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AGRICULTURAL DEVELOPMENT IN INDONESIA ENTERING THE 21ST CENTURY

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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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Highlights of agriculture development

Indonesia is now under a serious stress of economic crisis after thirty years of remarkable progress. The economic breakdown was poorly anticipated, and appeared as a great shock for a majority of business managers, policy makers, and economic observers. This is a very invaluable and expensive lesson to learn, giving us the warning that our current economic knowhow is really very poor to understand the nature of challenges in the new era of free market and globalization of the 21st century. Free market and globalization seem to increase the vulnerability of the world economic system due to the caprice of the international monetary market, especially it is true for the developing nations.

Free market or globalization is really a new innovation, and probably no economist knows the full consequences and impacts. One thing is certain, that free market makes the monetary system changes rather wildly, rather incomprehensively, so incomprehensible that some of us are talking about the death of economics. It seems to us that economics is not science any more, but pure gambling. A kind of Counter-Keynesian revolution seems to be desired. Neoclassical economics gives too much power to the monetary system to travel the path of its own, so that the real market is now under full control of the monetary market and not the other way round.

How far the international monetary institutions have the capacity to control the changing behaviour of the monetary market? Probably what we need is a brand new world monetary institution to prevent malbehaviour of the monetary market, especially new rules and regulations to control international flow of money, to ensure 'monetary sovereignty' of the member countries.

The intrinsic meaning of money to represent an IOU and 'in God we believe' as written on the dollar bill should be kept intact, to prevent the change of meaning to an 'ICU' ('I Cheat You') and 'in Money we believe'.

This article is not an interpretation or response to the wildly changing monetary market, but a conventional review to evaluate the real dimension, which is now hardly visible, being overshadowed by the thick cloud of monetary crisis and the rather incomprehensible political atmosphere.

Agriculture industry and industrialisation, or agribusiness development

The rather loose concept of 'industry' and 'industrialisation' seems to provide an opportunity for power groups to impart their political interest into ministerial structure, in such a way that the Ministry of Agriculture has no strong grip to develop a national policy for agricultural

development. The agricultural sector is proliferated, so that 'the bones' are separated from 'the flesh'. The Ministry of Agriculture has the mission only to improve agricultural production, as the rest of the 'industrial part' of the agriculture remains outside the domain of the Ministry of Agriculture, some part was transferred to the Ministry of Industry and Trade, some part to the Ministry of Cooperative, and some part was transferred to the Ministry of Transmigration, irrigation was transferred into the Ministry of Public Work. Yet irrigation is not actually 'a public work', but the working domain of agriculture.

The terms of 'agriculture industry' and 'industrialisation of agriculture or agribusiness development' should first be made clear, not in terms of 'formal vocabulary specification' but within the context of this article. In this treatise the terms of 'Agriculture Industry' signifies (i) a unified system of production, processing, and marketing subsystems down to the consumer's purchase and utilisation of the agriculture commodity, (ii) where the subsystems are institutionally linked in a mutual benefit relation, (iii) making use of the increasingly sophisticated technology (iv) to support specialisation within the context of synergic integration, (v) so that the whole system can grow reaping a steadily higher scale and higher economy of scale, (vi) and hence generating higher efficiency, value added and income, (vii) to produce a steadily improved quality of goods and services at the competitive price, and (viii) in line with the changing consumer's preferences.

The term of 'industrialisation' or in this context 'agribusiness development' is thus the underlying 'evolutionary process' to develop an 'industrial structure or agribusiness structure', where 'institutional building' and 'human resources development' play a decisive role. The process is facilitated by the development of advanced technology that runs parallel with the achievement of the higher level of human intelligence.

Considering the poor condition of traditional farmers, it would be immediately clear the colossal job to industrialise smallholding agriculture or to develop agriculture, especially at the interface between urban and rural, which is heavily characterised by dual economy. Thus the most difficult thing in the process is how to develop proper institutional linkages between urban and rural economy so that the two sub-systems can reap a balanced mutual benefit free from the trace of exploitation. Industrialisation of agriculture or agricultural development means 'to deal with the whole system of agribusiness development' in a sychronous and simultaneous fashion, taking into account the uniqueness of each sub-system involved in the process. A partial and peace-meal policy is not sufficient to deal with the colossal job of this kind.

What is happening within the national economy can be traced in the world economy. Economic dualism is real within the national and

world systems, and 'free market' is not the solution, but tends to perpetuate the ugly dual economy, within and outside the national boundaries.

The scope of work of the ministry of agriculture

The general institutional set up and the scope of work of the Ministry of Agriculture is determined by history and not by future needs. In the colonial time agriculture belonged to the Department of Economy and Welfare. When the republic came into being the scope of work of the department was divided into various ministries, and the following is crucial to observe:

- The image of 'welfare department' seemed to be taken over by the Ministry of Agriculture, and only the agriculture production 'industry' was transferred to the Ministry.
- Agriculture trade 'industry' was transferred to the Ministry of Trade, while agriculture processing and manufacturing 'industry' was transferred to the Ministry of Industry with a few exception. At present the two Ministries merge into Ministry Industry and Trade.
- Rural Financial 'industry' was transferred to the Ministry of Finance.
- Rural and Agricultural Cooperative was transferred to the Ministry of Cooperative and Small Business.
- Irrigation 'industry' was transferred to the Ministry of Public Works.

Thus from the very beginning the scope of work of the Ministry of Agriculture was limited 'to the production subsystem', a small part of the whole 'agriculture industry' mentioned in sub 1.1. Bimas, the main conveyor of smallholding agriculture development, was necessarily an inter-ministerial scheme of development, where the Ministry of Agriculture played the role as the field operation manager.

