

The Medium Term Outlook for Agriculture and Fertilizer Demand in Indonesia

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Outline of Presentation

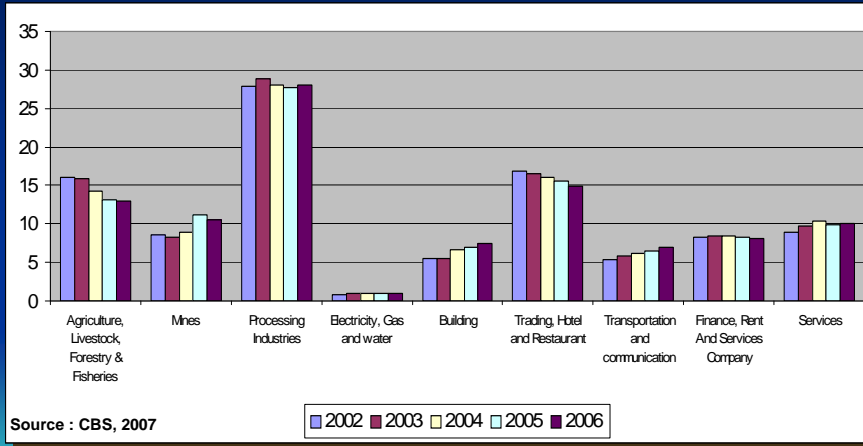
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Current Status and Prospect of Agriculture in Indonesia

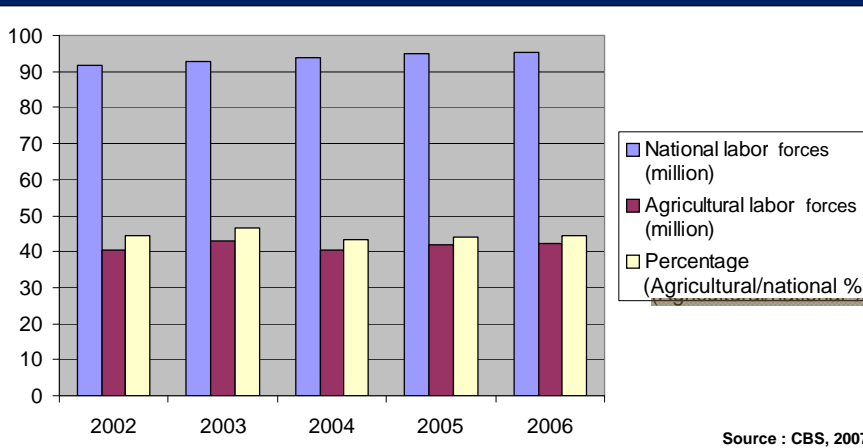
Current Status of Agriculture in Indonesia

- Agriculture sector has significant contribution to GDP (3rd place after manufacturing industry ; and trade, hotels & restaurants)
- Agriculture sector provides big employment (44 % of total labor forces)
- Agriculture sector can drive rural economy

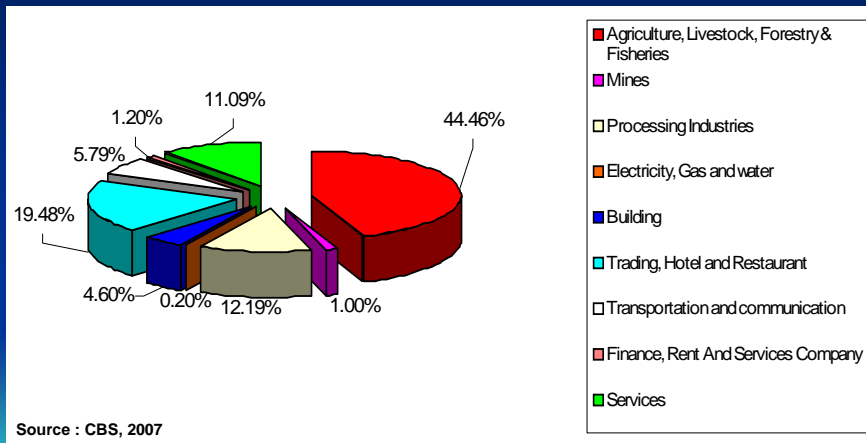
Percentage of Agriculture Contribution to GDP



