CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF RESEARCH

Coconut is one of the most important agriculture products in Malaysia. Coconut is at the rank of fourth in term of total plating area and the first is oil palm, second is rubber third is paddy (Sivapragasam, 2008). In Malaysia there are five main state that are the main coconut producer that are Perak (15,180 hectare), Johor (21,250 hectare), Selangor (10,320 hectare), Sarawak (22,290 hectare) and Sabah (19,150 hectare). Coconut is a very useful plant, the part that can use from coconut plant are roots, stems, nuts, leaves and even other components from the trees. Coconut Milk is produce by the coconut fruits and it is main target for food product in Malaysia, and coconut milk is the essential ingredient that most use in Malay dishes in Malaysia for example curry, and dessert (Alexander, J 2006). Coconut shell is a bio- degradable material but it is durable and strong so it needs a long time to bio-degrade. Beside that coconut shell also had been reuse as natural bowl, coconut shell charcoal, and also hand craft.

Coconut waste now had been become a large amount of waste in Malaysia, According Rice and Industrial Crops Centre (MARDI) and stated that in years 2007 Malaysia had produce 382000 tons of coconut with total 109185 hectare of land that are using for planting the coconut trees. There are about 63 % of the coconut is providing for Malaysia local use and 37 % is providing for export to other country and industry used. Besides that Malaysia also import RM 404, 517, 380 value of coconut from over sea example Indonesia and Philippines (Sivapragasam, A, 2008). From the data, it show that Malaysia is a country that having high consumption of coconut. Agriculture
and Agro-based Industry Minister Datuk Seri Ismail Sabri Yaakob reported that 30,000 hectare of land was needed to extra produce 72million of coconut in a year due to the high consumption of coconut in Malaysia, and he said that present coconut that produce by Malaysia only 539 million of fruits in a year but Malaysia are consume 611 million of coconut in a year there is 72 million of coconut different (TheStar, 2014). High consumption of coconut will produced high amount of coconut waste, it will increase the load for the land fill in Malaysia.

Sand is a very important material that are using in mix concrete design. The sand is act as the fine aggregate in the concrete, and the use of fine aggregate is use to bind the cement with the coarse aggregate. In addition sand also use to fill in the spaces that left between the coarse aggregate and to stick the coarse aggregate together (Day, K., 2003). In Malaysia budget 2016, Datuk Seri Najib Tun Razak concluded that PR1MA will build 175,000 houses in all the state in Malaysia which will be sold at 20 % below market prices and the total cost for the development of PR1MA is of RM1.6 billion (Thestar, 2015). The housing project need a huge amount of the usage of sand to construct the structure, due to the high usage of sand as fine in the concrete mix and it is straight effected the reduced of sand capacity in earth and the sand mining activity is increased. Sand mining is affecting the environment problem to Malaysia example Land losses due to the erosion by the mining. Besides that the river is polluted during the sand mining, and the water level for the river is decreased due to the sand had been excavated (UNEP, 2014).

For the research by reusing the coconut shell as partial fine aggregate replacement into concrete mix design, it can bring a lot of advantages to the construction field, environment and so on. It can reduce the capacity of land filling problem, reducing the usage of sand in construction and also reduce the sand mining activities.
1.2 PROBLEM STATEMENT

Coconut is one of the most high consumption fruit that use in Malaysia and consumed about 611 million of coconut in a year, due to the high consumption of coconut in Malaysia it produced large amount of coconut waste in Malaysia. Coconut shell is a bio-degradable material but it is durable and strong so it needs a long time to bio-degrade. The statement is stated by Little Cherry Ltd, this company are selling natural coconut shell in the description it stated that coconut shell are oil proof, waterproof, durable, durable, robust and can be washed over and over (Little Cherry Ltd). Due to the high durability and slow bio degradable of coconut shell, it will cause burden to the landfill capacity problem in Malaysia. The large amount of coconut waste will retain at the landfill for long time due to the high durability of coconut shell and it will cause the increasing number of landfill in Malaysia. Jabatan Pengurusan Sisa Pepejal Negara (JPSPN) stated that, all the non-recyclable waste will transfer to the landfill, and the landfill problem will cause environment and human health issue to Malaysia.

The waste management system in Malaysia is still poor compare to other country example Singapore, due to lack of technology on waste management, so JPSPN having problem environment problem in landfilling. In Malaysia having 261 unit of the land fill, only 150 of the land fill operating and the 111 unit of land is fully loaded with the solid waste, the number of the landfill is increasing year by year, and the land is causing a lot of problem to earth and also human living (Nur Shaylinda Mohd ZinHamidi, 2012). One of the effects from landfill are Greenhouse Gas Pollution, the broke down of organic material will released methane into the open air. The methane gas that produced from landfill is about 12% of total global methane released and it is about 5 % from total greenhouse gas emissions in the earth. In year 2012 Peninsular Malaysia is generated 25000 ton of waste and about forty 7 % of the waste is organic waste. Only 5 % of the waste had been recycled. By reusing the coconut shell in construction field, it can reduce the waste capacity of landfill and also the environment pollution in Malaysia.