



Talk on “ An Overview of Infrastructure Development in Oil Palm Plantations “ on 15 July 2017

by Ir. Vasan Mariappan

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The Agricultural and Food Engineering Technical Division (AFETD) of IEM organised a technical talk on “An Overview of Infrastructure Development in Oil Palm Plantations”, on the 15<sup>th</sup> of July 2017 at Wisma IEM.

The talk, attended by 29 participants, was delivered by Ir. Yong Hong Liang, the Chairman of Agricultural and Food Engineering Technical Division (AFETD) of IEM. In his talk, Ir. Yong has shared his experience of more than 17 years being in infrastructure development of oil palm plantations, and rural groundwater extraction and supply in Malaysia and also in Indonesia.

Ir. Yong began his talk with the general concept of development in an oil palm plantation, in which infrastructure or engineering facilities in oil palm plantations consists of housing & buildings, roads for agricultural activities, field structure and water management. He showed various type of housing such as manager (bungalow), staff (semi-d) and worker (quarters/terrace). Other common buildings were office, workshop, warehouse, laboratory, clinic, surau, chapel, creche, canteen, shop, kindergarten, community hall, weighbridge and genset house. All these housings and buildings are properly planned and strategically located for ease of operation. Housing development shall comply with the Standards of Housing and Amenities Act 1990 where site and building plans shall be endorsed by Professional Engineer (PE) for submission to Labour Office before commencement of any projects. Other important consideration includes adequate power and clean water supply.



Central Office (Sampit, Kalimantan, 2006)



Manager Bungalow (Dabong, Kelantan, 2011)

The second topic was the Agricultural road. Ir. Yong highlighted that quarry with reasonable quality of rock is one of the important criteria to purchase a new agricultural land, besides soil type and land profile. Gravel or crusher run produced from the quarry is used to surface the earth roads. A good road alignment requires detail feasibility study. Data required are topographical & hydrological data,

soil information, availability of surface material, geological maps, aerial photographs and ground reconnaissance.



Before aerial survey (Sampit, Kalimantan, 2005)



Aerial photograph

Agricultural road can be divided into 3 categories:-

- a) Transport road, connecting Palm Oil Mill (POM) to trunk road.
- b) Main road, connecting planted blocks to POM.
- c) Field/collection road, locate between blocks of plantation

Ir. Yong further elaborated that construction and maintaining the agricultural roads in oil palm plantations is a costly affair for the planter. This is unavoidable as good quality and adequately maintained road is a prerequisite to successful operation of fresh fruit bunch (FFB) harvesting and transporting from the field to palm oil mill, implementation of mechanisation program and delivery of crude palm oil to refinery.

During the initial period of land development or land clearing, Ir. Yong mentioned that temporary log bridges are installed along the stream. It provides an instant and low cost solution to the planter. However, logs tend to decay within 5 years and they are insufficient to bear heavy loaded vehicle such as CPO tanker, overloaded lorry, heavy machinery, etc. Proper design crossing such as composite bridge, RC box culverts or in some cases RC drift shall be applied. For drains, RC short bridge and PC round culvert are sufficient.



RC box culverts (Sampit, Kalimantan, 2016)



Short bridge within the field (Gua Musang, 2011)

In the following topic, Ir. Yong shows the importance of design and construct of FFB loading ramps at strategic places at undulating terrain. This is to optimise FFB collection and delivery time to the nearest Palm Oil Mill. The capacity of loading ramps varies from 10 to 50 tons.



45 tons RC loading ramp (Suai, Sarawak, 2006)



20 tons timber loading ramp (North Kalimantan, 2016)

In his talk, Ir. Yong stated that due to land scarcity, many oil palm plantation companies developed at problematic area such as floodplain zone. Without proper measure, flood water overspill from adjacent river not only cause crop losses, it also damages the infrastructure. He briefed the participants on the planning, type and costing of flood mitigation schemes.

As an Agricultural Engineer, Ir. Yong shares some of the common issues faced by Agricultural Engineers in oil palm plantation. The issues include capital and operation expenditures cutting during low palm oil price, lead to roads not surfaced and maintained over time, resulted crop losses as harvested FFB were unable to be transported out from the field during monsoon. Other issue like local social problem which end up with sabotage on the infrastructure.

At the end of his talk, Ir. Yong reiterated that the engineer who handle infrastructure in oil palm plantation need to be "multi-task". Besides C & S, infrastructure or engineering facilities also include M & E works such as electricity supply, water reticulation, infield mechanisation, farm tractor operation, heavy machinery utilisation, etc. In the office, the engineer often performs his task of planning, design, drafting, QS (costing & tender) and audit. So, the engineer shall equip himself with adequate design skill, technical knowledge and relevant experience in managing infrastructure and engineering facilities in oil palm plantations. He shall be able to solve problems with confident, and brings improvement.

The session ended with presentation of a token of appreciation by Ir. Ooi Ho Seng, the past president of AFETD.

