Mobilizing Greater Crop and Land Potentials Sustainably

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The supply side of the food security engine is the way we farm. The current engine of conventional tillage farming is faltering and needs to be replaced. This presentation will address supply side issues of agriculture to meet future agricultural demands for food and industry using the alternate no-till Conservation Agriculture (CA) paradigm (involving no-till farming with mulch soil cover and diversified cropping) that is able to raise productivity sustainably and efficiently, reduce inputs, regenerate degraded land, minimise soil erosion, and harness the flow of ecosystem services. CA is an ecosystems approach to farming capable of enhancing not only the economic and environmental performance of crop production and land management, but also promotes a mindset change for producing 'more from less', the key attitude towards sustainable production intensification. CA is now spreading globally in all continents at an annual rate of 10 Mha and covers some 157 Mha of cropland.

Today global agriculture produces enough food to feed three times the current population of 7.21 billion. In 1976, when the world population was 4.15 billion, world food production far exceeded the amount necessary to feed that population. However, our urban and industrialised lifestyle leads to wastage of food of some 30%-40%, as well as waste of enormous amount of energy and protein while transforming crop-based food into animal-derived food; we have a higher proportion of people than ever before who are obese; we continue to degrade our ecosystems including much of our agricultural land of which some 400 Mha is reported to be abandoned due to severe soil and land degradation; and yields of staple cereals appear to have stagnated. These are signs of unsustainability at the structural level in the society, and it is at the structural level, for both supply side and demand side, that we need transformed mind sets about production, consumption and distribution.

CA not only provides the possibility of increased crop yields for the low input smallholder farmer, it also provides a pro-poor rural and agricultural development model to support agricultural intensification in an affordable manner. For the high output farmer, it offers greater efficiency (productivity) and profit, resilience and stewardship. For farming anywhere, it addresses the root causes of agricultural land degradation, sub-optimal ecological crop and land potentials or yield ceilings, and poor crop phenotypic expressions or yield gaps.

As national economies expand and diversify, more people become integrated into the economy and are able to access food. However, for those whose livelihoods continue to depend on agriculture to feed themselves and the rest of the world population, the challenge is for agriculture to produce the needed food and raw material for industry with minimum harm to the environment and the society, and to produce it with maximum efficiency and resilience against abiotic and biotic stresses, including those arising from climate change. There is growing empirical and scientific evidence worldwide that the future global supplies of food and agricultural raw materials can be assured sustainably at much lower environmental and economic cost by shifting away from conventional tillage-based food and agriculture systems to no-till CA-based food and agriculture systems. To achieve this goal will require effective national and global policy and institutional support (including research and education).