

RICE YIELD AND COST In Relation to Factors of Production

Evidence from Regular Monitoring of
Rice-Based Farm Household Survey
(RBFHS) 2011-2012



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Objectives

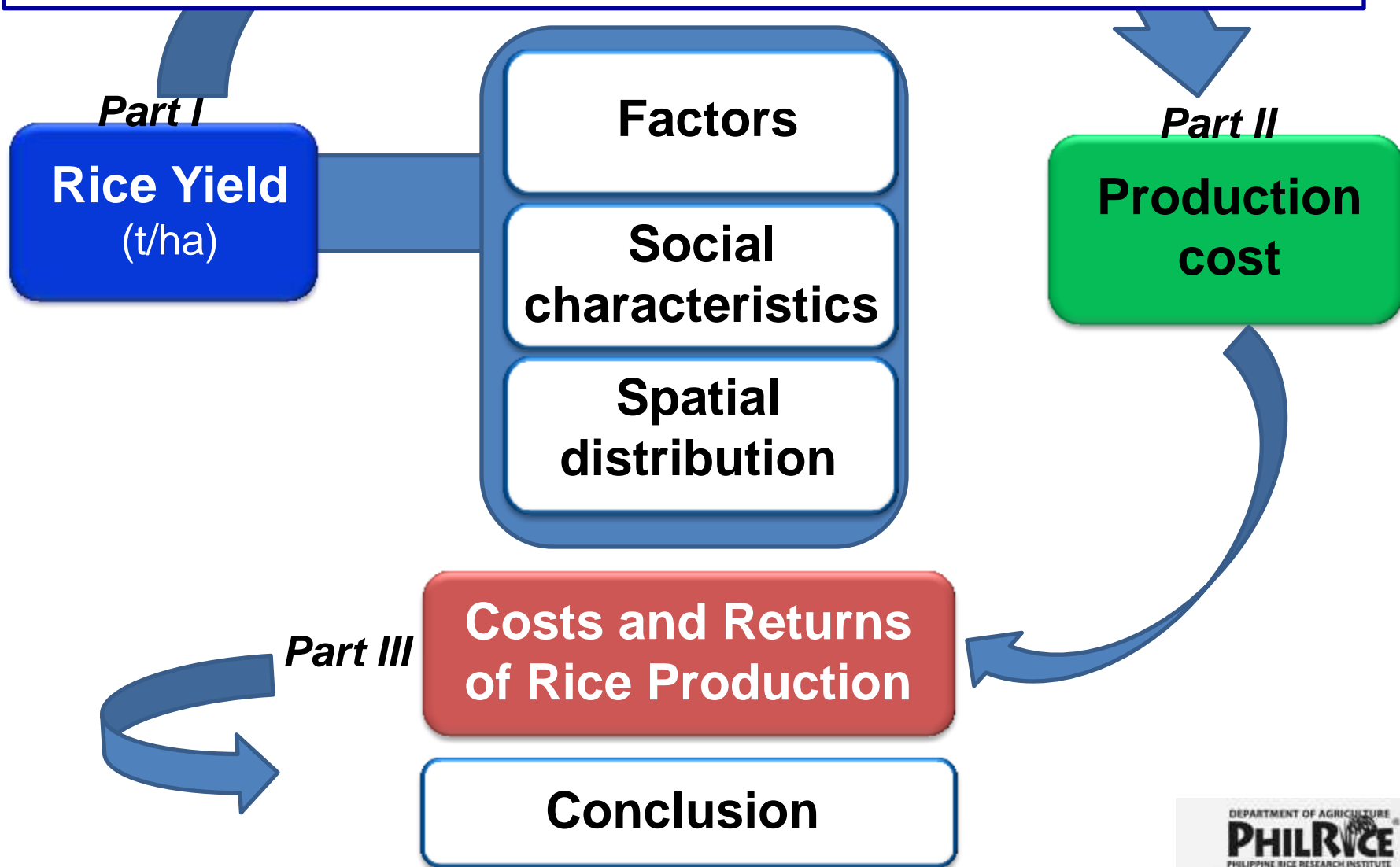


Relate rice yield and cost to factors affecting production

Present costs and returns of rice production in 2011WS-2012DS

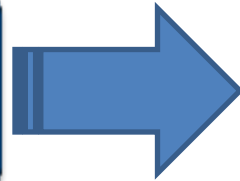
Demonstrate yield and cost variations across provinces and seasons

