

General Directorate of Agriculture Department of Rice Crop

Overview

Rice Production in Cambodia

18th - 22nd March 2013

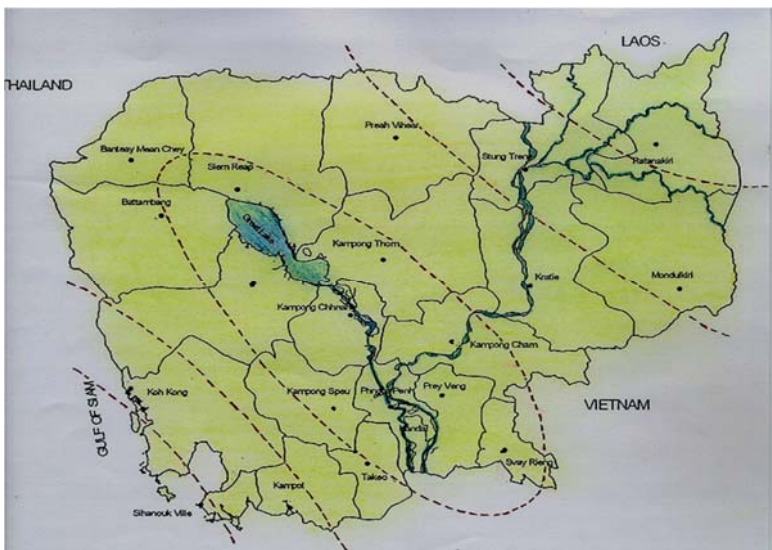
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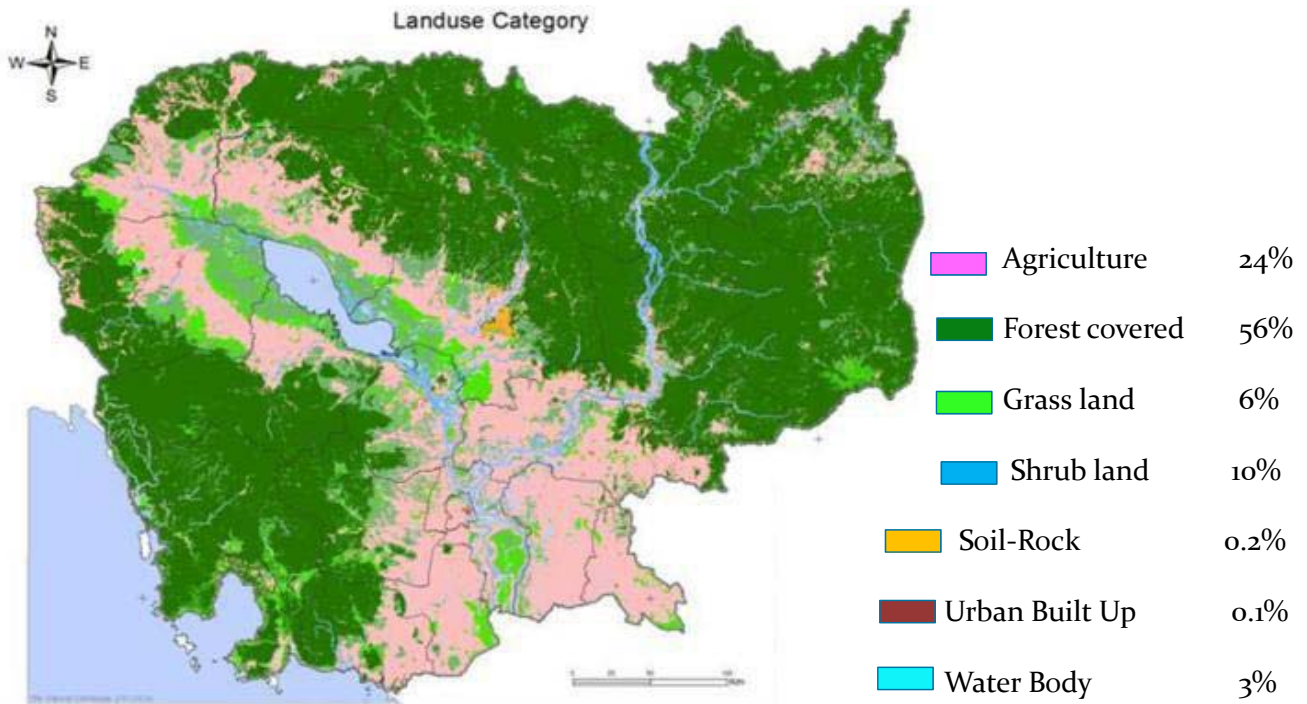


Climate

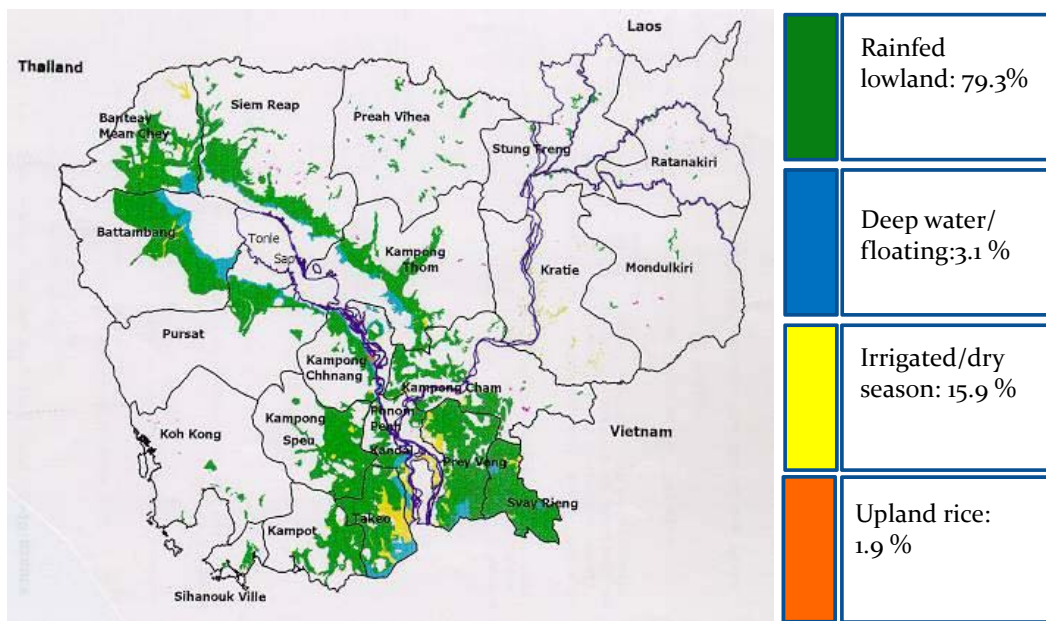


- ❖ **Climate: Hot and wet**
 - *April: the hottest*
 - *December: the coolest*
- ❖ **Temperature:**
 - *Max. : 35°C*
 - *Mean : 27°C*
 - *Min. : 21°C*
- ❖ **Locational variation**

