

The production of an alternative construction material economics essay



**ASSIGN
BUSTER**

To prepare an industry study of all the construction materials currently being used in housing and commercial developments.

To review the waste management system in the Philippines and look for areas that are sustainable sources of PET materials.

To identify the current drivers and trends of the real estate and construction industry, as well as the Non-government Organizations (NGOs) in order to explore the viability of introducing the EHB products for their construction needs.

To prepare a business model for each market segment, namely: (1) Non-government Organizations (NGOs) and (2) Real Estate Developers and Contractors.

This MRR is focused on the following market segments: real estate developers, construction companies and NGOs. The study is limited to the Philippines specifically the National Capital Region (NCR) and provinces within a 130 km radius. Other construction materials that have the potential to be used with PET flakes aside from the concrete hollow block are excluded from this study.

This MRR focuses on the Ecoblock venture into the Philippine market through the NGOs specifically on housing and development programs; and eventually cater to the local real-estate developers and contractors. Hence the desired outcome of this MRR would be a venture strategy considering the economic conditions, market outlook, competitive analysis, risks analysis and capital sourcing.

President Aquino's State of the Nation Address (SONA) last July 2010 highlighted the importance of Public-Private Partnerships (PPP).[1]The PPP was seen as an important strategy for infrastructure development. It has also been estimated that the pipeline of PPP projects (infrastructure projects for transportation, water, power, health, and agriculture) for the year 2012 will amount to USD 5. 49B.

Another factor that can have an effect on these projects is the upcoming election in the year 2013 that can increase government spending on infrastructure developments. Lastly, the issue of corruption (specifically in government infrastructure projects) is seen as an important political factor in the construction industry of the Philippines. The corruption issues of the Philippines regarding infrastructure was discussed during Finance Secretary Cesar Purisima's meeting with Ernie Bower, the senior adviser and director of the Center for Strategic and International Studies in Washington DC.[2]In this meeting, it was cited that the PPPs program of the Philippines will be able to address the current issues on corruption. According to Purisima, the right infrastructures should be accompanied by forward-looking policies for the Philippines to be competitive through highly-viable and promising ventures. It was also made clear that corruption is a major factor that will hinder the government to increase spending for infrastructure projects.

As shown in Figure 1, the Philippines' gross domestic product (GDP) decreased from 7. 6% in 2010 to 3. 7% in 2011. This is due to the negative export growth rates in 2011 that was influenced by the global economic conditions particularly the economic and financial crises in US and Euro countries[3]. The domestic factors on the other hand include the decreasing
<https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

demand and negative growth rate in agricultural production and the under spending of the government in infrastructure projects. Based on the GDP projections of the International Monetary Fund (IMF), Asian Development Bank (ADB) and World Bank, the Philippine economy will slightly improve in 2012 due to the support of growth in private consumption (higher OFW remittances), investment, and government spending[4]. However, if the debt woes in Europe will worsen and the recovery of the US economy will not be sustained, the Philippines will experience lower exports and foreign investment that may lead to lower GDP growth. Considering these factors the Philippine government must be able to increase government spending on infrastructure projects to prevent the economy to slow down further.

As shown in Figure 2, even if demand in the economy is lower in 2011 due to the lower GDP growth rate, overall prices still increased which was brought about by the increase in prices of petroleum in the global market.[5] Looking at the disposable income of Filipinos, if the overall prices increase, the purchasing power will tend to decrease. This might affect the amount of disposable income that might be allocated for house purchase. Based on Figure 2, inflation is lower in the 1st quarter of year 2012.

Meanwhile, the 91-day Treasury bill interest rate decreased when the Bangko Sentral ng Pilipinas (BSP) attempted to stimulate economic growth. The peso-dollar rate remained stable due to the increase in inflow of remittances. The stability of the peso-dollar rate is very important in the construction industry due to the fact that some of the materials being used in construction are imported. The instability of the peso-dollar rate will affect the price of these materials.

<https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

As shown in Figure 3, construction output in 2011 went down. This is due to the under spending of the government in infrastructure projects.[6]The construction-to-GDP ratio decreased from 5.7% to 5.2%. The increase in government spending can increase the GDP for the coming years.

Growth of other industries will also open opportunities for the construction industry. As shown in Table 1, the tourism industry, the Business Process Outsourcing (BPO), and the mining industry are continuously experiencing growth which may lead to more construction projects. For the tourism industry alone, 47 hotels with 14,000 rooms will be constructed by the year 2013.[7]

Due to the Philippines' stronger financial position, the Standard and Poor raised the Philippines' international debt rating to one notch below investment grade (BB+).[8]According to the DBS Group, the Philippines can achieve investment-grade credit rating with a year or two. Once this is achieved, more investments will flow to the country.