Outline of presentation



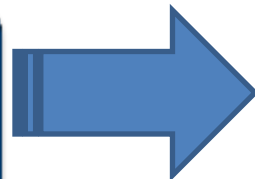
RBFHS 2011-2012 Data

**2011 WS Harvest
(Jul – Dec 2011)**



n = 2,399

**2012 DS Harvest
(Jan – Jun 2012)**



n = 2,051

**Temporarily
stopped farming**

Crop failure

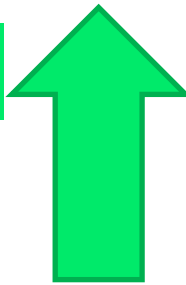
Missing data

Part I

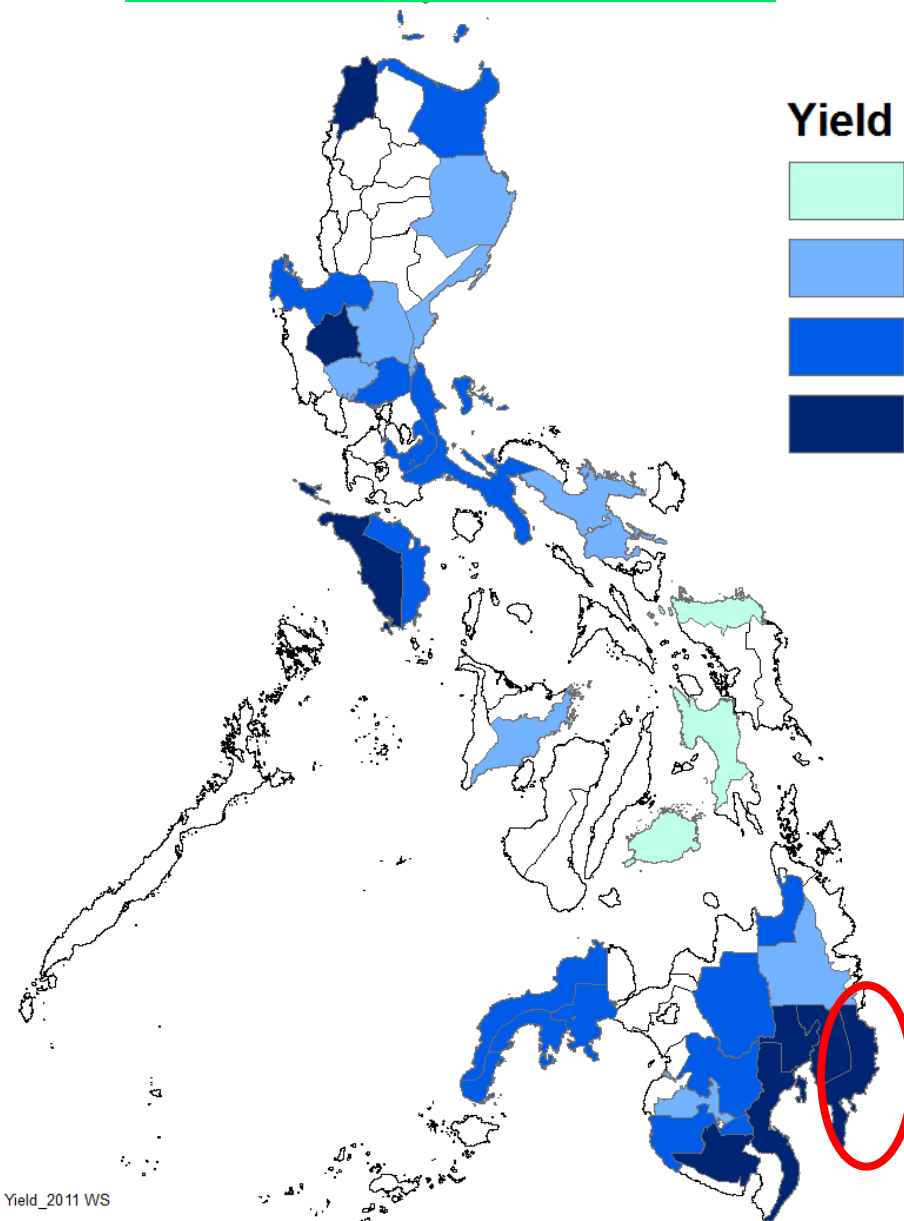
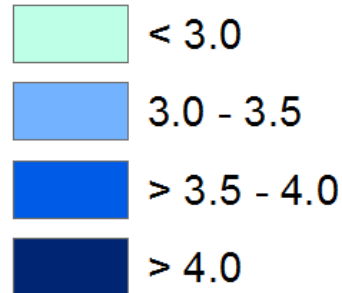
Rice Yield

