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**TOWARD SUSTAINABLE FOOD SECURITY: THE NEED
FOR A NEW PARADIGM**

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between

CASER (Bogor) • CIES (Adelaide) • CSIS (Jakarta) • RSPAS (ANU, Canberra)

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**CASER/CSIS/CIES/ANU
joint research project on**



**Policy analysis of linkages
between Indonesia's agricultural
production, trade and
environment**

Rapid economic growth in Indonesia has been accompanied by significant structural changes, including for its agricultural sector and its unique natural environment. Recently questions have been raised about the impact of Indonesia's agricultural, industrial, trade and environmental policies on sustainable rural development. The nature of interactions between the economic activities of different sectors and the environment are such that an intersectoral, system-wide perspective is essential for assessing them. An international perspective also is needed to assess the impact on Indonesia of major shocks abroad, such as the implementation of the Uruguay Round agreements, APEC initiatives, or reforms in former centrally planned economies. There is increasing pressure on supporters of liberal trade to demonstrate that trade reforms at home or abroad affecting countries such as Indonesia will not add to global environmental problems (e.g., deforestation, reduced biodiversity). Again, this requires system-wide quantitative models of the economy and ecology, because typically there are both positive and negative effects at work, so the sign of the net effects ultimately has to be determined empirically.

To begin to address these issues, the Australian Centre for International Agricultural Research (ACIAR) has generously provided funds for a collaborative 3-year project (to mid-1999) involving the University of Adelaide's Centre for International Economic Studies (CIES) as the lead institution, Bogor's Centre for Agro-Socioeconomic Research (CASER) which is affiliated with the Ministry of Agriculture, Jakarta's independent Centre for Strategic and International Studies (CSIS), and the Economics Division of the Research School of Pacific and Asian Studies (RSPAS) at the Australian National University in Canberra. Being based on Indonesia with its rich diversity of environmental resources (and on which there are relatively good data) and its rapid economic growth, the project could also serve as a prototype for similar studies of other developing countries in Southeast Asia and elsewhere.

The key objective of the project is to assess the production, consumption, trade, income distributional, regional, environmental, and welfare effects of structural and policy changes at home and abroad particularly as they will or could affect Indonesia's agricultural sector over the next 5-10 years. Among other things, the analysis will focus both on the effects of economic changes on the environment, and on the impacts on Indonesia's agricultural production and trade of resource and environmental policy changes. The implications of regional and multilateral trade liberalization initiatives and Indonesia's ongoing unilateral trade reforms will be analysed, along with other potential domestic policy changes and significant external shocks such as the entry of China and Taiwan into the World Trade Organization. The analysis will draw on and adapt computable general equilibrium (CGE) models such as the national INDOGEM Model (built as part of an earlier ACIAR project) and the global GTAP Model.

The project is being undertaken in close collaboration with the Indonesian Ministry of Agriculture and ministries involved in trade, planning, and the environment. A Research Advisory Committee has been established to encourage close collaboration of representatives from those and other ministries.

ACIAR INDONESIA RESEARCH PROJECT

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Introduction

It was really an irony that while Indonesian government was still in euphoria of enjoying international community praises for its success to achieve rice self sufficiency, which was apparently considered as a valid indicator for national food security, Indonesia once again plunged into a severe food crisis. The primary signals of the food crisis were quite eminent as shown by panic food buying in January 1998, excessive price hikes (January - September 1998), and extensive food lootings. The government has admitted that the food crisis is indeed very severe. According to official prediction, about 40 million or 20 percent of the total population have been suffering from hunger (Kompas 2 July 1998). UNICEF predicted that the prolonged economic crisis could cause 50 percent of the 23 million Indonesian children suffering from severe malnutrition problems (Kompas, 26 July 1998). Prompt government action along with international community supports to set up a strong and extensive social safety net system has been instrumental to prevent the food crisis worsening into an acute hunger and devastating famine.

Whatever the underlying causes are, the incidence of food crisis is an empirical evidence of food insecurity. The present food crisis is an unrefutable proof that the Indonesian long-term food policy has failed to achieve the objective of sustainable food security. By definition, a sustained food security exists if *access by all people to adequate diet for a healthy and productive life is always secured at all times*. A sustained food security must be able to sustain any disturbances, including any severe natural disasters and economic turbulence. It is true that harvest failure caused by the El-Nino phenomenon and entitlement failure caused by the economic crisis are the underlying trigger of the present food crisis. But saying that the food crisis is an '*unavoidable disaster*', and hence should be accepted as a warning from God, is indeed misleading and counter productive. With this argument, government policies will be misleadingly focused on temporary food crisis relief program, without touching the underlying causes of the food insecurity.

Although it might be harsh to some, but with due respect, I shall brave myself to use 'the reformation spirit' to argue that the 'present Indonesian food crisis is caused by accumulated government food policy failures'. The underlying cause of the policy failure is basically persistent use of a wrong paradigm, namely 'rice self-sufficiency approach'. This is a variant of the food availability approach which has been proven can not assure food security (Sen, 1981; 1988; 1991; Locke and Ahmad-Esfahami, 1993). As an alternative, a new paradigm toward sustainable food security is proposed in this paper for further discussion.

Inherent weakness of the previous policy

Poor governance: kleptocracy

Perhaps, the most fundamental weakness of the previous food policy might be its objective which was seemingly directed primarily toward the achievement of political and economic stability rather than sustainable food security in the sense secured access by all people at all times to adequate diet for a healthy and productive life. The basic tenet of the New Order regime has been that 'political and economic stability is the necessary condition for national development, whereas assured availability of rice, the primary staple food in the country, at low and stable price is the condition for the political and economic stability'. In other words food policy was more directed as a national security instrument rather than a food security instrument. The emphasis on political and economic stability, or national security, was indeed a legitimate objective in early period of New Order regime (second half of the 1960's) because at the time Indonesia was facing a devastating political and economic chaos. The country was facing political disorder, food shortage, and stagflation. Provision of sufficient food and reducing price of goods were two most pressing public demands for the survival of the New Order regime.

Since rice has been the main staple food, wage good, and price indicator for many other goods then consistent with political and economic stability objective food policy has been centred around rice. The strategic roles of rice for political and economic stability was described by Timmer (1989) as follows: "The chaotic conditions also generated wide spread support for measures to stabilise the economy, and this meant rice is the barometer of the economic situation in Indonesia. To most Indonesians, no return to normalcy was possible without price stability in rice prices". Accordingly, rice price stabilisation has been used as the foundation of strategic design for food security. In fact, food security and rice price stability were assumed synonymous (Falcon and Timmer, 1991). Since rice price in international market, where Indonesia was the largest buyer, has been highly unstable then the domestic market must be insulated from the international market. This was achieved by monopolising rice import and domestic distribution and by gradually reducing rice import through increasing domestic rice production. The long-term food security strategy therefore, was rice self-sufficiency.

