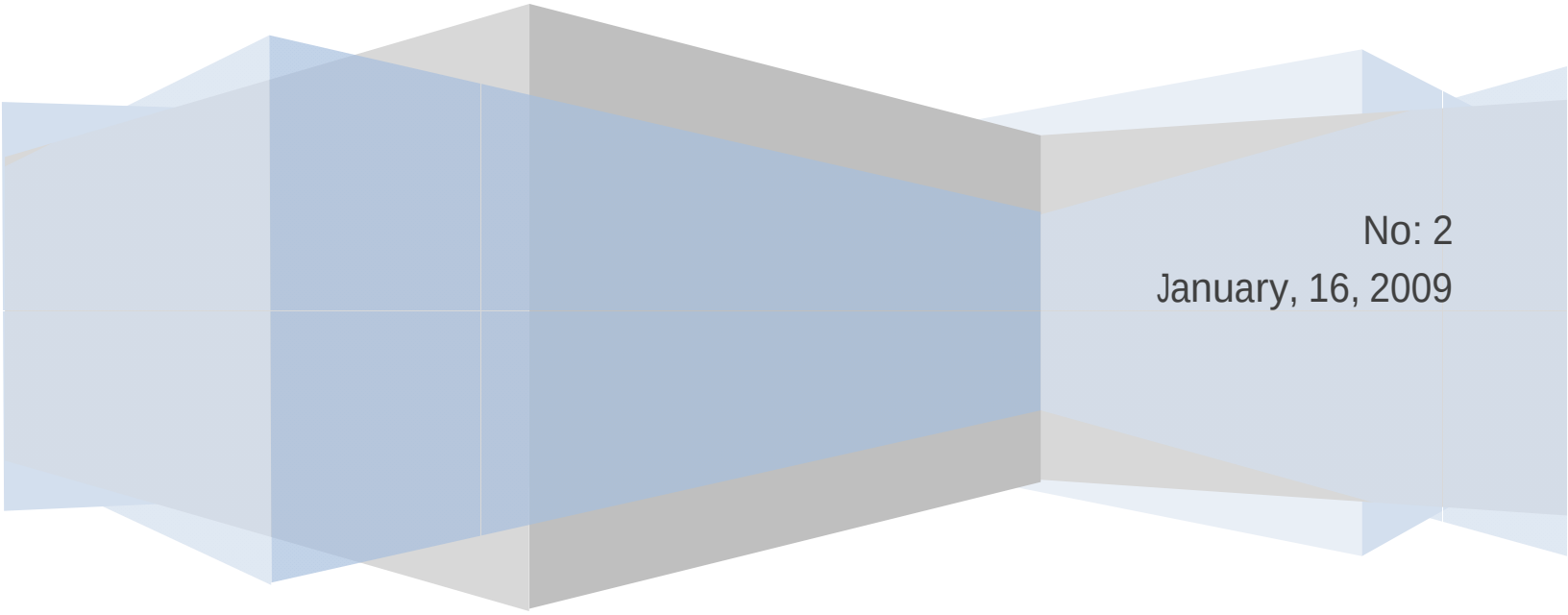
# Review on Recent Issues of Agriculture, Forestry, and Bio-Energy Sectors in Indonesia

Brighten Institute



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# EXECUTIVE SUMMARY

## Agricultural Sector

During the period of 2002-2007, foreign investment realization trend on food crops tended to increase. In 2002, there was only one foreign investment project implemented while in 2007 (as of October) there were 13 projects, implying a raise of 12 projects. Meanwhile, the value of projects in 2007 was more than 510 million USD, implying an increase of more than 398 percent from 102 million USD in 2002, but a decrease of about 4.2 percent from 533 million USD in 2006.

Indonesian statistical indicators in 2006 showed that the total land area in Indonesia was 186 million ha, but only 60.8 million ha or about 33% was utilized. Food crops area was 22.5 million ha or around 12% of total land in Indonesia. This number included paddy field which was about 7.7 million ha. Plantation area was 19.5 million ha (around 10.4% of total land), including palm oil, rubber, tea, tobacco, coffee, and cocoa. The growth of plantation area between 1995 and 2005 was 7.69% per year. The growth of plantation production between 1995 and 2005 was 8.69% per year. The average growth of urea fertilizer between 1995 and 2006 was 0.06% per year.

## Forestry Sector

Every year, 2.72 million hectares of Indonesian forests are lost. Each minute, the forest areas as large as five soccer fields are destroyed that is equivalent to the loss of forest as large as Bali Island in a year. Considering that only 41.25 million hectares of remaining Production Forest reserves have good forest cover, the supply of timber inputs from industrial plantations are only sufficient to fulfill the needs of pulp industries. Bio-fuel will stimulate acceleration of zoning for oil palm plantations. It is estimated that the natural forests in Sumatra, Kalimantan and Sulawesi will be extinct by 2012. The price of timber from these islands, including Java, will escalate dramatically because all timbers will have to be shipped from Papua. In 2022, all natural forests in Indonesia will be extinct and the price of timber will climb once again because woods will have to be imported from China and/or Vietnam.

Initiatives, such as certification, will have no impact in solving the problems if they continue to be voluntary. Solving the problems of forestry sector will not be easy. Anti-poaching operations have addressed nearly 8.7 percent of illegal logging, and the operational cost of these programs is not trivial, although it is much lower than the losses caused by poaching activities themselves, which extend beyond the timber smuggling problem.

Efforts to revitalize and restructure the industry came into conflict with attempts to increase industrial capacity. After the auditing of industries, for which the results remain unknown, the government increased the pulp production capacity in Sumatra. In addition, they also planned to build pulp industries in Kalimantan and Papua.

A moratorium on logging was taken up as an alternative because many interests require some forms of improvement. The large number of agendas made it difficult to find a single solution. Through a moratorium, all of these agendas can be put together so that overlapping problems in administration and policy can be improved first.

**Bioenergy Sector**

During the period of 2004-2008, the bio-fuel production in Indonesia has increased from only 3.3 thousand kilo liters in 2004 to 2,558.7 thousand kilo liters in 2008. Meanwhile, the installed capacity for bio-diesel production, which was about 2 million kilo liters a year, did not show any progress in the period of December 2007-June 2008. From this fact, coupled with the significant increase in bio-diesel production from 1.7 million kilo liters in 2007 to 2.6 million kilo liters in 2008, it indicates that there was an increase in the actual capacity from the company (institution) that contributed to the bio-diesel production in Indonesia.

However, the installed capacity for Bio-ethanol production in Indonesia has shown some progresses. The data showed that the installed capacity as of June 2008 was about 20 percent increase compared to its previous installed capacity in December 2007. The volume of installed capacity in June 2008 was 192 million liters, whereas in December 2007 it was only 160 million liters.

# PREFACE

This report consists of review on recent issues and development of agriculture, forestry, and bio-energy sectors in Indonesia. The report will be published every two weeks. The topic of each sectors may different in every publications but still with the same formats.