2011WS = 3.67 t/ha

2012DS = 4.13 t/ha

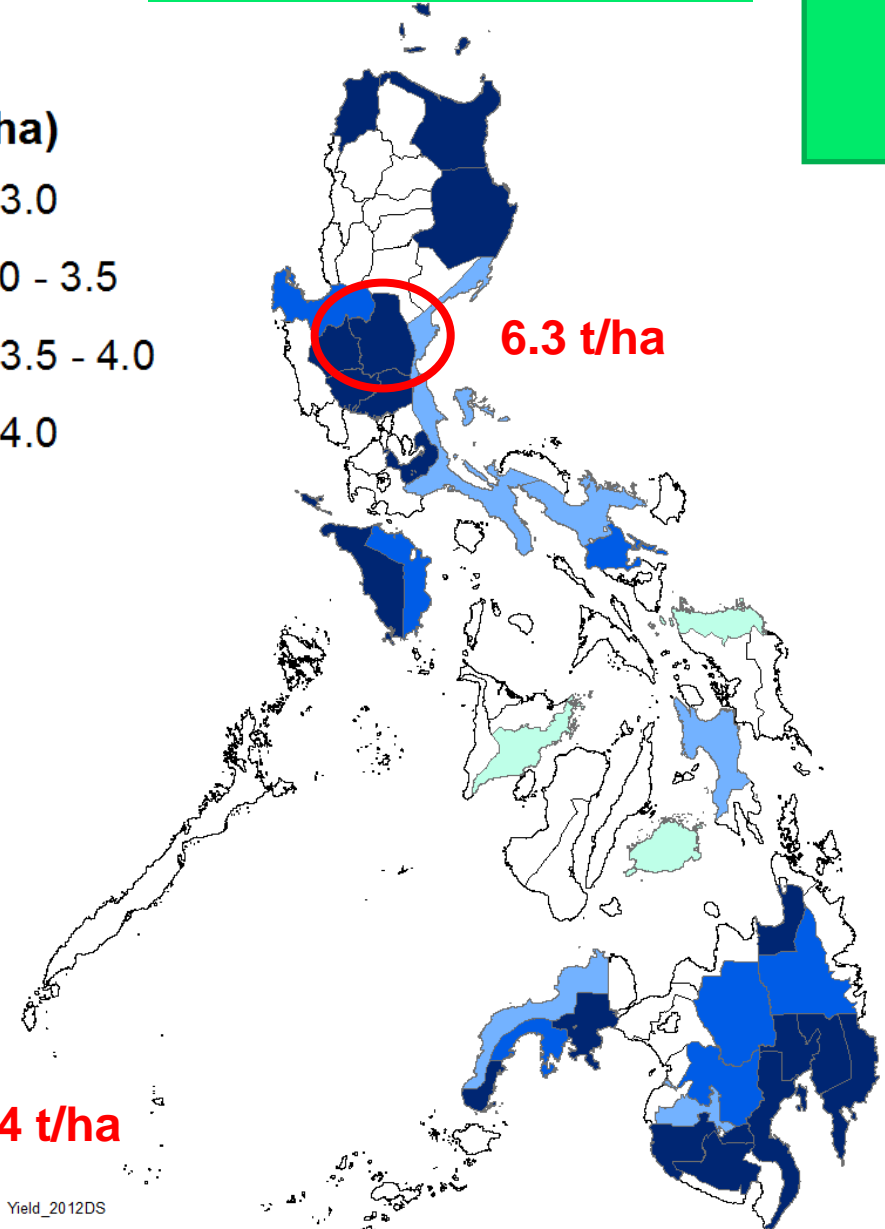


Yield (t/ha)

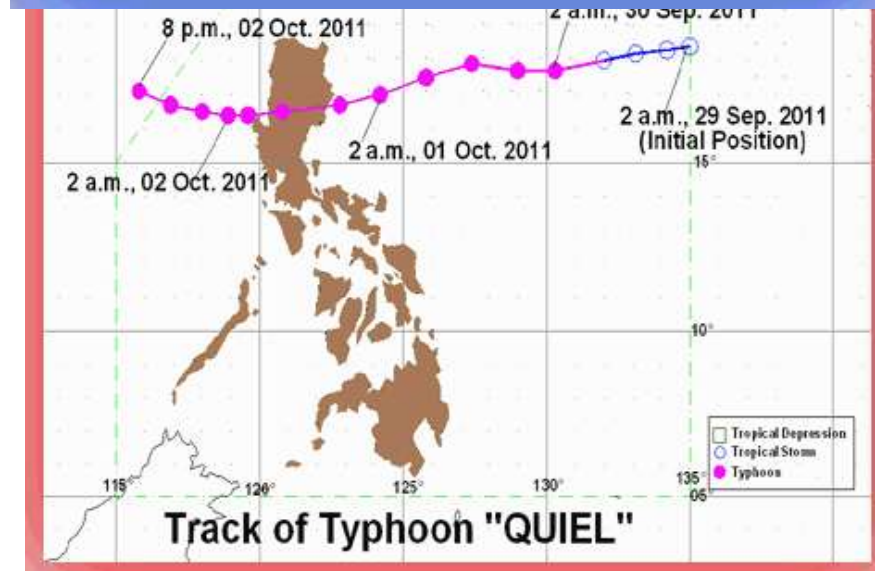
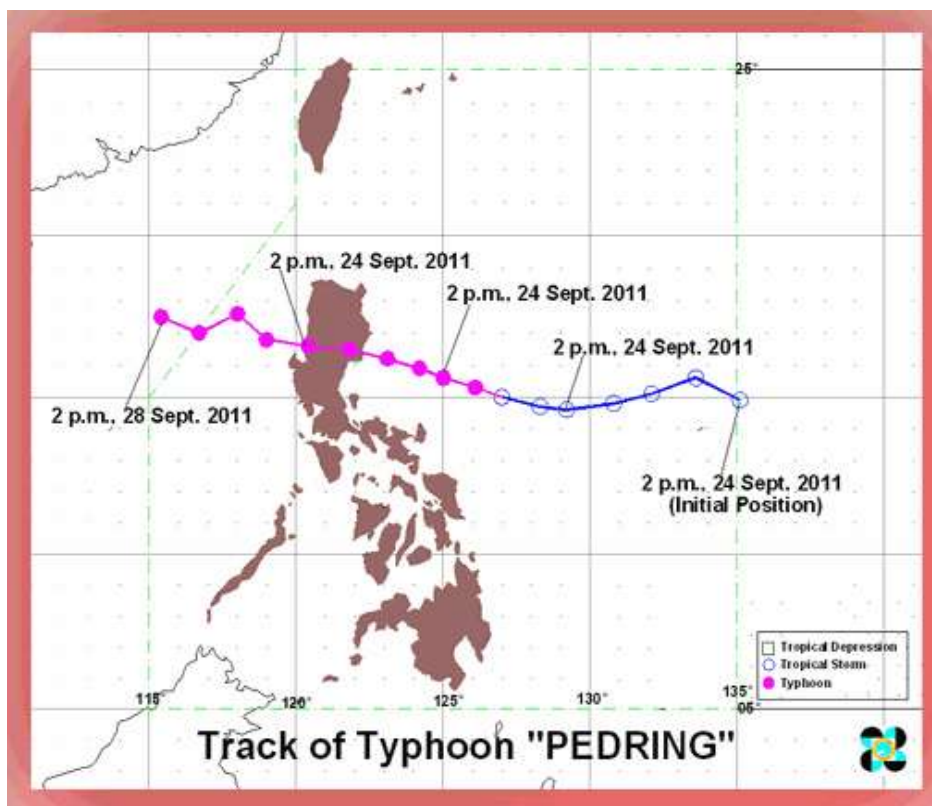


Yield_2011 WS

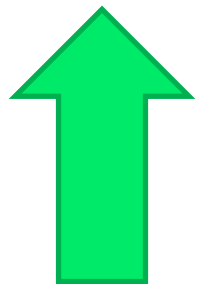
Yield_2012DS



Out of 13 typhoons that visited the country between July-December 2011, three of those traversed Nueva Ecija.