Contribution of Agriculture Sector to Employment



Percentage of Agricultural Employment in 2006



The Prospect of Indonesian Agriculture

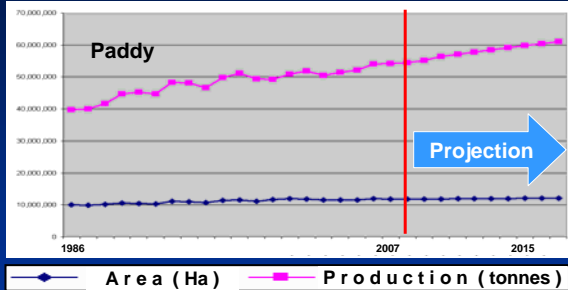
- Production and productivity of several commodities are increasing (Food Crops and Plantation)
- Natural resources have not been utilized optimally
- Supported by Government policies (Agriculture, Forestry and Plantation Revitalizing policy)

Support by Agriculture Inputs

Needs role of fertilizer industries

- The projection of agricultural commodities is carried out using the **trend analysis**.

Dynamics of area and production of paddy 1986 -2006 and their projection for 2007 - 2015



Source : MoA, 2007

The average productivity of paddy in Indonesia (Tropical Country) is however lower than that of in China (Subtropical Country).

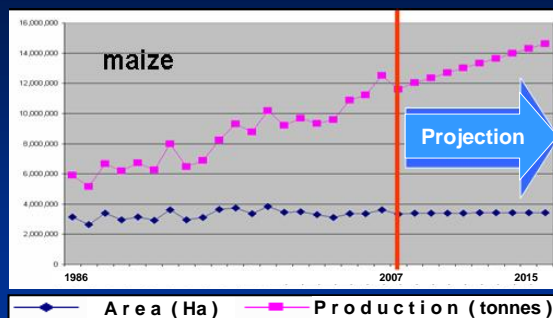
Country	Year		Change Two decades
	1986 (Tones/Ha)	2006 (Tones/Ha)	
Indonesia	4.1	4.6	0.5
China	4.1	6.0	1.9

Projection of paddy area by 2015 is about 12.08 million hectares, increase 0.3% annually in average

Projection of paddy production by 2015 is about 61.09 million tonnes, increase 1.33% per annum

Improvement of paddy's productivity in China is supported by input technology such as fertilizer usage (type, composition and dosage) and high quality seeds.

Dynamics and production of maize 1986 -2006 and their projection for 2007 - 2015



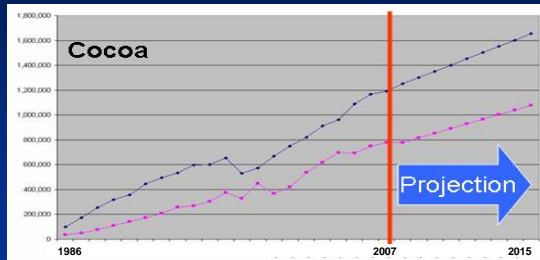
Source : MoA, 2007

Increase in Maize production is stimulated by the increase in demand for livestock feeds as government needs to improve Indonesian health status by implementing 100 chicken eggs per capita per annum program.

Projection of Maize area by 2015 is about 3.43 million hectares, increase 0.27% annually.

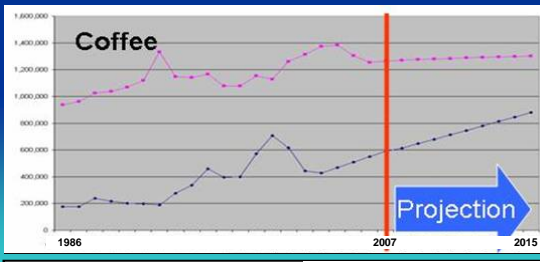
Projection of Maize production by 2015 is about 14.6 million tonnes, increase 2.59% per annum

Dynamic of area and production of other plantation commodities (cocoa and coffee) 1986 - 2006 and their projection for 2007 - 2015



Projection of cocoa area by 2015 is about 1.65 million hectares, increase 3.7% annually

