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Agriculture in South East Asia and South Asia: contribution to GDP and provision of employment to the labor force												
Country	GDP (2014)	GDP - real growth rate (2014)	GDP - composition, by sector of origin	Labor force – by occupation	Agriculture - products							
	\$746.1 billion	6%	agriculture: 9.3%	agriculture: 11.0%	Peninsular Malaysia - palm oil, rubber, cocoa, rice; Sabał palm oil, subsistence crops; rubber, timber; Sarawak -							
Malaysia			industry: 34.7%	industry: 36.0%								
			services: 56%	services: 53.0%	palm oil, rubber, timber; pepper							
	ć (02.2	6.1%	agriculture: 11.3%	agriculture: 30.0%	sugarcane, coconuts, rice, corn, bananas, cassava,							
Philippines	\$692.2 billion		industry: 31.2%	industry: 16.0%								
			services: 57.4%	services: 54.0%	pineappies, mangoes, pork, eggs, beer, isi							
	\$2.676 trillion	5%	agriculture: 14.2%	agriculture: 38.9%	nalm ail rubbar poultar boof farast products shrimp							
Indonesia			industry: 45.5%	industry: 13.2%	cocoa coffee medicinal berbs essential oil fish							
			services: 40.3%	services: 47.9%	cocoa, conce, medicinal fieros, essential oli, fisit							
Vietnam	\$510.7 billion	6.1%	agriculture: 17.9%	agriculture: 48.0%	rice coffee rubber tee pepper coubers eachering							
			industry: 38.1%	industry: 21.0%	cane peaputs bananas: poultry: fish seafood							
			services: 44%	services: 31.0%	carie, pearlots, baranas, pourry, rish, searoou							
	CORE E	0.7%	agriculture: 11.6%	agriculture: 32.2%	rice escave where each suggroups escavets asly all							
Thailand	\$985.5 hillion		industry: 32.6%	industry: 16.7%	nice, cassava, rubber, corn, sugarcane, coconucs, paim on							
	DIIIOII		services: 55.8%	services: 51.1%	pineapple, ilvestock, fish products							
Bangladesh	4500 7	6.1%	agriculture: 15.1%	agriculture: 47.0%								
	\$533.7 billion		industry: 26.5%	industry: 13.0%	nice, jute, tea, wheat, sugarcane, potatoes, tobacco,							
	DIIION		services: 58.3%	services: 40.0%	puises, onseeus, spices, fruit; beer, milk, pouitry							
China	\$17.62 trillion	7.4%	agriculture: 9.2%	agriculture: 33.6%	rice wheat notations care meanuts too millet barlow							
			industry: 42.6%	industry: 30.3%	nce, wheat, potatoes, corn, peanuts, tea, millet, barley,							
			services: 48.2%	services: 36.1%	apples, cotton, bilseed; pork; lish							
India	\$7.376 trillion	7.2%	agriculture: 17.9%	agriculture: 49.0%	rice wheat alload actton into too anory-restle							
			industry: 24.2%	industry: 20.0%	opions potatoes: dainy products poultary fich							
			services: 57.9%	services: 31.0%	omons, potatoes, dairy products, poultry; fish							







Farming system: SEA and SA regional aspects

Tree Crop Mixed Farming System

- mainly large private sector estates (particularly rubber and later oil palm in Malaysia and Indonesia) but also significant areas under smallholder ownership and management (usually a maximum of 2 or 3 ha in size, mostly coconut plantations)
- 2. Governments established specialized commodity research stations or institutes for improvement of tree crops
- 3. crop yields have been rising through the introduction of improved varieties developed by government research or in some cases by large multi-national companies involved in the plantation industry.
- 4. regular applications of fertilizers combined with effective weed control measures are used in productive, well-managed plantations
- 5. all these crops require intensive labor inputs for harvesting and processing and therefore profitability is determined by local labor costs.

