

# STRAW MANAGEMENT IN SOUTH-EAST ASIA & WORKING PLAN FOR PILOTS IN VIETNAM



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CSAM



# DISTRIBUTIONS OF RICE STRAW IN THE TARGETED SOUTHEAST ASIAN COUNTRIES

Countries	Straw distributions
Indonesia	75% in irrigated land and less than 10% in rain-fed lowland; Kediri in East Java, Klaten in Central Java, Majalengka, Agam and Pinrang-Sidrap
Vietnam	Mekong river delta, Red river delta, Northern Central & Central Coast, Northern highland & Mountain areas, Southeast region and the Central highland region
Thailand	Northeast, North and Central of the country occupying 49.1%, 25.4%, and 22.3%, respectively of the total rice straw producing area
Myanmar	Throughout the country
Cambodia	Battambang, Kampong Cham, Banteay Meanchey and Kampong Thom
Philippines	Central Luzon, Western Visayas, Cagayan Valley, Ilocos, and Socskargen

# STRAW YIELD IN THE TARGETED SOUTHEAST ASIAN COUNTRIES (Mt/yr)

Crop	Straw-grain ratio	Indonesia		Vietnam		Myanmar		Thailand	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
Rice	1.28	70.84	90.68	44.07 <sup>a</sup>	49.59 <sup>b</sup>	26.42	33.82	32.62	41.75
Wheat	1.38	-	-	-	-	0.186	0.256	0.0015	0.00028
Maize	2.05	18.51	37.94	5.19	10.64	1.60	3.28	4.87	9.98

(Source: FAOSTAT, 2014)

<sup>a</sup> : Statistical Yearbook of Vietnam 2013;

<sup>b</sup>: Diep Quynh Nhu, 2014

# STATUS ON STRAW USED AS FERTILIZER IN THE TARGETED SOUTHEAST ASIAN COUNTRIES

Country	Major used crop straw	Ratio (%)	Technology
Thailand	Rice, Maize	35.3	Straw directly returned to fields
Vietnam	Rice, Maize	26.1	Straw directly returned to fields
Philippines	Rice	29.7 - 40.2	Straw directly returned to fields
Thailand, Vietnam, Philippines	Rice	1-5	Straw indirectly returned to fields



# STATUS ON STRAW USED AS FODDER IN THE TARGETED SOUTHEAST ASIAN COUNTRIES

Country	Ratio (%)	Major used crops straws	Technology
Indonesia	31	Rice	Ensilage and coarse fodder
Vietnam	23 <sup>a</sup>	Rice	Coarse fodder
Thailand	15 <sup>b</sup>	Rice	Ensilage and coarse fodder <sup>c</sup>
Philippines	2 - 4	Rice	Coarse fodder

<sup>a</sup>: Truc and Ni, 2009 & Biomass Business Opportunities Vietnam, 2012;

<sup>b</sup>: Gadde et al., 2007

<sup>c</sup>: Rosmiza et al., 2014

# MUCH OF STRAW BURNT IN THE SOUTHEAST ASIA





# RICE STRAW COLLECTING DEVICES IN THE SOUTHEAST ASIA





# TRANSPORTATION OF RICE STRAW IN THE SOUTHEAST ASIA

**Transportation of straw rolls by trucks:  
215 rolls/truck**



**Transportation of bulk straw by  
boats in the MRD**



**Transportation of straw rolls by  
boats in the MRD**



# AREAS & OUTPUTS OF SOME MAIN AGRICULTURAL PRODUCTS OF VIETNAM

	Area (hectares)	Output (tons/year)	Remarks
Rice	7,800,000	45,000,000	
Cassava	560,000	9,400,000	
Pineapple	15,500	260,000	
Sugarcane	306,000	20,000,000	Output of sugarcane
Maize	1,210,000	5,450,000	
Grass	200,000		Meet 30% of total need for animal production