The social factors that we will be considering in this study will give emphasis on the population growth rate, age profile, and housing backlog in the Philippines and try to correlate them with the construction industry in the country.

As of July 2011 the Philippines has an estimated total population of 103.775 million and out of this, 11.86 million reside in the National Capital Region (NCR). The Philippines has an average population growth rate of 1.9% and the NCR has an average population growth rate of 1.78%.

The majority of the population in the Philippines belongs to the working class (15-64 years: 61. 1% or 62, 201, 170 as of 2010). This is the portion of society who are about to start their own families until those who are about to retire from their respective careers. People in this segment are also the ones who have the capacity to invest in residential developments.

As of 28 December 2011 Philippines' housing backlog is currently 3. 6 million.[9]The government will tap shelter agencies like the Housing and Urban Development Coordination Council (HUDCC), the Housing and Land Use Regulatory Board (HLURB), the Pag-ibig Fund, the Social Housing Finance Corporation, the National Housing Authority, the Home Guaranty Corporation, and the National Home Mortgage Finance Corporation to reduce the housing backlog by 50% with an annual target of 350, 000 housing units. To achieve this, the Aquino administration highlighted the need for more PPP programs to use the underutilized government lands. The insufficiency of available funding resulted to this housing backlog. The government needs Php 1. 7 trillion to address the Philippines' housing needs.

In 2011, several typhoons and flash floods occurred in the Philippines between May and September. The Department of Social Welfare and Development (DSWD) will develop recovery and rehabilitation projects for victims of flash floods in NCR and other provinces with a total of 187, 008 families. Also, projects will be developed for the victims of typhoons that entered the country, which affected 1. 4 million families[10].

Last June 28, 2012, the general membership meeting of the Philippine Constructors Association (PCA) was held to discuss the current issues that

the industry currently faces. In this meeting, innovation was considered as a driver of productivity. According to Executive Director Cosette V. Canilao, the players of the industry must be able to re-evaluate their resources and processes to make it more efficient, responsive and relevant to the present stringent requirements of the industry.[11]Regarding PPP for infrastructure projects, the government must demand from its private partners new technologies that will accelerate delivery time while ensuring public safety. However, Canilao also recognized the fear of “ being the first to try something different”. With this, he emphasized that those players who will not invest in technological innovation might be left behind at bidding time.

According to the Department of Public Works and Highways (DPWH), the Philippines may adopt new construction trends in Japan, particularly on the latest technology on roads and bridge construction.[12]The construction and engineering technologies from Japan through the Japan International Cooperation Agency (JICA) will help the Philippines build disaster-resilient infrastructures that would mitigate the effects of climate change.

Technological innovation in the Philippines doesn't only happen with government projects, private manufacturers of construction materials also try to innovate the products and processes to improve the product offering. Cement manufacturers like the Holcim Group created a green sustainable solution for cement.[13]The company is trying to minimize the impact of cement manufacturing in the environment. The company focuses on bringing down carbon dioxide (CO₂) emissions by reducing the clinker factor by using mineral components as alternative materials.[14]Innovation on the use of raw materials was accompanied by improvement in the process namely: (1)
<https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

use of alternative fuels; (2) co-processing; and (3) quarry habilitation policy. Co-processing is considered as a globally accepted technology that helps the company process water streams in the cement kilns to properly dispose hazardous industrial wastes.[15]The quarry habilitation policy would ensure that the quarry sites can be used productively by the community before they are completely mined out. Holcim Philippines was the first company to submit a Final Mine Decommissioning and Rehabilitation Plan to the Department of Natural Resources (DENR), which will serve as a blueprint in restoring quarry sites.

Land development and construction have a direct impact on the environment wherein land conversion from agricultural to urban and residential greatly reduces bio-capacity (ability of the land to produce food and other resources for the society).[16]Because of this, sustainable land development is becoming more important in the construction industry. The World Wildlife Fund (WWF) and Ayala Land, Inc. (ALI) developed an ALI Sustainability Framework to chart, monitor, and report the company's progress in sustainable land development. The increasing awareness about environmental impact of construction activities will eventually affect the way residential and commercial developments are built.