Source: FAO 2001



Farming system: SEA and SA regional aspects								
Tree Crop Mixed Farming System (trends/forecast)								
Given the large reported area of immature trees within the system, the tree crop sector is expected to continue its moderate expansion.								
 Prospective annual production increases to 2030 are estimated at: 3.4% for oil palm, 2.8% for rubber, 3.4% for coconut, 1.8% for coffee 3.8% for tea. 								
 The major factors influencing the future of the tree crop sector: international demand and prices for industrial crop products (price of those products that compete with oil-based synthetic products); 								
 replacement of labor-intensive and costly harvesting and processing practices through mechanization for some crops such as rubber, oil palm and tea; 								
 development and adoption of improved production technologies; Source: FAO 2001 								

Farming system: SEA and SA regional aspects

Upland Intensive Mixed Farming System

- the most widespread and diverse farming system in the region
- extensive cultivation of fragile slopes without the adoption of appropriate soil and water management practices
- local infrastructure is generally poorly developed
- links to markets and other systems are scarce (because remote areas)
- extensive crop production with only limited sales of products to meet livelihood needs
- average incomes are low, creating significant poverty and food insecurity
- rural credit is rarely available

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- rural infrastructure is often poorly developed, especially in more remote areas
- access to goods and services is poor

Source:Farming Systems and Poverty, FAO 2001

Farming system: SEA and SA regional aspects

Upland Intensive Mixed Farming System (trends)

- preservation of the natural resource base
- · improvement of technologies for both crop production and watershed management
- · diversification into higher-value products
- development of the rural financial system
- · increasing opportunities for improved marketing and off-farm income
- more responsive agricultural support services
- establishment of functioning land markets through the establishment or acceleration of cadastral and land titling procedures
- · establishment or strengthening financial markets to support purchase and sale of land

Source:Farming Systems and Poverty, FAO 2001

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Balanced Fertilization concept

The term "balanced fertilization" was first introduced by Justig von Liebig in 1840, who stated that farmers have to add those nutrients to the soil that have been removed by harvested crops, to be able to sustain high crop yields

In operational terms, balanced fertilization can have three meanings:

- the supply of all essential plant nutrients is adjusted in the proper ratios to crop demand
- the supply of plant nutrients equals the uptake of nutrients by the crop
- the supply of plant nutrients equals the removal of nutrients from the field via the harvested crop.







Effective Delivery of Fertilizer BMPs

Fertilizer BMPs fall within the larger contexts of nutrient, crop and farm management. They comprise an interlinked subset of crop management BMPs. For a fertilizer management practice to be considered "best", it must harmonize, in a given context, with the other agronomic practices in providing an optimum combination of farm-level management objectives

To be attractive to farmers, Fertilizer BMPs have to be:

- practical
- profitable
- productive
- resource use efficient
- socially acceptable

Source:IPNI

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Effective Adoption of Fertilizer BMPs To achieve adoption, Fertilizer BMPs must be developed through multi-stakeholder dialogue involving: • national government local government research institutes ٠ universities ٠ extension services ٠ infrastructure services ٠ nongovernment organizations ٠ farmer groups cooperatives ٠ input suppliers ٠ marketing organizations Source: IPNI 18

Indonesia: BMP for oil palm

- Indonesia is the world's largest oil palm growers
- Medium and small size oil growers represent 60% of Indonesian market
- Current average oil production is approximately 3.2 t CPO per ha per year for mature palm plantations
- Leading companies in the industry have regularly exceeded the national average in recent years and these yields have been achieved over large areas, suggesting that good management can consistently produce yields that are significantly higher than current average yields
- The International Plant Nutrition Institute's Southeast Asia Program (IPNI SEAP) tested the hypothesis that good management could substantially increase yields of mature oil palm plantations in Indonesia.
- A process to deploy a series of Best Management Practices (BMP) consistent with the guidelines of the Roundtable on Sustainable Palm Oil (RSPO) was developed and tested on commercial blocks in oil palm plantations









Bangladesh: Balanced Fertilization Project

- 1. The Balanced Fertilization project undertaken by Agri Bangla Consultants and input suppliers in collaboration with the Ministry of Agriculture started in 2009-2010.
- 2. The objective of the project was to make the farmers aware of the benefits of application of balanced fertilization and motivate them to use balanced fertilization
- 3. The main activities of the project:
 - mass media promotion
 - documentary film screening
 - distribution of posters and leaflets
 - setting up of demo plots on the main crops
 - arrangement of field days
 - arrangement of dealers conferences
 - participation in agricultural fairs