Cocoa production will increase 3.68% per annum

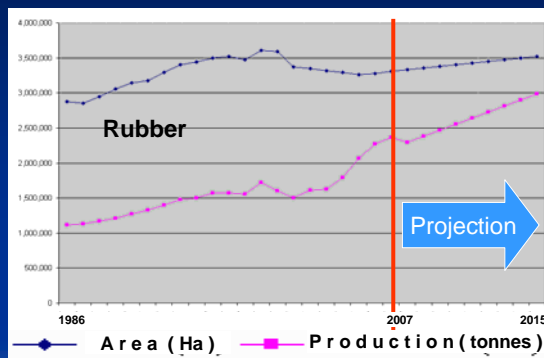


Projection of coffee area by 2015 is about 0.8 million hectares, increase 4.4% annually

Coffee production will increase 0.33% per annum

—◆— Area (Ha) —■— Production (tonnes)
Source : MoA, 2007

Dynamic of area and production of rubber 1986 - 2006 and their projection for 2007 - 2015

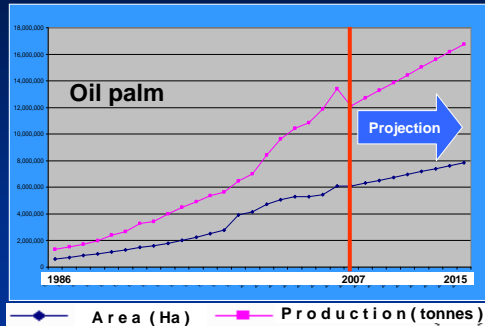


Projection of Rubber area by 2015 is about 3.52 million hectares, increase 0.69% annually.

Projection of Rubber production by 2015 is about 2.9 million tonnes, increase 2.65% per annum

Source : MoA, 2007

Dynamics of area and production of Oil Palm 1986 - 2006 and their projection for 2007 - 2015



Source : MoA, 2007

Currently (2007) Indonesia is the biggest oil palm producer in the world with production about 16.2 million tonnes of CPO per annum. Malaysia about 15.8 million tonnes of CPO per annum.

CPO price is predicted to increase and positively related to world oil price since CPO is an alternative input for biofuel production.

Government of Indonesia (since 2007) through the agrarian reform plan has targeted the increase in agricultural area by 8.15 million hectares by 2014, 70% for estate plantations and 30% for food crops. Part of these are marginal or less fertile land that need more fertilizer .

Projection of Oil palm area by 2015 is about 7.62 million hectares, increase 2.87% annually.

Projection of Oil palm production by 2015 is about 16.2 million tonnes, increase 2.62% annually

Dynamics of Main Fertilizers Consumption in Indonesia

Dynamics of Main Fertilizer Consumption in Indonesia (Tonnes)

USAGES	2000	2001	2002	2003	2004	2005	2006
UREA							
Food Crops	3.652.082	3.904.815	3.783.983	3.911.255	4.210.586	3.992.689	3.962.404
Plantation	3.652.082	3.904.815	3.783.983	3.911.255	4.211.586	3.992.689	3.962.404
Others	513.533	487.311	452.205	468.880	550.255	599.899	511.011
Total	4.667.918	4.868.780	4.678.504	4.838.760	5.299.062	5.179.368	4.973.251
SP36/TSP							
SP36 (Food Crops)	623.260	645.388	600.991	600.991	820.100	819.688	738.725
TSP (Plantations)	501.386	455.741	452.564	470.576	368.641	449.065	418.554
Total	1.124.646	1.101.129	1.053.555	1.071.567	1.188.741	1.268.753	1.157.279
KCL (MOP)							
Food Crops	277.323	286.875	266.749	266.939	310.356	448.606	306.800
Plantations	570.489	535.727	522.269	538.078	425.897	521.635	490.323
Others	1.383	1.430	1.330	1.331	1.547	1.665	1.530
Total	849.194	824.033	790.348	806.348	737.800	971.906	798.653
ZA (Amm Sulphate)							
Food Crops *	531.676	513.933	424.438	526.671	670.131	702.902	737.288
Plantations	369.377	360.644	348.952	354.505	360.571	407.429	380.286
Others	1.575	1.522	1.257	1.560	1.985	2.082	2.184
Total	902.628	876.099	774.647	882.736	1.032.687	1.112.413	1.119.758
NPK							
Food Crops	65.768	63.492	123.920	129.933	194.380	268.199	402.376
Plantations	144.747	131.440	200.724	171.763	321.400	221.539	278.649
Total	210.515	194.932	324.644	301.696	515.780	489.738	681.025

* paddy, sugar cane, and horticulture small holdings
(Data processed) Source: APPI (2007), IFA (2007), Mol (2007) and MoA (2007)

Besides fertilizers such as Urea, SP 36, TSP, KCI, ZA and NPK, Agricultural sector in Indonesia also uses DAP and Rock Phosphate.