1. This is probably the reason why Bimas remains to have the 'permanent status of project', because there is no 'comprehensive industrial or agribusiness approach' in the design of Bimas.
2. In fact, Bimas resembles more the image of a 'welfare program' rather than a realistic program to industrialise smallholder agriculture. In the sixties Mosher stressed on the importance of 'progressive rural structure' to industrialise smallholding agriculture. But what can be developed by the Ministry of Agriculture through Bimas is only a 'project oriented progressive agriculture intensification structure' in irrigation ecosystem. Because it is 'project oriented' the lifetime of investment depends primarily on the lifetime of the project.

Rice industry and rice self-sufficiency in 1984

In spite of the limitation of the scope of work of the Ministry of Agriculture and Bimas, Indonesia was able to reach rice self-sufficiency in 1984, which was considered as 'a miracle' by many sceptical observers. This lesson we learned was really 'the strategic point to start', and not 'the strategic point to slow down'. We have to start applying a comprehensive industrial and agribusiness approach for smallholder development, to change from project oriented to a realistic program design. We should realise the fact that the success was primarily pushed by the perishable project support, and from this strategic milestone we have to claim the necessity to provide the lasting 'industrial and agribusiness support' for smallholding agriculture, particularly rice in irrigated ecosystem.

But in practice the milestone was regarded as the signal for Bimas to slow down and diversify agriculture! In 1984 oil boom had already receded and the government was facing a serious problem (i) to minimise the dependence on oil industry, (ii) to push increasing export of non-oil products, and (iii) to minimise subsidy. Free market doctrine was beginning to ring. Probably, the Ministry of Agriculture responded too eagerly to these signals, so that the limited project support was partly reduced, along with a stepwise reduction of agriculture subsidy for farm supply.

The success story could be maintained for some years, but rice production began to level-off in 1989, and then El Nino came on the scene bringing a series of dry-spells. At the same time, the rate of conversion of the most productive rice field in Java continued on an accelerated scale. Finally, the deadly blow of crisis in 1997 jeopardised the miracle of rice production in Indonesia. The Government, had to resort to the peak import of rice of 4 million metric tons in 1998, two times higher than the peak import in the sixties. Indeed, rice appeared to be the most vulnerable 'agriculture industry' badly affected by the economic crisis. It means the underlying 'industrial support' is the weakest. Agriculture industry geared for export received a positive impact of price escalation. This is in general true for the large agriculture estates managed by private or government corporations.

The Bimas program was also regarded to become less effective over time. In early days Bimas was probably the only significant project for most of the villages, and also for many of the districts and provinces. Agriculture at the inception of Bimas had a share of 43 percent of GDP in Pelita I (1968-1973), that changed to 23 percent in Pelita III (1978-1983), and to only 16 percent in 1996. The change was also associated with the decrease of the relative importance of agriculture in the overall national development, with the consequence of reducing the intensity of participation from non-agricultural partners in the Bimas program. This

again reflects the need to develop a permanent industrial and agribusiness support system to substitute for the project oriented Bimas program.

1 Indeed, Bimas was successful to generate Green Revolution in irrigated ecosystem in 1984. The generated surplus was able to trigger the growth of rural economy, creating a significant multiplier effect, as the larger part of the value added was absorbed by the village society.
2. Small scale rice mills developed vast in response to the higher production, that appeared to make rice market more competitive. The use of hand tractors was induced by the increase of farm surplus, including some innovation in harvesting and post-harvest handling.
3. Human resource development in terms of formal and informal education was steadily improving, while urban-rural linkages was becoming stronger, being reflected by the increasing trend of urban and non-farm employment.
4. Fertiliser and agrochemical industries received a significant multiplier effect from the growing rice production. But the most important multiplier effect was probably the relatively abundant and cheap rice, facilitating the growth of urban industry to employ the relatively cheap labor force.
5. Indeed, the opportunity to shift agricultural development was encouraging. It was not the time to slow down the intensity to modernise and industrialise smallholding agriculture, but it was the time to step up creating the broad-base progressive rural structure. Unfortunately, it was the opportunity foregone reflected by a steadily and rapidly declined in the relative share of agriculture to the GDP, which was probably associated with the limited scope of work of the Ministry of Agriculture, 'the Ministry of Crop Intensification'.

Soybean, corn, feed and chicken industry

Chicken industry is part of the agriculture industry having the highest 'foreign resource cost component', yet its growth rate was among the highest, suggesting the high rate of growth of domestic demand associated with the growth of income and purchasing power. This is really a good opportunity to develop a strong 'industrial support' by step-wise eliminating the foreign resource cost component, meaning to say generating domestic capacity to develop feed industry and DOC production using domestic resources. In fact it was a great irony, how Indonesia developed chicken industry precisely in the wrong fashion applied in the aircraft industry, probably because 'chicken can fly' like an aircraft.

But again the scope of work of the Ministry of Agriculture was limited, so that the development of the industry was dominated by private corporations. For them the best option to respond to the expanding

market was simply to buy the technology rather than to create domestic capacity to produce DOC and feed components. This is a good example of 'free market bias'. In spite of the increasing demand for corn and soybean in the domestic market farmers were not able to respond proportionately, so that the opportunity to produce was responded by the increase of import of corn and soybean. Due to the high foreign resource cost component chicken industry was the most adversely affected by the crisis.