The issues addressed in this edition vary among sectors. In agricultural sector, we report the trend of investment realization on food crops and plantation, and fertilizer industry in Indonesia. Meanwhile, in forestry sector, we addressed about moratorium on logging. Lastly, the report outlines the recent issues on bio-energy sector, that is progress of Bio-fuel Development in Indonesia comprises: (i) bio-fuel production; (ii) progress of installed capacity for bio-diesel production; (iii) progress of installed capacity for bio-ethanol production.

Bogor, January 16, 2009

Brighten Team

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# I. INTRODUCTION

As the US tumbles into its worst-ever economic crisis, companies and governments around the world are affected as liquidity dries up and stock and bond markets fall, sending the global economy into recession. The ongoing global financial turmoil will bring pain to many Indonesian in the days, weeks and months to come. Given the severity of the situation, there have been some comparisons made between the current financial uncertainty and the 1997 Asian financial crisis. In 1997/1998, Indonesia experienced its worst crisis in more than three decades and which led to the fall of the Suharto government.

President Susilo Bambang Yudhoyono has shown strong leadership and with his economic ministers has moved swiftly to mitigate the impact of the global crisis on the country's financial system. Indonesia's foreign reserves stand at $57 billion and the rupiah remains relatively stable, having only depreciated 5 percent since the start of the year. Inflation is well under control and interest rates are relatively low at 9.25 percent. Indonesia has a healthy trade surplus and sufficient rice stocks. Macroeconomic fundamentals are stronger than they were 11 years ago. The Central Bank has given the corporate sector hope by slashing its benchmark interest rate for the third consecutive month in a bid to cushion the impact of global economic slump and amid a recent slowdown of inflation. Central Bank gave signs it was willing to slacken its monetary policy, with a rate cut of 50 basis points to 8.75 percent.

The government would cushion the country against the impact of the global economic downturn by providing an expansive stimulus package and sponsoring massive infrastructure projects. The package would be taken in part from the surplus of the revised 2008 state budget, about $1.76 billion (Rp 20 trillion). This amount excludes some Rp 12.5 trillion in the state budget for waived income tax, value-added tax, and import duty. After closing the 2008 account, the government still has in its coffers $4.6 billion (Rp 51.3 trillion) of unspent fund due in part to higher than expected earning and lower than estimated expenditure. The unspent funds accounted for 5.2 percent of the 2008 state budget. The unspent funds would count as an addition to the stimulus package already included in the state budget for helping industries hit hard by the economic downturn.

The government would prioritize job creation, fighting inflation, cutting the fuel subsidy, protecting the poor and ensuring food reserves. According to state budget 2009, the government allocates Rp 61.67 trillion on infrastructure spending. The Public Works Ministry is to allocate $1.54 (Rp 17.5 trillion) for making new roads and improving existing roads and facilities. The limited road capacity has become a bottleneck for business requiring good distribution and logistics for deliveries, creating unnecessary delays and additional economic

costs. The government will also spend Rp 8 trillion on irrigation canals and Rp 9.5 trillion for sanitation and other projects. The government estimates that the projects will be able to create 1.1 million jobs, not including jobs in the informal sector. The Government had forecast the economy would expand by 5 percent. Several financial institutions, including IMF, WB, and ADB projecting figures of 5 percent or below.

According to Central statistics Agency (BPS), export in November last year dropped to $9.61 billion from $10.81 billion in the previous month. The November 2008 figures represented a 2.36 percent decline from the same month in 2007. With the advanced economies beginning to head toward recession in October, importing countries started reducing demand. Indonesia, whose export heavily depends on commodities such as coal, palm oil, rubber, coffee, copper, tin, and chocolate, suffered significant drops in commodity export. Although overall exports decline in November, export to United States were up to $935.2 million from $922.7 million in October, because of increasing demand for fisheries products, shrimps, and woven garments. Declining exports have had an impact on the nation's trade balance, even though not much, as imports was also down. The drop in imports mainly occurred on the imports of raw and supporting materials.

The Ministry of Trade predicts that non oil and gas export for 2009 would grow by between 4.3 percent and 8 percent. The growth of non oil and gas exports would much depend on the growth of world economy. Those figures are much lower than annual average 18.3 percent export growth achieved between 2003 and 2007. The non oil and gas exports contribute about 80 percent to the country's total exports. In an effort to realize the projected 2009 growth, the GOI would seek new export markets since Indonesia's main traditional export markets, including United States, The European Union, and Japan have all been severely affected by the crisis. New markets include Middle Eastern countries, Egypt, and South Africa. The government would redirect furniture, textiles and garments, crude palm oil, construction materials, fisheries and shrimps, and foot wear, sales of which had begun dropping significantly in main export markets, to the new markets.

The President has issued a decree, effective from January 1, 2009, raising the price the government pays to buy rice from local farmers to ensure national rice self-sufficiency amid a slowing economic activity and global food crisis. The presidential decree stipulates the government will pay Rp 4600 per kilogram to buy rice from farmers, or 7 percent increase from the current price. The government intends to stabilize domestic rice prices by exporting and importing the grain, in order to benefit the farmers and consumers. Indonesia produced 38.6 million metric tons of milled rice in 2008, a 5.5 percent increase from 2007. The national demand of rice last year was 37 million tons. The government plans to maintain national rice self-sufficiency this year by encouraging farmers to use certified paddy seeds and fertilizer.

# II. II. AGRICULTURE SECTOR

## 2.1. Foreign Investment Realization Trend on Food Crops and Plantation

During the period of 2002-2007, although foreign investment realization trend on food crops and plantation experienced a huge fluctuation, but as overall the trends tended to increase. There was only one foreign investment project realized in 2002 and in 2007 (as of October) there were 13 projects, implying a raise of 12 projects. Meanwhile, the value of projects in 2007 was more than 510 million USD, implying an increase of more than 398 percent from 102 million USD in 2002, but a decrease of about 4.2 percent from 533 million USD in 2006. This indicates the increasing confidence of foreign companies to expand their operations in food crops and plantation sectors..

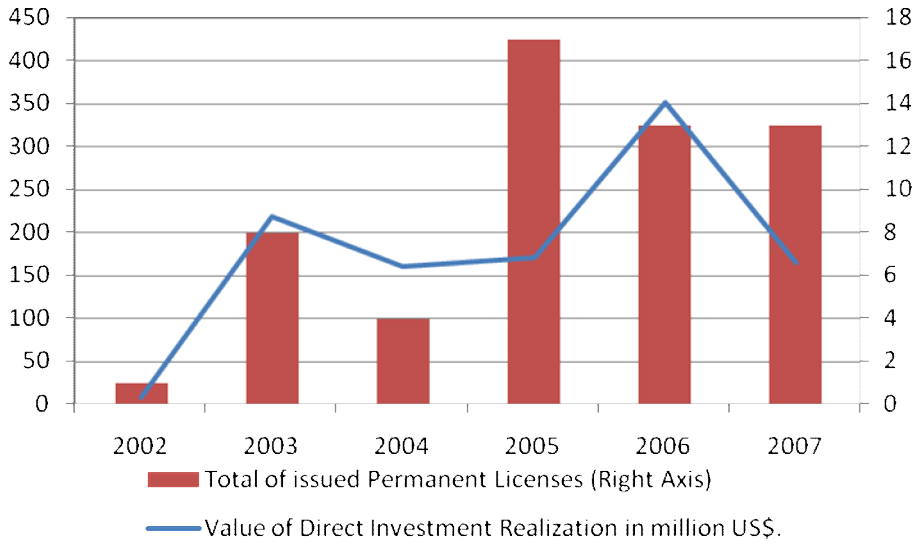


**Figure 1.** Foreign Investment Realization on Food Crops and Plantation, 2002-2007

## 2.2. Raising on The Government Purchasing Price of Rice

The Government of Indonesia, through the Presidential Decree issued on December 24, has raised the purchasing price of rice, which will be bought from local farmers in a bid to ensure national self-sufficiency amid a time of slowing economic activity and a global food crisis. Through the State Logistics Agency (Perum Bulog), the government now procures unhusked paddy (GKP) for 2,400 rupiahs for a kilogram, up from 2,200 rupiahs for a kilogram; husked paddy for 3000 rupiahs for a kilogram, up from 2800 rupiahs for a kilogram; and rice in storage for 4,600 rupiahs for a kilogram, up from 4,300 rupiahs for a kilogram.