Consumption of DAP and Rock Phosphate in Indonesia (Tonnes)

Fert. / Year	2004	2005	2006
DAP	869,565	1,086,957	1,358,696
ROCK PHOSPHATE	1,428,000	1,558,900	1,486,000

Source : IFA (2007)

Due to data limitation, we only present these three years data

ORGANIC FERTILIZER

- Besides the demand for chemical fertilizers, recently demand for organic fertilizers also tends to increase in Indonesia. The organic fertilizers are used for restoring and improving soil structures and this can be considered as complement to chemical fertilizer usages. Hence the demand for organic fertilizer increases as demand for chemical fertilizers raises.
- Government of Indonesia recently has planned “Go Organic 2010” Program → The demand for organic fertilizer will increase significantly.

Projection of Domestic Demand for Fertilizers

In this presentation, projection for fertilizer demand is derived from future trends of main agricultural commodities, particularly

- Food Crops : Paddy and Maize
- Plantation : Oil Palm, Rubber, Cocoa and Coffee

The Fertilizer demand is undertaken using the econometric method.

In the fertilizer projection, instead of using nutrient contents, we use the product (commercial and local names) format due to convention (more practical), ie : KCL for MoP, NPK for Compound Fertilizer, ZA for Ammonium Sulphate.

Disadvantage of using this : complexity to convert into nutrient content as the nutrient content in each commercial product is so diverse, especially for Compound Fertilizer.

Model for the Projection

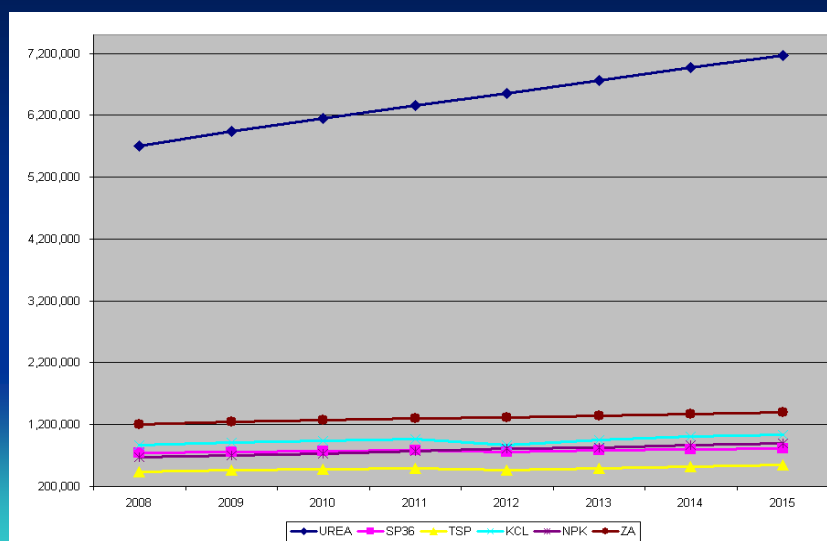
- Econometric (simultaneous equation) model is firstly estimated. The estimated model is then utilised to carry out forecasting (projections) by simulating a number of policy scenarios
- Data used in the estimation is time series data from 1986 to 2006 comprising fertilizer usage, production of fertilizer, fertilizer price, productions of several agricultural commodities, areas, prices of agricultural outputs, exchange rate and interest rates
- PT. Pusri cooperates with Graduate Program of Management and Business - Bogor Agricultural University (MB-IPB) to develop the model.