Land Use



Paddy land distribute map



Data Source: MAFF, 2012

General Characteristics of Cambodia

Characteristics



Land area in 2008 (km ²)*	181,035
Share of arable land (%)*	22.1
Share of agricultural area in total land (%)*	31
Population in 2009 (million persons)*	14.8
Rural population (%)*	78
Average annual population growth (1990 - 2010 %)*	2.2
Poverty rate in 2010 (%)*	28.3
Share of Agriculture in GDP in 2010 (%)**	29
Gross value added for agriculture in 2010 (Billion US\$)**	2.08
Rice consumption per capita in 2010 (kg/person/year)	143

Data source: * world Development Indicators 2011. ** Annual Report of MAFF (2010-11), Cambodia

General household characteristics

Characteristics	Northwest	Central	Southwest	All
Sample size - <i>Respondent info</i>	180	182	245	607
Female respondents (%)	57	66	58	60
<i>Average age (years)</i>				
Males	46	47	48	47
Females	45	42	43	43
<i>Average education (years)</i>				
Males	5	5	6	5
Females	5	4	5	5
Average household size	4.6	5	5	4.9
Average number of household				
Member in labor force	2.7	3	2.7	2.8
<i>Age group (%)</i>				
Less than 16 years	26	28	25	26
16 to 65 years	68	70	72	70
More than 65 years old	6	3	3	4

Data Source: GRS project, Household survey 2010

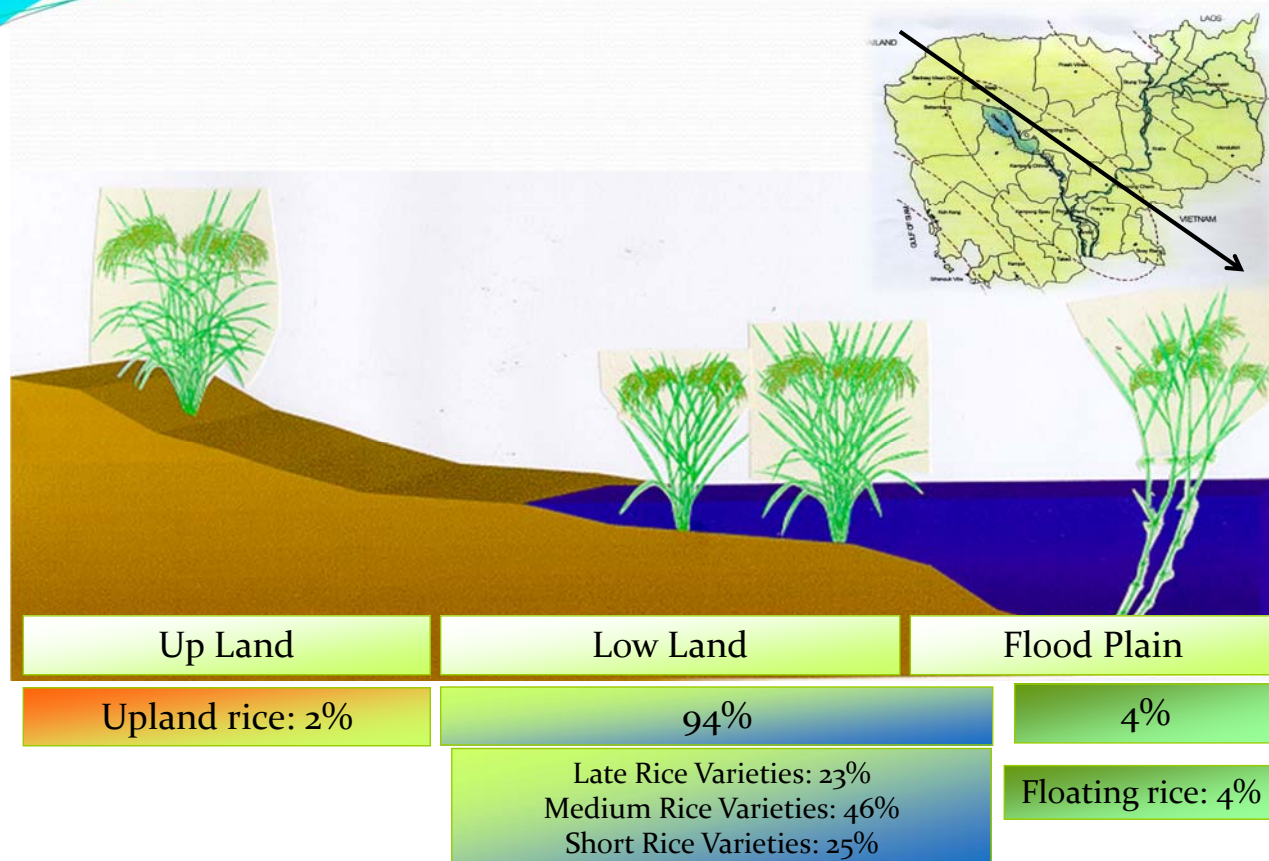
Landholding Characteristics (mainly for high potential rice production regions)

Item	Northwest	Central	Southwest	All
Average farm size (ha)	1.9	1.5	2	1.8
<i>By land type (% of area)</i>				
Lower field	48.5	52.5	55	52
Middle field	34	39	30	34
Upper field	17	8	16	14
<i>By tenure (% of area)</i>				
Owned	87	93	96	92
Rented-in	13	7	4	8
<i>By irrigation (% of area)*</i>				
Rainfed	83	81	67	77
Irrigated				
Canal	9	25	8	14
Well	1	0	15	5
Lake	0	0	5	2
Others	1	1	3	2