The government will stabilize domestic rice prices by exporting and importing the grain, thus benefiting farmers and consumers. Indonesia, Southeast Asia's largest economy, produced 38.6 million metric tons of milled rice in 2008, a 5.5 percent increase from 2007, enabling the country with 230 million people to meet national demand, which was 37 million tons last year. Bulog's total rice stockpile stood at 1.4 million tons at the end of 2008.

Rice output may jump to 40 million tons this year, which would open the door for the country to export a maximum of 2 million tons, which would be the largest amount in 50 years. The government plans to maintain national rice self-sufficiency this year by encouraging farmers to use certified paddy seeds and fertilizer, according to deputy to the Coordinating Minister for the Economy, Bayu Krisnamurthi.

He said the government would continue disbursing rice to the poor in 2009. The government will provide 15 kilograms of rice over 12 months to 18.5 million poor households. The presidential decree also encourages investment in rice, but stipulates that owners of rice fields will remain under the supervision of the Investment Coordinating Board.

Key points in the presidential regulation on rice policy:

1. Encourage use of certified top-quality rice seeds and inorganic or organic fertilizers.
2. Guarantees aid for farmers suffering losses during post harvest and controls the reduction of irrigation areas.
3. Facilitate the rehabilitation of land and water catchment areas.
4. New incentives for investment in rice.
5. New price for government to buy rice and paddy.
6. New policies on stockpiling and distributing subsidized rice for the poor, and on the government's control of its rice reserve to stabilize national rice prices, as well as a policy to prepare for emergency situations and disasters.
7. A policy to stabilize the domestic price of rice.
8. New export and import policy designed to protect farmers and buyers.

### 2.3. National Fertilizer Industry

Fertilizer factories could not buy gas from producers at the prevailing price in international market because they sell their production at a government set price, which is much lower than the market price. With the highest retail price (HET) set by the government, a fertilizer factory could pay not more than US$2 per MMBTU of gas.

The government, which has a target to make the country self-sufficient in food production by 2015, has announced a plan to launch revitalization program for fertilizer factories. The

country expects to increase fertilizer production with program, which is estimated to cost around Rp 49.01 trillion. The program, however, will not succeed without any guarantee in gas supply. Banks demand the government to give a 20-year guarantee before they are ready to funnel money to the project.

### 2.3.1. Production Capacity

The country's fertilizer production capacity has not changed significantly since 2003. Capacity expansion was made for urea in 2005 to 8.03 million tons from 7,517,000 tons earlier. The expansion of the production capacity depends much on the government policy which determines the quantity of fertilizers to be supplied to the plantation sectors in line with the subsidy provision.

The government encourages the use of NPK to increase productivity. The price of the compound fertilizer is relatively expensive but it will improve the productivity of plants. In 2005, PT Petrokimia Gresik (PKG), the producer of NPK, expanded its NPK production capacity by 100,000 tons. The production capacity was raised again later to reach 910,000 tons a year. Meanwhile, the country's production capacity for ZA and TSP/SP-36 has not changed in the past five years.

PT Pusri is the oldest fertilizer producer in the country. It now has six factories with a total production capacity of 2.28 million tons a year. PT PKG is the only producer of ZA, phosphate and NPK fertilizers in Indonesia with a total production capacity of 2,583,000 tons a year. PT Pupuk Kujang is a producer of urea with a production capacity of 1,140 million tons a year. PT Pupuk Kaltim has a production capacity of 2.98 million tons a year and the largest producer of urea fertilizer in Indonesia.

PT Asean Aceh Fertilizer, which is a joint venture of the founding member countries of ASEAN stopped operation in 2003 and was finally liquidated in 2006. It had production capacity of 627,000 tons urea. PT PIM, which suspended operation for some time has production capacity of 1.17 million tons of urea and urea granules.

### 2.3.2. Major Fertilizer Producers

Indonesia has six fertilizer producing companies, including five state-owned companies under a Holding Company where PT PUSRI is the Leading Company. PT Asean Aceh Fertilizer was liquidated in 2006, after being idle since 2003 because of scarcity of gas supply.

1. **PT Pupuk Sriwijaya (PUSRI)**

   PUSRI was established in 1959 in Palembang, South Sumatra. It was built specially to produce urea fertilizer. Its first factory started operation in 1963, with a production

capacity of 100,000 tons. Later it built four more factories - in 1974, 1976, 1977 and 1994 - that its total production capacity was 2.28 million tons a year.

Based on a decision of the industry and trade minister No. 70/MPP/Kep/2/2003 on 11 February 2003 regarding procurement and distribution of subsidized fertilizers, PT Pupuk Sriwidjaja (business unit) is responsible for fertilizer distribution to West Sumatra, Jambi, Riau, Bengkulu, South Sumatra, Bangka Belitung, Lampung, Banten, Jakarta, Central Java , Yogyakarta and West Kalimantan.

**2. PT Petro Kimia Gresik (PKG)**

The Indonesian government established PKG in Gresik, East Java, in 1972 to produce ZA (Zwavelzuur Ammonia or Ammonium Sulfate), with a production capacity of 200,000 tons a year. The factory coped with the scarcity of supply of nitrogen-based fertilizers, which are cheaper. Construction of new unit of factory in 1985 and 1986 had increased its ZA production capacity to 650,000 tons a year.

PKG also built two (Triple super phosphate)/SP-36 factories in 1979 where each factory had a capacity of 500,000 tons in order to reduce dependence on imports. In 1994, its urea plant came on stream with an annual capacity of 460,000 tons. PKG is also the only producer of NPK (Nitrogen-Phosphate-Potassium/K). The NPK plant was built to reduce dependence on imports of NPK fertilizer. The types of NPK fertilizers produced by the factory include NPK Phonska, NPK Blending, NPK Granules. The production capacity of NPK factory is 910,000 tons a year.

**3. PT Pupuk Kujang (PKC)**

PKC was built in 1975 in Cikampek, West Java, with a production capacity of 570,000 tons a year. The factory was built to cope with the shortage of urea fertilizer supply in the country, especially in Java. The production capacity of PKC has increased with the construction of new production unit, which came on stream in 2005 with the same capacity, bringing its production capacity to be 1.14 million tons a year.

