

The Production Leveling-off Versus Exploding Demand for Maize in Indonesia

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Abstract: In Indonesia, maize is the second most important crops after rice and a major component of animal feed, accounting for about 51% of feed ingredient. Domestic maize demand for food and feed industries grew faster than its production. This article is aimed to review the past and current status as well as the future prospect of maize in Indonesia, based on the last 41 years time series data. Our study showed that most of the maize (about 64%) is used for food, including direct food and manufactured food, and about 22% is used for feed industry. In recent years the total demand of maize for feed and food industries has increased substantially. On the other hands, maize production grew slower than its demand, and tended to leveling-off. Since, the slow growing production could not meet the domestic exploding demand, it is projected that Indonesia will have an increasing deficit of maize. To reduce maize deficit, there is a need of some strategic steps, such as (i) intensive promotion of the use of hybrid seed, (ii) development of fair partnerships among seed growers, seed companies, maize farmers, feed millers and food factories, (iii) providing farmers with subsidized and simple credit and (iv) strengthen farmers group to improve their bargaining power. Otherwise, maize production will continue to leveling-off while its demand is exploding and Indonesia will be more dependent on maize import.

Key words: Production, Leveling-off, Demand, Maize, Feed, Food industry

Introduction

The changes in per capita income, population growth and urbanization are the driving factors in changing the diets of billion of people toward animal products in developing countries, especially in Asia (Hutabarat, 2003). With increase in demand of animal product the utilization of feed grain also increases as feed grains are raw materials for animal feed. In Indonesia, maize is a major component of animal feed, accounting for about 51% of feed ingredient (Tangendjaja *et al.*, 2003). Maize is also the second most important food crops after rice, as indicated by the percentage of area planted to maize (about 19% of the total area planted to food crops). Rice occupied about 61% area (Kasryno, 2002). In terms of utilization, the Maize Balance Sheets data showed that in 2002 about 64.4% of maize was used for food, including direct food and food industry and about 22% for feed industry.

Maize Production

During past four decades, maize production in Indonesia grew at an average rate of 3.61% per year. The growth was mostly attributed to yield growth, accounting for 2.99% per year, and about 0.63% was contributed by area growth. The highest growth of maize production occurred during the 1980 ~ 1990 period, due to relatively high growth of both area planted to maize and productivity per unit land. A high growth of yield indicated a good progress of technology, especially the use of high yielding varieties (HYVs), consisted of composites and hybrids. The 1980s era was the early stage of introduction of hybrids. Maamun (2001) reported that during 1980 ~ 1989 at least 15 HYVs (consisted of 9 composites and 6 hybrids) were introduced. The use of HYVs has increased consecutively. Nugraha and Subandi (2002) reported that in 2000 about 75% of maize area in Indonesia was planted to HYVs, con-

sisted of 47% composites and 28% hybrids. Unfortunately, most of them were recycled seed.

The trend of maize area, production and yield in Indonesia is presented in Figure 1. The growth of area planted to maize was fluctuated. For the last five years, area planted to maize is decreasing (- 1.40% per year). The study of Subandi (1998) reported that price instability at farm level has discouraged farmers to produce more maize, especially in the regions of no

existence of food and feed industries. This report was consistent with the study of Timmer (1987) in East Java who reported that demand for maize from feed mills was the key to price formation. The study done by Swastika *et al.* (2001 and 2004) indicate that the constraints of farmers to grow maize were high price of inputs, low price of maize grain especially during harvesting season and less access to feed and food industries.