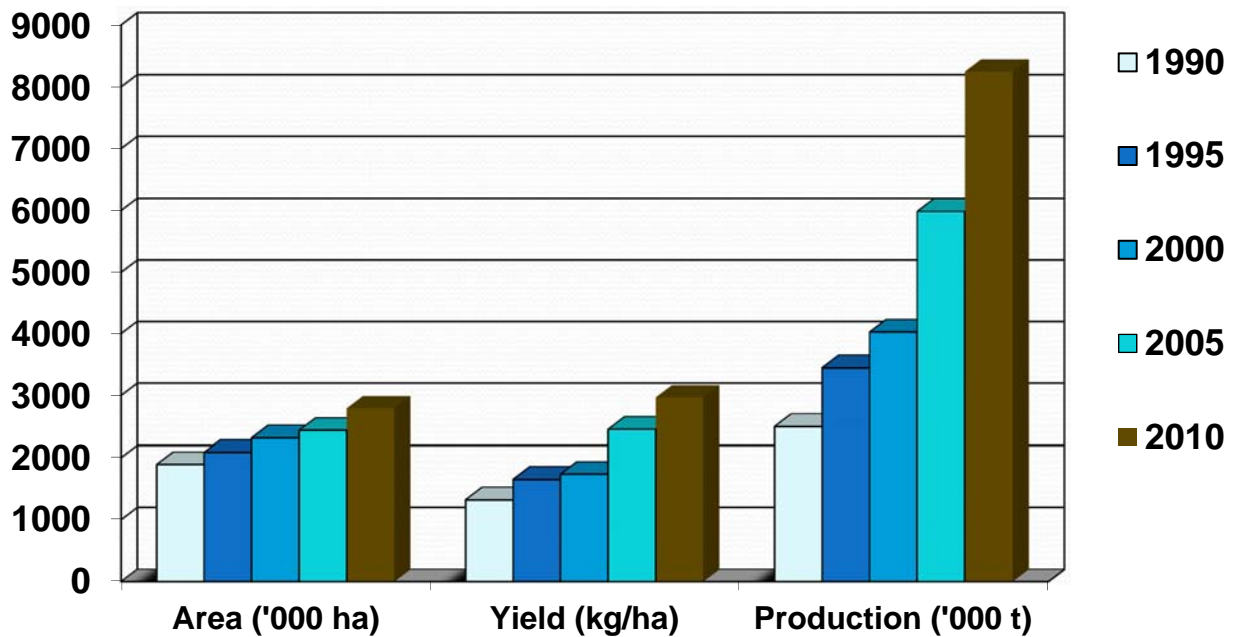
* This is the percentage of the gross cultivable area combining WS, DS and early WS.

Data source: IRRI GRS project, household survey 2010.

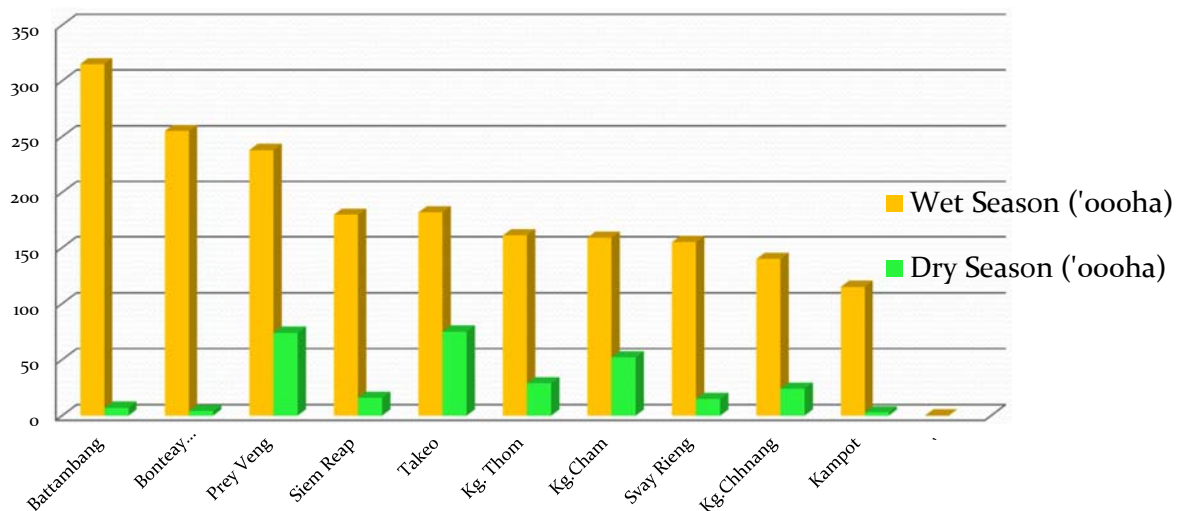
Rice Agro- Ecological Systems in Cambodia



Rice production Trends in Cambodia (1990-2010)