PROJECTED DEMANDS FOR UREA, SP36, TSP, KCL, NPK AND ZA 2008 -2015 (Tonnes/Year) : BUSINESS AS USUAL SCENARIO

YEAR	DEMAND PROJECTION (TONNES)					
	UREA	SP36	TSP	KCL	NPK	ZA
2008	5,697,614	738,143	438,479	870,134	1,105,439	1,207,854
2009	5,941,520	753,782	459,378	903,666	1,163,390	1,242,848
2010	6,143,856	765,687	477,493	931,608	1,220,728	1,272,973
2011	6,363,776	778,422	494,856	959,855	1,279,251	1,301,606
2012	6,549,633	756,925	460,793	869,277	1,347,972	1,317,506
2013	6,762,043	781,500	498,111	954,491	1,394,959	1,345,536
2014	6,964,169	797,308	522,806	1,001,689	1,451,579	1,371,755
2015	7,167,890	810,310	543,065	1,036,951	1,508,080	1,396,788

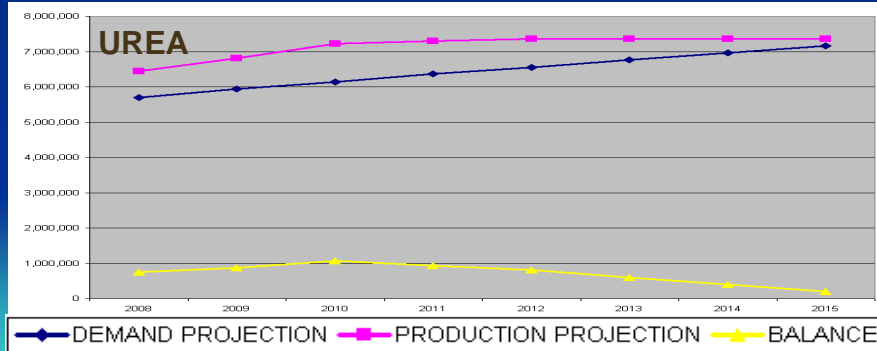
The government plans to subsidize SP36 and NPK by 1 million tonnes each in 2008 → even better prospect

PROJECTED DEMANDS FOR UREA, SP36, TSP, KCL, NPK AND ZA 2008 -2015 (Tonnes/Year) : BUSINESS AS USUAL SCENARIO



DEMAND VS PRODUCTION PROJECTION OF UREA (TONNES)

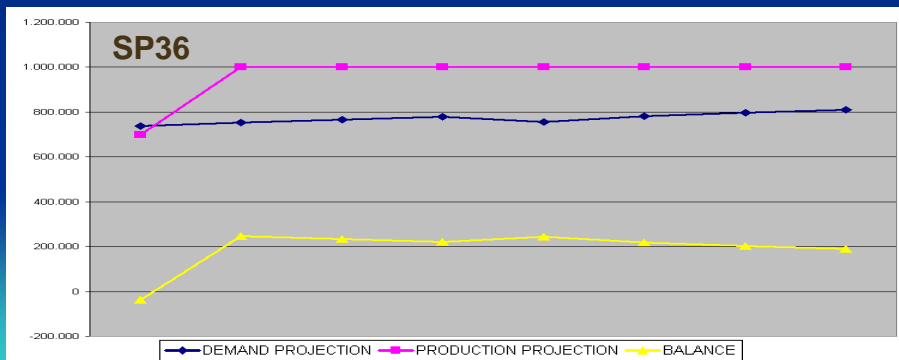
YEAR	DEMAND PROJECTION				PRODUCTION	BALANCE
	Food Crops	Plantation	Others	Total		
2008	4,476,215	605,234	616,165	5,697,614	6,446,000	748,386
2009	4,668,517	633,737	639,266	5,941,520	6,809,000	867,480
2010	4,822,368	659,121	662,367	6,143,856	7,214,100	1,070,244
2011	4,994,638	683,670	685,468	6,363,776	7,295,300	931,524
2012	5,141,018	700,046	708,569	6,549,633	7,360,000	810,367
2013	5,305,446	724,926	731,671	6,762,043	7,360,000	597,957
2014	5,461,157	748,239	754,773	6,964,169	7,360,000	395,831
2015	5,618,816	771,201	777,873	7,167,890	7,360,000	192,110



Production projection is based on the producers existing plant capacity and gas availability.