Management of national rice distribution and price stabilisation is indeed a heavy task and should be conducted by a specialised agency. Indonesia Food Logistics Agency (BULOG) was then founded in 1967 with two main tasks; (1) stabilisation of rice prices, and (2) provision of monthly rice rations to the military and civil service. This again shows

the intertwined of food security and political objectives. The first task is the real instrument for national food security, whereas the second task might be designed for the ruling government political security. Military and civil service workers, the government bureaucratic machinery, were given the privilege of guaranteed food security in order to keep their loyalty to the ruling government. In the latter years, the BULOG's mandate was expanded to include monopoly on sugar, wheat, soybean and soymeals, corn, and a number of lesser commodities. BULOG becomes a huge organisation and large volume of businesses with monopoly power which creates ample opportunities for rent seeking activities through corruption, collusion and nepotism or KKN. KKN is widely considered to be a strategy used by the New Order regime to maintain its power (Kholifah, 1995).

Rice self-sufficiency was also not only a matter of food and economics, but also political and individual prestige as well. The political strategic value of the rice self-sufficiency arose from the fact that rice self-sufficiency has long been a governments' obsession since 1930's (colonial era). Moreover, Indonesia was the longest rice importer in the world. Rice self-sufficiency was then presumed to be a prestigious achievement of the ruling government. This was indeed perfectly true. President Soeharto was praised by national and international communities for 'his government administration' success to achieve rice self-sufficiency in 1984. Food and Agricultural Organisation (FAO) gave him a medal for the great achievement. No wonder, rice self-sufficiency was a President Soeharto's personal obsession and that was the main reason why it had always been the top priority of agricultural development during the New Order regime.

Indeed, there is nothing wrong with the government (President) self-interests as long as it is consistent or better yet articulate with the national food security objective. Although it appears to be costly, government strong commitment for rice price stabilisation is a sound food security policy because it has proven to be welfare enhancing at least up to 1980's (Timmer, 1992; 1996). Strong personal interest greatly enhanced government commitment to push rice production to achieve rice self-sufficiency as soon as possibly can. The government had poured huge budget for land development, input subsidies and price support, credit subsidies, and infrastructure development which were instrumental for rapid growth of rice production and eventually leading to the achievement of rice self-sufficiency in 1984.

But, the New Order regime, however, had been lacking of public accountability and hence transformed itself into a 'kleptocracy' *a term to characterise a governance in which those who run the government seem largely concern to enrich themselves* (Van Arkadie, 1989). As mentioned before, BULOG monopoly on food procurement and

distribution had induced KKN practices. BULOG was considered as money making machine for both in individual and the ruling political groups. Some even said that the real reason behind replacement of the BULOG chief in August 1999 was a fighting among some ministers in the cabinet over the choosing of which private companies should be given the rights for rice importation (Widyanto, 1998). The KKN practices, of course, make food security management is highly inefficient and fails to achieve its primary objective namely to secure adequate food to all individuals in the country. The most ironical one is the fact that the food crisis in 1999 was partly caused or greatly worsen by wide practices of illegal selling of rice delivery orders (DO) that led to speculative stock accumulations and illegal exports which created supply shortages and price surges in some local markets (Wahyuana dan Yuniyanto, 1998). In other words, Indonesian food crisis in 1998 was partly caused or at least worsened by poor governance of national food security systems which was plagued by kleptocracy disease.

As will be discussed in the next section, rice self-sufficiency is not an appropriate policy for sustainable food security. Rice self-sufficiency does not imply food security. The rice self-sufficiency was also proven to be unsustainable. Indonesia has become a rice deficit country again since 1988/89. The latest President Soeharto 'big push' investment initiative to retain the rice-self sufficiency by launching the 'Peat Mega Project' to develop about one million hectares of rice field in Central Kalimantan was also considered plagued by kleptocracy and hence terminated by the new Reformation government in 1998. In general, we may say that personal interests, kleptocracy in particular, have tampered the government serious attempts to develop a sustainable food security systems in Indonesia.

Lack of public accountability

The New Order government was based on a centralistic command system. Complete loyalty to the boss is the necessary condition for subordinates career security. The basic job operating rules were: *wait or ask the boss directions first, do not argue but just do as the boss said, report good things only to make the boss happy, and do not interfere but mind your own jobs only* (culture of ABS = *Asal Bapak Senang*). All of the government employees must be in unity to protect, defend and execute the central government policies. This bureaucratic culture along with inexistence of opposition groups has made the government officials mainly concerned about '*boss accountability*' not '*public accountability*'. We certainly believe that the lack of public accountability is one of the main reason for the government failure to set up a sustainable food security system leading to the 1998 food crisis. It was the lack of public accountability that flourished kleptocracy

practices which has been undermined national food security system. The lack of public accountability has allowed the rice self-sufficiency to persist although it may not be an appropriate policy for sustainable food security objective. It was the lack of public accountability that allowed diversion of the government agency orientation from 'public service' to 'the boss service' or self-interest.

Because it was president Soeharto decree, all related government agencies must protect, defend, and execute the rice self-sufficiency program. Rice production growth become an indicator of job performance of regional (provincial, regency, and district) officials. Farmers were forced to produce rice with recommended technology even though it might be against their will. If necessary, security forces may even be used to destroy the farmers' farming field if they were dare enough to refuse the government directions. Rice farming was not based on voluntary participation. In this respect we may say that food security program may have been a stigma for the farmers. It was more directed for consumers food security without due consideration on farmer's food security. Wide spread of food lootings in rural areas during the 1998 food crisis was a good indicator of the vulnerability of the farmer's food security.

Because it is related to their job performance and the culture of 'report the good things only', government officials would hide or iron-out 'unpleasant' food statistics. Government officials were hyper reactive to 'bad news'. As an example, when national mass media reported the FAO/WFP mission report in April 1998, that 7.5 million people in 15 provinces are likely to experience acute food shortages unless food assistance is provided (FAO/WFP, 1998), government officials then immediately busy denying its accuracy. Using official statistics, government officials had argued that instead of facing acute food shortage, Indonesia would enjoy rice surplus in 1997/1998. But in reality, Indonesia imported more than 4 million tons of rice and faced a serious food crisis in 1998.

'Bureaucratic culture of *report the good things only and counter the bad information*' has also undermined Indonesia food security. First, it covers up any imminent danger of food insecurity hence abolishes food security monitoring and early warning systems. Inexistent of monitoring and early warning system was the main reason why the 1998 food crisis was seemingly undetected. Failure to anticipate the food crisis has made the government and public at-large were not well prepared and failed to develop a strong crisis prevention systems. Consequently, they were over reactive to early signals of the food shortages. This has created both policy and market panics leading to self-realisation of the food crisis.