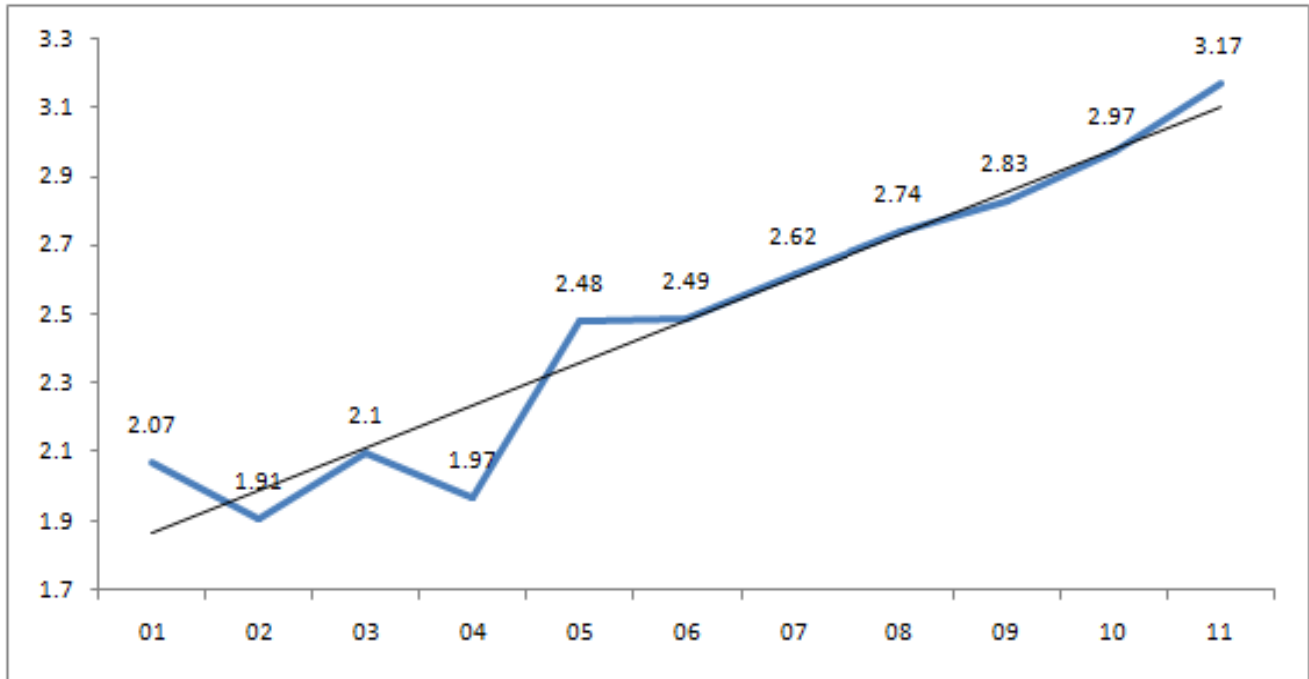


High Potential Areas for Improve Rice Production & Rice for Export

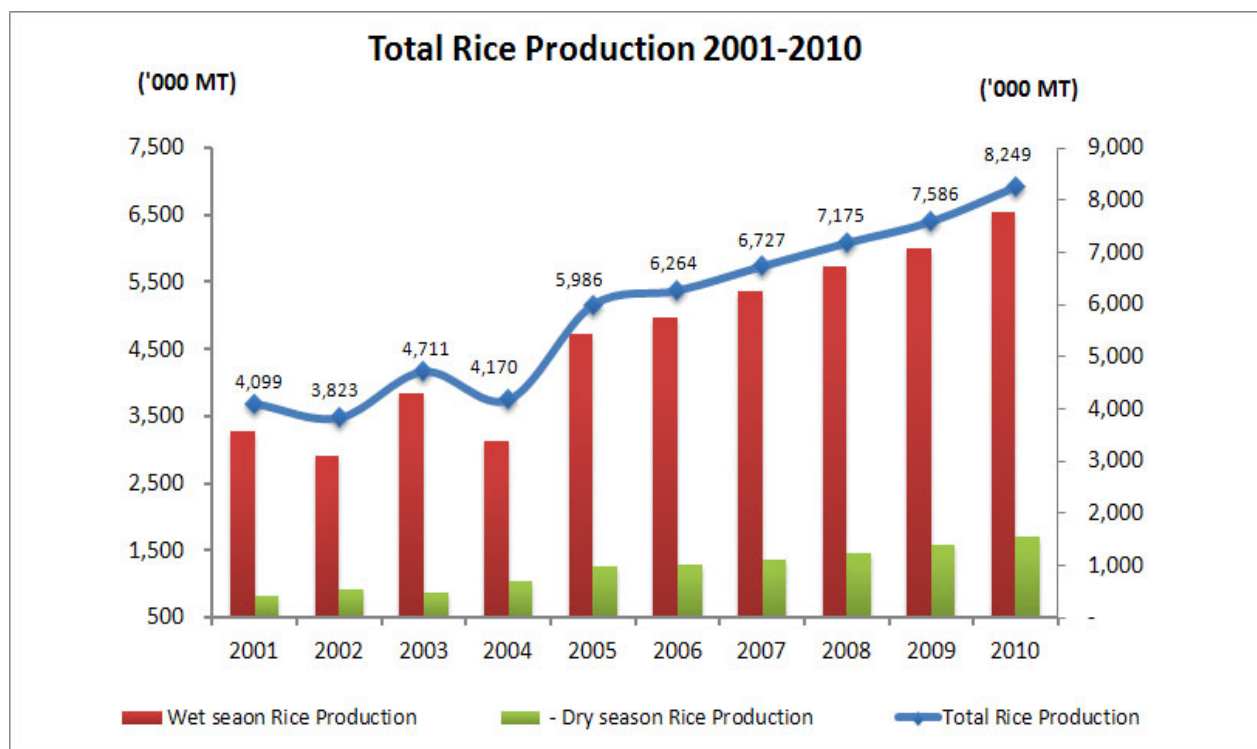


Wet season rice (WSR) is planted in May-June & harvested in Dec – Jan. It account 85% of total rice area. WS is subdivided into EWS (Apr – M to Aug – Sep) and normal WS (Jul-Dec). 2011, EWS rice was approximately 21% of total rice area. Dry season rice (DSR) under irrigated conditions during Jan-Feb to May-Jun. in 2011-12, DSR is approximately 405,000ha and it accounted for over 14% of total rice area and 21% of total annual rice production. DSR in 2011 yielded 4.2 t/ha, 52% more than yield of WSR (2.76t/ha).

Paddy Rice Productivity



10 Years Evolution of Rice Production



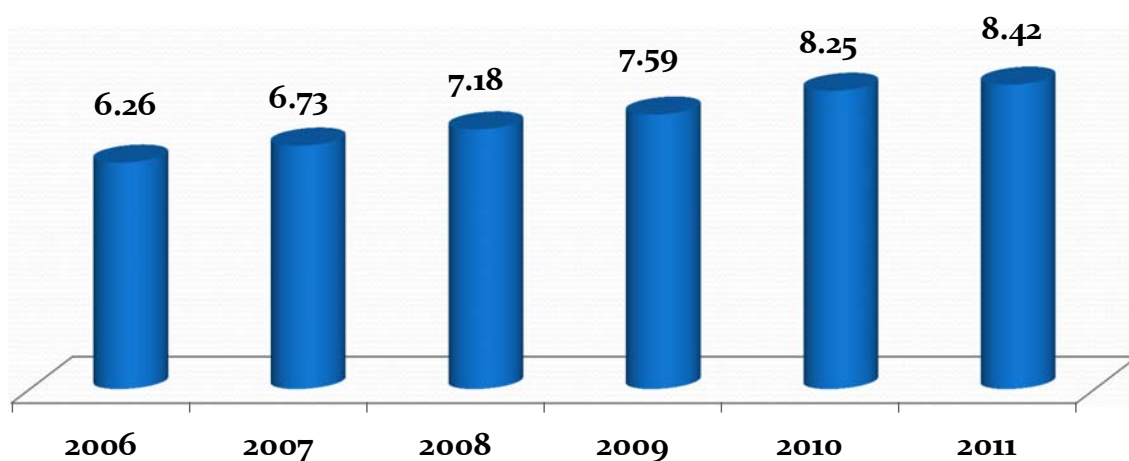
Rice Production Status for last 5 years (07-11)