DEMAND VS PRODUCTION PROJECTION OF SP36/TSP (TONNES)

YEAR	DEMAND PROJECTION		PRODUCTION PROJECTION		BALANCE	
	SP36	TSP	SP36	TSP	SP36	TSP
2008	738.143	438.479	700.000	0	-38.143	438.479
2009	753.782	459.378	1,000.000	0	246.218	459.378
2010	765.687	477.493	1,000.000	0	234.313	477.493
2011	778.422	494.856	1,000.000	0	221.578	494.856
2012	756.925	460.793	1,000.000	0	243.075	460.793
2013	781.500	498.111	1,000.000	0	218.500	498.111
2014	797.308	522.806	1,000.000	0	202.692	522.806
2015	810.310	543.065	1,000.000	0	189.690	543.065



Production projection is based on the producers existing plant capacity

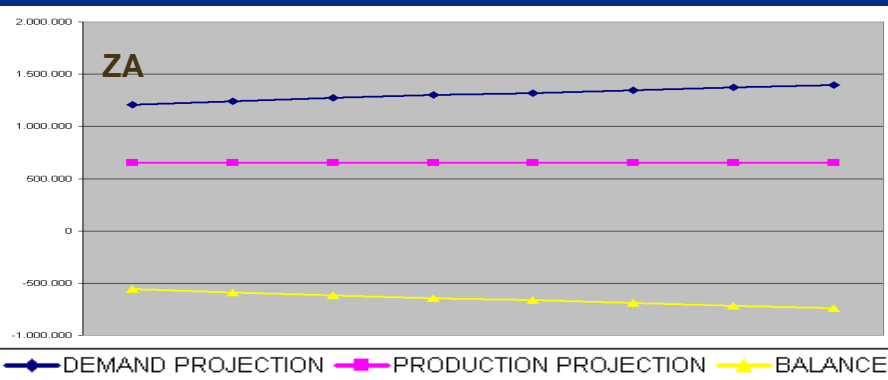
DEMAND PROJECTION OF KCL (TONNES) 2008-2015

YEAR	DEMAND PROJECTION OF KCL (tonnes)			
	Food Crops	Plantation	Others	Total
2008	313,544	555,071	1,519	870,134
2009	313,149	588,990	1,526	903,666
2010	315,289	614,787	1,532	931,608
2011	320,130	638,188	1,538	959,855
2012	325,241	542,491	1,545	869,277
2013	331,011	621,929	1,551	954,491
2014	336,647	663,485	1,557	1,001,689
2015	342,410	692,977	1,564	1,036,951

Note : All KCL are imported, no domestic production.

DEMAND VS PRODUCTION PROJECTION OF ZA (TONNES)

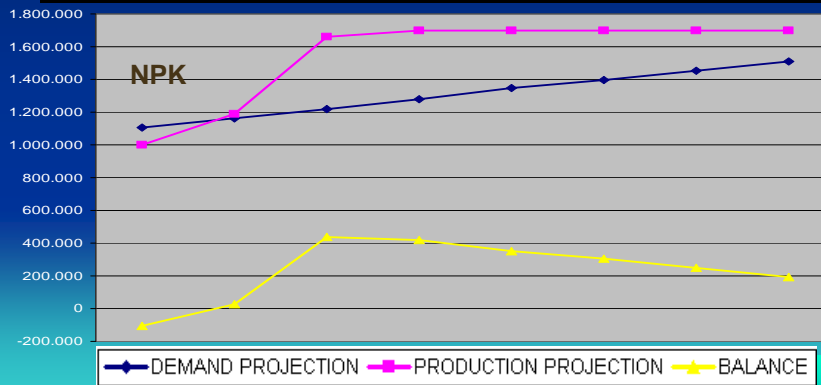
YEAR	DEMAND PROJECTION OF ZA (tonnes)				PRODUCTION	BALANCE
	Food Crops	Plantation	Others	Total		
2008	763,065	442,553	2,236	1,207,854	650,000	-557,854
2009	785,922	454,594	2,331	1,242,848	655,000	-587,848
2010	805,421	465,125	2,427	1,272,973	655,000	-617,973
2011	824,589	474,495	2,522	1,301,606	655,000	-646,606
2012	837,440	477,449	2,617	1,317,506	655,000	-662,506
2013	855,931	486,894	2,712	1,345,536	655,000	-690,536
2014	873,395	495,553	2,807	1,371,755	655,000	-716,755
2015	890,371	503,515	2,903	1,396,788	655,000	-741,788



Production projection is based on the producers existing plant capacity

DEMAND VS PRODUCTION PROJECTION OF NPK (TONNES)