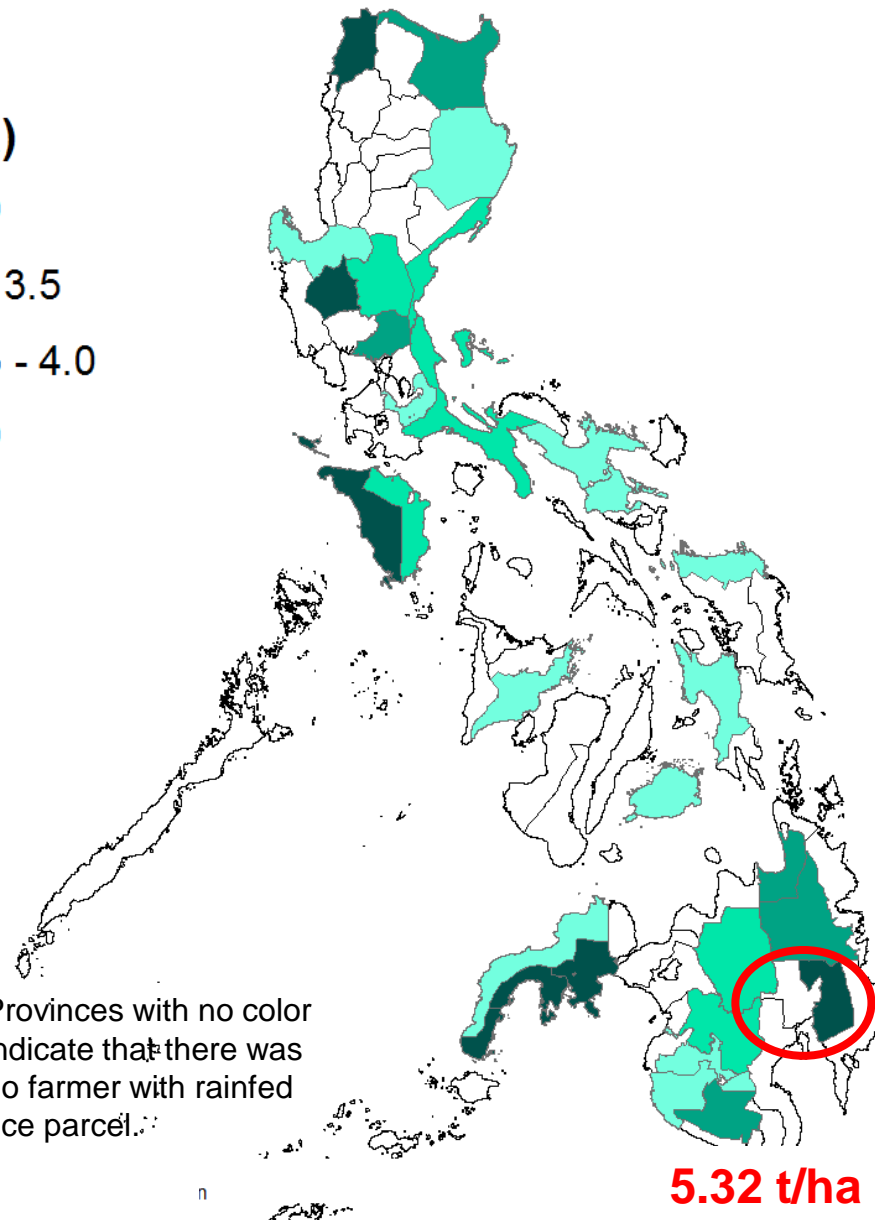
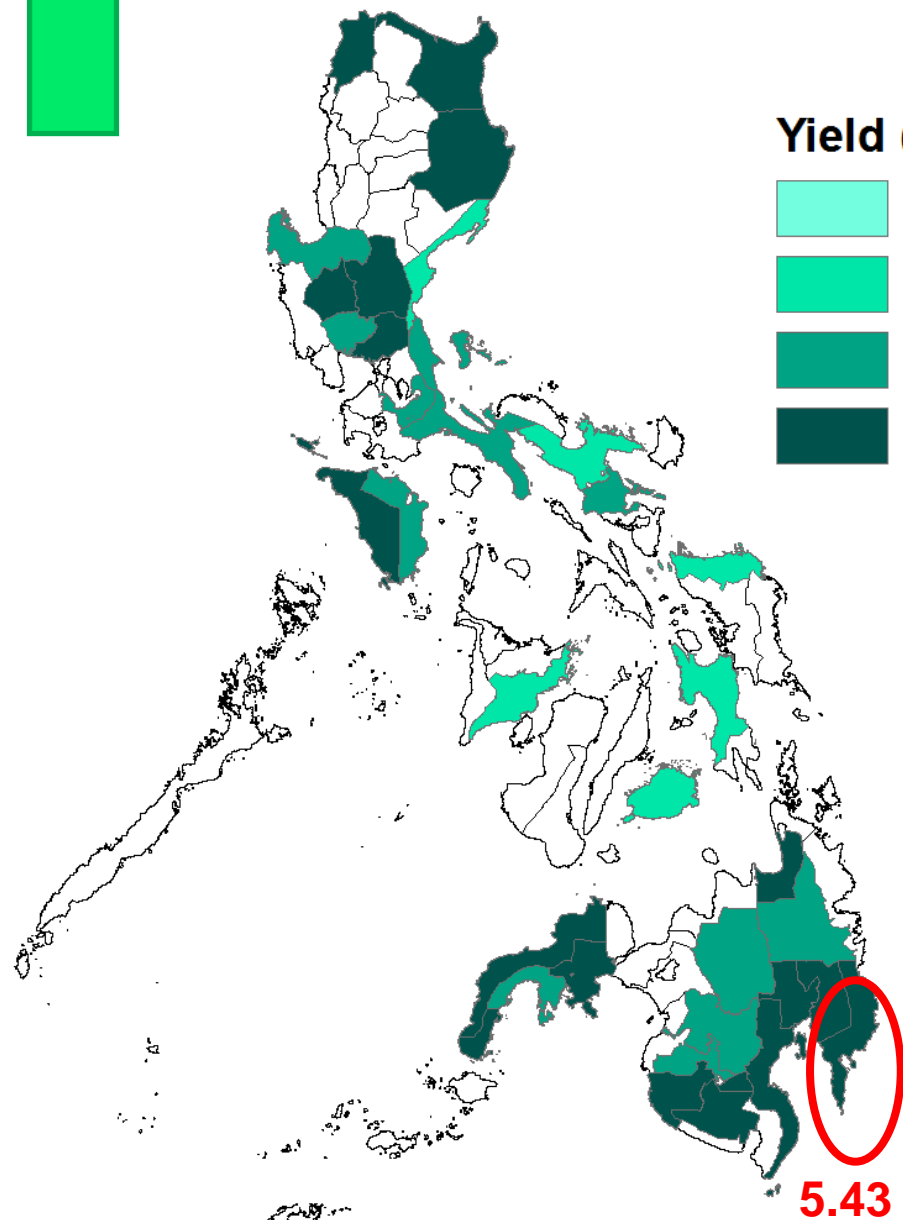