In 2006, the Philippine Green Building Council (PHILGBC) was formed as a national non-profit organization through the alliance of building and construction industry leaders from the private and public sector.[17]This organization was formed to ensure an ecologically and economically sustainable industry. This resulted to a local green building rating system that is now called Building for Ecologically Responsive Design Excellence <https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

(BERDE). The BERDE scheme will serve as a benchmark for all property developers in the country.

Last August 17-19, 2011, the first Philippine International Total Green Movement Exhibition and Conference was held at the SMX Convention Center, Mall of Asia Complex in Manila. The joint venture of the Philippine Constructors Association, Inc. (PCA), Global-Link Exhibitions Specialist, Inc. (GESI), Philippine Society of Ventilating, Air-conditioning, Refrigerating Engineers, Inc. (PSVARE), Philippine Center for Environmental Protection and Sustainable Development, Inc. (PCEPSDI), and Society of Manufacturing Engineers (SME) Manila, created the Green Philippines 2011.[18]This event featured four exhibit segments on construction (Green Construct), manufacturing (Green Manufacturing), lifestyle (Green lifestyle), and energy (Green Energy). Also, last August 16-17, 2011, the 2nd Sustainable Building Technology Conference was held that invited international sustainability experts to discuss the best practices for a green industry. These events would show that the players in the construction industry are already leaning towards environment friendly development projects.

The construction industry is one of the most hazardous and risky occupations in the country. With this, the Department of Public Works and Highways (DPWG), the Department of Interior and Local Government (DILG), the Department of Trade and Industry (DTI), the Department of Labor and Employment (DOLE), and the Professional Regulation Commission (PRC) signed a Memorandum of Agreement last May 4, 2011 to strengthen the campaign to minimize accidents in construction activities. This MOA aims to “ promote the welfare of construction workers and prevent the recurrence of <https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

construction-related incidents, notably the ones that recently killed or severely injured workers early 2012.[19]Also, this MOA is an off-shoot of DOLE Department Order No. 13 (which provides the Guidelines Governing Occupational Safety and Health in the Construction Industry) and aims to intensify the holistic and extensive execution of the policies and programs set forth in D. O. No. 13 in construction sites”.

The construction industry in the Philippines is currently leaning toward ecological friendly materials due to the global campaign to save the environment. The materials that are available range from pre fabricated walls and blocks to bricks that is considered to be the oldest building material used. The pre-fabricated walls and blocks use polystyrene as an aggregate that is added to the concrete mixture to produce a lighter and insulating product. Reinforced fire bricks are also one of the common construction materials that are used in construction of homes. Reinforced bricks are made of industrial wastes such as rice hull, coal ash, silt, mud and clay.

The existing market for pre-fabricated walls and blocks are the contractors for commercial buildings and high-rise residential buildings. There are also some contractors that use pre-fabricated materials for home construction but the homeowners still prefer to use concrete hollow blocks (CHB) because of the high cost of the pre-fabricated material. The walls are pre-ordered by the contractor and are sometimes manufactured on site to avoid delivery expenses. On the other hand, the reinforced firebricks are used in home construction. This material is usually specified by the people who belong to

the higher class of society mainly because of the price of this construction material.

Pre-fabricated walls are used in exterior and interior applications in building construction. The lighter wall means that the foundations of a building project could be smaller due to the reduction in weight that the foundation needs to support. Installation time for the pre-fabricated wall is shorter compared to using conventional materials in wall construction. The product is smoother and does not need additional plastering (only the joints require additional concrete) because of the smooth finish that these walls generally have. The pre-fabricated walls also serve as good insulators that result to less energy consumption. A notable disadvantage of using this product, aside from the cost, is that the sizes that are available are only limited and could not be cut to size. The advantages of using reinforced fire brick in construction is that it uses less cement and is stronger than concrete. Bricks are also weather resistant and are considered to be ideal in tropical countries like the Philippines because it slowly absorbs heat to keep the inside of the house cooler. Bricks do not need cement plastering and the walls do not need to be painted. The disadvantage of using this material is the high cost. Even if it requires less cement and no paint the cost of the material is still higher compared to common construction materials used.

In the Philippines, CHB remains as a backyard industry because it is easy to produce, especially the non-load bearing CHB. The CHB can be produced manually by using an improvised mold. In producing a non-load bearing CHB, a mixture of sand, gravel, cement, and water can be manually compressed using the improvised mold.

<https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

There are three reasons why CHB is still being used in construction, namely: (1) cost; (2) availability; and (3) ease of installation and handling. CHB still remains as the a cheaper choice in construction of a concrete house. As a backyard industry, CHB is available nationwide with similar product specifications. Lastly, CHB is a traditional product. With this, majority of the laborers or construction workers are familiar with CHB in construction. The familiarity of the laborers with a product is the main reason why CHB is still being used.

