade with louvers, overhangs, and moveable walls allows the facility to change with the conditions and seasons. Hot water can also be preheated through solar gain and then heated at each location by efficient, small hot water heaters to minimize heat loss through stagnant pipes. By raising the floor surface for ventilation a radiant floor heating system can also be placed under the floor. This comfortable, energy efficient system heats the people through direct contact with the warm surface rather than unnecessarily heating the entire space. This is especially valuable in a large factory space where there is a lot of extra ceiling air space. The preheated water from the solar panels can often be used for this purpose. By taking care of

these typically energy draining processes through passive means the factory can be less reliant on the unreliable national energy system and make huge steps towards accomplishing the 2010 energy benchmark.

Water conservation and protection is very important since further pollution of the lake could have a drastic impact on the area. Water contamination within the facility can be removed from the water before it reenters the natural cycle by installing a filtering living machine. A living machine used plants and bacteria found in nature to break down polluting particles and clean the water. The other risk the factory posed to Wushan's water supply is the runoff and erosion caused by placing a huge, non-porous surface on such a sensitive hillside. By replacing that absorbent ground surface with a green roof the building can absorb its own runoff area rather than putting further pressure on the soil below. Water can also be collected from the roof and used for basic water needs to augment what is being drawn from municipal services ("LEED...").

After the local conditions have been considered and those decisions made the consultants and the entrepreneurs will look at the construction materials and how they can be used to minimize cost, waste, pollution, and maximize building performance and the local economy. There is a movement in product development and industry to create products that have a cradle to cradle cycle (McDonough). This is the idea that man-made materials can act much like the natural world where the end of one life becomes food for the next (through decomposition or food). Even if this level of integration can't be reached considerations like: how is the material made, what toxins are left in the material, what pollutants are created, how much fuel must be used to transport the material, etc ("LEED..."). This is particularly relevant in China where cities are already challenged by serious pollution that fills the streets and makes breathing

difficult. Materials like steel and concrete have very energy intensive forms of production and in China's case much of the supply for construction is being shipped from overseas which has raised prices (Pearson). The other consideration in material choice is the labor need to construct in that material. Most of the construction done to create New Wushan was done by skilled laborers brought in from other regions. This wastes more resources and creates a higher cost for the owner. On the other hand there is a ready work force of Wushan residents familiar with traditional construction techniques that do not require heavy equipment knowledge. Thirdly, it is also important to look at how much energy, water, and maintenance the building will need and how that can be minimized. Lastly, the building design must be versatile and well built so that it can serve the client now and as the economy changes.

To conserve materials it is important to look at what renewable resources, local materials, etc. could be used. Such materials include bamboo hardwoods that can be used for flooring, walls, etc. Bamboo is material grown through out the country; including the Three Gorges Region, so that reduces international transport cost and bamboo grows quickly so a nonrenewable resource would not be depleted. It is a very economical, yet durable material that can be used for structure, cladding, and finishes. It also needs minimal processing and what is done is not energy intensive ( $1/50^{\text{th}}$  of what is needed to produce steel). By purchasing bamboo the client would also be supporting the national economy rather than importing materials. Its lightweight/elastic qualities make it resistant to earthquake damage and reduce the loads being placed on the loose hillside soil. Another benefit is that its installation does not necessitate special equipment which makes the overall building costs cheaper and allows construction to be done by local workers who are skilled in traditional construction techniques, but not modern industrial techniques (Johnson). The possibilities are more open for a one story textile factory

since the scale of both the building and equipment are smaller than for many other industries or building types. Another material is Kirei board which is made with stalks, of the food plant kirei, that left after harvest. Kirei is grown in Northern China. This additional income from a former waste material has created an industry with good wages and working conditions. The boards can be used for furniture, paneling, cabinets, and more (“Building Materials”). Another consideration is to take material salvaged by local residents (in an attempt to profit in some way from the destruction) and incorporate that into the building design rather than shipping in new material.

Careful analysis should be done of how each of the facility spaces will be used. Often one room can be used for many functions since these function at different times of the day, year, etc. By creating moveable walls and furniture spaces can change as needed. It is also important to provide natural light and air which has been proven to improve employee productivity. The more uses that can be served by one building the more cost effective and sustainable it will become. In both the branch office and the new factories there is opportunity to create a dynamic facility that will serve visitors and users alike. The concept of each factory as part of eco tourism route will be integrated into each design plan. Each factory becomes a living museum for the area and the development of the textile industry. If the courtyard serves local, traditional artisans who come and weave, or make traditional clothing, then visitors can see a long textile tradition and how it has developed. A small boutique as part of the factory facility would also allow the factory to benefit from the local economy as well.

Collaboration and integration will be discussed and considered at every step of the facility planning to ensure the entrepreneur has a facility that will serve the company well rather than simply provide a basic enclosure for their business venture.

## **Conclusion**

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The professionals involved with the CBIK Wushan branch have provided the knowledge, education, and assistance the Wushan region needs to establish a lasting economy. Through continuing the practices that have been recognized to promote a sustainable community, further generations will benefit from the New-Wushan businesses. Continued assistance will be provided to the citizens through the developing phases of local projects and business ventures.

The CBIK Wushan branch is an organization model that can effectively be applied throughout China. By evaluating the local industries and resources within the planned region of interest, the organizations services and guidance can be changed accordingly to the needs of the area. With the expansion of CBIK the growing network of working professionals and their local experiences and contributions within each branch will strengthen the organization as a whole. The creation of a sustainable business model with a focus on local industry and conservation has also kept in mind expansion and the inherent diverse needs of future branches.

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