Secondly, it covers up the real need to develop a strong social safety net systems. This failure has made the impact of the food crisis was so quick and devastating. As mentioned before, the food crisis have made 40 million or 20 percent of Indonesia population suffering from hunger. We should note that by definition, social safety net systems is a risk coping mechanism and hence should always be in place before the crisis erupts. Accordingly, the presently implemented social safety net program is more a crisis relief program rather than a safety net program. It should have been implemented some years ago.

Third, it undermines government information credibility. Food market panics and speculative accumulation, the trigger of the 1998 food crisis, were mainly caused by inexistence of public trust on government information. Even though some cabinet ministers and the head of BULOG had been repeatedly announced in national mass media that BULOG has sufficient food stock to meet any rice demand and that rush buying was unnecessary, consumers and traders were not convinced at all. The government has been seemingly losing its credibility. Excessive speculative stock accumulation was the trigger of food crisis eruption in January 1998.

Fourth, inexistence of reliable data on food vulnerable households has made it difficult to set up a targeted food relief program in an attempt to alleviate the effects of the food crisis. This is one of the main constraints faced by the government in implementing the present social safety net program. In addition, there are conflicting figures on the number of poor people which are supposed to be the target of the social safety net program. The International Labor Organisation (ILO) and the Central Bureau of Statistics (the government version) are 49 and 40 percent of the population respectively, whereas the World Bank estimate is only 14.4 percent of the population. Ironically, a prominent economist accused that the government purposely inflated the number of the poor in order to justify huge budget allocated for the social safety net program (Kompas, 9 February 1999).

Fifth, inexistence of reliable data and information has made it impossible to get accurate food policy analysis and long term planning. This must also be contributing to the government failure to develop a sustainable food security systems. Worst yet, different agencies may have different data sets and hence come up with different (conflicting) analysis and policy proposals and then finally end up with open polemic among themselves. This may lead to a wrong policy. An example on this was on the need for rice importation. The polemic delayed rice importation which also contributed to the burst of food crisis 1998.

Inexistent of pressure groups and free press

Political pressure groups and free press were not tolerated to exist during the New Order regime. There has been no effective political party opposition, while non-government organisations (NGO) were tightly controlled. Jail threat as well as political and economic isolation had been effective to suppress the existence of critical opinions. Mass media were controlled under the ideological camouflage 'Pers Pancasila'. Publishing critical news and opinions were considered to be 'unresponsible' and 'hindering national development progress' and hence deserved pre-emptive punishment 'dead penalty' by terminating the mass media publishing permit. The existence of political pressure groups and free press had been the main reasons for the sustained practice of intransparency and kleptocracy, lacking of government public accountability, and erosion of government public credibility. As we discussed in the previous section, these are governance diseases that hamper the national food security systems.

We should also point out that inexistent of political pressure groups and free press was also the main reason why government policy has been biased against the farmers in favour of consumers and traders. Unlike consumers, farmers do not have organisation to effectively articulates their political interests. Traders are generally united in a particular trading association with strong political lobby. This policy biased may have negative effects on national food production. It should also be noted that farmers are food consumers too. In fact most of the poor population in Indonesia are marginal farmers. Unfavourable government policies reduce the farmers income and hence their capacity to command sufficient food. It is really a pity that farmers food security has been persistently neglected in the discussion and design of national food security programs.

Inexistent of free press and political pressure groups has made government policies unchecked through an open public debate. This is also the reason why rice self-sufficiency persists as the strategy for national food security program although it may not be the most appropriate one. The government may have been able to tap diverse ideas for a better strategy if there were free press and political pressure groups. Furthermore, inexistent of free press has precluded the strategic roles of mass media as a monitoring, as well as an early warning instrument of the national food security systems.

Narrow and unrealistic conceptual framework

Conceptual misinterpretation of national food security may have also contributed to the government failure to develop a sustainable

national food security. The government has been seemingly adopted a very narrow definition of food security namely: *'capability of the country to produce adequate amount of food for all consumers at affordable prices. Since food shortages are quickly reflected in rising food prices, food security is closely related to the government's ability to maintain stable domestic food prices'* (Pearson and Monke, 1991). Furthermore, 'the proximate definition of food security always revolved around price stability, especially for the price of rice, the country's primary food staple. Food security and price stability were synonymous (Falcon and Timmer, 1991). We may say, therefore that this is a *'food stability approach'* to food security.

The definition is clearly based on the food availability approach to food security (Ravallion, 1997). It mainly concerns with price stability at affordable level with three implicit assumptions :

- (1) Food shortages are quickly reflected in rising food prices.
- (2) Affordable prices are sufficient to secure access of all consumers for adequate food.
- (3) Domestic sufficient food production (self-sufficiency) is the most effective way for domestic food price stability (and hence food security).

These three assumptions lead to the main concept that *'self-sufficiency is the proximate definition of sustainable food security'*. This had been the concept of food security used by the New Order regime (Falcon and Timer, 1991, Pearson, Naylor, and Falcon, 1991).

The first assumption, food shortages are quickly reflected in food prices, is based on the neoclassical economic unrealistic assumption that national wide food markets in Indonesia are in perfect competition: perfect information, perfect mobility of goods, nobody has market power, and all participants maximise individual economic satisfaction. The neoclassical economic assumption of perfect market competition does not exist all. Food price signal is not a perfect indicator of food availability. A real fresh example is during the 1998 food crisis. Food prices increased dramatically although there was no food shortages. Food prices increased because of information failure due to the lack of government credibility on actual food stock condition, smuggling, and speculative rational expectation that food prices will be eventually increased as a direct consequence of rupiah hyper devaluation.

The second assumption, affordable food prices are sufficient to secure access of all consumers for adequate food, is also misleading. Logically, access or ability to command adequate food is not only determined by the food prices. Purchasing ability is determine by both price and income. Even food prices are very low, one may not be able to buy adequate food if his income is not sufficient. However, access to

food is not only through market exchange but also through non-market transfer such as gifts and aids. The key for food security is ability to command or entitlement for adequate food, not the food prices perse. This is the argument of the '*entitlement approach*' to food security proposed by Sen (1981), which has been proven superior to the food availability approach in explaining various incidence of famines (Sen, 1991; Lock and Ahmadi-Esfahami, 1993). Accordingly, price stability is not synonymous with, nor even a good proximate definition of, food security.

The third assumption, food self-sufficiency is the most effective way for domestic food price stability, is not always true either. Certainly, if self-sufficient in food, a country may insulate its domestic food markets from international markets without worrying about national food shortages. This would prevent the international food price instability passes through the domestic markets. Self-sufficiency also provides maximum autonomy and hence reducing vulnerability to other international social and political pressures which may also beneficial for domestic price stability. But, domestic price fluctuation is not only determined by international price or import. Domestic food production is not really perfectly stable. Indonesia food production, for an example, has been vulnerable to abnormal climate phenomena and pest attacks. On the other hand, some countries, Singapore as an example, do not have food security problem although they are heavily dependent on food imports. Accordingly, food self-sufficiency does not guarantee domestic food price stability nor food security.

