# Innovative Approaches to Intensification of Oil Palm Growing Systems

The world population is expected to increase to more than 9 billion in 2050. Most of these people will be city dwellers (Clay, 2011). A larger population coupled with increased disposable incomes and associated change in diet, with greater demand for processed food, animal products and biofuels, indicates the need to increase total agricultural production in the coming decades (FAO, 2006), including and specifically so oil palm (*Elaeis guineensis Jacq.*) the most important source of vegetable oils (Fry, 2010). The demand of edible vegetable oils is expected to double from 120 million t today to 240 million t in 2050. Most increases in palm oil production over the past fifty years have been due to expansion in area planted to oil palm, and concerns abound on how to increase productivity to meet future requirements (Corley, 2009).

Corley (2009) analysed strategies and argued that considerable expansion of oil palm is possible, without further environmental damage, if the expansion is properly managed, for example with emphasis on expanding into anthropogenic grassland. A scenario based on improved management practices as a strategy, with yields of 5.85 t crude palm oil per ha per year (about 3% annual productivity growth) would require a total of 9 million ha of land by 2020, with most of the increase in area coming from degraded lands (Dros, 2003). In line with this, Wicke et al. (2011) point out that the only possible means of meeting production targets, without major expansion into forest lands, is through increased yields on current plantations and incorporation of degraded lands with acceptable yields.

Estimates of degraded land area in Indonesia (as reported in Wicke et al., 2011) vary from 12 million ha (Casson, 2000), to 23 million ha (van Lynden & Oldeman, 1997), to 32 million ha (FAO, 2008), to 74 million ha (Indonesian Ministry of Forestry, 2008). Degraded land areas often contain *Imperata cylindrica*. Indonesia has approximately 8.6 million ha of large contiguous areas of more than 10,000 ha with *Imperata* as the dominant vegetation (Garrity et al., 1996). We conclude that large areas of degraded lands are available for production of oil palm in Indonesia. However, there are doubts, (a) as to whether the required yield increases can be achieved on degraded lands, and (b) as to where precisely these degraded lands are, and (c) that they do not have other limitations than land degradation.

Over the past few years, IPNI Southeast Asia Program (IPNI SEAP) has developed and tested a series of site-specific Best Management Practices (BMP) with plantation groups in Indonesia to reduce the yield gap in mature oil palm plantation (Witt and Donough, 2007) that is consistent with the guidelines of the Roundtable on Sustainable Palm Oil (RSPO). Based on the BMP practices, fresh fruit bunch (FFB) yield increased on average 11% in sites with optimal and 18% in suboptimal conditions. Hence, crude palm oil yield levels (a) increased well above the national Indonesian average of 3.5 – 4.0 t/ha (Donough et al.,

2011) and (b) were close to the yield levels that are required to produce sufficient oil for increasing global demands without further environmental damage.

Besides the BMP practices, Suitability Mapper, a freely available online mapping tool aids in identifying potential sites for long-term sustainable palm oil production especially on low carbon, degraded land, launched by World Resources Institute (WRI) and Sekala in October 2012. With the customizable maps in this mapping tool, potentially suitable lands for palm oil production can be identified easily into which BMP practices can then be deployed. With these innovative tools and methods at hand, we are confident that increasing oil demand can be met without a significant burden on the environment.

*Photo by T. Oberthür*

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