

Bio-integrated systems and the bio-refinery concept for rural prosperity

Horst W. Doelle

Given the current accessibility and knowledge levels of agricultural biotechnology, there is no reason for rural farming communities to struggle on low per capita incomes. A complete utilization of all renewable resources, such as plant biomass, crops, human and animal [livestock] wastes, can give self-efficiency and sustainability to the rural communities and the environment. But farming has to change from the old industrial-economic into a socio-economic structure, using bio-integrated systems and current biorefinery concepts for energy, food, feed, fertilizer and commodity product formation. Such a system will help in eradicating poor health and living standards, poverty and starvation, which in turn will automatically influence population growth.

Introduction

The so-called Green Revolution, which aimed to convert the rural farming sector into an industrialized economic production system, has been a total failure. Although higher crop yields were initially obtained, the changes in farm management drove farmers into urban areas and poverty; the ever increasing use of pesticides, insecticides and chemical fertilizers led to increasing soil infertility; the concept of mono-culture led to enormous price fluctuations and pressure on farmer incomes; and the enormous development of the livestock industry resulted in an increase in pollution and health risks.

Instead of eradicating poverty and starvation and raising health standards, the opposite has occurred. We still have approximately 1.2 billion people living on less than US\$ 1 a day, 826 million

undernourished people, and 2.5 billion people without proper sanitation.^{1,2} Out of 1,100 million people in the developing countries, 800 million people live in rural areas.³ In Viet Nam, for example, 80 per cent of the population lives in a rural environment, a totally different situation compared to the developed countries. Since such large populations are concentrated in the rural areas, they often get neglected in the development process, and this results in an alarming growth in the number of hungry and unemployed people, with low health and living standards.

This failure was due to an entirely unilateral thinking of our industrial economy system, as established by advisers during the Industrial Revolution.⁴ They ignored all old and new biotechnological advances and tech

Dr. Horst W. Doelle
Chairman, IOBB
Deputy Director of MIRCEN-
Biotechnology Brisbane and the Pacific
Regional Network
21 Belsize St., Kenmore 4069, Australia
Tel: (+61-7) 33783180
Fax: (+61-7) 38783230
E-mail: doelle@ozemail.com.au