The demand for quality, economy, and completion time are the major considerations for all construction projects that usually dictate the choice of technology[20]. The traditional construction material currently being used for construction projects is the CHB. Based on the interview with key players in the real estate industry, another alternative is the pre-fabricated walls. For fabricated walls, the entire wall is built off- site or on-site before installation as compared to CHB that are stacked one on top of another. In the Philippines, only 5% are using prefabricated building material in housing construction[21].

Over the years, different types of construction materials have been offered containing recycled plastic, such as PVC pipes. Recycling is especially important for thermoset polymers since this form of plastic cannot be reheated and melted back to liquid form.

In the Philippines and in other countries, shredded plastic has been used as aggregates for bricks and construction blocks. Most of these, however, are not widely offered commercially and are not load bearing.

The demand for this product is readily accessible in most areas and the market is sensitive only to the price relative to the quality of the product they receive. At present the 4-6inchconcrete hollow blocks prices are standard for all and vary only between the volume suppliers and the backyard suppliers because of their respective approach to the business. The buyers of the product favor the suppliers who are nearer to them (because of transportation costs) and if satisfied with the quality they retain their suppliers. However there are instances where the buyer changes suppliers in lieu of quality issues for this reason, industry rivalry will be considered medium.

The technical skill and labor required isn't advanced nor does it require highly specialized machines to deliver the product, the only obstacle is the cash required to: 1) purchase the hollow block maker and; 2) to secure working capital requirements. The cost of a concrete block mixer is between Php30, 000-P40, 000, and a mold container would be approximately Php5, 000 per piece. Normally a block maker can start a small-time business with 6 molds which is equivalent to Php30, 000 therefore a backyard business can start at a Php60, 000 investment excluding working capital.

The disadvantage of this practice is it sacrifices the quality/durability of the blocks due to the lack of compression of the block being formed thereby resulting in a lower PSI rating. The difficulty in securing funding for this particular business is high because the business is not unique while the returns in this type of business do not instantly translate to high growth profits. The local venture capitalists who provide seed capital to startups look to sunrise industries such as the BPO sector and IT services delivery, or the <https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

next big website investment. The prospects of a potential participant to capture market share will primarily be on their ability to reduce the cost of their concrete hollow block while maintaining a reasonable quality and service. In order to achieve this, the potential participant must have a large base of clients in order to achieve economies of scale in their production of quality products and a person who will provide assistance to the client to ensure proper delivery and satisfaction, a backyard hollow block maker will not be able to be competitive and for this reason the threat of new entrants is rated as medium taking into consideration these factors.

Some projects outsource their hollow block while others make it onsite. While it is preferred to buy the product in order to avoid the cost of investment and taking into consideration that there is abundant supply for this product (but at varying prices depending on which type of supplier: backyard supplier, volume supplier or a wholesaler, and depending on the volume purchase of the buyer the bargaining power of buyer is medium given the availability of a quality product in the market.

The demand for reasonably priced hollow blocks are assumed to be growing at 10.5% and construction materials 5.4% which supports the argument that demand is good. Another consideration is that the real-estate residential development is in the form of condominiums and they make use other products such as pre-fabricated walls instead of hollow blocks. The construction boom doesn't directly translate to increased hollow block use and the prices of hollow block are generally stable therefore for these reasons the supplier's bargaining power is low.

The bargaining power of cement and sand suppliers remain low since there are abundant sources for these suppliers. The PET flakes suppliers have a medium bargaining power since they are less abundant than the cement and sand suppliers. Moreover, the local PET suppliers have different methods in shredding and cutting the plastic such that those suppliers that have the ability to shred PET flakes at a certain size have a stronger bargaining power than others.

For the low cost housing sector and other housing projects hollow blocks are still preferred. The emerging sector of high-rise residential projects make use of pre-fabricated products and gypsum boards however the market share of these products is only 5% for construction materials, therefore the threat of substitutes are rated medium.

The success in this industry will be in the costing of the product and the quality. In order to reduce the overall cost of the product there is a need to meet operation efficiency and effective marketing in order to achieve economies of scale that will bring down overall costs for our firm while producing a good quality product.