**4. PT Pupuk Kalimantan Timur (PKT)**

The company where its factory is in Bontang, East Kalimantan was established in 1984 with a production capacity of 700,000 tons. The new factories, including a Popka factory, were built and came on stream in 1985, 1989, 1999 and 2002, respectively, raising its total capacity to 2.98 million tons. PKT is now the country's largest producer of fertilizers. Its fifth urea factory is expected to be established in 2011 to meet a surge in demand by 2015.

**5. PT Asean Aceh Fertilizer (AAF)**

Based on Asean declaration in Bangkok in 1979, a joint venture fertilizer company named PT Asean Aceh Fertilizer (AAF) was established in Lhokseumawe (Aceh) to produce urea fertilizer. PT AAF is 60% owned by Indonesia's PT PUSRI, 13% by Thailand's Finance Ministry, 13% by Malaysia's Petronas, another 13% by Philippines's National Fertilizer Corporation, and 1% by Singapore's Temasek Holding Pte Ltd.

The factory started production in 1983, with an installed capacity of 627,000 tons a year. Its entire production was for export to other founding countries. The company stopped operation in 2003 after it received no more gas supply from Arun gas field operated by ExxonMobil Indonesia (EMOI). EMOI stopped gas supply after the failure in agreement on gas. EMOI wanted to raise the gas price to US$ 1.5 million per British Thermal Unit (MMBTU) under a new contract but PT AAF wanted the price remained at US$ 1 per MMBTU. Finally, after being idle in the long period, the company was liquidated in 2006.

**6. PT Pupuk Iskandar Muda (PIM)**

PT PIM was the latest urea producing factory built by the government in Lhokseumawe in 1982. The company started operation in 1984 with a capacity of 600,000 tons a year. The company is responsible for urea supply in Nanggroe Aceh Darussalam and North Sumatra. Part of its production is exported. Its second factory was built in 2005 with a capacity of 570,000 tons a year where its total production capacity became 1.17 million tons. The two factories temporarily suspended their operation in 2005 because of the scarcity of gas supply. One factory was able to resume its operation after receiving gas under swap arrangement from PT Pupuk Kaltim. PIM still relies on ExxonMobil for gas supply until 2009. It expects to start receiving supplies from the off shore A Block in Aceh operated by Medco E&P. PT PIM has signed a long term contract with Medco for gas supply from 2010 until 2020.

### 2.3.3. Production Stagnant

Fertilizer production depends on the government policy where all producers are owned by the state and they are all established mainly to support the development of farm and plantation sectors. However, production is also determined by the availability of gas supply, especially urea fertilizer. Shortage of gas supply for domestic consumption has caused difficulty in increasing and maintaining production lately. Production has remained stagnant in the past several years.

Production of urea fertilizer in 2003 reached 5,733,121 tons and it remained unchanged until 2007. Increase in production capacity in 2005 resulted in a decline in capacity utilization to 70.4% in 2006 from 76.3% in 2003. Production of ZA fertilizer rose substantially from 479,281

tons in 2003 to 625,000 tons in 2006, and that of NPK surged from 113,842 tons in 2003 to 412,663 tons in 2006.

The capacity utilization of NPK industry rose from 31.6% in 2003 to 89.7% in 2006. In 2007, the country's production of NPK rose further to 746,347 tons, but the capacity utilization fell to 82.2% because of the expansion of NPK production capacity of PT Petrokimia Gresik. The capacity expansion was in line with the government's call to use more NPK to improve farm productivity.

The country's production of urea has been dominated by PT Pusri and Pupuk Kaltim, with production relatively stable from year to year. Production of PT Pusri reached 2,020,760 tons in 2007 where it was down slightly from 2,053,410 tons in 2003. An increase in urea production was recorded mainly by PT Pupuk Kujang, after the operation of Kujang 1B in 2005. A decline has been recorded in production by PT PIM as a result of the scarcity of gas supply in Aceh since 2003. It was even forced to temporarily stop its operation. It could resume its operation after receiving gas under swap arrangement with PT Pupuk Kaltim in addition to supply from ExxonMobil. PT AAF was finally liquidated in 2006 after being idle since 2003.

### 2.3.4. Distribution System

After the 1997 crisis, the government made Pusri as the holding company monopolizing distribution and marketing of fertilizer in the country. A year later the trade monopoly regulation was abolished, except the distribution to the isolated areas. In 2000, the subsidy fund was given to fertilizer producers. A year later fertilizer trade regulation was imposed again for food and plantation crops. Pusri was again given the monopoly right in fertilizer distribution in the country. In 2003, it was revised twice with a decision of the industry and trade minister. Each of the five fertilizer producers was then responsible for fertilizer supply in a certain region.

Based on a decision of the trade and industry minister No. 70/MPP/Kep/2/2003, the responsibility to distribute subsidized fertilizer down to the regency areas was given to the five state-owned companies. Pupuk Iskandar Muda is responsible for supply in Nanggroe Aceh Darusalam and North Sumatra, covering 31 regencies. Pupuk Sriwijaya as a holding company is responsible for supply in 12 provinces, covering 114 regencies. Pupuk Kujang and Petrokimia Gresik are responsible for supply in West Java and East Java, covering 22 regencies and 37 regencies, respectively. Pupuk Kaltim is responsible for supply in 14 provinces in eastern Indonesia, including Bali, West Nusa Tenggaa, East Nusa Tenggara, Kalimantan, Sulawesi and Papua, covering 141 regencies. Altogether the five companies cover 31 provinces and 325 regencies. With the distribution of responsibility in fertilizer supply, control is expected to be more effective. In addition, supply of fertilizers for farmers is better guaranteed. The government also authorized producers to import subsidized fertilizer in case of shortage of domestic supply

and the producers are allowed to handle the marketing without going through the holding company.

To allow the farmers to buy more fertilizers, the government issued a policy to reduce the highest retail price (HET) for fertilizers in 2003. The policy was in line with the subsidy of Rp 1.3 trillion provided by the government for fertilizer. The subsidy is expected to help the farmers to buy fertilizer with a cheaper price, and therefore, increase their productivity. The agriculture ministry is set to maintain subsidy. In 2006, government has increased the highest retail price (HET) for fertilizers to Rp 1,200 per kg urea and this policy still prevails. Subsidy for fertilizers in 2008 was Rp 7.51 trillion. The subsidy is not against the rule of the World Trade Organization (WTO).

In order to prevent urea fertilizer from being sold above its HET, producers are required to follow the policy under the exercise of authority by the government. They are responsible for preventing fertilizers form being sold above HET. Producers are liable to be punished under criminal code for violation of the price regulation as regulated in a decision of the industry and trade minister No. 70/MPP/Kep/2/2003 regarding the procurement and distribution of subsidized fertilizers.

### 2.3.5. Shortage Recorded

The scarcity of supply was recorded in February 2004. Reports of scarcity first came from Aceh and North Sumatra because of the suspension of the operation of PT Pupuk Iskandar Muda (PIM). PIM is responsible for supplying urea fertilizer in Aceh and North Sumatera. The supply of 21,000 tons, therefore, had to be brought in from PT Pusri.

