

## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND OF STUDY

Nowadays, the construction industry has become more advanced in technology such as Industrialized Building System (IBS), beside that the usage of brick is more demand in construction. The growths of population of people are increasing with increase in construction. According to the Department of Statistic, Malaysia, the population for year 2010 is 28.6 million, and it is foreseeable to rise by 10 million to 38.6 million in year 2040.

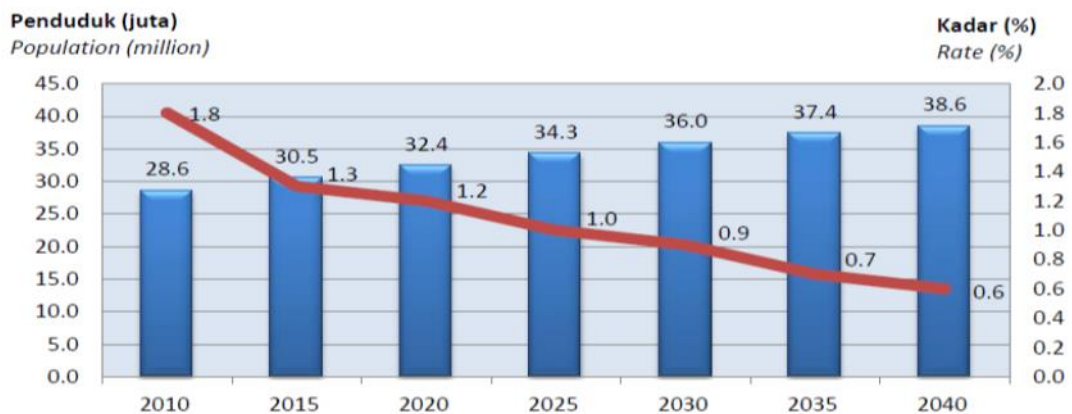


Figure 1.1 Chart of Population Projection and Annual Population Growth Rate, Malaysia Source: Department of Statistics, Malaysia

The manufacture of bricks is about 1391 billion per year in worldwide and it is foreseeable that the demand of bricks will constantly increase. By using bricks, the building construction have more compressive and flexural strength in order to save from foreign disturbance. The advantages of bricks to the structural component of a building are, increase the thermal mass of a building and can protect the building from fire, can be economically moulded into a different shape, can resist multiple resistance against heat and sound. The building construction can become much easier, faster and cheaper, in term of workability. One of the most accommodating masonry units is bricks, due to its

physical, chemical and mechanical properties. Bricks can be classified as one of the backbone of building construction.

Malaysia has many natural waste materials like agricultural and industrial waste. Those waste materials can be recycled into beneficial materials, which is into renewable building materials. Some non-decaying waste materials will remain in the environment maybe for thousand years. The waste materials could cause so many problems, and then contributing to the environmental problems. However, to reduce or to end the environmental troubles is by using waste materials into a useful material, and remains the environment in a perfect condition without waste materials problems.

Various researchers have investigated the possibility of using agricultural waste in building construction material. These immediately will award more advantages, which are elimination of waste material and reduction in construction cost. In addition, Malaysia can become one of a country have abundant waste material, those waste materials can be used as a useful material in building construction. One of the waste materials is a rice husk.

Rice Husk is one of the waste materials in the rice growing areas. This not only makes the purposeful utilization of agricultural waste but it will also minimize the consuming of energy used in the produce of sand. Thus, Rice Husk is an agro based product which can be used as a replace of sand without giving affect on strength and durability of the brick.

Market Year	Area Harvested	Unit of Measure	Growth Rate
2006	645	(1000 HA)	-2.27 %
2007	650	(1000 HA)	0.78 %
2008	660	(1000 HA)	1.54 %
2009	670	(1000 HA)	1.52 %
2010	672	(1000 HA)	0.30 %
2011	675	(1000 HA)	0.45 %
2012	688	(1000 HA)	1.93 %
2013	690	(1000 HA)	0.29 %
2014	688	(1000 HA)	-0.29 %
2015	690	(1000 HA)	0.29 %
2016	695	(1000 HA)	0.72 %

Figure 1.2 Malaysia Milled Rice Area Harvested Annual Growth Rate,  
(United States Department of Agriculture)

One of the material is environmentally friendly which is green brick. Green element refer to any product or service is not damaging to the surroundings or atmosphere. Commonly, the application of green brick is not so familiar in Malaysia compared to other countries. Malaysia can be one of the countries that can produce a green brick due to Malaysia is a tropical country that have plentiful of natural waste materials such as rice husk. Rice husk is one of the common agricultural wastes in tropical countries. Brick is the first masonry material that can be certified for environmental demands, by adding the natural waste materials to the bricks mixture, it is the allowed materials by building codes to be reused in new building application.

## 1.2 PROBLEM STATEMENT

Nowadays people starting to turn into green buildings, a green building come from usage of green building materials. One of the green building materials is a brick, the basic that we have in construction is a sand brick and clay brick. But to improvise the brick, which is by turning the bricks into green bricks, we can add natural waste material from agricultural waste. There are lots of agricultural wastes such as rice husk. By adding these agricultural wastes into brick mixture can help to reduce the environmental impacts, which is by disposing these wastes into a potential building source material.