Beside the unrealistic assumptions, we should emphasise that the failure to address income and non-market mechanism roles in food access is the second fundamental weakness of the old paradigm which has had great contribution to the food security program failure. Food security program does not include households income promotion element. This is one of the reason for the emergence the 1998 food crisis. As discussed by Fagi and Simatupang (1998), the 1998 food crisis is an economic crisis induced rather than food availability decline induced. There was actually no shortage of food supply, but many households just did not have sufficient income to buy food they need. Sharp declining food purchasing power of many households, due labor lay-offs, income reduction, and food inflation, was the real culprit of the food crisis.

The food price stability approach to food security is basically a pure market exchange system. It precludes the existence of non-market mechanism as an important source of food access. This line of thinking has, indeed, had devastative effect on the design of food security systems Indonesia. Both formal and informal social security systems have been neglected as important elements of national food security

systems. Many indigenous institutions and knowledge, which had been historically proven quite successful to construct sustainable food security systems in rural areas, disappeared (Anwar, 1996). On the other hand, formal social food security systems has not been developed. Inexistent of social security systems was one of the reasons why economic crisis immediately induced food crisis in 1998.

The third conceptual weakness of the old food security paradigm is its failure to address the importance of local and household dimensions for individual food security. It mainly concerns on national wide food security. However, experience shows that while national food security is necessary, but it is not sufficient to guarantee local and households food security (Alamgir and Arora, 1991). The market based-nationally focused food security approach neglects remote local areas. This failure has caused very bad causalities. *While there was plenty of food available nationally, but many Indonesian citizens in Irian Jaya were dead suffering from a severe famine in 1997.* This paradigm creates ‘hunger paradox’.

The fourth conceptual weakness of the old food security paradigm is that it involves policy dilemma (Timmer, 1986; Timmer, Falcon, and Pearson, 1983). It requires to promote domestic production for self-sufficiency while keeping prices stable at affordable level. In a country where a large portion of its population are still poor, ‘affordable price’ means low price. The low food price policy is good for consumers. Keeping food prices low, however is not conducive for domestic food production and for increasing farmer’s income. Low food price policy is not good for farmers and food self-sufficiency. Moreover, keeping food prices low while promoting the food production requires government subsidies. This is the reason why the old food security programs has been very costly to the government budget. Increasing budget burden can not be sustained economically and difficult to defend politically. Accordingly, the old food security strategy can not be sustained for both economic and political reasons.

The cheap food price strategy is biased toward consumers benefit at the expense of the farmers. But a large number of the farmers are still poor. In fact, most of the poor in Indonesia are farmers. Accordingly, the old food security program is contradictive with the poverty eradication program. In addition, the old food security program is not fair because hurts the farmers which are already poor. It is not consistent with income equity objective either.

Dilemmatic strategy and policy

Since rice is the primary staple food, then in line with the conceptual framework, the national food security has been mainly

focused on rice availability at affordable prices. The food security policy was based on the following twin-strategy :

- (1) Short-run strategy : rice price stabilisation
- (2) Long-run strategy : rice self-sufficiency

Rice price stabilisation

Rice price stabilisation has been conducted by effective controlling the whole chain of rice marketing distribution through national wide integrated management of BULOG. This was done through the following means :

- (1) Monopolisation of rice import.
- (2) Paddy price control by setting floor price and using domestic procurment operation as the operating policy instrument.
- (3) Rice price control at the consumer level by setting 'target price' or 'ceiling price' and conducting market operation as the operating policy instrument.
- (4) Controlling rice wholesale traders through 'quasi mutual cooperation': BULOG provides the traders with rice supply allocation at assured minimum profit but the traders must be responsible to assure rice availability at the targeted prices in the designated regions.
- (5) Developing national wide rice storage houses and always maintaining sufficient rice stock for price stabilisation.
- (6) Providing routine rice allocation for civil service and military as part of their in-kind monthly salary.

The comprehensive policy device has been quite successful to effectively stabilise domestic rice price. But indeed, the rice price stabilisation policy is very costly and some annalists have been doubtful of its economic feasibility (Jonnie, 1995). But, Timer (1992, 1996), however, argued that critics against the rice stabilisation policy has been unfounded because they were generally based on partial analysis and failed to capture the whole strategic roles of rice stabilisation for macroeconomic development and political stability. He has proven that price stabilization policy was indeed feasible economically. Ravallion and Van de Walle (1991) also argued that to some degree rice price cheap policy is beneficial for poverty alleviation.

It may be true that the rice price stabilisation at low level is feasible economically and beneficial for political stability and for poverty alleviation. But this policy is certainly not sustainable. First, sustained cheap rice price maintains high demand for rice and prohibits consumption diversification. Maintained high demand for rice is not conducive for rice self-sufficiency. In other words, rice price stabilisation strategy and rice self-sufficiency strategy are contradictive

and hence the 'twin strategy' are very costly to implement and will bound to failure too. High dependence on rice consumption will make household food security highly vulnerable to rice price fluctuation or rice availability. This, of course, is not consistent with the very objective of the national food security program. Moreover, if food diversification is positively correlated with food nutrition quality then this policy is also inconsistent with the objective of nutrition security, the more universally accepted concept of food security.

Second, price stabilisation at low level is costly and must be covered with government budget. Since government budget capability is limited, highly dependent on macroeconomic situation and determined through political process, then price stabilisation policy is vulnerable to economic fluctuation and the change of political orientation. Government budget capacity, and hence rice price subsidy and stabilisation capacity, decreases during economic stagflation when rice price subsidy and stabilisation would be needed most. Accordingly, this policy is not quite appropriate to prevent economic crisis induced food crisis like the 1998 food crisis.

Third, price stabilisation at low level involves heavy government interventions. This is inconsistent with the new mood of global political economy toward market liberalization. This policy may not be consistent with the GATT/WTO agreement which has been ratified by Indonesia. Its huge budget requirement and negative impact on farmer's income has also made this policy fails to get strong domestic political supports. This policy is certainly unsustainable politically and will be abandoned in the near future.

Fourth, implementation of this policy provides ample opportunities for kleptocracy practices, which was discussed in previous section. Besides costly to the government, kleptocracy may also render the price stabilisation policy fails to enhance national food security. This is what exactly happened during the 1998 food crisis. In general, the rice stabilisation strategy is dilemmatic (Timmer, 1986), politically difficult to support, creates economic inefficiencies and hence doom to failure.

Rice self-sufficiency

Rice self-sufficiency has been pursued by promoting domestic rice production through the following means:

- (1) Rice producer price support by setting floor price and using domestic rice procurement operation as the operating policy instrument.
- (2) Subsidised fertiliser provision.
- (3) Subsidised credit provision.
- (4) Land development and farm equipment investments.

- (5) Infra structure investments (irrigation, extension, research and development).
- (6) Institutional supports (regulation, government directives).