<http://www.pagasa.dost.gov.ph/index.php/tropical-cyclone-information/25-tropical-cyclones/33-annual-tropical-cyclone-tracks#2011>



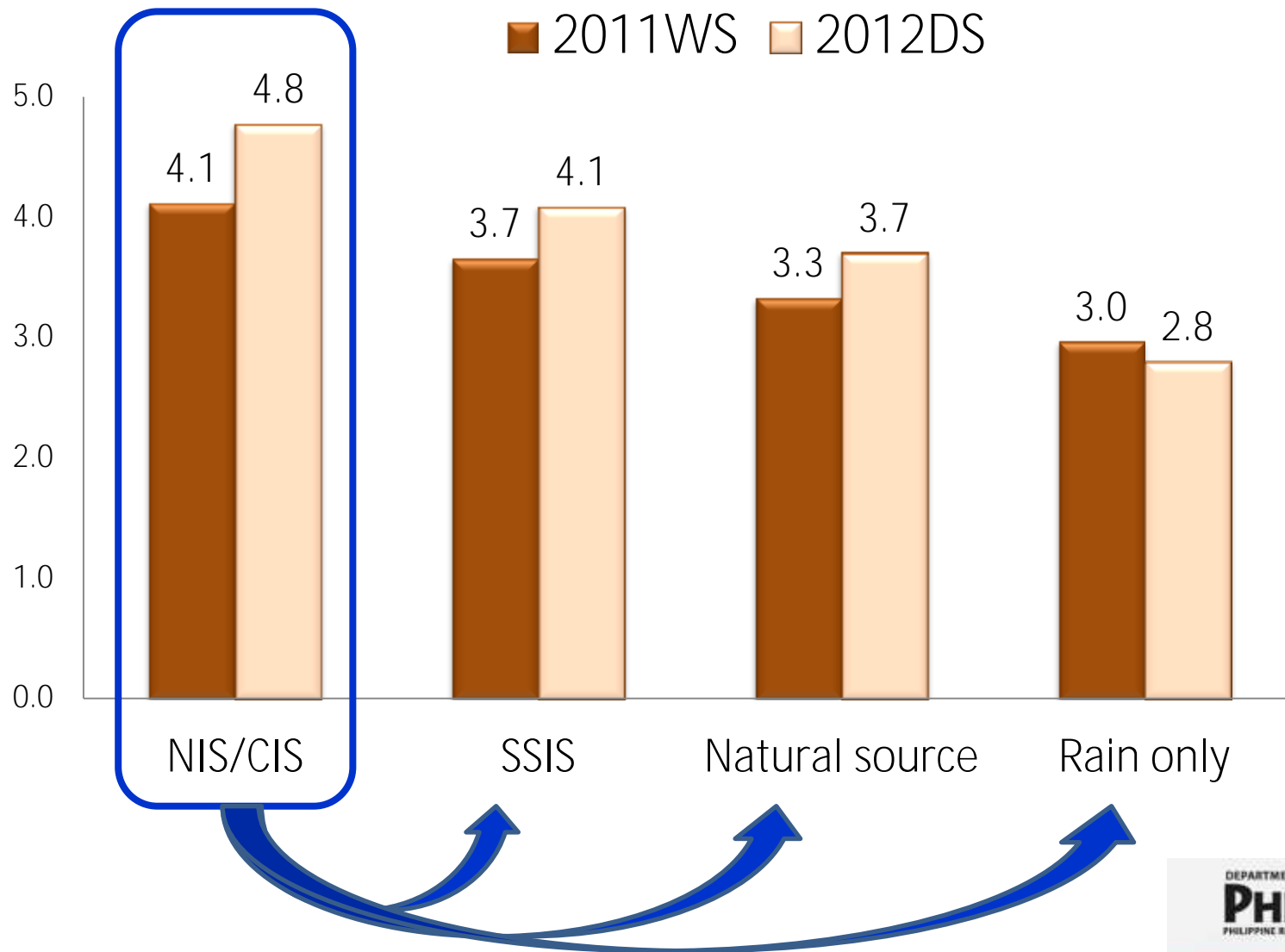
Irrigated = 4.15 t/ha

Rainfed = 2.90 t/ha



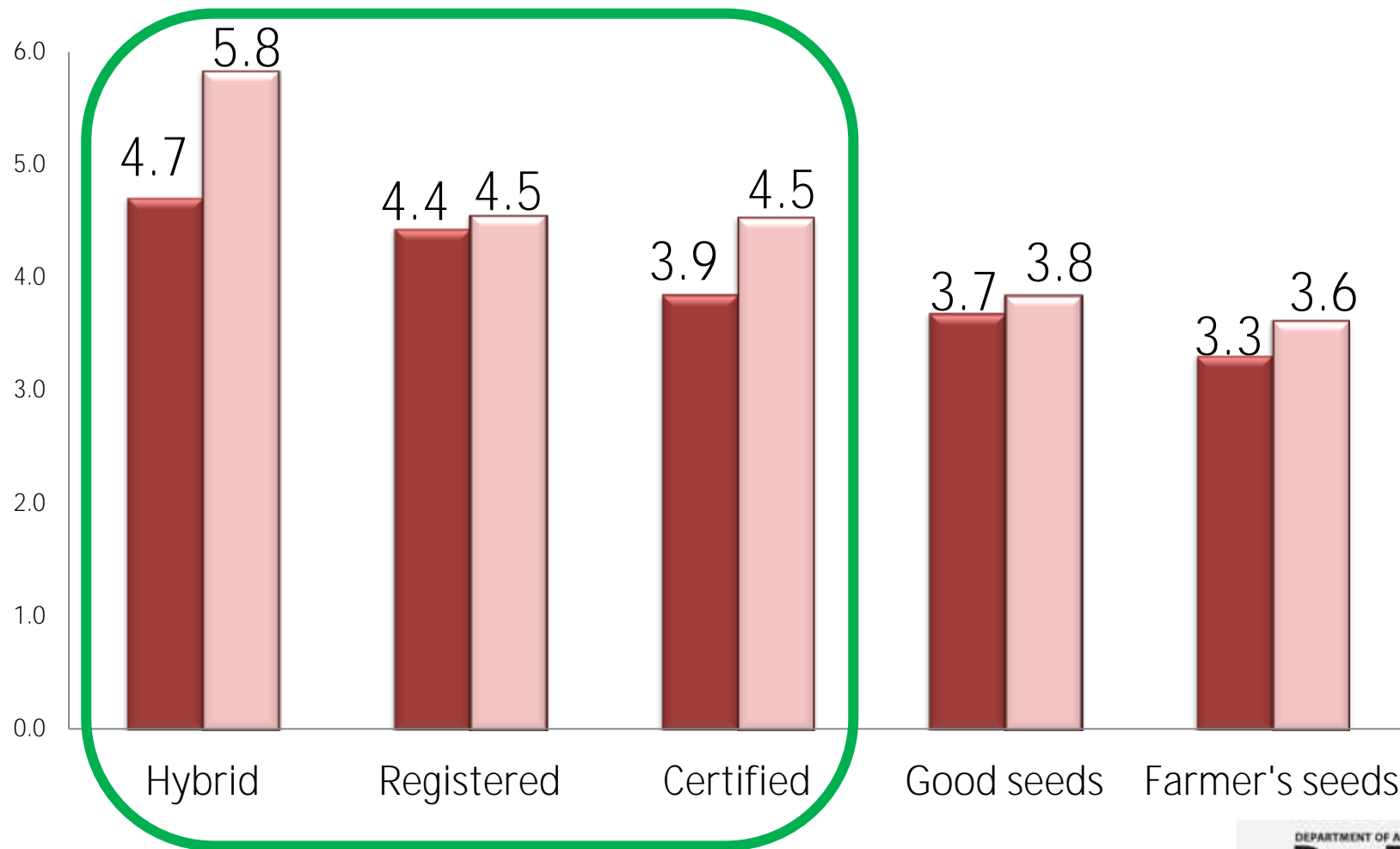
Provinces with no color indicate that there was no farmer with rainfed rice parcel.

