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Proceeding

International Conference on
Redesigning Sustainable Development on Food and Agricultural System for Developing Countries

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FOREWORD

The world population is estimated to grow from 5.8 billion people in 1997 to 7.5 billion people in 2020. The increasing number of population raises serious problem in whether the world's food production system will be able to feed so many people while the stock and quality of natural resources are declining. According to the World Food Summit hosted by Food and Agriculture Organization (FAO) in November 1996, the number of hungry people in the world reached 840 million and there could still be some 680 million hungry people by the year 2010 if well-targeted actions are not accelerated to improve food security. Moreover, United Nation Report on the world environmental status, GEO-2000, makes it more clear that if the present trends in population growth, economic growth and consumption patterns continue, the natural environment will be increasingly stressed.

Most of the poor are living in developing countries (more than 250 million of whom would be in sub-Saharan Africa). In case of Indonesia, although the number of people living in poverty could be reduced from 40.1 percent of the population (54.2 million) in 1976 to 11.3 percent (22.5 million) in 1996, but at the end of 1998, the number of Indonesian living in poverty had raised again and reached almost 50 million or 24.3 percent of the population. This condition will cause a serious threat on environment because poor people usually have no other choices in their lives but to exploit their environment. They will get anything from their surrounding to survive without any consideration on the environment. As an example, in Indonesia, deforestation has reached about 2 million hectares a year; and about 1 million hectares of arable land for agricultural activities has been unwisely allocated for non-agricultural activities such as industry and housing during the past ten years. This reality showed that the development is unsustainable and the people will live in food scarcity condition. And finally, poverty will lead to the situation in which people live in a chronic under-nutrition and lost generation will come thereafter.

According to FAO, failure in creating a sustainable development is principally caused by a low productivity in agriculture that frequently cause in part by policy, institutional and technological constraints. In order to create a world without hunger and people live in a sustainable food security system, a top priority should be addressed on increasing agricultural productivity in the frame of sustainable development. Therefore, redesigning sustainable development on food and agricultural system especially for developing countries is essential.

Objective of this international conference is to get some new information, concepts, models, experiences, and paradigm in policy, research, education, and industry to build a new design of sustainable development on food and agricultural system, especially in the developing countries.

This conference is conducted as a part of the 40th anniversary of the Faculty of Agricultural Technology, Gadjah Mada University. On behalf of the organizing committee I would like to express my sincere appreciation to all sponsors, invited speakers, participants and colleagues for their support.

Organizing Committee
Chairman,

Dr. Djagal W. Marseno.

Welcoming Address from the Dean of the Faculty of Agricultural Technology – Gadjah Mada University

The Excellency Ministry of Agriculture Indonesia
Rector Gadjah Mada University
Distinguished invited speakers, guests and participants
Ladies and gentlemen,

First of all I would like to welcome you to the Faculty of Agricultural Technology Gadjah Mada University. It is a deep and great pleasure for us to have you today in the **International Conference on Redesigning Sustainable Development on Food and Agriculture System for Developing Countries**. This conference is a part of the activities for celebration of the 40th years Anniversary of the Faculty of Agricultural Technology Gadjah Mada University on September 19, 2003.

The activity of Agricultural Technology covers knowledge to utilize, to process and to manage the natural resources and biomass in agriculture for human needs and human welfare that environmentally sustainable, friendly, clean and healthy. The agricultural technologists enhancing the nation development through agroindustry. In this opportunity therefore, the Faculty of Agricultural Technology pointed out that the program of redesigning sustainable development on food and agriculture is very Important. By this conference we do hope that we get some new information, concept or models, experiences, and paradigm to build a new design of sustainable development on food and agricultural system, especially for our country. Agricultural development of the country has been very promising. The agricultural products have potential to grow its export volume as raw material for industry or other industries. Agro-promotion policy has been the most important issue in the 5 years economy development plan of the government. Therefore, agricultural development must design in such a way, so that its competitive role can be significantly improved. In addition to intensifying the primary activity of agricultural sector, its competitiveness should be created through agribusiness and agro-industrial oriented development.

We do hope this conference will have a fruitful results to built a new design of sustainable development on food and agricultural system that may useful for our country.

Prof. Dr. Kapti Rahayu Kuswanto
Dean of the Faculty of Agricultural Technology GMU

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PROCEEDING INTERNATIONAL CONFERENCE On
Redesigning Sustainable Development On Food and Agricultural System for Developing Countries
September 17-18, 2003 – Gadjah Mada University, Yogyakarta, INDONESIA

SYSTEM DYNAMICS MODEL OF SUSTAINABLE AGRICULTURE: THE CASE OF INDONESIA

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ABSTRACT

Growth, equity, and stability of farming system are recognized as sustainable factors in agricultural sector development. The specific objective of this research are to identify a dynamic feedback relation and to develop a system dynamics model of sustainable agriculture for the case of Indonesia. The proposition is that growth, equity and stability programs have been poorly and inadequately managed, resulting in many imbalances situation. The proposed sustainable agriculture model will be presented by reinforcing and balancing feedbacks; assuming that agricultural production affects farmers' income level and its productivity positively. However, production (with delay) has an effect on productivity in negative way unless agricultural technology is used. Increases in production will increase income per capita of farmers which will change their educational levels, technology use, and agricultural productivity. Over the time horizon of interest the higher income will change the average educational level and it will affect the systematic shift of farmers to non-farm labor. The study generates a conceptual model of sustainable agriculture, as a way to gain better understanding of the dynamic relation leading to sustainable agriculture. Although empirical validation has not been established, the study concludes i.e: (1) Growth, equity and stability are factors to be measured in the context of the sustainability of agriculture; (2) From the conceptual model, investment in agricultural sector to provide proper capital and technology in the sector was central to the growth of agricultural productivity; (3) In order to achieve equity in economic activities, government intervention is required mainly by establishing and controlling the ratio of the average income in agricultural and non-agricultural sector. This ideal ratio will control the reinforcing loop in the non-agricultural sector, thus economic stability in agricultural sector is maintained. As further study using empirical data is needed to validate the model, extension to a more complex variables along the model justification are required.

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