The scarcity then spread to Java. Reports of scarcity came from West Java, including Cirebon, Indramayu, Sukabumi, Cianjur, Tasikmalaya and Ciamis. Local farmers had to buy urea fertilizer with price above the HET. Reports of shortage also came from Banten where Pusri had to send fertilizers to that region. More serious scarcity was reported in East Java, where there is only one fertilizer producer, Petrokimia Gresik, which alone could not meet the requirement in that province. Pusri is also responsible for supply in East Java, but the shortage was still reported.

The high price difference between domestic market and international market had encouraged exports. The price in international market was around US$ 500 per tons that was much higher compared to US$ 125 per ton in the country. The government asked the state-owned producers to control distribution and supply of fertilizer to prevent illegal exports. Distributors that violated the export ban will have the risk that their license will be revoked.

# III. FORESTRY SECTOR

## 3.1. Moratorium on Logging

Since 2007, the proposed Moratorium on Logging has been the most-discussed policy anticlimax in the forestry sector. A number of key government officials themselves described a moratorium on logging as the best way to avoid a range of disasters and negative impacts caused by extractive industries in the forestry sector. But, there are many parties that immediately considered the pros and cons. With forestry businesses providing direct benefits to 2.8 million households and 9 billion dollars in foreign exchange, a Moratorium on Logging would surely contain some economic threats.

By definition, a Moratorium on Logging is the temporary cessation of logging and forest conversion activities. Its objective is to provide some leeway regarding problems that a long term and permanent solution should be found.

Based on Indonesian Forum for Environment (WALHI), a Moratorium on Logging must be applied for at least fifteen years. Before the end of this period, an evaluation is carried out to re-assess the situation. A fifteen-year period is considered sufficient to improve the management and policies that often had to resolve some conflicts or problems during its implementation. Fifteen years is also considered as the adequate time to formulate: (1) a protocol for conflict resolution; (2) a standard for ecological service in plantations; and (3) the conceptualization of a community forest system as the standard policy for forests in Indonesia.

A Moratorium on Logging is the most sensible choice. Every year, 2.72 million hectares of Indonesian forests are lost. Each minute, the forest areas as large as five soccer fields are destroyed, equivalent to the loss of a forest as large as the size of Bali island each year. Considering that only 41.25 million hectares of remaining Production Forest reserves have good forest cover, the supply of timber inputs from industrial plantations are only sufficient to fulfill the needs of the pulp industry, and the bio-fuel will stimulate acceleration of zoning for oil palm plantations. It is estimated that the natural forests in Sumatra, Kalimantan and Sulawesi will be extinct by 2012. The price of timber in these islands, including Java, will escalate dramatically because all timber will have to be shipped from Papua. In 2022, all natural forests in Indonesia will be extinct and the price of timber will climb once again because wood will have to be imported from China and/or Vietnam.

Timber production involves a lot of externalities through some economic linkage effects; the negative externalities of timber production seem to outweigh the former. Studies from National Consortium for Forest and Nature Conservation in Indonesia (Kophalindo) showed that

extraction of timber from Indonesia's natural forest has created negative economic, environmental and social externalities.

As can be seen in Table 1, timber production in Indonesia showed a decreasing trend during the period of 1997-2006, except for chip wood and pulp production which has increased 219.44 percent and 39.03 percent, respectively. According to the timber types, during this period, the greatest timber production was log (174,112 thousand cubic meters), followed by plywood (45,685 thousand cubic meters) and pulp (18,869 thousand tons).

**Table 1.** Timber Production in Indonesia, 1997-2006

| Timber Types | Years | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Total |
| Logs (000CU M) | 29,520 | 19,027 | 20,620 | 13,798 | 11,155 | 9,004 | 11,424 | 13,549 | 24,223 | 21,792 | 174,112 |
| Plywood (000CU M) | 6,710 | 7,155 | 4,612 | 4,443 | 2,101 | 1,694 | 6,111 | 4,514 | 4,534 | 3,812 | 45,686 |
| Sawn timber (000CU M) | 2,613 | 2,707 | 2,060 | 2,790 | 675 | 623 | 763 | 433 | 1,472 | 679 | 14,815 |
| Wood Working (000CU M) | 142 | 7 | 10 | 299 | 278 | 72 | 162 | 388 | 131 | 39 | 1,527 |
| Block Board (000CU M) | 601 | 662 | 427 | 321 | 388 | 122 | 436 | 277 | 403 | 189 | 3,826 |
| Veneer (000CU M) | 1,129 | 1,314 | 1,035 | 669 | 94 | 4,361 | 289 | 155 | 1,012 | 256 | 10,314 |
| Particle Board (000CU M) | 443 | 282 | 188 | 200 | 297 | 7 | 94 | 244 | 125 | 41 | 1,920 |
| Chip wood (000CU M) | 174 | 496 | 203 | 20 | 385 | 22 | 127 | 317 | 352 | 557 | 2,653 |
| Others (000CU M) | 471 | 795 | 648 | - | 37 | - | 727 | 766 | 360 | 23 | 3,828 |
| Molding (000CU M) | 920 | 978 | 634 | 160 | 139 | 162 | 322 | 239 | 273 | 119 | 3,946 |
| Dowel (000CU M) | 4 | 5 | 4 | 3 | 1 | - | - | - | 4 | 0 | 20 |
| Pulp (000 tons) | 2,424 | 1,994 | 1,194 | 659 | 702 | 281 | 4,662 | 2,594 | 988 | 3,371 | 18,869 |

Source: Directorate General of Forest Production Development & Forestry

Initiatives, such as certification, will do nothing to resolve the problem if they continue to be voluntary. The Green Label that was applied to forestry products has provided no added value to sold products in practice, although it was the main objective. The communities of consumer countries such as Europe, Japan and China, in reality have low awareness whether the timber they buy is derived from a sustainable source or not. Lower price is still the main choice of consumers in these importer countries. Also, certification can cast a false illusion of sustainable forest management, and can shift the focus from the real fundamental problems. This does not mean that campaigns for the use of materials from sustainable sources must be stopped, nor that consumption of raw timber materials must be stopped. However, even if these objectives are achieved, we will still face the extinction of Indonesia's natural forests.

These concerns arose from the reality of forestry industry itself. The rate of illegal logging in 2006 was greater than 19 million cubic meters, causing a loss of Rp 22.862 trillion rupiah. This figure is slightly less than the foreign exchange obtained from forestry exports,

excluding pulp, which was Rp 29.536 trillion. However, if we added the direct losses from flooding and landslides in the same year that would cost Rp 8.158 trillion, total losses would become Rp 31.020 trillion.

In sum, the forestry industry contributes Rp 1.484 trillion to the national foreign account deficit each year. This excludes losses from timber smuggling, costs of conflict, and the ecological value of forest resources.

Solving the problems of the forestry sector will not be easy. Anti-poaching operations have addressed nearly 8.7 percent of illegal logging, and the operational cost of these programs is not trivial, although it was much lower than the losses caused by poaching activities themselves which extend beyond the timber smuggling problem.

Efforts to revitalize and restructure the industry came into conflict with the attempts to increase industrial capacity. After the auditing of industries, for which the results remain unknown, the government increased the pulp production capacity in Sumatra. In addition, they also planned to build pulp industries in Kalimantan and Papua.