Chicken industry is an example how a simplistic economic consideration may impair the strategy to develop a strong domestic agriculture industry to support the long term perspective. We have to realise that farm resources in domestic agriculture is highly underemployed, and any opportunity to increase employment should be materialised. The problem is not really technology, but the generally weak 'industrial and agribusiness support system'.

The most critical 'agribusiness service' lacking in rural areas is the 'financial industry'. Economic theory is really very simple, telling us that 'growth depends on the rate of investment'. Everyone knows that investment capacity of smallholder is very limited, so that a significant growth of smallholder agriculture depends critically on investment support from the financial institution. Because the financial services are not available, the only channel is to internalise financial support within the Bimas program. But this approach has been proven to be ineffective to develop a strong 'industrial support' for smallholder development. Credit program channelled through Bimas can in no way substitute the role of the financial institution to directly serve smallholder development. It is particularly in this regard that Bimas has an image of a 'welfare program', and how the credit scheme is rigidly designed, bureaucratically applied, centrally designed and controlled.

Chicken industry pushed by the increasing demand for protein diet should be developed along Crop-Livestock Cycle exemplified in the natural bio-ecological life. It is relatively not difficult to strengthen the cycle through our capacity to use the abundant 'tropical foliage' as feed component, such as in the form of 'leave meal' or 'fortified cassava meal'. Many traditional fruits and nuts can be used as raw materials for feed components, such as Pithecolobium biloba ('jengkol') that can be used as soybean substitute. Current market price is high, because the tree has never been industrially utilised.

1. The strategy should be changed for Bimas to work on the regional basis, along with the need to accelerate decentralisation.
2 The AARD has initiated to develop regional research network (AIATs) in the provinces, yet the role of this new research institution will depend on the success of decentralisation.

3 The stress of agriculture development should shift from commodity to farming system, from production to resource based and farmers' income approaches to broaden and deepen the services in a stepwise realisation of agroindustrial development.
4 Current commodity-based organisation structure of the Ministry of Agriculture is probably desired in the past, but the industrial future of agriculture may require a thorough organisational change.
5 Proliferation of agriculture subsystems under various ministerial organisations is probably a strategic weakness preventing the growth of industrialised smallholder agriculture.

Estate crops development

The success to reach rice self sufficiency in 1984 gave an enormous facilitation to push industrial development geared for export, probably colored by over-optimism to procure foreign capital and foreign technology having no root in domestic economy and resources. Investment was the key word of success, no matter how capital was acquired and how investment was selected. Real estate industry was developed beyond the clearing capacity of the market. Aircraft industry was pushed 10 years ahead of motorcycle and automotive industry, leaving manufacturing of components technology to lag fifty years behind. The result was increasing import far above the trend of export in 1993, pushing DSR to reach the red signal, but the trend seemed to continue unabatedly.

In agriculture it was the time to push industrial crop development geared for export. Oil palm was the most prospective commodity, the area of which grew from 110,000 ha in 1970 to about 2.46 million ha in 1996 at the incredible exponential rate of about 11.5 percent per year. Four large private corporations were able to develop about 750,000 ha, followed by government estates (450,000 ha) and smallholders (820.000 ha), mostly under nucleus-plasm system. The data reflect some distribution problem and the impact on smallholder development. The fast development was partly supported foreign-loan and by fertiliser and agrochemical subsidy, as price differential between smallholders and large estates was difficult to maintain.

Rice economy must have a sizeable share in the industrial development since 1984, yet the success was interpreted as the signal to slow down government spending for rice intensification program. Some foreign and domestic experts came to remark that "it is time for rice economy to enter the free market".

Current policy to strengthen small and medium scale enterprises

In the time of crisis we are becoming aware of the neglected task to develop small scale and medium enterprises, agriculture smallholders

included, where about 80 percent of the national labor force is employed. For this purpose the government channels a large financial support of about Rp 10 trillion to the Ministry of Cooperative and Small Scale Enterprise to be distributed as a credit program to ease employment and to generate income. The Ministry of Home Affairs is also appointed to distribute about Rp 1 trillion funds for a similar purpose through LKMD, Rural Development Organisation attached to the village administration.

The problem comes up, how and to whom the funds should be distributed, administered and controlled. Previously, the funds of IDT program were channelled to the so called 'IDT Groups' developed and supervised by the village heads, whose responsibility was to make sure that 'the funds are rolling'. Yet in practice the village administration had no capacity to supervise the program. That the non-financial institution is given the task to manage a huge credit program reflects the need to develop a specifically designed financial institution to support small scale enterprises.

It also suggests that 35 years of the Bimas program fails to develop the supporting credit institution at the village level. This is an example how difficult it is to develop rural areas and to support small scale enterprises. The most difficult thing is probably related to the question 'how to develop a viable financial institution at the village level'. If the existing financial institution has no capacity to do the job, it is easy to see that the non-financial institution has nothing to offer as substitute.

Probably we have to reassess the role of Village Unit Cooperative (KUD). As a matter of fact, what we need is not a village cooperative but a rural credit institution (Bank Unit Desa) to serve financial need of small scale entrepreneurs and farmers. The so called Farmer Groups developed by Bimas should be encouraged to take over the present role of KUD, by merging into a larger farmer association and, finally farmer cooperatives.

Food crops and horticulture development

The GDP share of food crops changed from 25.3 percent in 1970 to only 8.5 percent in 1996, yet within agriculture the GDP share changed very much slowly from 61.3 percent in 1970 to 53.2 percent in 1996. It was the GDP share of agriculture that dropped significantly, but within agriculture the relative component shares changed slowly.