In general, these policy devices are very strong to make it almost impossible for the farmers to resist for not using their technically feasible land for rice farming although it may not be the most profitable one for them. The main objective is to increase domestic rice production. Increasing farmer's income is merely a secondary objective of this strategy.

The strong and persistent government supports has been successful to increase rice production leading to achievement of rice self-sufficiency in 1984. But this rice self-sufficiency was not sustainable, however since early 1990's Indonesia has become a rice importer again and even has reached its historical long-time peak in 1998. This unsustainable rice self-sufficiency along with the 1998 food crisis incidence are sufficient empirical proofs that rice self-sufficiency is not a suitable strategy for sustainable food security. The fundamental reasons are explained below.

First, paddy floor price at the farm level is restrained by rice ceiling price at the consumer level. But, since government has been leaning toward consumer protection, the rice ceiling price at consumer level dominates the paddy floor price, and hence paddy-rice price policy is directed more for low and stable price objective rather than rice self-sufficiency objective. Paddy floor price is primarily intended to maintain a minimum level of rice farming profitability both for keeping the farmers stay in rice farming and for maintaining a minimum level of farmer's income. Paddy-rice price policy may have been more likely rice self-sufficiency restraining than enhancing.

Second, fertiliser subsidies have induced persistent over-intensification use of fertiliser in rice farming. Fertiliser use has been too high and has caused soil quality degradation leading to reduction of land productivity (Adiningsih, 1997; Christianto, 1997). Growth rate of rice farming productivity has been declining sharply since mid 1980's and even negative during 1994-1998 period. This phenomenon is also true in many other Asian countries (Pingali, Hossain and Gerpacio, 1996). Meanwhile, there has been no new technological break-through since mid 19980's. This also may be the main reason why rice self-sufficiency is not sustainable.

Third, land extensification program is limited by arable land availability, and hence it can not be sustained. In fact, in some areas, especially in Java, rice field extensification program has passed its ecological limits that indicates already exploitation of marginal lands (Christianto, 1997). This again indicates that excessive obsession to achieve and maintain rice self-sufficiency has caused environment

degradation. This is another proof that this policy is not sustainable ecologically.

Fourth, excessive obsession to achieve rice-sufficiency prevents farm diversification which may be beneficial to increase farmers' income and to cope with risks and uncertainties. In this case, national rice self-sufficiency program may have negative effects on farmers' food security. Consequently, since the majority of Indonesian households are marginal farmers, rice self-sufficiency strategy never leads to the achievement of food security for all Indonesian households.

Fifth, like rice price stabilisation, rice self-sufficiency involves heavy government interventions and requires huge government budget which are unsustainable both for economical and political reasons. In general we may conclude that rice self-sufficiency is not suitable for sustainable food security. The excessive obsession to achieve rice self-sufficiency during the New Order regime may even contribute to the failure to achieve sustainable food security leading to the 1998 food crisis incidence.

Macroeconomic policy failures

The other important determinants of national food security are macroeconomic policies. This aspect, however, has been overlooked due to the wrong choice of food security paradigm. The most important one is poverty alleviation policy. By definition, poverty is inability to command adequate basic needs for a healthy, decent, and productive life. Nationally, food is the most important basic need for human living. Accordingly, secured access to adequate food or simply food security for all people is the necessary condition for poverty alleviation. This is why most absolute poverty lines are based on food expenditures for adequate food.

It is true, the New Order regime had been successful to reduce the number of people living in absolute poverty. The number of poor people decreased dramatically from 54.2 million or 40.1 percent of total population in 1976 to 22.5 million or 11.3 percent of total population in 1996. But, a large portion of the population may have been marginally not poor, highly vulnerable to economic shocks. This is the reason why the economic crisis immediately dragged down a large number of population into absolute poverty. Official version indicates that the number of people has reached 79.4 million or 39.1 percent of total population in 1998. This may be the least number of people which are now facing food insecurity problem. We may say therefore that the failure to eradicate absolute poverty directly causes national food insecurity.

Another macroeconomic element which is crucial for national food security systems is Social Security Systems (SSS) or Social Safety

Net Systems (SSNS). It is really unfortunate that SSNS has been neglected as an important element of national development. We may even say that the SSNS is a new term to most Indonesians, introduced by international organisations when they are discussing the rescue programs to minimise the impacts of the economic crisis on human destitution. The limited knowledge and experience may be one the main reasons why the government has been facing difficulty to design appropriate SSNS programs.

While neglecting development of formal SSS, national development process has also destroyed many indigenous informal SSS. Village community food storage (*lumbung desa*) which was one of indigenous food security system to cope with food production risks has long been disappeared because of the food stabilisation policy. Various, indigenous farming systems and communal property rights which were historically proven effective for sustaining food security in village communities have also been destroyed by modern technologies and formal laws (Anwar, 1991). Inexistent of social security systems, both formal and informal, is the main reason why the economic crisis immediately causes severe poverty incidence and then food crisis.

We should also mention that some other macroeconomic policies, such as exchange rate policy, trade policy, credit policy, etc., play important roles on national food security systems. Rupiah, has been overvalued most of the times. This makes food prices cheaper than it should be and then suppresses domestic food production, reduces farmer's income, and increases dependence on food imports. Trade policies have been biased against agricultural sector and hence suppress domestic food production and farmer's income. Credit policy has also not been in favour of food sector development. Moreover, rural credit markets, which is one of income risk coping instrument, have not well developed in most regions. All of these policies have contributed to the failure to achieve sustainable food security in Indonesia.

Towards a new paradigm of food security

In the previous section we have discussed the fundamental weaknesses of Indonesia food security program during the New Order era leading to the burst of food crisis in 1998. The New Order food security program was based, on food availability paradigm which has been proven to be a misleading concept. We have also argued that rice price stability and rice self-sufficiency, the twin food security strategy during the New Order era, is based on an unfounded policy framework. In essence, the New Order food security program was based on an obsolete and misleading paradigm. This is the main reason why the program failed to achieve a sustainable food security. Accordingly, we

need to think about a new more appropriate food security paradigm to replace the old one.

The previous lessons also teach us that good governance is an essential component of food security program. National food security is a matter of political economy. Food security is essential for national economic development and national economic development policies also affect food security. In fact poverty eradication, the main objective of national development is a necessary condition for sustainable food security. Accordingly, food security program must be considered as an integrated component national development programs. Therefore, treatment of food security as a special program, independent from overall national development program, is a wrong policy design. This may be another fundamental weakness of food security program during the New Order era.

In what follows we will discuss some perspectives which are considered critically important to design a new sustainable food security program. We argue that the new 'sustainable food security paradigm' is a better alternative to the old rice price stability cum rice self-sufficiency approach. What we are able to present here is, however, merely rough ideas with an expectation that this will induce further discussion for a more solid and operational concept. Food security is one of the most important national issues that deserves national wide intensive discussion of this country's best intellectuals.