In sum, many agendas diverged in the forestry sector. On the one hand, problems of disaster and conflict incurred high costs. On the other hand, there is a push to continue extraction to fill foreign exchange reserves and pay off debts in industries accountable to the National Banking Restructuring Agency.

This has led to regency-level development/growth of industry that the central government may have incomplete information about or may be unaware of that forestry development planning can only be based on assumptions. Working out solutions for forestry sector development failed to take three basic issues into account: (1) lack of acknowledgement of people's rights; (2) corruption; and (3) a huge discrepancy between supply and demand in the timber industry.

A Moratorium on Logging was taken up as an alternative because there were many interests required some forms of improvement. The large number of agendas made it difficult to find a single solution. Through a moratorium, all of these agendas can be put together so that the overlapping problems in administration and policy can be improved first.

The same goes for conflict resolution. The regulation of standards related to permits and the system of community forest management can be reviewed more clearly.

A Moratorium on Logging will have multifold benefits in improving management of forest resources and the sustainability of the timber industry, including:

a) Provide the natural forests with political and ecological space in which to 'breath' and halt the continuing destruction of tropical forests in Indonesia;

b) Provide the best opportunity to monitor timber-tracking and log-auditing activities, as well as to catch illegal logging using satellite monitoring technology;

c) Provide an opportunity to restructure the forestry industry and tenurial rights to forest resources, and to increase the yields of non-timber forestry resources;

d) Correct domestic timber market distortions by opening the tap on imports as wide as possible, so that domestic timber market prices become comparable to world log prices;

e) Through the market mechanism, conduct restructuring and industrial rationalization of timber processing and correct excessive industrial capacity: only industries that carry out business genuinely and competitively are allowed to continue their enterprises and those that depend on illegal timber supply will be unable to compete;

f) Through the market mechanism, force timber processing industries to improve the efficiency of their raw material usage; and

g) Through the market mechanism, encourage pulp industries to seriously establish plantation forests.

Indonesia will suffer huge losses in the future if a moratorium on logging is not put in place now, including:

a) The Government will be unable to effectively monitor illegal logging activities;

b) Market distortions will be uncorrectable and wastage of logs will continue;

c) No incentive for industries to improve the efficiency of their raw material usage or to import more;

d) Pulp industries will continue to postpone development of plantation forests and will further destroy the natural forests;

e) The forestry industry's deficit of Rp 1.484 trillion per year from illegal logging and disasters will be unstoppable;

f) The lowland forests in Sumatra will be lost by 2009, lowland forests in Kalimantan by the next five years, and lowland forests in Papua by the next fifteen years;

g) We will lose the basis of non-pulp industries, which would otherwise contribute US$ 4 billion of foreign exchange in the future. When the forests are gone, hundreds of thousands of workers in this sector will lose their jobs in the next seven years.

Nationally, there has no regulation concerning moratorium on logging. But, locally, Aceh has implemented the moratorium on logging since June 2007, for a period of 15 years.

However, it was not yet effective. Currently, flood occurred in Aceh Jaya, Aceh Barat Daya, Aceh Utara, Lhokseumawe City, Subulussalam, and Aceh Singkil, after the heavy rain.

Although, there is no national regulation about moratorium on logging, at the ninth CGI meeting from 1 to 2 February 2000 in Jakarta, the Government of Indonesia that was represented by the Minister of Forestry and Plantations declared eight government commitments during the forestry session as follows: (1) a moratorium on the conversion of natural forests; (2) closure of debt-laden industries; (3) elimination of illegal forest logging; (4) restructuring of timber processing industries; (5) recalculation of the value of forest resources; (6) linkage of reforestation programs with industrial capacity; (7) decentralization of forestry administration; and (8) formation of a national forestry program.

In its November 2000 action plan, addenda to these commitments included: (9) tackling forest fires; (10) restructuring tenurial rights; (11) taking inventory of forest resources; and (12) improving the forest management system.

The twelfth step would entail a fundamental change in forest resource management to become more sustainable. To execute its commitments, the Government of Indonesia formed an Inter-Departmental Committee on Forestry through Presidential Decree No. 80/2000 on 7 June 2000 that is responsible for coordinating and implementing all government commitments in the forestry sector.

Recently, in November 2008, Minister of Forestry has signed a new regulation (SK.400/Menhut-II/2008 dated 20 November 2008) concerning allocation of national log production in 2009, which proceed from legal forest plantation. Based on this regulation, Directorate General of Forest Production Development & Forestry has arranged the log production in every province (SK.432/VI-BPHA/2008 dated 17 December 2008). In this regulation, national log production during 2009 is determined to be 9.1 million m3, with tolerant limit 5%.

# IV. BIOENERGY SECTOR

## 4.1. Bio-fuel Production

As shown in Table 2, in the period of 2004-2008, the bio-fuel production in Indonesia has increased from 3.3 thousand kilo liters in 2004 to 2,558.7 thousand kilo liters in 2008. In 2004, the share of bio-ethanol in the national bio-fuel production was 76 percent. But, starting from 2005, the national bio-fuel production had been dominated by bio-diesel. In 2008, the contribution of bio-diesel in the national bio-fuel production was about 91 percent. The production of bio-oil was started in 2006, and in 2008 the contribution of bio-oil in the national bio-fuel production was only one percent.

**Table 2.** Bio-fuel Production (thousand kilo liter)

| | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| Bio-fuel | 3.3 | 122.5 | 471.5 | 1722.2 | 2558.7 |
| Bio-diesel | 0.8 | 120 | 456.6 | 1550 | 2329.1 |
| Bio-ethanol | 2.5 | 2.5 | 12.5 | 135 | 192.4 |
| Bio-Oil | | | 2.4 | 37.2 | 37.2 |

According to strategic plan for bio-fuel development issued by TIMNAS BBN (December 2006), the bio-ethanol production for 2007 was planned to reach 232 thousand kilo liter. After that, in the 2008 and 2009, the target for bio-ethanol production were 2,95 million kilo liter and 4,54 million kilo liter, respectively. At the other side, the bio-diesel and bio-oil production for 2007, 2008, and 2009 were planned to reach 11,04 million kilo liter, 11,2 million kilo liter, and 11,9 million kilo liter, respectively.

Considering the above figure and coupled with the fact that table 1 showed, it is to note that although the progress of the bio-fuel development, in terms of production, in the 2004-2008 period is fast, the gap in level of production with those as it plan is still very big. From this situation, It is very difficult to catch up the 2009 bio-fuel production target. Thus, if there is no breakthrough policy exercised to boost up the production, the proper adjustment regarding the bio-fuel development planning is needed.

## 4.2. Progress of Installed Capacity for Bio-diesel Production

As described in Table 3, the installed capacity for bio-diesel production, which was about 2 million kilo liters per year did not show any progress in the period of December 2007-June 2008. From this fact, coupled with the significant increase in bio-diesel production from 1.7 million kilo liters in 2007 to 2.6 million kilo liters in 2008 (Table 2), it indicates that there was an increase in the actual capacity from the company (institution) that contributed in the bio-diesel production in Indonesia.