Food crops and horticulture was primarily, if not exclusively, produced by smallholders, such as (1) rice, corn, soybean, cassava and other palawija crops, (2) fruits, and (3) vegetables, about 60 percent of which was produced in Java. Rice is the most important commodity, economically as well as politically, as it is the most dominant staple for most of the population, especially in urban areas.

The highly significant role of rice in Indonesia's economy makes government intervention on rice industry, production as well as marketing, extraordinarily strong, being regarded too strong by many economic observers. The price is tightly set mostly at the low level to provide economic ease to maintain the general 'low wage policy', and as the immediate consequence the government has to keep alert to push rice production in spite of low price and hence low incentive to producers.

Indeed, there are too many artificialities in the rice economy of Indonesia, which is probably part of the heritage of 'low wage policy' applied by the colonial government in the past. 'Low wage policy' leads in fact to the 'biased shadow price of labor', and hence 'biased feasibility of investment'. An investment proposal appears feasible, because of the low price of labor, which is 'subsidised by the low price of rice'.

Sure, it is difficult to resolve this problem in the short run, but this is an important economic issue to deal with in the long run, to ease Indonesia's economy from 'the shadow' of rice economy.

1. Horticultural crops, such as tomato, chilli, and onion are high price alternative of rice usually grown by farmers in Brebes, Tegal, and Yogyakarta. If Indonesia were able to unmask its economy from 'the shadow' of rice economy, the high price horticulture crops could be expanded in rice ecosystem, to liberate rice farmers from 'shadow' of rice economy.
2. To develop the high price horticultural crops the participation of private enterprises is a must, especially in genetic resources management and utilisation. Property right is regarded as a strong incentive for the private firm to enter into this neglected area of research and invention. Government research program should provide basic support in germ plasm collection and maintenance.
3. Ecologically, economically, and sociologically the best option in the irrigated ecosystem is probably diversification to the high price horticulture and palawija crops. The fact that corn and soybean could not catch up the rate of increasing demand, is probably due to the 'high shading effect' of rice economy.
4. For rice areas near urban centers in Java rural, enterprises to serve urban economy have the prospect to develop. But to ensure balanced and mutual benefit, the development of urban oriented rural enterprises should be planned and properly designed. Probably, the seasonal flow of labor from rural to urban area should be institutionally designed to ensure competitive wage for the rural labourers.
5. The need for diversification is becoming stronger under heterogenous ecosystem, such as in the tidal swamp ecosystem. Concentration on

single crop rice farm is against ecological sustainability and economic optimum.

6. The fact that extensification of agricultural land through transmigration program was farther and farther away from the grip of the Ministry of Agriculture was probably the prime generator of the poor agriculture development in many transmigration sites. Probably most of the transmigration areas should be geared from the very beginning to develop estate crops, rather than food crops, even if the area is very suitable for food crops production. Two hectares of food crop cultivation is too large for a traditional farm household.
7. Fruits, such as mango, mangistan, salaka, citrus, durian, rambutan, duku, banana, and so on should be industrially developed, where the participation of private corporation is necessary, from the upstream area of research and genetic resources management and utilisation, to the downstream area of processing and marketing. A very great natural capital in the form of genetic resources remains idle, while its potential to push agriculture development is essentially unlimited.
8. Research should be eased from a strong grip of bureaucracy, to have direct and synergic linkage with private entrepreneurs, and hence opening new sources for research funding and income.
9. Indonesia is very rich in agricultural resources, but the richness cannot be properly tapped to generate income. Agricultural technocrats have the responsibility to see that there must be something very wrong in agricultural policy. Probably this things are: proliferated food crops development programs, and 'the very low profile' of agricultural technocrats and scientists, acknowledging their very inferior status with respect to 'the aircraft and automotive engineers', and with respect to the incomprehensible 'banking expert and macro-economic designers'. 'Incomprehensible', probably not because they are true and extraordinarily clever, but (who knows) because they are 'incomprehensibly stupid' on matters of agricultural development, the flesh, bone, blood and spirit of Indonesia's economy, the immediate livelihood for about 44 percent of Indonesian population. The well known Bimas Program initiated in 1964 is not really an economic development, but a 'welfare program' believed to be a comprehensive agricultural development, which is not. The stress of the Bimas program is instant services and not a permanent constriction of economic infrastructure and services. Most of the services is delivered through project organisation, including credit services designed by the Central Government.

Several issues need to be considered for future food crop development include: (a) feasibility for expanding agricultural land for food crop production, (b) comprehensive landscape and infrastructure development to serve efficient agribusiness development ,and land titling,

(c) human resource development, (d) seed industry and agroindustry development, (e) locally specific technology generation and adaptation to improve competitiveness, and (f) rural institutional development and decentralised management.

Estate crops development

The agriculture GDP share of estate crops was relatively constant at about 16 percent within the three decades of development, reflecting an average growth rate within the sector. Yet, considering the high comparative advantage of industrial crop in the economy, the mere constant share was considered too low.

The total estate crops areas (rubber, oil palm, coffee, tea, coconut and spices) were about 8.5 million ha in 1970, consisting of 2.5 million ha of rubber, 3 million ha of coconut, and only 133.000 ha of oil palm. The total areas changed to about 13.1 million ha in 1997, and about 2.5 million ha were oil palm. The aggregate change was about equivalent to an exponential growth of 3.5 percent per annum, while for oil palm it was about 21 percent per annum, reflecting a very profitable investment in oil palm agribusiness.