<i>Description</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>Change 2011/2010 (%)</i>
Cultivated Areas (ha)	2,585,905	2,615,741	2,719,080	2,795,892	2,912,118	4.16
Harvested Areas (ha)	2,566,952	2,613,363	2,674,603	2,776,323	2,709,823	-2.4
Rice Yield (t/ha)	2.621	2.746	2.836	2.97	3.106	4.58
Production (mt)	6,727,127	7,175,473	7,585,870	8,249,452	8,416,942	2.03
<i>Rice Surplus (mt)</i>	<i>1,649,640</i>	<i>2,025,033</i>	<i>2,244,598</i>	<i>2,515,752</i>	2,578,531	2.43
<i>Paddy Surplus (mt)</i>	<i>2,577,562</i>	<i>3,164,114</i>	<i>3,507,185</i>	<i>3,930,425</i>	4,028,955	2.44



AGRICULTURE REMAINS A BRIGHT SPOT, DUE IN PART TO PRODUCTIVITY IMPROVEMENTS AND INFRASTRUCTURE DEVELOPMENT

Paddy Rice Production 2006 – 11
Rainy and Dry Season (Tonnes)



Labour Use in Rice Farming

Item	Average/ha
Total labor (person-day per ha)	80
Share of labor use (%)	
Land preparation	9
Crop establishment	30
Crop care management	17
Harvesting and threshing	36
Post harvest activity	8
Labor cost (in \$)	221
% cash cost for hired labor	31
% inputed cost for family labor	69

Data source: Household survey 2010 (GSR project)

Labour use for each activity by crop establishment method (WS)

Labour Use	Person-day per ha			Percentage		
	Direct seeding	Transplanting	All	Direct seeding	Transplanting	All
Total labour	57	87	80	100	100	100
Land preparation	6	7	7	11	8	9
Crop establishment	7	29	24	12	33	30
Crop care management	11	14	13	19	16	17
Harvesting and threshing	27	30	29	47	34	36
Postharvest activity	6	7	7	11	9	8

Data source: Household survey 2010 (GSR project)

Costs and returns from rice production (wet season)

Item	Total
Average yield (ha)	2.5
Average price (in \$ per ton)	231
Cross income (in \$ per ha)	577
Input cost (in \$ per ha)	98
Power cost (in \$ per ha)	40
Hired labor cost (in \$ per ha)	68
Cash cost (in \$ per ha)	206
Net returns above cash cost (in \$ per ha)	371
Returns to cash cost (%)	62

Data source: household survey 2010

Share of incomes from different sources

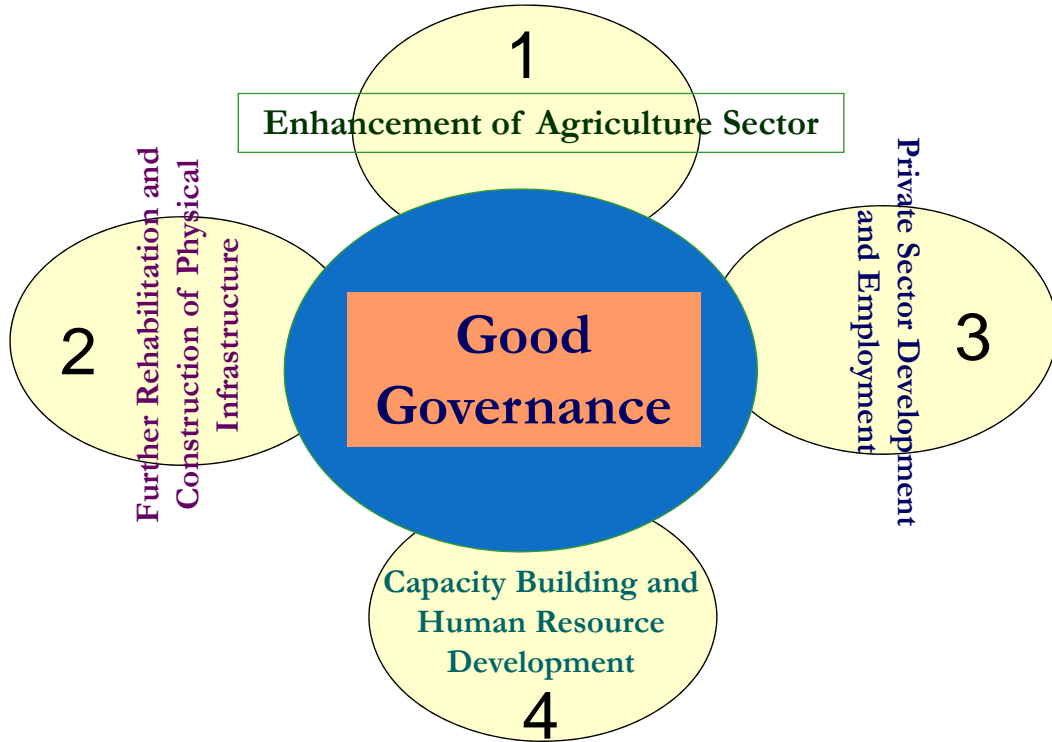
Incomes share	Total
Total income (in\$)*	1,688
Share (%)	
Rice	44
Nonrice	1
Animal sale	13
Off-farm income	2
Nonfarm income	
Salary from regular jobs	16
Seasonal jobs	4
Business	13
Remittances and pension	4
Transport operation	2
Others	1

* Annual estimate.

Data source: household survey 2010.

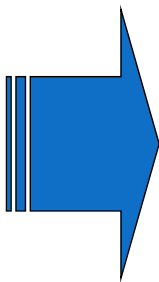
Rice is main source of income, it account 44% of total HH income. Nonfarm income account for less than 40% of total HH income. Indicates the potential role of increase in rice production for poverty reduction

Government Policy: "Rectangular Strategy"



Rectangular Strategy

1
Enhancement of Agriculture Sector



1. Improving agricultural productivity and diversification
2. Land reform and mine clearance
3. Fisheries reform
4. Forestry reform

Long-Term Vision

To ensure enough & safe food availability for all people, reduce poverty, increase GDP per capita and sustainable natural resource management & conservation.

Sectoral Goal:

“To ensure food security, increase incomes, create employment and improve nutrition status for all people by improving the productivity and diversification and commercialization of agriculture with environmentally sound protection and food safety”.

Rice Policy

- Policy Paper on “the Promotion of Paddy Production and Rice Export” was promulgated on 17th August 2010 by RGC and all concerned stakeholders to develop “Action Program” for efficient and effective implementation ,
- The vision is to transform Cambodia into a “Rice Basket” and a major rice exporting country in the global markets through the increase of rice productivity, improved quality and commercialization.
- RGC has set the year 2015 as the target year to achieve paddy surplus of more than 4 million tons and achieve rice export of at least 1 million ton.
 - ✓ Cambodia will be one of the largest rice exporting countries of the world:
 - ✓ **world rice basket**
 - ✓ Exporting one million tons of milled rice at least by 2015.