Yield in relation to Water source

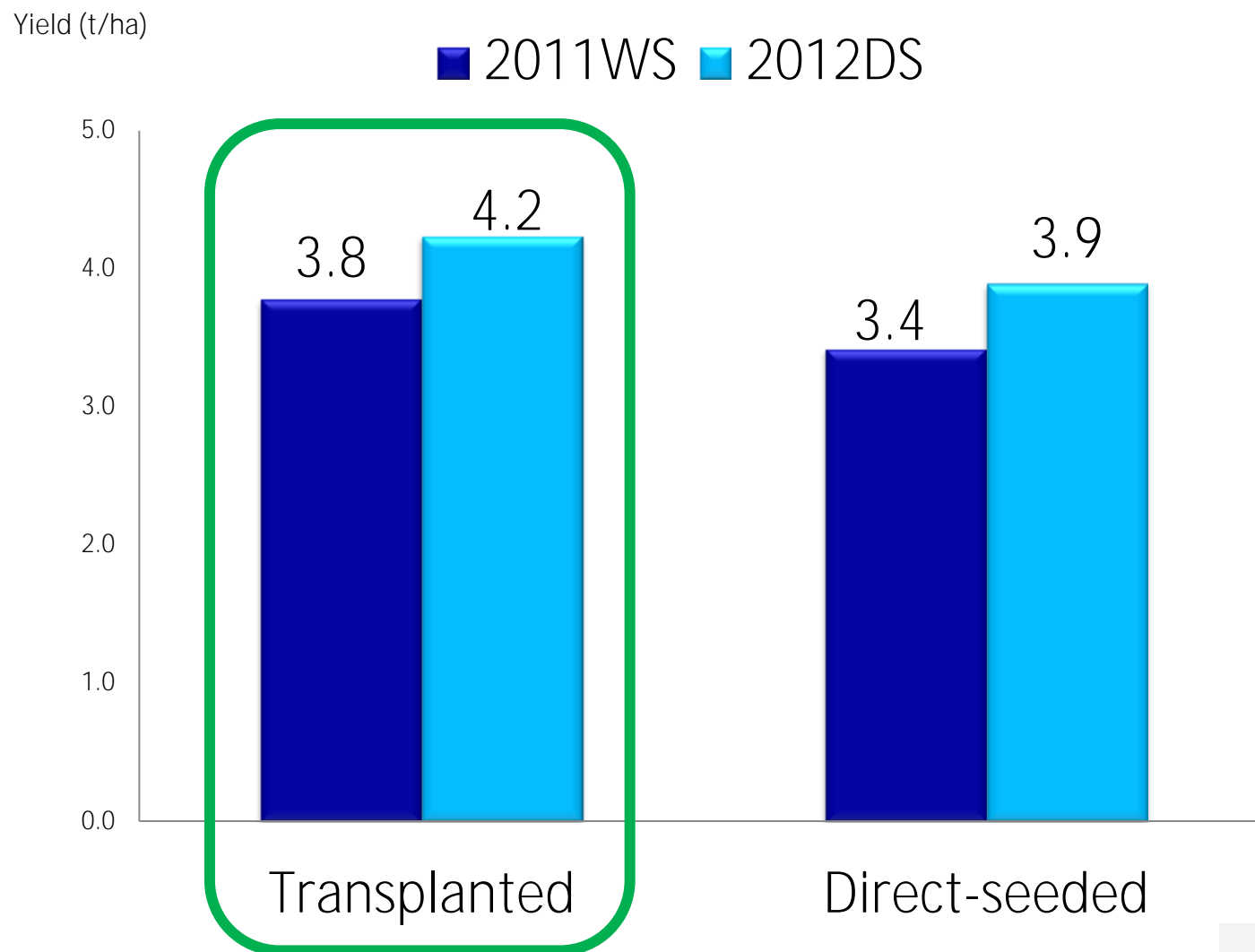


Yield in relation to Seed class

■ 2011WS ■ 2012DS



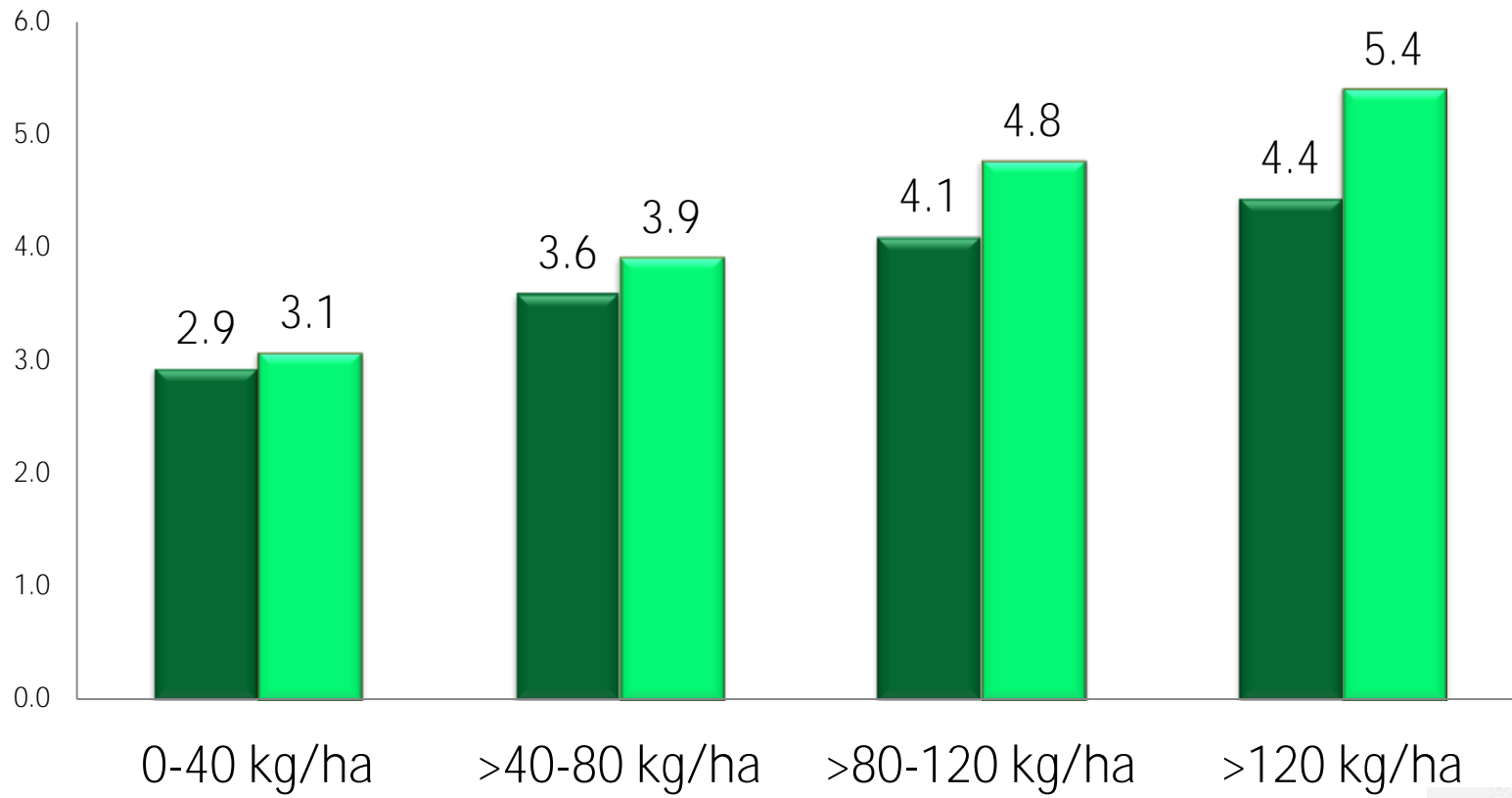