In 2007, the production has reached 1.7 million kilo liters, as the capacity installed was about 2 million kilo liters. In 2008, the production has reached 2.6 million kilo liters, as the capacity installed was about only 2 million kilo liters. It indicates that in 2008, since the most updated data of installed capacity is in June 2008, there was one of the two possible progresses happened after June 2008. First, there was an additional company (institution) that contributed to the bio-diesel production in Indonesia. Second, there was an increase of the existing company's installed capacity.

**Table 3.** Installed Capacity for Bio-diesel Production (Dec 2007-June 2008)

| Dec-07 | | | | Jun-08 | | | |
|---|---|---|---|---|---|---|---|
| Status: 2 million kl/year | | | | Status: 2 million kl/year | | | |
| Company (Institution) | Location | Installed Capacity (kl/year) | Raw Material | Company (Institution) | Location | Installed Capacity (kl/year) | Raw Material |
| PTPN 4 & GANESHA ENERGI | MEDAN | 4,400 | CPO | PTPN 4 & GANESHA ENERGI | MEDAN | 4,400 | CPO |
| MUSIM MAS | Pekanbaru | 300,000 | CPO | MUSIM MAS | Pekanbaru | 300,000 | CPO |
| WILMAR GROUP | Dumai | 1,100,000 | CPO | WILMAR GROUP | Dumai | 1,100,000 | CPO |
| BPPT | Serpong | 330 | CPO | BPPT | Serpong | 330 | CPO |
| INDO BIOFUELS ENERGY | Merak | 111,000 | CPO | INDO BIOFUELS ENERGY | Merak | 111,000 | CPO |
| RAP | Bintaro | 1,830 | CPO | RAP | Bintaro | 1,830 | CPO |
| EAI | Jakarta | 550 | CPO | EAI | Jakarta | 550 | CPO |
| SUMIASIH | Bekasi dan lampung | 111,000 | CPO | SUMIASIH | Bekasi dan lampung | 111,000 | CPO |
| PLATINUM | Serang | 22,000 | CPO | PLATINUM | Serang | 22,000 | CPO |
| DHARMEX | | 111,000 | CPO | DHARMEX | | 111,000 | CPO |
| ETERINDO | Gresik dan Tanggerang | 267,000 | CPO | ETERINDO | Gresik dan Tanggerang | 267,000 | CPO |

### 4.3. Progress of Installed Capacity for Bio-ethanol Production

The installed capacity for Bio-ethanol production in Indonesia has shown some progresses. As shown in Table 4, the installed capacity per June 2008 was about 20 percents increased compare to its previous position (December 2007). The position of installed capacity at June 2008 was 192 million liter, as its position at December 2007 was only 160 million liter.

As the installed capacity in the period was increased, there was also increasing in terms of the number of the company (institution) who contribute to the bio-ethanol production in Indonesia as following (Table 4):

- The installed capacity for commercial scale was rose about 50 percent from 120 million liter per year in December 2007 to 180 million liter in June 2008. The contribution of MEDCO (Lampung) after December 2007 was contributed the additional 60 million liter capacity.
- The installed capacity for small and medium scale was also rose about 39 percent from about 7 million liter in December 2007 to 9,8 million liter in June 2008. The contribution provided by KUD Neg. Tulangbawang (Lampung), PT. Taktakan Bioenergi (Serang), BERLIAN LIMA (Gadog), PT. Bio Prima Energi Mandiri (Kebumen), Koperasi Kairos (Halmahera Utara), and RAP Bintaro after December 2007 was totally contributed to the additional 2,8 million liter capacity.

**Table 4.** Installed Capacity for Bio-ethanol Production (Dec 2007-June 2008)

| | Dec-07 | | | | | Jun-08 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Status: 160.000 kl/year | | | | | Status: 192.349 kl/year | | | | |
| | Company (Institution) | Location | Installed Capacity | Raw Material | Note | Company (Institution) | Location | Installed Capacity | Raw Material | Note |
| | | | (kl/year) | | | | | (kl/year) | | |
| Commercial Scale | | | | | | MEDCO | Lampung | 60,000 | Cassava | Integrated Industry |
| | SUGAR GROUP | Lampung | 70,000 | Molases | Integrated Industry | SUGAR GROUP | Lampung | 70,000 | molasses | Integrated Industry |
| | Molindo Raya | Malang (Jatim) | 50,000 | Molases | Ex-PTPN | Molindo Raya | Malang (Jatim) | 50,000 | molasses | ex-PTPN |
| Small and Medium Scale | PANCA | Cicurug | 573 | Cassava and Molases | | KUD Neg. Tulangbawang | Lampung | 73 | molasses | |
| | TRIDAYA | Cilegon | 1,095 | Molases | | PT. Taktakan Bioenergi | Serang | 1,095 | molasses | |
| | BEKONANG | Solo | 5,180 | Molases | 140x37 | BERLIAN LIMA | GADOG | 73 | Cassava, Molasses | |
| | BLUE | Balikpapan | 73 | Molases and sorghum | | PANCA | Cicurug | 573 | Cassava, Molasses | |
| | BLUE & MONONUTU | Minahasa Selatan | 146 | Sugarpalm | 2x73 | TRIDAYA | Cilegon | 1,095 | molasses | |
| | | | | | | BEKONANG | Solo | 5,180 | molasses | 140x37 |
| | | | | | | PT. Bio Prima Energi Mandiri | Kebumen | 1,095 | Cassava, molasses, corn | |
| | | | | | | BLUE | Balikpapan | 73 | Molasses, Sorghum | |
| | | | | | | Koperasi Asri Sea | Minahasa Utara | 73 | Sugarpalm | |
| | | | | | | Koperasi Kairos | Halmahera Utara | 73 | Sugarpalm | |
| | | | | | | BLUE & MONONUTU | Minahasa Selatan | 146 | Sugarpalm | 2x73 |
| | | | | | | RAP Bintaro | Bintuni-Irjabar | 300 | Sugarpalm, Nipapalm, and Sweet | |
| Research Project | BPPT | Lampung | 2,500 | Cassava | | BPPT | Lampung | 2,500 | Cassava | |

# V. CONCLUDING REMARKS

Foreign investment realization trend on food crops tended to increase in the period of 2002-2007 both in the number of projects and value. During this period, foreign investment project has risen by 12 projects (from only one project in 2002 to 13 projects in October 2007) and the value has increased by more than 398 percent (from 102 million USD in 2002 to more than 510 million USD in October 2007).

Nowadays, Indonesia still faces crucial problem in agricultural production due to fertilizer scarcity. In Indonesia, fertilizer industry has been developed since 1959. It began with PUSRI I Urea Plant which commenced production in 1963. PT. Pupuk Sriwidjaja (PUSRI) Holding is a state-owned company that has 14 urea plants, 3 ammonium sulphate plants, 2 SP-36 plants and 1 NPK plant. Indonesia has six fertilizer producing companies including five state-owned companies under a Holding Company where PT PUSRI is the Leading Company. PT. Asean Aceh Fertilizer was liquidated in 2006, after being idle since 2003 because of the scarcity of gas supply.