Estate crops areas were larger than food crop areas, yet the GDP share was much lower (16 percent and 51 percent, respectively). This was due to the low management level of estate crops smallholders. Coconut, rubber, coffee, pepper, and spices were dominated by smallholders, most of which was beyond the touch of modern agriculture.

Indonesia was ranked number two in world palm oil production after Malaysia, and number 3 in rubber production after Thailand and Malaysia. Coffee production was ranked number one in Asia. Smallholding estate crops were primarily developed through 'Project Management Unit' and 'Nucleus-Plasm System'. Yet the huge area of smallholding estate crops requires a very large investment to initiate, beyond the capacity of government funding. Most of the programs to improve smallholding estate crops were primarily based on international loan.

There is something incomprehensible about smallholder capacity to develop. In spite of no quality improvement and relatively small part of investment support from outside, in aggregate the system could grow to compensate for the growth of population, reflecting its proven tenacity at the stage of subsistence. Sometimes the performance was unexpectedly high, such as in the case of cocoa production that grew at the unbelievable rate of 16 percent per annum. The high rate of growth of oil palm was not surprising, because it was strongly supported by capital investment from private and state owned enterprises partly financed from foreign loan.

The rate of growth of estate crops area seemed reasonable (3.5 percent/annum), but the export price of agricultural commodities had a tendency to decline, so that the agriculture GDP share remained constant.

Oil palm

Due to the relatively large size of surplus, Nucleus-Plasm system of palm oil can be properly developed, which was generally discouraging for rubber. Average CPO production was about 3 ton/ha/annum at the price range between US$ 250-580/ton, reaching an average revenue of about US$ 1245/ha/annum. The crop was able to grow at the exponential rate of about 11 percent per annum(120,000 ha in 1968 increased to 2.472 million ha in 1997).

The urban and foreign entrepreneurs have been heavily involved in the development of the oil palm agribusiness, where around 67 percent of the 2.47 million ha of the oil palm areas managed by the private and state owned enterprises.

Coffee

Coffee is a 'black horse' in agricultural development, where smallholding dominate. The price was very high when Brazil failed to produce due to frost damage. The area grew from 340,000 ha in 1968 to 1.160 million ha in 1996, at an exponential growth of about 4.7 percent/annum. The price fluctuated between US$ 1.0 - 2.50/ton. At the average production of 450 kg/ha the gross revenue ranged from US$ 500 - 900/ha/annum. The smallholders carried out investment for area expansion by their own financial resources. Sumatera is the major coffee producing area, which contributed to 70 percent of Indonesia coffee production, where Java and Nusa Tenggara each has 11 percent of share.

Coconut

Coconut is really the petty family crops for all households in the country, non-farmers included. Probably this 'petty feature' makes the crop difficult for intensification. There was virtually no estate crops of coconut. Only recently hybrid coconut attracted some investors to enter, but the prospect was much overshadowed by oil palm. In spite of the limited touch of development the coconut area was able to grow at the exponential rate of about 3.2 percent per annum within the last three decades (1.595 million ha in 1978 and 3.740 ha in 1996). The price of copra ranged between US$ 340 - 420/ton. At the average productivity of 750 kg of copra/annum, gross revenue ranged between US$ 255 - 315/ha./annum. Perhaps investment and maintenance cost of this

commodity are also relatively very low, where most of the activities are carried out by family labor.

Rubber

Rubber is also considered as an 'household family' for many farmers in Sumatra and Kalimantan. The area changed from 2.210 million ha in 1968 to 3.518 ha in 1996, at an exponential rate of about 1.7 percent/annum. Rubber was the first to attract government program, with or without foreign loan. Yet the image of smallholding rubber remained essentially the same, producing at an average level of 400 kg DW/ha/annum, about one-half of the productivity of the estate managed plantation (850 kg DW/ha/annum). Farm size appeared to slightly decline, probably due to the less competitive strength with respect to other alternatives. The current price was about US$ 0.90/kg, yielding a gross revenue of about US$ 360/ha/annum for smallholder farms.

Cocoa

Cocoa is considered as 'the wonder crop' for some regions, particularly Maluku and Sulawesi. In 1968 the area was 12,900 ha and grew to 655,000 ha in 1996, at an exponential rate of about 15 percent/annum, most of it was smallholder (74.5 percent). The productivity of smallholders farm was about 450 kg/ha/annum, compared with about 1,200 kg for large estate. The price ranged between US$ 1.20 - 2.50, yielding a gross revenue of about US$ 900/ha/annum for smallholders. This level of revenue might be higher than competitive crops, such as coconut and secondary crops (palawija) where investment and maintenance cost also of maintenance low relatively.

Tea

The area of tea plantation grew very slowly or even constant. From an area of 120,000 ha in 1968 it grew to only 143,000 ha in 1996. About 45 percent of the area was smallholding. The productivity was about 1,200 kg/ha for a large estate, and only 800 kg/ha for smallholding. At the price of about US$ 1.60/kg smallholding farm yielded a gross revenue of about US$ 1200/ha/annum. Probably the slow growth was due to a strong international competition, where Indonesia was ranked number 5 after India, Cina, Kenya, and Sri Lanka. Tea is a highlander crop preferring to grow in an altitude above 1000 m, which is probably another limiting factor for tea production.

Sugar Cane

Sugar cane has a very specific history in Indonesia, the once number 1 cane sugar producer in the early thirties, with Java as the world record holder for cane sugar productivity of 20 ton/ha/annum. During

colonial time sugar was grown in the best irrigated ecosystem of Java, where farmers had to hand-over about one-third their farm for sugar cane managed by sugar cane estates. The system continued after independence, but the relation between sugar cane estate and farmers was changed. The renting system and smallholding scheme were introduced. By the Presidential Decree of 1975 only the smallholding system was allowed, with a few exception where the sugar estate had their own land concession, which was rare.