YEAR	DEMAND PROJECTION OF NPK (tonnes)			PRODUCTION	BALANCE
	Food Crops	Plantation	Total		
2008	795.508	309.931	1.105.439	1.000.000	-105.439
2009	846.146	317.244	1.163.390	1.190.000	26.610
2010	892.354	328.374	1.220.728	1.660.000	439.272
2011	939.752	339.499	1.279.251	1.700.000	420.749
2012	985.380	362.592	1.347.972	1.700.000	352.028
2013	1.030.998	363.961	1.394.960	1.700.000	305.040
2014	1.075.963	375.617	1.451.579	1.700.000	248.421
2015	1.121.071	387.010	1.508.080	1.700.000	191.920



Production projection is based on the producers existing capacity on plan

Impact of Government Policies to Demand for Main Fertilizers

Impact of Government Policies to Demand for Various Fertilizers

- Indonesian government has pledged to revitalize agriculture, fisheries and forestry. It will be implemented by several measures such as increasing productivity, funding accessibilities and agrarian reform.
- The agrarian reform is targeted to extend agricultural areas up to 8.15 million hectares by 2014 where 70% of the total areas will be allocated to plantations and the rest for foods crops. Oil palm will be the prioritized commodity to develop as it complies with land suitability. Oil palm development is also intended to anticipate bio-fuel boom, as this commodity can be used to produce bio-diesel.
- The following section illustrates model simulation by changing variables influencing demand for fertilizer. It is assumed that there are increases (data per 2006) in :

(1) paddy area by 1.25%;	(2) maize area by 3%;
(3) oil palm area by 6%;	(4) rubber area by 5 %;
(5) paddy price by 10 %;	(6) Maize price by 10%;
(7) Oil Palm by 10%;	(8) Rubber price by 10%;
(9) No Subsidy For Urea from 2010 and its price will be determined by the market.	

Impact of the Policies to the Demand for Fertilizers

YEAR	DEMAND PROJECTION (TONNES)					
	UREA	SP36	TSP	KCL	NPK	ZA
2008	5,848,637	760,482	459,219	930,554	1,150,852	1,236,547
2009	6,205,322	791,681	492,976	1,002,511	1,244,830	1,298,779
2010	4,307,255	691,363	572,844	1,009,670	1,441,779	1,749,927
2011	5,003,240	730,523	619,457	1,075,777	1,576,924	2,065,535
2012	5,293,117	729,595	606,059	1,032,501	1,696,999	2,271,859
2013	5,856,620	791,095	663,208	1,185,691	1,817,925	2,450,669
2014	6,268,302	837,629	709,417	1,305,635	1,942,691	2,593,521
2015	6,790,012	888,897	753,739	1,424,823	2,081,336	2,722,931

2008 – 2009 demand for urea will still increase, and decrease in 2010 as the subsidy be revoked, but it will tend to increase in the following years. The subsidy termination for urea will result in demand instability since there will be disparity between purchasing power and sale price of urea. However, this is likely to recover by 2013. Interestingly, when the demand for urea decreases as subsidy is revoked, the demand for other N-based fertilizers such as NPK and ZA increases.

Cautionary Note :

Projected demand for SP36 and NPK seem to be underestimated because the time series data used in the model estimation started from 1986, whereby the consumption of these fertilizers were still relatively small. Demand for SP36 and NPK could have been greater than the projected figures if the production capacity is allowed to increase following increases in subsidized amount of these fertilizers.

Concluding Remarks

CONCLUSIONS

- Agricultural development in Indonesia is indicated by several improvements in agriculture areas and productivities.
- Plantation sub-sector, especially oil palm, will be the driving commodity to develop agriculture in Indonesia as the government supports to the development of this commodity is considerably large through revitalizing policy. The development of plantation sub-sector cannot be isolated from the increase in the world demand for CPO including for bio-fuel production
- In the business as usual scenario, it is predicted that the demand for fertilizers, both subsidized and non-subsidized, will increase.
- If the government revokes subsidy for urea by 2010 then there will be a decrease in its demand but afterwards it will tend to increase gradually to reach normal condition as before the subsidy termination.
- The use of balanced fertilizer (NPK) in the future will increase if subsidy for NPK is still in place while that of Urea is revoked, assuming that commodity prices also increase.



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