Opportunities

Emphasis on PPP programs for government infrastructure projects

Good forecast for the tourism, BPO, and mining industry

Movement towards sustainable community development

The use of plastic as an aggregate is not yet widely introduced in the Philippines

The high amount of investment on PPP programs is seen as a good opportunity for the construction materials industry. For year 2012, several PPP projects are in the pipeline, namely: (1) 14 projects on transportation; (2) 2 projects on utilities-water' (3) 2 projects on power; 1 project on health; and (4) 2 projects on agriculture that amounted to USD 5.49B will increase the demand for construction materials. These PPP programs will also serve as an opportunity for private companies to increase their annual construction projects.

The growth of three industries, namely: (1) tourism industry; (2) BPO; and (3) mining industry will also contribute to the growth of the construction materials industry. The increasing annual foreign tourist arrivals and domestic travelers opted for the increased in resorts, hotels, and condominiums. The increase in number of accommodation facilities was accompanied by the Republic Act of 9593 or Tourism Act of 2009 wherein the roads that are not initially classified as national but lead to tourism sites, airports, and seaports will be improved which will be included in the DPWH budget for 2012.[22] For the BPO, construction of commercial buildings is also expected to increase to meet the demand of the industry. The investment of the Mines and Geosciences Bureau (MGB) would show that the mining still remains as a promising industry (Table 1). Investment on mining would result to more office sites and barracks for mining companies.

The movement towards building more sustainable developments is seen as an improvement for the construction industry. New technologies for products and processes will help improve the viability of construction projects in the Philippines. By focusing on the impact of construction on the environment, the need for environment-friendly products may increase as the industry tries to include the society's welfare in planning construction projects.

The use of plastic as an aggregate is currently being used in Germany. However, this new aggregate is not yet widely introduced in the Philippines. This is seen as an opportunity for the company to introduce a product with more benefits than the existing products in the market.

Threats

Competition (large companies)

Emergence of new products

Competition especially against large competitors is seen as a major threat because these companies are already established in the industry. New companies that may introduce new products in the market may face difficulties especially if these products are not patented. Large companies can simply launch the same product at a larger scale. The availability of funding for these large companies will give them an advantage to produce more products. The more products a company manufactures, the opportunity to capture a larger market is bigger. Also, large companies can be seen as good suppliers for developers and contractors who want a steady supply of materials.

Even if CHB currently remains as the primary choice for wall construction, emergence of new products as a substitute may pose as a threat for the CHB market. Even if only 5% in Philippines uses prefabricated building components in housing construction, the boom in the construction industry may increase the market for pre-fabricated walls. Across time, if more housing developments will be built using pre-fabricated walls, the demand for CHB may decrease.

The cost of the EHB is at P5. 90 per unit. The cost of direct labor is the largest at P2. 52 per unit, followed by raw materials at P2. 12 and factory overhead at P1. 26. The key assumptions for these figures are assuming that 2, 991, 150 units of hollow blocks will be manufactured for the year. The hollow blocks will be used for 5, 175 houses which represent only a conservative 5% of Gawad Kalinga's projected housing projects. The cost of EHB at the end of the third year of operations will be at P4. 94 assuming that quantity manufactured has grown to 4, 307, 206 units. The cost savings is achieved mostly on the labor side at P1. 91 per unit (24% savings from P2. 52 per unit) brought about by more productivity. The hollow block machine's full capacity for one year is 9, 000, 000 of hollow blocks, therefore as long as quantity improves to no greater than this amount, economies of scale can be achieved since there is little reason for labor and overhead costs to increase.

Currently the market price for concrete hollow blocks is at P13. 30 per unit which is 56% more than the cost of our EHB, the EHB is projected to sell at the CHB market price therefore we feel this cost is competitive enough to be in business. The pricing of EHB will not be lower since the EHB is a superior product compared to the CHB nor will be priced higher since the market may

<https://assignbuster.com/the-production-of-an-alternative-construction-material-economics-essay/>

still be critical of the product in its launching phase therefore the best entry strategy is to price it aggressively at par with the CHB market price

There is a 21% cost savings per square meter with the use of EHB versus CHB. This is based on Table 2. The addition of PET flakes lessens the requirement for both cement (27% less cost) and sand (32.7% less cost). Additional savings is realized from the labor cost on painting, layering and plastering in hollow block aggregate components, which lead to an overall reduction in cost per square meter.

The Filipino construction materials market experienced an annual growth of 6.54% but is expected to witness a more sustainable growth of 5.36% until year 2015[23]. Being a supply-driven industry, supply of construction materials come from local suppliers based on the location of the project. However, with the boom in the construction industry (10.5% average annual growth rate), smaller projects like GK projects experience sh