The right to development paradigm

The first fundamental question we should answer before designing a national food security program is what is the motivation, objectives, and basic principle of the program. This question may be answered by identifying and evaluating the values of food security for human being and national development in general. The value of food security can be seen from two views: instrumental view and intrinsic view (Sen, 1988). Instrumental view emphasises the value of food security arises from what it permits us to achieve some valuable goals or to do some valuable activities. The intrinsic view, on the other hand, put more emphasis on the value contains in the food security itself.

In the context of national development, instrumental view emphasises the importance of food security as a policy instrument of national development. In this respect, food security is generally considered of especially important for (Timmer, 1994): (1) Securing social and political stability which are necessary for economic development; (2) Securing economic stability (containing inflation); (3) Controlling wage rate land hence competitiveness; (4) promoting investments (implication of 1-3); (5) improving human resource quality

and hence productivity (impacts of good nutrition). As a whole, food security is considered very important for national economic development and household's income and welfare (Strauss and Thomas, 1998).

Certainly, national food security program bears some operational costs and negative impacts as well. The value of the food security program therefore, is measured by its net benefit contribution. In other words, feasibility of the food security program is based on an economic benefit-cost analysis, like most other economic development programs. In general, the *development instrument view* of food security is basically a pure economic justification of food security program. This view has been adopted throughout the world. The Indonesian food security program during the New Order regime was also based on this view.

Pure development instrumentalists generally argue that the value of food security is limited. It may be a valuable instrument if markets have not been developed well. In a developed market economy, the best food security policy is no food security program. Food security program generally involves heavy government interventions and hence creates market distortions that caused resource misallocations which do more harms than goods for economic development. For them, food security program does not deserve priority position in overall national development programs. This line of thought has been the main challenge for food security program in most developing countries.

The pessimistic development instrument view is, however, rejected by Timmer (1996). Timmer argues that the roles of food security in national development is so diverse and complex which make it impossible to measure empirically. He presumes that the importance of sustainable food security is so great and even a necessary condition for national development. As he puts it 'little development can take place until there is a public perception that food security can be sustained. (And hence) stabilising the food economy and ensuring food security are minimum tasks of government (Timmer, 1997). In other words, sustainable food security program must be placed as the top priority of the national development programs.

Intrinsic view of the importance of food security, however, asserts that food security is valuable in itself, and not only because of what it permits us to achieve or to do something. In this respect, food security, in the sense secure access to nutritionally adequate diet, is necessary to assure a healthy life for all persons in a society. A healthy life is necessary for human life existent as well as human happiness. Preserving human life existent is part of human dignity. The right to life is a universal basic human right. The 'right to a nutritionally adequate diet' or simply the 'right to food' is therefore is a universal basic human

right, without which human life and human dignity can not be sustained (Byron, 1988).

The philosophy that the 'right to food' is a basic human right has been formally accepted universally during the Rome World Food Conference in 1996 which was also ratified by Indonesia (FAO, 1996). This has also been explicitly acknowledged in the Indonesia Food Security Law No.7/1996. Accordingly fulfilment of the human right to food must always be the overriding motive in setting up national food security systems. Economic and political objectives must always be subsidiary to the fulfilment of human right objective. Therefore, sustainable food security must always be the primary objective of national economic development. This is consistent with '*the right to development*' paradigm.

We should note that the right to development paradigm does not neglect the importance of food security as a necessary preconditioning for and an instrument of national development. The instrumental roles enhance people entitlement to food through increasing households purchasing power and domestic food availability as the results of national development. But these instrumental values must always be considered as the by products of the attempt to secure the right to food for all people. In other words, the main motivation in designing food security policy is to promote and protect the right to food for all people.

The right to development paradigm asserts that sustainable food security is invaluable by itself. Conventional benefit-cost method is not appropriate for feasibility analysis of food security program. The choice of food security policy instruments or projects should be based on cost effectiveness criteria (Devarajan, Squire, and Suthwart-Narueput, 1997; Hammer, 1997). The issue is not which instruments or projects give the highest net economic value, but which instruments or projects are the most effective or have the least cost to achieve the objective of sustainable food security. In this respect, the right to development approach to food security also concerns about economic efficiency.

The right to development paradigm extends food security issues beyond economic matters and beyond government responsibility. The right to development paradigm treats food security issue as a matter of human dignity. Consequently, it is the duty of the whole society to protect, defend and support food security program to secure the right to food for all people. This paradigm promotes whole society participation in the food security program. Of course, as the executive body elected by the people, the government is the first held responsible to develop a sustainable food security systems in the country. The right to development paradigm draws strong social and political supports which are necessary for the success of food security program. We may conclude that the 'right to development' paradigm provides a more

stronger basic principles toward the ‘achievement of sustainable food security than the old instrument for development’ paradigm. The right to development paradigm provides the basic principle for sustainable food security program.

Sustainable food security systems paradigm

Definition and performance criteria

The widely accepted definition of food security is ‘when all people at all times have both physical and economic secure access to sufficient food to meet their dietary need for a productive and healthy life’ (World Bank, 1986; Von Braun, et al, 1992; Chung, et al, 1997). The term ‘... at all times’ clearly indicates that ‘sustainability’ is a necessary element of food security. Food security program must not only concern with the needs of the present people for some limited period, but also for future time and future generation as well. It concerns with ‘sustainable food security, not temporary food security.

This definition implicitly includes four elements of food security (Maxwell, 1996): (1) availability; (2) accessibility; (3) vulnerability; (4) sustainability. Vulnerability may be broken down into two component: stability and reliability. Those are the four (or five) performance criteria for sustainability food security.

The sustainable food security paradigm (SFSP) asserts that sufficient food availability is necessary but not sufficient to guarantee food security. Indeed, there will be no food security if there are no sufficient foods available to access. However, although there are plenty of foods available, yet, some people may suffer from hunger or famine because they do not have sufficient access to the foods (hunger paradox). It also fails to recognise susceptibility of food security to various risks (vulnerability). Moreover it does not consider sustainability, the necessary condition for achieving a sustainable food security. This is why food availability approach (FAA) to food security, including food self-sufficiency, fails to achieve sustainable food security in many countries.

Sen (1981) amends the FAA by proposing ‘accessibility’ as another necessary components of food security. Sen argues that ‘entitlement’ or ability to command adequate food is the most important determinant of food security. Access to food can be either, through market exchange or non-market exchanges (aids and transfers). This food entitlement approach (FEA) to food security stresses the importance of household income as well as non-market social and public transfers of income or foods for food security. The FEA has been proven

superior to FAA in explaining hunger and famines in many countries (Sen, 1981; 1988; Locke and Ahmadi-Esfahami, 1991; Ravallion, 1997). We suspect, the Indonesian 1998 food crisis was caused by titlement failure rather than food shortage. But some have criticised that the FEA puts too much emphasis on economic aspects (Islam, 1997). It fails to address the importance of vulnerability and sustainability issues in food security problem (Maxwell, 1996; Watts and Bohle, 1993).