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Ten Important Rice Varieties

10 Rice Varieties were promulgated by Government to implement the Rice Policy:

- **Early** : Sen Pidor, IR 66, Chulsa.
- **Medium** : Phka Rumduol, Phka Rumdeng, Phka Rummeat, Phka Chansensar.
- **Late** : Riang Chey, CAR 4 and CAR 6.

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Quantities of Mill Rice Export by month 2009-12

M/Year	2009	2010	2011	2012
1. January	360	10,012	6,798	9,703
2. February	792	13,644	5,089	14,417
3. March	1,248	5,062	12,534	12,310
4. April	664	17,287	17,946	15,036
5. May	399	5,499	20,520	13,115
6. June	316	4,274	17,990	13,426
7. July	226	15,030	12,703	20,527
8. August	673	5,997	20,404	15,530
9. September	956	4,744	14,384	15,169
10. October	2,964	6,078	19,067	16,967
11. November	1,690	7,988	9,559	25,189
12. December	2,325	9,645	44,905	34,328
Total for 12 months/year	12,613	105,259	201,899	205,717

Source: Secretariat of One Window Service for Rice Export Formality (SOWS - REF)

Cambodia Perspective on high yielding rice varieties for Food Security & Export

Cambodia is just only emphasis on Plant Breeding Program to develop varieties of major agricultural crops for high yielding, good quality, resistance to major biotic and abiotic stresses and broad adaptation to diverse conditions.

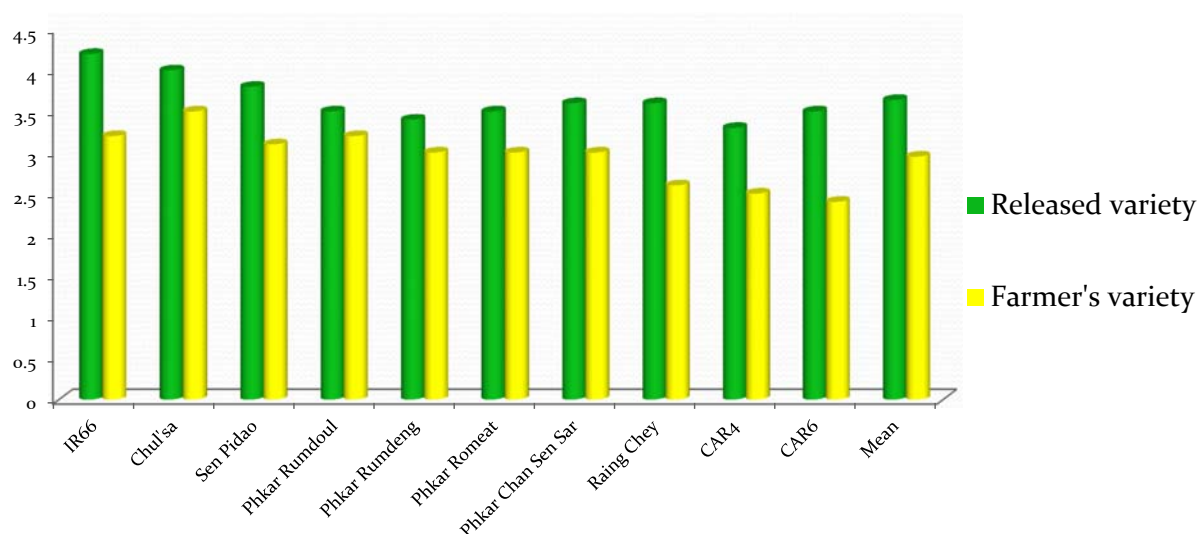
Hybrid rice technology is not successful in Cambodia research program, due to farmers are not adopted to this technology, even rice hybrids yield better than the best inbred varieties, but high input cost and low grain quality. Other hand due to lack of government funding to support the research programs and also lack of private investment in rice seed research and seed production program.

From year 1990 to 2010, Cambodia Research Institute had released 38 rice varieties which have high yielding and good quality for famers use. All of these varieties had been purified through annually rice seed production.

Ten of 38 high yielding varieties was encouraged for farmers use in the purposes of food security and rice for exportation. Means of average yield = 18% higher than farmer's varieties (see graphic 1)

Through field assessment, in year 2000 number of farmers adopted HY rice varieties increased 17% and increased up to 79% in year 2010, which proportion to the additional productivity up to ONE million MT and income up to 100 million US dollars.

Cambodia Perspective on high yielding rice varieties for Food Security & Adoption of Hybrid Rice (cont.)



Graphic 1: Yield (t/ha) of 10 HY varieties compared to farmer's varieties

Fertilizer Recommendation Use (Kg/ha) in Cambodia (2011)

Soil group	Early maturing (wet and dry season)			Intermediate and late maturing (WS)		
	Nitrogen	Phosphorous	Potassium	Nitrogen	Phosphorous	Potassium
Prey Khmer	45	25	50	40	20	40
Prateah Lang	75	50	50	60	50	25
Bankan & Orung	130	60	50	100	25	25
Toul Samrong	150	50	0	75	50	0
Koktrap	125	75	50	85	50	50
Kampong Siem	100	0	0	100	0	0
Kien Svay	120	0	0	For early maturing grown in both WS&DS		
Krakor	200	50	0	For deepwater and recession rice		
Kbal Po	170	0	0			
Average Used:	124	52	50	77	39	35
Mean of Fertilizer Used	100.5	45.5	42.5			

Demand and supply of Inputs of fertilizer nutrients, NPK (metric ton)

Items	2007	2008	2009	2010	2011
Supplied / Imported chemical fertilizers for crops production in Cambodia *					
Mineral fertilizers (NPK)	168,535	162,140	172,021	265,110	503,911
Chemical Pesticides	770	488	794	4,382	5,598
Demand of fertilizer nutrients based on Fertilizer Recommendation for rice production**					
Nitrogen	259,883	262,882	273,268	280,987	298,337.16
Phosphorous	117,659	119,016	123,718	127,213	135,068.07
Potassium	109,901	111,169	115,561	118,825	126,162.48
Total	487,443	493,067	512,547	527,026	559,567.72

Note: * source of DAL/MAFF
** CARDI recommendation

Mechanization of rice production and Challenges

Shifting from manual agriculture into agricultural mechanization in Cambodia is just recently developing and progressing.