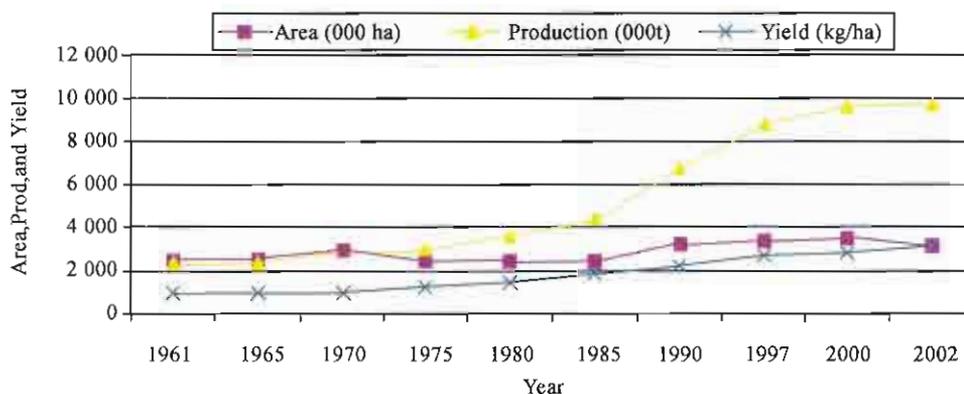


Figure 1 Area, production and yield of maize in Indonesia, 1961 ~ 2002

Maize Demand

Use of maize for direct human consumption was declining or grew at a rate of - 1.51% per year, while per capita income grew by 7.12% per year, indicated that maize is considered as inferior if it is consumed as grains for direct food. During the economic crisis (1997 ~ 2002), when per capita income declined by 3.72% per year, maize consumption for direct food increased by 2.87% per year. It confirmed the less preference of maize as a direct food. On the other hand, use of maize for feed industry increased from only about 0.27 million tons (12.38%) in 1961 to about 3.07 million tons (31.22%) in 1997 and then declined to 2.39 million tons (22.19%) in 2002. The starting point of reduction was in 1997, when the economic crisis just began. It was mainly attributed to the contraction of livestock industry, especially poultry, as well as feed industry during the economic crisis.

The highest growth of maize demand was for food industry, such as for maize flour, coffee mixed,

cooking oil, snacks, sugar free sweetener, pop corn, corn flake etc. It was rapidly increasing from about 0.36 million tons (16.84%) in 1961 to 6.20 million tons (57.47%) in 2002. An increase in per capita income, in combination with improvement of nutritional knowledge and technology, resulted in an increase in demand for manufactured food that uses maize as a raw material. For example, the educated and rich people have more demand for non-cholesterol cooking oil and sugar free sweetener, which use maize as raw material. Thus, maize is no longer considered as an inferior food when it is consumed as processed food. Keeping in view the trend of maize usage (Figure 2), there was a structural change of maize consumption from direct food toward feed and food industries. With increase in per capita income and knowledge of people regarding dietary and nutrition, the demand for livestock products and processed food is steadily increasing. Therefore, maize demand for feed and food industries in the future is expected to be substantially increasing. Further con-

sequence is that there will be a competition in terms of demand for maize, between feed mills and food industry. In view of this there is a good prospect for farmers to increase maize production both as feed and food crops. The important question is then, whether

or not Indonesia will be able to meet its domestic exploding demand for maize, following the rapid growth of feed and food industries? The answer will be depending upon efforts to encourage farmers to grow more maize using modern technology.