# COMPARISON BETWEEN PRODUCTS PROCESSED FROM RICE STRAW

Products from rice straw	Uses	Convenience in uses	Feasibility
Raw/bulk rice straw	<ul style="list-style-type: none"> <li>- Cooking fuel</li> <li>- Ruminant feed</li> </ul>	<ul style="list-style-type: none"> <li>- Simple</li> <li>- Difficult in transportation and uses</li> </ul>	Low
Mushroom	<ul style="list-style-type: none"> <li>- Human food</li> <li>- Diversified products</li> </ul>	<ul style="list-style-type: none"> <li>- Easy in production</li> <li>- Improve farmers' income</li> </ul>	Very high
Baled/compressed straw	<ul style="list-style-type: none"> <li>- Cattle feed</li> </ul>	<ul style="list-style-type: none"> <li>- Need quite simple technology /machines</li> <li>- Convenience and low cost in transportation</li> <li>- Need investments in equipment</li> <li>- High added value</li> </ul>	Very high
Rice straw pellets (gathering, baling, chopping/grinding, drying and pelleting)	<ul style="list-style-type: none"> <li>- Cattle feed</li> <li>- Fuel</li> <li>- Exported and used for different purposes</li> </ul>	<ul style="list-style-type: none"> <li>- Need higher investment in machines /equipment</li> <li>- Convenience and low cost in transportation</li> <li>- Very high added value</li> </ul>	Very high
Ethanol, diesel or bio-plastic	<ul style="list-style-type: none"> <li>- Bio-fuel</li> <li>- Bio-plastic</li> <li>- Other products</li> </ul>	<ul style="list-style-type: none"> <li>- Need complicated technology/ equipment</li> <li>- Need very high investment</li> <li>- Reduce environmental impact</li> </ul>	Low for developing countries

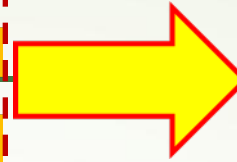
# DEVELOPMENT IN CATTLE PRODUCTION OF VIETNAM TOWARD 2020

PROVINCE/CITY	NUMBER OF COWS/CATTLE BEEF AND MILK PRODUCTION	
	2014	2020
Soc Trang province	6,000 cows at 2,174 dairy farms	17,800 cows
Ho Chi Minh City	100,000 cows at small dairy farms	75,000 – 80,000 cows at medium or large dairy farms
Ha Noi City	13,000 cows	20,000 cows
Vietnam	200,000 cows/ 550,000 tons of fresh milk/year  4,720,000 cattle beef 2,580,000 buffaloes	300,000 cows; > 900,000 tons of fresh milk/year; 12,000,000 cattle beef; 3,000,000 buffaloes



# AGRI BY-PRODUCTS + COWS = HIGH VALUE MILK

INPUT OF LOW VALUE  
BY-PRODUCTS



OUTPUT OF HIGH VALUE  
MILK





# PREPARATION OF TOTAL MIXED RATION (TMR) FEED FOR COWS & CATTLE BEEF



# **MUSHROOM PRODUCTION IN THE MEKONG RIVER DELTA, VIETNAM**

- Vietnam is one of the 5 biggest mushroom producing countries in the world due to a plentiful materials of rice straw, saw dust, sugarcane, etc.
- Vietnam produces about 250,000 tons of mushroom per year with export value of US\$ 25-30 million, mainly from Eastern provinces and the Mekong river delta
- Average selling price of freshly harvested mushroom is US\$ 1.7/kg
- Export price of salted mushroom is US\$ 1,790/ton
- Average profit from out-door mushroom production in the Mekong river delta is about US\$ 0.5/m<sup>2</sup>.cycle
- 20-30 million tons of rice straw produced annually in the Mekong river delta can produce about 2 million tons of mushroom with a total value of US\$ 1 billion.



# METHODS OF MUSHROOM GROWING

Out-door mushroom growing



Traditional in-field  
mushroom growing



In-door mushroom  
growing

# COMPARISON BETWEEN OUT-DOOR AND IN-DOOR MUSHROOM GROWING

Criteria for Comparison	Out-door growing	In-door growing
Initial investment cost (US\$)	0	7,500
Number of production cycles per year	1 - 2	8 - 9
Efficiency of rice straw use (kg of mushroom/100kg of rice straw)	13.85 – 16.15	9.86
Mushroom yield (kg of mushroom/meter)	0.7 – 0.9	1.67
Production cost (US\$/kg of mushroom)	0.8 – 1.0	1.4
Average selling price (US\$/kg of mushroom)	1.2 – 1.45	2.0
Profit (US\$/kg of mushroom)	0.35 – 0.50	0.75
Annual profit (US\$/1,000 meter.year)	900	9,850