The high and immediate competition with rice is obvious, and in this struggle the land reserved for sugar cane shifted to upland area, but a significant part of the irrigated rice field was retained, because the sugar mills were built right at the center of the irrigated ecosystem. Only beginning in the seventies that new sugar estates were developed on upland ecosystem outside Java, in Sumatra, Kalimantan and Sulawesi. But up to the present sugar cane production was dominated by Java (77.2 percent in 1996).

In 1970 sugar cane area was 121,720 ha producing 872,440 ton of sugar (7,170 ton/ha). In 1996 the area changed to 446.500 ha, but the productivity decreased to 4,690 kg/ha, which was the consequence of the shift to smallholder system and upland. The share of smallholding was about 68 percent. Total area of sugar cane outside Java was 120,210 ha, comprising about 26.9 percent of the total area in 1996. Sugar cane productivity was slightly higher in Java (4,954 kg/ha) compared to outside Java (4,378), because part of the sugar cane area in Java was irrigated.

At the cif price of US$ 421.70 /ton the gross revenue of sugar in Java was US$ 2.089.1/ha. The processing cost was about 40 percent, so that the gross revenue accrued to farmers was US$ 1,253/ha/annum, which was equivalent to about 5 ton of rice. Rice productivity in irrigated area of Java was about 6 ton unhusked rice/ha/season, making sugar cane less competitive for irrigated area in Java.

Livestock development

The livestock subsector grew relatively faster than the rest of the agricultural subsectors, the agricultural GDP of which increased from 5.8 percent in 1970 to 11.0 percent in 1996. The per capita consumption of livestock protein increased from 1.4 gram/cap/annum in 1969 to 4.3 gram/cap/annum in 1996.

In the period of 1970-1980 about 21 percent of meat consumption was supplied by poultry, 45 percent cattle, 10 percent buffalo, 14 percent small ruminants and about 10 percent by hogs industry. In 1980-1990 the share of poultry industry increased to 40 percent, the share of large

ruminants (cattle and buffalo) decreased to 30 percent, while the share of small ruminants was constant. In 1996 the share of large ruminants dropped to 19 percent, while the share of poultry industry increased to 51.7 percent. In this period the growth rate of meat consumption was 5.0 percent/annum, in 1980-1990 it increased to 9 percent/annum, or about 6.5 percent/annum within three decades. The high increase of meat consumption was supported by the growth of poultry industry (5.8 percent/annum) and import of cattle. In 1993 the import of heifers was 35,400 heads and increased to 378,320 heads in 1996. The imported beef comprised about 3.5 percent of total beef consumption in 1993 that increased to 17.5 percent in 1996. Egg consumption was also increasing within the period at the rate of 13.65 percent/annum, while milk consumption increased at the rate of 5.20 percent/annum, 65.7 percent of which was imported.

In 1970-1980 the population of cattle and imported heifers grew at the rate of 2.74 percent/annum, but in the last five years it grew only at 1.65 percent/annum. Buffalo population tended to decrease. The population of small ruminants and hogs increased at the rate of about 3 percent/annum.

The estimated population of cattle in 1997 was 12,165,000 head (DG Livestock 1997) with the potential birth of 3,205,000 head. The number of cattle slaughtered was 2.863,000 head, so that the population increase was 342,000 head or about 3 percent per/annum. Beef consumption in 1997 was 448.200 ton which was equivalent to 3,448,000 head, which was above the number of domestic cattle slaughtered. According to I Gede Putu (1998) the estimated import need of cattle in 1997 was 500,000 heads. With the rate of increase of demand of 4 - 5 percent/annum will push the trend of increasing import if domestic production failed to increase proportionately.

Major producing cattle for inter-island trade with cattle population above 500,000 head having the capacity in the last five years to supply about 50,000 heads/annum was Aceh, South Sumatra, Lampung, and Central Java, East Java, Bali, West Nusatenggara, and East Nusatenggara. Lampung and Central Java are fattening region, as annually about 40,000 - 50,000 heifers flow into these provinces. The number of fattening companies in 1992 was only 5 and grew to 41 in 1997 about 75 percent of which was in Lampung, West Java, Central Java, and East Java. The rest was (25 percent) spread in eight provinces, one fattening company per province.

North Sumatra, Lampung, West Java, East Java and South Sulawesi were the major development region for highbred chicken industry. West Java was the first in broiler industry (30 percent) followed by Central Java (15 percent). West Java, Central Java and East Java were also the major region for layer industry.

The broiler industry began to develop in 1981, and by 1984 the industry emerged as the significant source of chicken meat. Total domestic meat production in 1984 wa 742,200 ton, consisting of 29.2 percent of beef, local chicken 24.1 percent, and broiler 10.6 percent. In 1996 of the total of 1,632,200 ton of domestic meat the share of beef and local chicken decreased to 21.3 percent and 17.1 percent, respectively, while broiler industry increased to 36.5 percent. Within the period domestic meat production increased by the rate of 7.0 percent/annum. Beef, broiler and local chicken increased at the rate of 4.2, 20.1, and 4,0 percent respectively.

Along with the growth of the livestock industry, protein consumption increased proportionately. In 1984, meat, egg, and milk consumption were 4.64, 1.84, and 3.9 kg/cap/annum respectively, that changed to 8.4, 3.16, and 5.72 kg/cap/annum respectively.