In decade of 80th to 90th up to 80% of Cambodia farmers had used animal (cattle and buffalo) as draft power and manual practices for their agricultural cultivation and the country was unable to feed itself.

Away from centrally planned economy after general election in year 1993 (2nd Royal Government) has achieved a great deal in food production (from 1995, food insecurity was released). Since then, Cambodia farmers – energized by restructuring, achieving higher yields with improved rice varieties, improved irrigation to raise two crops per year and especially tapping improved agricultural mechanization into agricultural production (mainly rice crop).

From year 2000 up to 2010, the using of mechanization of rice production is increasing from 16% - 63% of the total rice cultivation area (see table 1 & 2), approximately around 1.7 million hectares.

Mechanization of rice production and Challenges (Cont.)

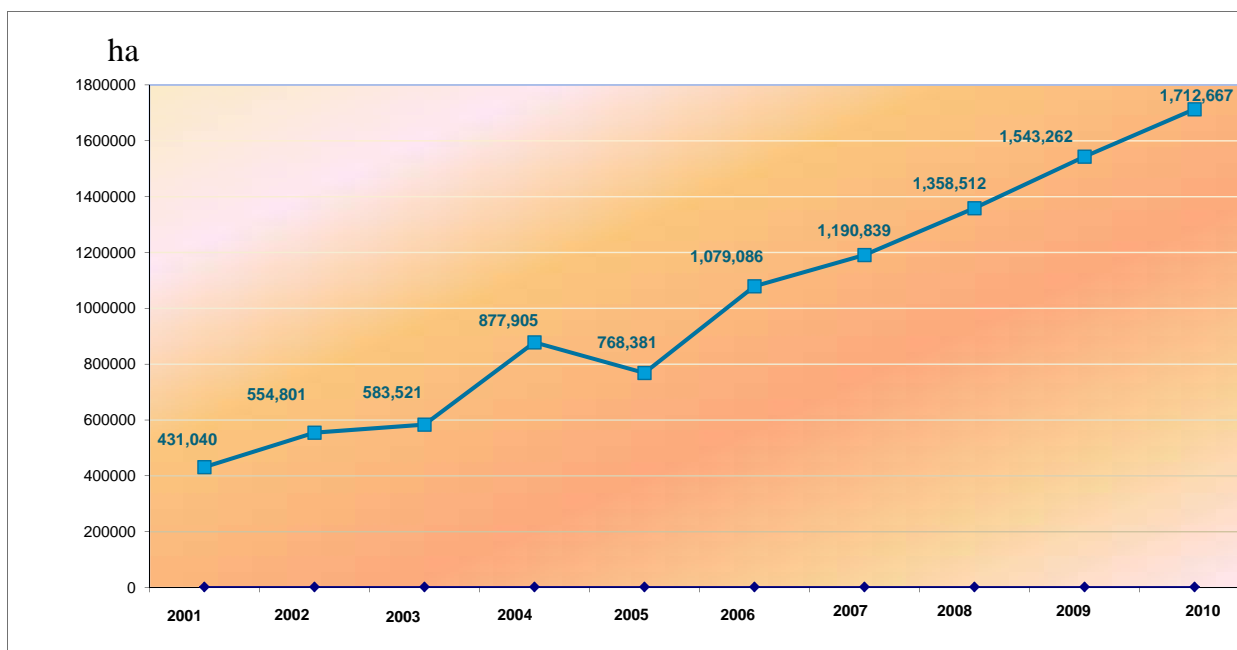


Table1: Rice Cultivation Areas by Mechanization

Mechanization of rice production and Challenges (cont.)

List of Agricultural Mechanization and Tools in year 2001 – 2010

No	Items	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Harvesting Machines						325	395	430	836	947
2	Tractors	3,072	3293	3310	3857	4166	4247	4475	4611	5495	6200
3	Thresher Machines	3780	4199	4967	6220	7338	7795	8036	8237	13,798	14,390
4	Hand Tractors	8789	9782	13,693	20,279	26,504	29,706	34,639	38,912	53,220	66,548
5	Miller Machines	30,542	31,507	32,945	36,531	38,606	38,618	38,680	39,429	47,620	48,217
6	Pump Machines	64,406	82,622	99,875	106,569	120,968	127,610	131,702	136,061	164,974	166,633

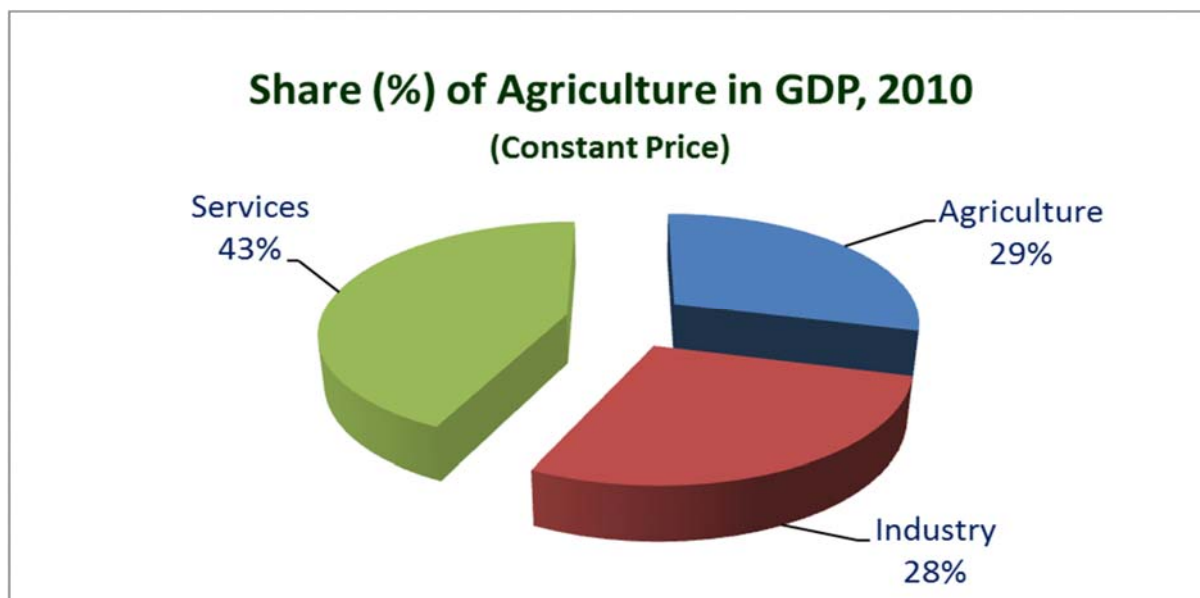
CAMBODIA: Large Rice Mills (tons paddy/hr)

