CHAPTER EIGHT CONCLUSION

In terms of infiltration rate, it was found that the soils of forest and 20 year-old rubber and 20 year-old oil palm vegetation cover performed infiltration at a greater rate than the soils of other landuses. In forest and rubber (20 years old), it was also found that infiltration rates rarely exceeded the infiltration capacity of the soils.

The infiltration rates of soils under forest was 21.97 cm/hr while soils under 20 year-old rubber vegetation cover was 20.98 cm/hr. For soils under 20 year-old oil palm vegetation cover, the infiltration rate was 20.42 cm/hr.

Soils under 7 year-old rubber and 7 year-old oil palm vegetation cover showed a slightly different infiltration characteristic, by revealing a lower infiltration capacity. This was demonstrated by the large amount of runoff produced at the later stages of the rainfall simulation. The infiltration rates were recorded as 7.99 cm/hr for soils under 7 year-old rubber and 8.14 cm/hr for soils under 7 year-old oil palm vegetation cover.

Infiltration characteristics of bare soils showed the lowest infiltration capacity. This was indicated by the large proportion of runoff occuring even in the early stage of the rainfall simulation. The infiltration rates of the bare soils are recorded as low as 4.61 cm/hr for the five year-old plot and 6.41 cm/hr for the one year-old plot respectively.

An important finding of this study is that higher infiltration capacity of soils was found to be linked to the density of the vegetation cover. This condition promoted better physical properties of soils, and thus higher infiltration capacity. Under forest condition, the soils were determined to have the lowest value of bulk density, highest organic matter content and total pore space which facilitated greatly the infiltration process.

A layer of litter and humus of more than 3 cm over the surface floor of the forest provides a sponge-like shield which progressively absorbs the kinetic energy which resulted from throughfall. This eventually reduces the compaction process on the soil surface and allows more time for infiltration to proceed.

In the case of soils under 20 year-old rubber and 20 year-old oil palm vegetation cover, a dense cover of thick under-storey vegetation also prevail. It provided good shield against direct rainfall, hence reducing compaction on the soil surface.

The findings of this study point to the notion that the similarity in soils physical properties had resulted in the close agreement of infiltration rates in soils under forest and 20 year-old rubber and 20 year-old oil palm vegetation cover.

For soil under rubber and oil palms (of 7 years-old), it was found that a link existed between the lower infiltration

rates and the compaction of the soil surface. These soils, even though they were under good vegetation cover, had little storey cover. This under-storey vegetation cover has proven to be an effective shield against direct rainfall.

The compaction of soil surface in these soils were reflected by the in a higher values of bulk density and lower values of total pore space and organic matter content. The result was that soils under 7 year-old rubber vegetation cover recorded an infiltration rate of 7.99 cm/hr, while those of 7 year-old oil palm vegetation cover had a rate of 8.14 cm/hr.

Infiltration rates in barren soils were mainly governed by the physical properties of the soils. Having little vegetal cover, or in the case of the plot of barren soil of 5 years old, nearly 95% of its surface area was totally exposed; compaction of soil surface was therefore inevitable. The end result was that the formation of crusts on the soil surfaces reduced greatly the infiltration rates and increased the surface runoff. Thus the plots of barren soils produced infiltration rates as shown in Table 5.5.

In this study,it was found that the infiltration rates were highest in soils under forest conditions, and under 20 year-old rubber and 20 year-old oil palm vegetation cover, followed by soils under 7 year-old rubber and 7 year-old oil palm vegetation cover. Infiltration rates were lowest in 5 year-old bare soils and 1 year-old bare soils.

This study also found that infiltration rates of soils of various landuses were greatly affected by the physical

properties of the soils, namely the bulk density, total pore space, organic matter content and aggregate stability.