Both food availability and access are highly vulnerable to various risks such as production, trade, price, income, political, and social risks. In fact, the word 'security' in the term 'food security' is an explicit recognition the roles of risks or vulnerability aspects in food security issues. Accordingly, vulnerability is a necessary component of food security. A sustainable food security systems, by definition must be strong enough to absorb various risks including domestic food decline (say due to abnormal wether or pests attacks). Accordingly, social security systems or social safety net systems are also the necessary components of sustainable food security systems. The lack of social security systems or social safety net systems contribute to the emerge of Indonesia 1998 food crisis.

Vulnerability can be broken down into two elements': stability and reliability. Stability refers to internal vulnerability or susceptibility of food availability and access to domestic shocks such as domestic food production decline and economic shocks. Reliability refers to external vulnerability or susceptibility of food availability and access to external shocks, such as international trade fluctuations. Degree of self-sufficiency is an important determinants of reliability of food availability.

Sustainability addresses long-term continuity of the food security. A practical indicator for sustainability is non-negative long term trends of both food availability and access. Food farming sustainability is of especially important in this respect. In generally food security program must be environmentally friendly or ecologically sustainable. Ecological sustainability has been a global concern in recent years. Sustainability element will also be important to draw international supports for the national food security program.

Hierarchical food security systems

By definition, food security is *secure access of all people to adequate food*. Accordingly, the ultimate object at which food security is measured is individual person. The exact measure of food security's the number of people are suffering from or at risk of inadequate food. This is and absolute measurement.

At the individual level, food security is determined by nutritional adequacy of his food intake. In this sense, individual food security reflects his nutritional security. Individual person food intake, however, is not fully controlled by him/her self but by his/her household food allocation system. Accordingly, household food security defined as secure access of all households to adequate food to meet dietary need of all household members, is the necessary condition for individual food security. But we should note however, that household food security is not sufficient to guarantee individual food security. The connection between individual food security and household food security is determined by within-household food processing and allocation, household members health status, and household as well as local community sanitary condition. These, in turn, are highly dependent on husband-wife education, cultures, and community infra-structures.

In the next higher hierarchy, local community food security is the necessary condition, but not sufficient, to guarantee food security for all households. If a local community does not have sufficient foods to meet the dietary need of all households within the community then some households in the community must be suffering from hunger or famine (food insecurity). But, although there are plenty of foods available in the community, some households may be food insecure because they do not have sufficient entitlement to access adequate food for all of their household members. Household food entitlement depends on household income, local food prices, own food production, food and income, transfers, local community social security systems, and local community infrastructures.

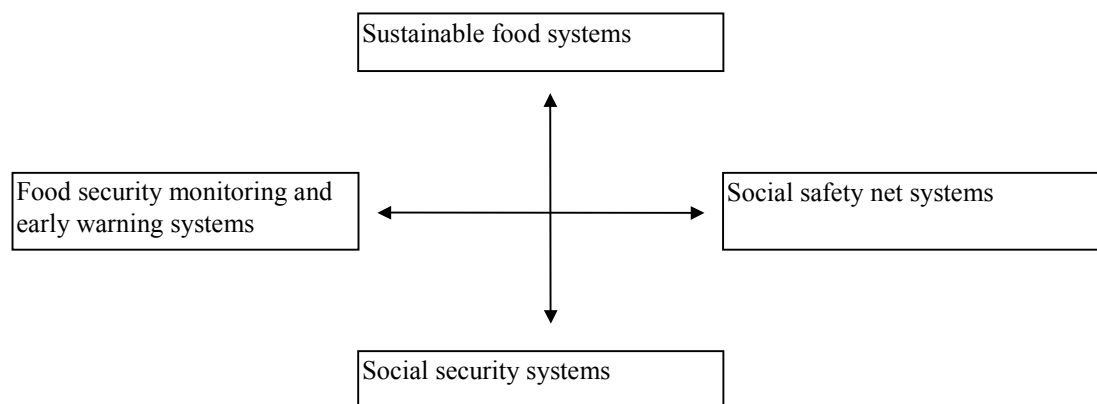
Local communities are subsets of regional areas. Regional food security is, therefore, the necessary condition but not sufficient to guarantee local food security. Within region food marketing and distribution, community level food production, community level aggregate income, infrastructures and social security systems are the important determinants of the regional-community food security linkages. Furthermore, national food security is the necessary condition but not sufficient to guarantee food security in all regions within the country. Regional trade, regional food production, regional income, national infrastructures and national food security systems determine the linkage between national food security and regional food security. Finally, national food security depends on global food security too.

It is clear therefore, that national level food security is not sufficient to guarantee the existence of food security in the sense '*secure access of all people at all times to adequate food for a healthy and productive life*'. Accordingly, targeting national food security objective is not an appropriate food security strategy. This is another weakness of the national food self-sufficiency. Sustainable food security paradigm,

therefore, asserts that food security must be seen and treated as a hierarchical systems as shown in Figure 1. In other words, food security issues must be seen using a system framework.

We must also note that the food security systems is susceptible to various uncertain shocks. Accordingly, sustainable food security systems must also have three other important elements namely: (1) food security monitoring and early warning systems, (2) social security systems, and (3) social safety net systems. Food security monitoring and early warning systems is very crucial for policy formulation and evaluation as well as for early anticipation and coping strategy formulation of any threat to the food security systems. Social security systems is needed for risk coping. Social safety net systems is very crucial as the final shield for the food security system in case some risks are unanticipated or the risk coping measures fail to neutralise the anticipated risks. Accordingly, sustainable food security systems is an integrated components of food systems, food security monitoring and early warning system, social security systems and social safety net system (Figure 2).

Figure 2. Sustainable Food Security Systems



Endogenous integrated policies

Sustainable food security systems paradigm asserts that the food security policies must be integrated and endogenous in the systems. As discussed previously, food security systems is very complex and requires policy supports from various government agencies. Fragmented departmental policies may not be effective or may even be counter

productive to the food security systems. Integrated policies are therefore, very important in building a national wide sustainable food security systems. This policies must also be endogenous in the food security systems in the sense they are formulated based on the prevailing food security problems with full consideration on the nature as well as behaviour of the systems.

The government policies are designed to address the risks that endanger the food security sustainability. Understanding determinants of and relationships in food security problems is essential in designing an effective policy. Conceptual framework proposed by Teklu, Von Braun and Zaki (1991) may be a good reference in designing the government policies (Figure 3). Some policy options and their hypothetical effectiveness to address various food security risks are presented in Table 1. This, of course, is just conceptual thoughts for reference and discussion tool. The real policies must designed based on a comprehensive research.