Mill	Capacity	Location
<u>Existing 2009</u>		
Angkor Rice (AKK)	10	Near PP
Golden Rice	20	Near PP
Green trade	10	Various 4 of 6 in pp
Lor Ngor Peng	8	K.Cham
Loran Import-Export	12.5	Battambang
Men Sarun	24	PP
Phou Poy Rice Mill	9	Battambang
<u>New Mills</u>		
Baitang	20	Battambang
BVB	30	K.Thom
Chhun Thom	10	Prey Veng
QQ Rice	12	Pursat
Sour Keang QC Rice	12	K.Cham
Yam Leoung	10	Battambang
Vinh Cheang	12	K.Cham
<u>Rice Polishing</u>		
Baitang	30	Battambang
International Rice Trdg	10	PP
Khmer Foods	10	PP
Loran Import-Export	30	Battambang
<u>Rice Upgrading</u>		
Ying & Yang Rice	10	Sih'gile port

Agriculture Growth in Economy

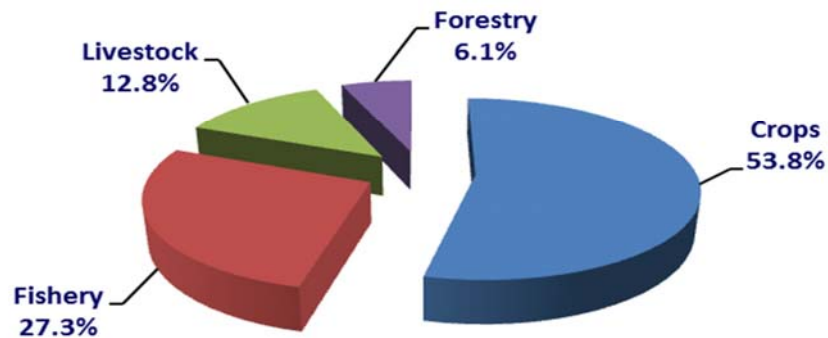
Share of Agriculture in GDP:

The share of GDP contributed by the agricultural sector estimated at 29% in 2010 compared with 28% from industrial sector and 43% from the services sector.



Agriculture in Economic Growth

Composition of Sub-Sector in Agriculture, 2010



In the whole agriculture sector, the composition of sub-sector contribution in percentage (%) in 2010 shown around 53.8% contributed by crop production, followed by 27.3% for fisheries, 12.8% for livestock production and 6.1% for forestry and logging.

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Key Challenges in Rice Production

- **Key Challenges in Agro-ecosystem:**
 - Depend on Rain fall (monsoon),
 - Access to water (need to improve irrigation systems, at mean time up to 1 million hectares can be irrigated with 1,450 irrigation schemes (big, medium & small scale) for both wet and dry season),
 - Land/soil fertility in many rice areas,
 - Small land in agricultural production.
 - Climate change – natural hazards (flood and drought)
- **Key Challenges in Technology:**
 - Low access to better production technologies and best practices by farmers (need to improve extension service),
 - Postharvest technology
 - Farmers' traditional practice of retaining seeds for next cultivation - quality seeds retained will gradually deteriorate),
 - Access to affordable good quality seeds and other quality agricultural inputs including Fertilizer (need to improve the input supply chain to enable smallholders in remote locations to access quality inputs – achievements in rice productivity improvement)



Key Challenges in Rice Production (cont)

- Diseases, pests and weeds,
- Postharvest technology (inadequate),
- Drying and storage facilities,
- Low rice price,
- Investment in Research and Development
- Investment of private sectors in rice sector
- Quality of chemical fertilizers and pesticides,
- Processing (rice mill machines),
- Inadequate of labours / skill labours,
- Plant protection...etc.



Key Challenges in Rice Production (cont)

- **Key Challenges in Socio-economic:**
 - Infrastructures (Poor),
 - Agricultural cooperative and farmer organization,
 - Contract farming enhancement,
 - High cost of inputs,
 - Access to micro-finance (credit too high of interest)
 - Lack of training,
 - Extension services (limited),
 - Inadequate inputs,
 - Limit access to information (technical),
 - Lack of helpfulness from local authorities.
 - Export Procedures (technical barriers: Quality standard, quality control, quality certifications);



Key Challenges in Rice Policy

- Issue affecting of paddy production
 - Low productivity,
 - Land issue,
 - Rice intensification,
 - Farmer organizations.
- Issues affecting rice processing and trade:
 - High electricity price ,
 - High transportation cost ,
 - Lack of access to and high cost of credit
- Issues affecting rice export facilitation
 - Weak institutional support,
 - Lack of international recognition of quality and standards,
 - Limited port infrastructure.

Key Challenges in Rice Policy (cont.)

- Issues related to market opportunity:
 - Rice market is heavily protected and import procedures vary from country to country. As Cambodia is a new player in rice market, it must face a steep learning curve and it needs to improve its export capacity to penetrate the international market.

Key Opportunities

1. The Government policy supports

- Policy Paper on “the Promotion of Paddy Production and Rice Export” was promulgated;
- Increase public investment in physical infrastructure including transportation, irrigation, market facility and agricultural research and extension;
- Loans for rice millers to increase paddy rice stocks and improve rice mill capacity and processing quality;
- Increase the capital of Agriculture Development and Support Fund (ADSF);

Key Opportunities (cont')

2. Development of 5 Programs under SAW

- Institutional capacity building and management support program for agriculture and water;
- Food Security Support and productivity improvement;
- Agriculture and Agri-business (Value Chain) Support;
- Water resource Management, Irrigation, and Land;
- Agricultural and Water Research, Education and Extension.

Key Opportunities (cont')

3. *Development Partners and Private Sector*


- Many development partners and NGOs provide financial support to implement projects related to rice productivity and market access improvement;
- Increase of investment from private sectors into rice sector,

4. *Capacity and Technology*

- Staff capacity and appropriate technology on rice based intensification and diversification are developing;
- Accelerated access of smallholders to improved rice technology, improved agricultural inputs, improved soil fertility and water management;
- Research and training capacity on enhancement of rice productivity, post harvest technology and market access are in place;

5. *Institutions and Infrastructure*

- Rice Department established to play key roles, together with other, in enhancing rice sector in Cambodia;
- Irrigation system has been developed and can be irrigated up to 1 million hectares with 1, 450 schemes (big - medium - small scale), and road access has been improved
- Farmer Organization has been formed to work on rice production and marketing,
- Rice mill association has been formed to work on improving the processing capacity and quality.



Thanks for your kind attention