The breakthrough in highbred poultry industry had a significant impact on the growth of livestock industry and protein consumption, yet the whole technology was imported, including a sizeable part of the feed components (soybean meal, corn, fish meal, and feed supplement). The technology was essentially capital intensive. Grand parent stock and parent stock were imported, and DOC production was in the hand of a few large corporations. The DOC was distributed to the growing chicken farms. By government decree the chicken farm should be managed by smallholders.

DOC and feed production was in the hand of big corporations, and chicken farms were managed by smallholders. Usually, with or without government support, chicken farmers received DOC and feed on credit. Some of them received also credit for the initial investment. Under such an arrangement the value added received by farmers was discouragingly small. The number of chicken farms in 1973 was 120166, and decreased to 90022 in 1983. In 1997 the number of chicken farms (smallholder) was only 72345, but it was compensated by the growth of medium and large commercial companies (280 broiler and 925 layer companies).

The highbred chicken industry had no root within domestic agriculture, and therefore it has little or negative multiplier effect to the economic growth in rural economy. It is a full grown urban enterprise. The foreign cost component is exceedingly high, so that the industry was the most adversely affected by economic crisis. As a matter of fact there is no technological difficulty to produce grand parent and parent stock domestically, but it needs investment in research. The inability of domestic production to provide the demanded feed components, is not certainly the problem of technology, but the problem of industrialisation of smallholding agriculture. This is the strategic area where social scientists should play the leading role.

Certainly, a breakthrough in cattle production is badly needed. Indeed, the increasing demand for beef is the opportunity to grow, which is also a challenge. We need to accelerate the acquisition of breeding technology. But it must be strengthened by the growth of the supporting feed industry. Breeding, animal breeding in general, should be developed along with the provision of property right for the breeders, and that research should be supported by the potential users, ie. private investors.

Yet, probably one of the most serious limitations for livestock industry to grow is the limited number of veterinarians in Indonesia. Very few universities have a veterinary department, and with very few students.

Fishery development

The fishery subsector is one of the faster growing subsector, its growth increased from 6.8 percent in 1970 to 9.1 percent per annum in 1996. The rapid rate of growth of the fishery subsector is induced by the rapid growth of demand for the fishery products in domestic and international markets. It is a diversified subsector, producing a wide range of products using diverse production techniques. In the last ten years the domestic demand for fishery products grew at a rate of 5.1 percent annually, where the production grew at a rate of 6.0 percent annually during that period.

Export value of the fishery products for 1994 was about $US1.7 billion, 60 percent of the value was from shrimp and 14 percent was from tuna. In the last decade the export value increased at a rate of 13.4 percent annually. This rate of growth is expected to decline somewhat in the future because of the stock depletion in some of the marine resource areas such as North Coast of Java, Malacca Strait, and South Coast of Sulawesi.

The maximum sustainable yield (MSY) was estimated at 6.7 million ton per year, with the total marine fishery products in 1997 of 3.47 million ton or about 57.0 percent of the MSY. This data indicate there is an opportunity to increase fishery production in the future.

The number of fishing boats and fishing vessels increased from 334000 in 1987 to about 419000 in 1997, at a growth rate of only 2.7 percent annually. However, the number of non-motorized fishing boats managed by artisan fisherman only increased at 1.4 percent, where the motorised fishing boats growth at 4.6 percent, and fishing vessel growth at a rate of 6.0 percent annually. This data also reflect the inability of the smallholding fishermen to response to increase in the consumers' demand for the fishery products.

A World Bank study in 1992 identified several issues that need to be resolved in the fishery development as follows :

1. A more accurate stock assessment data to established MSY for different commercial species,
2. Monitoring and regulation of water quality standards, particularly on Java,
3. Recognition that the future of impoverished marine fishing commodities on Java and Sumatera probably does not lie in fisheries in their existing locations,
4. The use of unexploited marine fishery resources in eastern Indonesia as a vehicle for development of those areas. This involves the avoidance of enclave development, aimed solely at export promotion, which have very limited backward linkages to the local economies.
5. With regard to shrimp aquaculture industry, constraints may be from : (a) product quality inconsistencies; (b) poor post harvest handling; (c) declining world prices; (d) diseases due to deteriorating water quality, and (e) shortages of low-cost high-quality aquaculture feed.

Reorientation of agricultural development for the next century

Using current knowledge, we can find better alternative to proceed. Past experiences can be used as a precious lesson to learn, because probably we have never used past experience properly as a learning process. Comparative study abroad may also shed some important hints how to improve our capacity in rural and agriculture development.

New Quantum Leap Innovation is desired but it is not necessary. Development cannot wait until we know everything perfectly, because knowledge and understanding can only be acquired through experience. We have to proceed based on 'the existing knowledge and resources', and to go on the path of learning by doing, the path of trial and error, where we have to equip ourselves with an unmeasurable honesty to acknowledge our sheer ignorance. This attitude will help us a great deal to learn the lesson as we proceed, to know the error timely, so that we are able to make correction before it generates serious undesired impact beyond our management span of control. Probably it was this honesty that was lacking in the past, so that we learned very little from the three decades experience in agriculture development. We learned a lot about success, yet we learned nothing about failure. And so failures accumulated over time to generate the crisis of today.

Economic development in the developing countries should be geared to increase the productivity and purchasing power of the poor, and not primarily to increase the productivity and purchasing power of the

rich. The rich should wait for the purchasing power and productivity of the poor to increase, that will play the role to push the productivity and purchasing power of the rich. This mode will be called the Mode of Wave-Pushing development.