Bangladesh: Balanced Fertilization Project													
The national average yield of major crops and yields of the demo and control plots undertaken by the Balanced Fertilization project.													
	2005-06			2010-11			2012-13						
Crops	Nat. Av.	Demo	Control*	Nat. Av.	Demo	Control*	Nat. Av.	Demo	Control*				
Paddy T-Aman	2.99	-	-	3.40	5.40	4.64	3.45	4.99	4.43				
Paddy-Boro	5.15	-	-	5.85	6.83	6.06	5.92	7.74	6.83				
Paddy-Aus	2.53	-	-	2.87	5.28	4.30	3.07	4.74	4.11				
Wheat	0.91	-	-	2.60	4.18	3.61	3.01	4.04	3.59				
Maize	5.30	-	-	6.15	8.34	5.13	-	10.02	8.34				
Potato	13.82	-	-	18.09	28.84	26.15	19.38	38.08	35.73				
*- yield goal set by BARC (Bangladesh Agricultural Research Council)													
25 Source: Agri Bangla Consultants													

Bangladesh: Balanced Fertilization Project

- 361 demo plots were implemented
- The demo plots provided the farmers an opportunity to see for themselves the results of use of balanced fertilization.
- The average increase in yield in the demo plot was usually in the range of 5 - 35% compared to the control plots
- The demo plots which resulted in lower yields compared to corresponding control plots were analyzed to find the reasons for lower yield. It was observed that in most cases, external factors influenced the yields and the lower yield in the demo plots were not attributable to the fertilizer dose applied.



26 Source: Agri Bangla Consultants

Bangladesh: Balanced Fertilization Project

Government involvement in project's planning and implementation

- The members of the committee formed by the Ministry of Agriculture participated in the selection of demo plots and collection of soil samples.
- Officials of the Department of Agricultural Extension (DAE) and Bangladesh Agricultural Development Corporation (BADC) located in the area regularly visited the demo plot sites to supervise the demo and the control plots and advise the farmers on the steps to be taken.
- Members of the Committee, DAE and BADC officials from the head office and officials of the project visited the plots as and when required to monitor progress.
- Several visits of the project officials, senior officials of DAE/BADC and the Ministry of Agriculture were undertaken to see the growth of the demo and the control plots.
- This provided the farmers with opportunities to take advice and guidance on their farming practices and to discuss their problems to find a solution

27 Source: Agri Bangla Consultants

Bangladesh: Balanced Fertilization Project

Government policy changes implemented by project results

- 1. Significant improvement in the phosphate and potash fertilizers leading to balanced fertilization resulted
- 2. Ministry of Agriculture extended support to bring the fertilizer application towards balanced N:P:K use and formulated policies accordingly.
- Bangladesh market is extremely price sensitive. Selling prices of fertilizers to the end users are fixed by the government. To keep non-urea prices within the affordable limit of the farmers, the Government increased urea price and provided a higher subsidy for non-urea fertilizers.
- Consumption of fertilizer in Bangladesh is mainly subsidy driven. The project monitoring committee involves representatives from the Ministry of Agriculture, Department of Agricultural Extension, Bangladesh Agricultural Development Corporation and Soil Resource Development Institute. These are the key decision making bodies of the government for preparing demand forecasts of fertilizers and recommendation of fertilizer subsidy.

Conclusion

- Improving farm management to meet an industry-based Best Management
 Program generally gives positive benefits but external support may be needed to encourage this change.
- However, the economic benefits of Best Management Programs alone may not be large enough to drive adoption. The benefits from changing management practices also varies between farms, so the cost-effectiveness of changes can differ significantly across practices, farms and industries. This means that there is a challenge to find the most efficient solutions that will deliver improvements where they achieve the largest benefits.
- The transaction costs associated with changing management and the largely riskaverse nature of agribusinesses are factors that can prove significant barriers to adopting improved practices. Increasing adoption rapidly and in cost-effective ways remain key challenges.