# REASONS & OBJECTIVES OF PILOTS

Pilots using rice straw	In-door mushroom growing	Ruminant feed processing
<b>1. Reasons</b>	<ul style="list-style-type: none"><li>- To minimize field burning</li><li>- To use up rice straw at high moisture content in wet seasons</li><li>- To increase value of the rice straw</li><li>- To develop agro-processing industry in rural areas</li></ul>	<ul style="list-style-type: none"><li>- To minimize field burning</li><li>- To balance crop production and livestock production</li><li>- To increase value of the rice straw</li><li>- To develop agro-processing industry in rural areas</li></ul>
<b>2. Objectives</b>	<ul style="list-style-type: none"><li>- To control better mushroom growing conditions (temperature and relative humidity of the surrounding air)</li><li>- To control better diseases and quality of the mushroom</li><li>- To enhance yield and number of growing cycles of mushroom/year</li><li>- To improve income of rice farmers, especially female farmers and during off-seasons</li></ul>	<ul style="list-style-type: none"><li>- To reduce feed cost &amp; production cost of the ruminant animals</li><li>- To improve profit and income of different partners in the meat or milk value chains</li></ul>



# METHOD OF SETTING UP THE PILOTS

Pilots using rice straw	In-door mushroom growing	Ruminant feed processing
<b>3. Method or setting up the pilots</b>	<ul style="list-style-type: none"> <li>- Surveys on potential markets of rice straw mushroom</li> <li>- Identification of proper locations and right partners for in-door mushroom growing pilot</li> <li>- Pilot site set up</li> <li>- Financial analysis of the pilot</li> <li>- Complete the business model, ready for out-scaling in the region</li> </ul>	<ul style="list-style-type: none"> <li>- Surveys on potential market of ruminant feed using rice straw</li> <li>- Identification of proper locations and right partners for ruminant feed processing pilot</li> <li>- Pilot site set-up</li> <li>- Financial analysis of the pilot</li> <li>- Complete the business model, ready for out-scaling in the region</li> </ul>
<b>3.1 Selection of pilot site locations - the Mekong river delta</b>	<ul style="list-style-type: none"> <li>- The Mekong river delta (MRD) is the biggest rice producing region in Vietnam</li> <li>- MRD is convenient for demonstrations to international members of CSAM and easier for out-scaling of the successful pilot</li> </ul>	<ul style="list-style-type: none"> <li>- The Mekong river delta (MRD) is the biggest rice producing region in Vietnam</li> <li>- MRD is convenient for demonstrations to international members of CSAM and easier for out-scaling of the successful pilot</li> </ul>
<b>3.2 Selection of pilot site partners</b>	<p>+ Mr. Vui:</p> <ul style="list-style-type: none"> <li>- Having good knowledge and experience of mushroom growing</li> <li>- Having good markets of mushroom</li> <li>- Having financial capacity for new investments</li> </ul>	<p>+ Bình Minh Co-operative:</p> <ul style="list-style-type: none"> <li>- Having experiences in rice straw collection and semi- processing</li> <li>- Having good knowledge and experience of animal feed processing</li> <li>- Having good markets of animal feed</li> <li>- Financial capacity for new investments</li> </ul>

# WORKING PLANS & EXPECTED OUTPUT OF THE PILOTS

Pilots using rice straw	In-door mushroom growing	Ruminant feed processing
<b>4. Working plans</b>	<ul style="list-style-type: none"> <li>- Design of a mushroom growing house 1-2/2018</li> <li>- Building up a mushroom growing house 2-3/2018</li> <li>- Mushroom growing 4-10/2018</li> <li>- Technical training for mushroom growers 8-10/2018</li> <li>- Financial analysis 9-10/2018</li> <li>- Pilot site demonstrations for international friends from CSAM 11-12/2018</li> <li>- Completion of the pilot 12/2018</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of rice straw scaling conveyor, chopping and compressing machines 1-6/2018</li> <li>- Technical training of the machines for operators 6-8/2018</li> <li>- Putting the machines into operation 8-10/2018</li> <li>- Financial analysis 11/2018</li> <li>- Pilot site demonstrations for international friends from CSAM 11-12/2018</li> <li>- Completion of the pilot 12/2018</li> </ul>
<b>5. Expected outputs</b>	A successful pilot of in-door mushroom growing, ready for out-scaling	A successful pilot of ruminant feed processing using rice straw, ready for out-scaling



***THANK YOU VERY MUCH FOR  
YOUR ATTENTION***