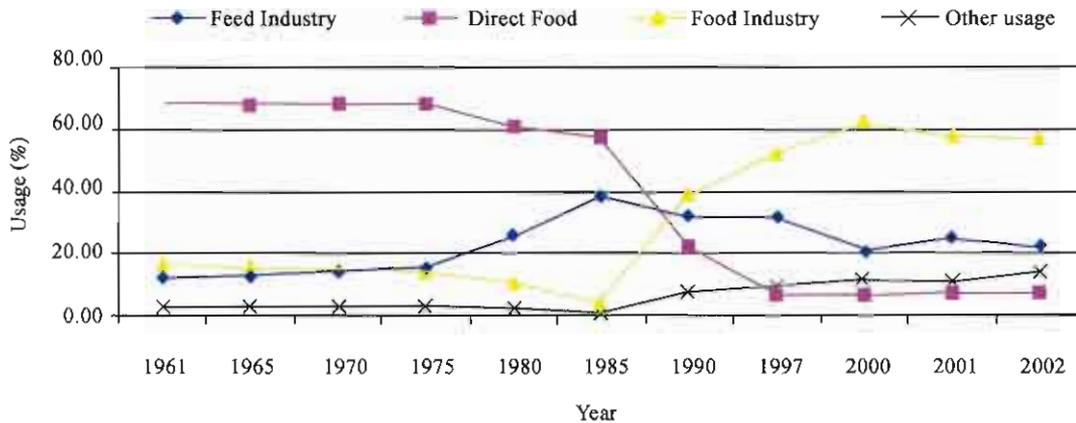


Figure 2 The utilization of maize in Indonesia, 1961 ~ 2002

Maize Trade

Until 1975, Indonesia was self sufficient on maize with the sufficiency indices of greater than 1.0 (Swastika, 2002). However after 1976 up to presence, Indonesia has become a maize importing country, with the peak of 1.26 million tons during year 2000. For almost three decades, maize import increased at an average rate of 22.3% per year, while export declined by 6.02% per year. There should be policy efforts to encourage farmers to grow maize by providing some incentives, either through input subsidy or price support; although it contradicts the WTO agreement. The negative growth of maize area and a declining growth of maize production should be considered as a warning that Indonesia is facing with production leveling-off, while domestic demand is exploding. In future, it will be difficult to find maize in relatively thin world market. Pasandaran and Kasryno (2003) and Kasryno (2003) reported that maize trade only about 13% of the total world production. Another 87% of maize production is currently consumed by the producer countries. Japan, South Korea, Taiwan and Mexico are the four biggest maize importing countries. They import al-

most 45% of the total maize trade in the world for the last decade (Swastika *et al.*, 2005).

Projected Balance of Production and Consumption

The projection is done by using growth trend during 1990 ~ 2002 in production (3.05% per year) and consumption (4.19% per year), and applied for their future growth. The estimation is applied by assuming that the future growth will be approximately following the last decade growth of production and consumption. The results are presented in Table 1, which shows that maize production is projected to increase from 9.65 million tons in 2002 to 12.28 million tons in 2010 and 16.58 million tons by 2020. On the other hands, the demand for maize is also projected to increase at a higher rate from 10.79 million tons in 2002 to about 14.99 million tons in 2010 and 22.59 million tons by 2020. Thus, there will be a deficit of about 2.71 million and 6.01 million tons in 2010 and 2020, respectively. Therefore, without any breakthrough in technology and economic policy, Indonesia will not be able to

meet its domestic exploding demand for maize from domestic production.

Table 1 The projected production and consumption of maize in Indonesia, 2002 ~ 2020

Year	Production (× 10 ³ t)	Consumption (× 10 ³ t)	Surplus/deficit (× 10 ³ t)
2002	9 654	10 792	- 1 138
2005	10 565	12 206	- 1 641
2010	12 277	14 986	- 2 710
2015	14 267	18 401	- 4 134
2020	16 579	22 592	- 6 013
Growth (%)	3.05	4.19	

Source: author's projection

Conclusions and Policy Implications

Based on the above results and discussion, our conclusions are as follows:

1. Maize consumption changed structurally from direct food to feed and food industries, due to an increase in per capita income and knowledge of people about dietary food. Maize is considered as inferior food if it is directly consumed, however, it is no longer inferior when it is processed into manufactured food.

2. The rapid growth of poultry industry as well as food industry resulted into substantial increase in demand for feed, and finally mounting demand for maize as a major component of feed and a raw material for food industry.

3. After 1975, the growth of maize production could not meet the growing demand for maize. Therefore, Indonesia has become an importing country for maize.

4. Presently, maize production in Indonesia tends to leveling-off, while its demand for both feed and food industries is exploding. Therefore, in future without a significant breakthrough, Indonesia is projected to have an increasing maize deficit.

To reduce the dependency of Indonesia on maize import, there should be some strategic policy efforts, such as: (i) intensive promotion of the use of high yielding hybrid seeds, (ii) development of a fair partnership among seed growers, seed companies, maize farmers, feed millers and food factories, (iii) helping

farmers with subsidized and simple credit and (iv) strengthen farmers group to improve their bargaining position.

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