There are two conventional modes of development, which are based upon the principle to increase the productivity and purchasing power of the rich. The poor must be satisfied with the trickle down effect, which will hardly ever happening in the real world especially in developing countries.

(a.) The first mode is called the Horse Riding Mode, where the poor is considered as the horse to ride on. The rider provides enough income to satisfy their subsistence livelihood. This converges to slavery and colonialism.

(b.) The second mode is called the Rope Pulling Mode, which is common in the industrial stage of development, the emergence of the professional class or " the middle class ". The professional is badly needed by the rich, while their number is scarce. It means that they have the bargaining power in the search for a better employment. This converges to capitalism, this is what has been happening in Indonesian economy in the last 15 years .

What we need perhaps is not free market or globalization but open market equipped with proper institutional setting to ensure world-wide Wave-Pushing Development. As a matter of fact, the world had been able to institute world wide Wave-Pushing Development in the form of Marshall Plan and Japan Rehabilitation scheme after World War II.

The real problem faced in rural and agricultural development in developing countries is really economic dualism between rural and urban. In this respect economists use consistently the principle of equivalence of reference system, as if rural and urban economies are the same, so that they have to use one universal economic system and services. As we can not also use economic development models of the developed countries.

We have to use the principle of uniqueness of eigen system, because we have to deal with different economies and social environments. Several issues need to be considered to revitalise agricultural development in Indonesia:

1. Wave Pushing Mode of Development can be applied, but it is not enough, because we have to know how to operate the system in rural and agricultural development. This mode of development actually had been implemented in part during the period of 1968 – 1983 or during PELITA I – III. After 1984 it was completely

changed to the Rope Pulling Mode of development which converges to capitalism.

2. The creation of Rural Bank System, to institute the principle of uniqueness of the rural and agricultural economies. It is not a branch of the existing Urban Bank system, but its sister institution. The Rural Bank should be owned and managed by the rural society. The Bank Nagari and Bank Perkreditan Rakyat (BPR) in West Sumatera are examples of the system.
3. Rural economic system is outside the reach of the current urban bank system, when investment opportunity is concerned. The rural economy is served by the monetary system only at the time they bring the goods needed by urban economy. This is the true source of economic dualism, the main reason why rural economy and agriculture are developing very slowly.
4. The essence of a monetary system is the ability to produce fresh money following the growth of the economy. Investment in the rural area is fully dependent on the magnitude of rural saving account which is very small. Most of rural and agriculture investment are carried out outside the monetary system, using non-monetary family labor resources.
5. When urban entrepreneurs invest in agriculture they are properly served by the monetary system, and fresh money is created in the process, increasing liquidity necessary to back up follow up investment and operation maintenance.
6. The Rural Bank Eigen System has the role to offer the opportunity for the rural economy to create their fresh money. The monetary system should respond to the fact that farmers have been able to develop a coconut garden or a rice field, that is the form of money creation. The fresh money created is owned by the rural economy, to facilitate follow up investment and operation maintenance. The liquidity of the rural monetary system increases, opening the opportunity for the rural people to get additional services from the rural bank system.
7. We have to make sure that the fresh money created in the rural economy does not freely flow to the urban monetary system, creating inflationary impact of the whole economy. Money is free to flow from urban to rural, but we have to check monetary mobility in the reverse direction.
8. Rural Bank and Urban Bank might be merged into one, when rural and urban economy system can be regarded equal, or economic dualism has been resolved.

Agricultural development is then defined as ‘evolutionary process’ to develop efficient and effective ‘agribusiness structure’ where

institutional building and human resources development play a decisive role in increasing farmers income and welfare through willing and active participation of the farmers in increasing agricultural output efficiently. Basic strategies to achieve agricultural development are expansion, stabilisation, and terms of access to opportunities; on the growth of activities; and in facilitating and stimulating productive performances (Shariff, I , 1998).

Agricultural development also means increasing man's efforts and will to control over physical nature and that the efforts may be made more productive if participation in the economy of agriculture is achieved. Therefore the strategies for agriculture development can be formulated as follows: (a) expansion, stabilisation and management of economics opportunities for expansion of agricultural output, productivities, income and welfare of the farmers, (b) expansion and development of science and technology for agriculture comprehensively to improve competitiveness of agricultural commodities, (c) improvement of farmers skills and knowledges, (d) expansion of farmers access to productive assets and economic opportunities, financial sources, and information and technology, and (e) facilitating and stimulating rural institutions(Kasryno, F; A. Suryana; T Sudaryanto, 1998). So far rural and agricultural development proceeded through a mere intellectual guess and trial and error approach, so that unanticipated problem may come up from time to time demanding a series of ad hoc and provisional solutions.

Five Mega Theses are offered to reshape agricultural development:

(1) Paradigmatic change of agricultural and rural development, resulting in the unification of efficient resource based farming system and sustainable development, farmers' income and welfare improvement, and efficient output growth, into comprehensive agricultural development, to eliminate economic dualism and to guide free market and globalization to reach the ultimate global peace and welfare for all rural community.

(2) Develop comprehensive land scaping, agribusiness infrastructure, agribusiness zoning and mapping to support efficient agribusiness development.

(3) Institute Wave Pushing Mode of Development along Marshall Plan empirical analogue.

(4) Develop Rural institutions and Rural Bank Eigen System, a quantum mechanical analogue to play the role as the sister institution of the current Urban Bank Eigen System, the prerequisite to support Wave Pushing Mode of Development.

(5) Reunification of the proliferated agriculture industry or agribusiness into one Ministerial structure, with due reorganisation along functional lines and decentralised management.

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