Since 2007, the proposed Moratorium on Logging has been the most-discussed policy anticlimax in the forestry sector. A number of key government officials themselves described a moratorium on logging as the best way to avoid a range of disasters and negative impacts caused by extractive industries in the forestry sector. But, there were many parties that immediately considered the pros and cons. Since the forestry businesses providing direct benefits to 2.8 million households and 9 billion dollars in foreign exchange, a Moratorium on Logging would surely contain some economic threats.

Although, there is no national regulation about moratorium on logging, at the ninth CGI meeting from 1 to 2 February 2000 in Jakarta, the Government of Indonesia that was represented by the Minister of Forestry and Plantations declared eight government commitments during the forestry session as follows: (1) a moratorium on the conversion of natural forests; (2) closure of debt-laden industries; (3) elimination of illegal forest logging; (4) restructuring of timber processing industries; (5) recalculation of the value of forest resources; (6) linkage of reforestation programs with industrial capacity; (7) decentralization of forestry administration; and (8) formation of a national forestry program.

Recently, in November 2008, Minister of Forestry has signed new regulation (SK.400/Menhut-II/2008 dated 20 November 2008) concerning allocation of national log production in 2009, which proceed from legal forest plantation. Based on this regulation, Directorate General of Forest Production Development & Forestry has arranged these log production in every province (SK.432/VI-BPHA/2008 dated 17 December 2008). In this regulation, national log production in 2009 is determined to be 9.1 million m3, with tolerant limit of 5%.

The bio-fuel production in Indonesia has increased from 3.3 thousand kilo liters in 2004 to 2,558.7 thousand kilo liters in 2008, whereas the contribution of bio-diesel in the national bio-fuel production was about 91 percent in 2008. The production of bio-oil started in 2006, and in 2008, the contribution of bio-oil to the national bio-fuel production was only one percent. In addition, the installed capacity for bio-diesel production did not show any progress in the period of December 2007-June 2008. From this fact, coupled with the significant increase in bio-diesel production from 1.7 million kilo liters in 2007 to 2.6 million kilo liters in 2008, it indicates that there was an increase in the actual capacity from the company (institution) that contributed to the bio-diesel production in Indonesia. However, the installed capacity for Bio-ethanol production in Indonesia has shown some progresses. The installed capacity as of June 2008 was about 20 percent increase compared to its previous installed capacity in December 2007. The installed capacity in June 2008 was 192 million liters, while it was only 160 million liters in December 2007.

# RESEARCH ISSUES/EVENTS

## 1) ANNUAL SEMINAR AND CONGRESS MAKSI

Indonesian Palm Oil Community (MAKSI) and Bogor Agricultural University (IPB) undertake: Annual Seminar and Congress MAKSI with the theme : Competitiveness of Indonesian Palm Oil through Research.

Day / date : Thursday, January 29, 2009

Time : 08.00 - 17.00 WIB

Venue : IPB International Convention Center, Jl. Raya Pajajaran Bogor

### PARTICIPANTS

Indonesian Oil Palm Businessman, staff and managers based palm oil industry, recent decisions at the level of government, researchers from universities and NGOs, and major members of the public who are interested in the field of oil palm. Registration at the latest on Tuesday, 27 January 2009.

### REGISTRATION FEES

Cost
Member of MAKSI : Rp. 250.000, -

Non MAKSI : Rp. 350.000, -

Registration fee includes a snack, lunch, seminars kits and certificates.

### CONTACT

MAKSI Office

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E-mail: maksi_sawit@yahoo.com

## 2) AGRINEX CONFERENCE AND EXPO 2009

Date: 13-15 March 2009

Place: Hall A & Cenderawasih Jakarta Convention Center, Jakarta

Since centuries ago, Indonesia has been well-known as a rich agrarian country which came to the idiom of 'gemah ripah loh jinawi' in Javanese means 'the rich, fertile, and prosperous land' due to its fertile soil and vast unexplored marine sources. Unfortunately, since this past 20 years, the attractively of farmer has been transferred to urban society caused by the large expansion of industrialism in Indonesia since 1997 with the rapid growth of foreign investment especially in the big cities. The strong attraction or metropolitan city has made the great urbanization. In the mind of villagers, working as an industrial labor is more promising for their future than being a farmer in the village. In fact, with high living cost in the city made it contrary, and caused them tempted to do such deviated action and raise more poverty.

With the increase of minimum regional wages, the increase domestic price of petrol equal to international price since not subsidized by government, and the wide open of international investment, currently, Indonesia is not the main target for foreign investment. Therefore, Indonesia has to hold the unprecedented speed of urbanization and should increase the average income in all provinces, in the same time decrease the criminality level in big cities by enforcing the rural society through the fasten of agriculture processing and production growth as what other countries such as China, Vietnam and Thailand have done.

The AGRINEX has become Indonesia's leading agribusiness exhibition since 2005, where major on-farm and off-farm players can present themselves and discuss productive opportunities. The 2009 exhibition promises to display abroad range of sectors, including seeding, breeding, farming, forestry, fisheries, packaging, distribution, exports-imports, hyper-retailers, banking, consultants, local government, and the media.

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## 3) MARINE SCIENCE AND TECHNOLOGY TRAINING COURSE (MST) 2009

### BACKGROUND

Marine Science and Technology Training Course (MST) is a special training program for senior undergraduate students, graduate students or junior scientist/researchers, who want to improve their knowledge as well as skills in the field of marine sciences. MST is carried out by the cooperation between Bogor Agricultural University (IPB) and German Academic Exchange Service (DAAD) since year 2001 and keep improving until now (2008). This international training program is held annually at the Department of Marine Science and Technology, Faculty of Fisheries and Marine Science (ITK-FPIK-IPB).

### MST GOALS

- To train Indonesian students and junior scientists / researchers in marine science and technology by employing an international training standard
- To better prepare the students / junior scientists for the graduate or advance study or research in the field of marine science and technology

### MST 2008

In the MST 2008, the participants had 51 days of lectures and 5 practical works in laboratory and 3 field works. At the end of the course, each participant should make a seminar presentation and a scientific proposal. The course comprised various topics, given by 33 lecturers/researchers from IPB, LIPI, COREMAP/UNHAS, UNESCO Jakarta and a guest lecturer from Germany. The course was divided into 18 modules, i.e: Oceanography; Marine Microbiology; Marine Plankton; Acoustic Instrumentation & Remote Sensing; Marine Nekton; Ichthyoplankton; Mariculture; Benthos Ecology; Scientific Writing & Communicating; Sampling

Strategy in the Deep Sea; Marine Biotechnology; Marine Pollution; Fish Processing Technology; Capture Fisheries; Stock Assessment; Tropical Marine Ecology; Integrated Coastal Zone Management; Coral Assessment & Public Awareness.

This year, MST has brought up 18 successful students. Overall, there are already 108 MST alumni so far.

Deadline Application : 31 Januari 2009

**MST COORDINATION COMMITTEE :**

1. Prof. Dr Indra Jaya (Dean of FPIK)
2. Dr. Karen von Juterzenka (Guest lecturer at ITK-FPIK, supported by DAAD)
3. Prof. Dr. Setyo Budi Susilo (Head of ITK)
4. Dr. Tri Prartono
5. Dr. Totok Hestirianoto
6. Dr. Neviaty P Zamani

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