Accountable government, pressure groups, and free press

The 'right to development paradigm' asserts that the 'right to food' or simply 'food security' is a basic human right. It is the moral duty of the whole society to promote and protect this universal right. This has been formally adopted in the Indonesian Public Law No.7 (1996). Accordingly, it is now the formal duty of the government and the society as a whole to promote and implement the law. Socialisation of this law is extremely important in order to create citizens awareness that it is indeed their basic right to have adequate food and to mobilise national-wide participation to protect and defend the right. National-wide awareness and participation is extremely important to mobilise social acceptance and political supports which are necessary for sustainability of the food security program.

The social awareness is necessary in order to have an accountable government. In a democratic society, the government gets its power from and must be responsible to the citizens. The government must be accountable to the public. The government must pursue what ever the majority people want it to do. Through social awareness and political participation, the citizens have the power to force the government to make sustainable food security and poverty eradication program as its program priority. Making food security as the national development priority is the first important step toward the achievement of sustainable food security systems.

Transparent and accountable government is also necessary to prevent wide spread of 'kleptocracy practices'. As it has been mentioned, by nature food security program is highly vulnerable to kleptocracy. Kleptocracy is the most dangerous bureaucratic disease that

can easily make food security program fails to achieve its objective. This has been proven during the New Order era. We may say that there will be no sustainable food security if there is no accountable government.

The existence of pressure groups and free press is necessary to articulate the citizens demands. There will be no accountable government if there is no pressure groups and free press. The pressure groups and free press also function as control device of the governance system. Social control is extremely important to reduce kleptocracy. Moreover, existence of pressure groups and free press will generate creative ideas through public debate on designing more appropriate food security policies. Public debate provides opportunity to tap diverse ideas from all concerned citizens, including intellectual community at large. Public debate will make government policies transparent and hence reduce kleptocracy practices. Accordingly, food security policy should be designed through a public debate process.

Finally, pressure groups and free press also play some roles of monitoring and early warning systems. They provide information on food security condition through out the country and pass them quickly to the public at large. Monitoring and early warning system is very crucial for early detection of any mismanagements in and imminent risks to the food security systems. But we should note, however, that the pressure groups and the press must be honest and wise. Unwise news casting may also be dangerous to food security. Over exaggerated news may create information distortion which is harmful to food security. As an example on this case is Bangladesh famine in 1973/1974 which might have been worsened by news exaggeration by the mass media (Islam, 1996).

Conclusions

With strong supports and persistent commitments from the government Indonesia has been quite successful to increase rice production especially since late 1960's up to mid 1980's leading to the achievement of rice self-sufficiency in 1984. The shifting status from the largest rice importing country in the world to become a rice self-sufficient country is indeed a respectable achievement. Without doubt, Indonesia food security condition during the New Order era has also been greatly improved compared with during the Old Order era. But this rice self sufficiency was not last very long. Indonesia has been importing rice again since late 1980's with an increasing amount and has even reached its historical record in 1998. Meanwhile, there had been also some incidence of hunger and famines in limited areas. The most serious one was devastative famine in Irian Jaya in 1997 which caused hundreds

(thousands ?) of people starving to death. Severe food crisis also emerged in 1998. All of these indicate that the New Order regime has failed to develop sustainable food security systems in Indonesia.

We argue that the underlying reasons of the failure are: poor governance, inappropriate policy framework (paradigm), and inexistence of effective integrated policies. Centralised and unaccountable governance has generated kleptocracy practices, a dangerous bureaucratic disease, that ruined the food security systems. Kleptocracy was the real culprit of the burst of the 1998 food crisis. Food security program was based on an obsolete food availability approach with twin-strategy: rice price stability and rice self-sufficiency. We argue that this policy framework is unsustainable economically, politically and ecologically, and hence bound to failure. This policy framework must be revised or abandoned.

We propose sustainable food security paradigm as the alternative choice. This paradigm is built on the following perspectives:

(1) The right to development perspective :

The right to food is a basic human right and this must be the main principle for food security program. The primary motivation and objective for developing a sustainable food security systems is to protect, defend and assure the right to adequate food for all people. The instrument for development functions of food security must be considered as by products useful to achieve the primary objective, but must always be treated as subsidiary objectives.

(2) Sustainable food security systems perspective.

Food security must be seen and treated as an integrated hierarchical systems starting from global food security down to household food security. The food security systems must also include three elements which have been neglected in previous years: (1) Monitoring and early warning system, and (2) social security systems; (3) social safety net systems.

(3) Strategic roles of good governance, pressure groups and free press.

The proposed paradigm argues that accountable government pressure groups, and free press are the necessary supporting components of the food security systems. Food security is a very important policy, too important to be given solely to the government without public control. Food security policy should be formulated through public debate process. Of course, pressure groups and press must also be accountably without which they

may be harmful to the food security systems by distorting information.

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Table 1. Hypothetical policy option matrix

Policy Options	Risks						
	Food production	Trade and availability	Food price	Income and employment	Health and environment	Political and policy failure	Demographic and gender
1. Agricultural production							
a. Technological change	PHL	PHL	PHL	PHL	P/N	PLL	PLL
b. Input subsidies	PHS	PHS	PHS	PHS	NMS	NLS	-
c. Output price support	PHS	PHS	NHS	P/N	NLL	NLS	-
d. Diversification	PLL	PHL	PML	PML	PHL	PHL	PLL
e. Extensification	PHL	PHL	PHL	PHL	NLL	PHL	PLL
2. Food trade and distribution interventions	PHS	PHS	PHS	PLS	PLS	PHS	PLS
3. Food subsidies and transfers							
a. Food price	NHS	PHS	PHS	PML	PLL	PHS	PLS
b. Feeding program	NLL	PHS	PLS	PLL	PHS	PHS	PHL
c. Food stamp	NLL	PHS	PLS	PLL	PHL	PMS	PLS
4. Income and employment							
a. Public works	PLL	PLL	PLL	PHS	PHS	PLS	PLS
b. Credit	PLS	PLS	PLS	PHS	PLS	P/N	PLS
5. Food institutions							
a. Food security safety net	PHL	PHL	PHL	PHL	PHL	PHL	PLL
b. social security system	-	-	PLL	PHL	-	PHL	PHL
c. Laws and regulations	-	PHL	-	-	PHL	PHL	PHL
6. Non-agricultural sector development	PML	-	PML	PHL	P/N	P/N	PLL
7. Macropolicies							
a. Exchange rate over-valuation	NMS	PHS	PHS	NMS	-	NHS	-
b. Infrastructure investment	PHL	PHL	PHL	PHL	PHL	PHL	PHL
c. Education	PHL	PLL	PLL	PHL	PHL	PHL	PML
d. Health	PHL	-	-	PHL	PHL	PML	-

PHL = Positive High Long-term; PML = Positive Medium Long-term; PLL = Positive Low Long-term; NHL = Negative High Long-term; NML = Negative Medium Long-term; NLL = Negative Low Long-term; PHS = Positive High Short-term; PMS = Positive Medium Short-term; PLS = Positive Low Short-term; NHS = Negative High Short-time; NMS = Negative Medium Short-term; NLS = Negative Low Short-term; P/N = Positive/Negative.