Yield in Relation to Crop establishment



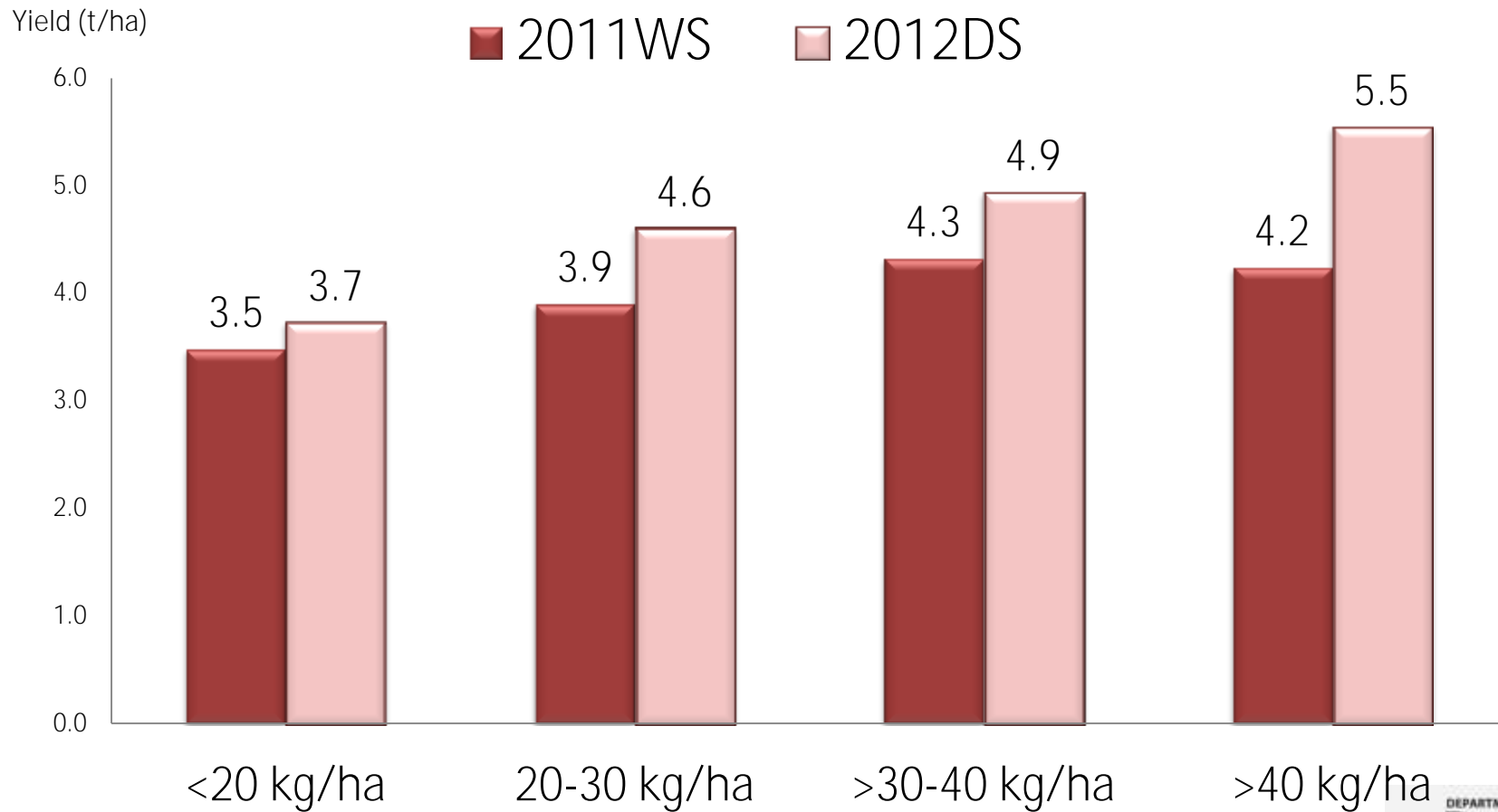
Yield in relation to Nitrogen level

Yield (t/ha)

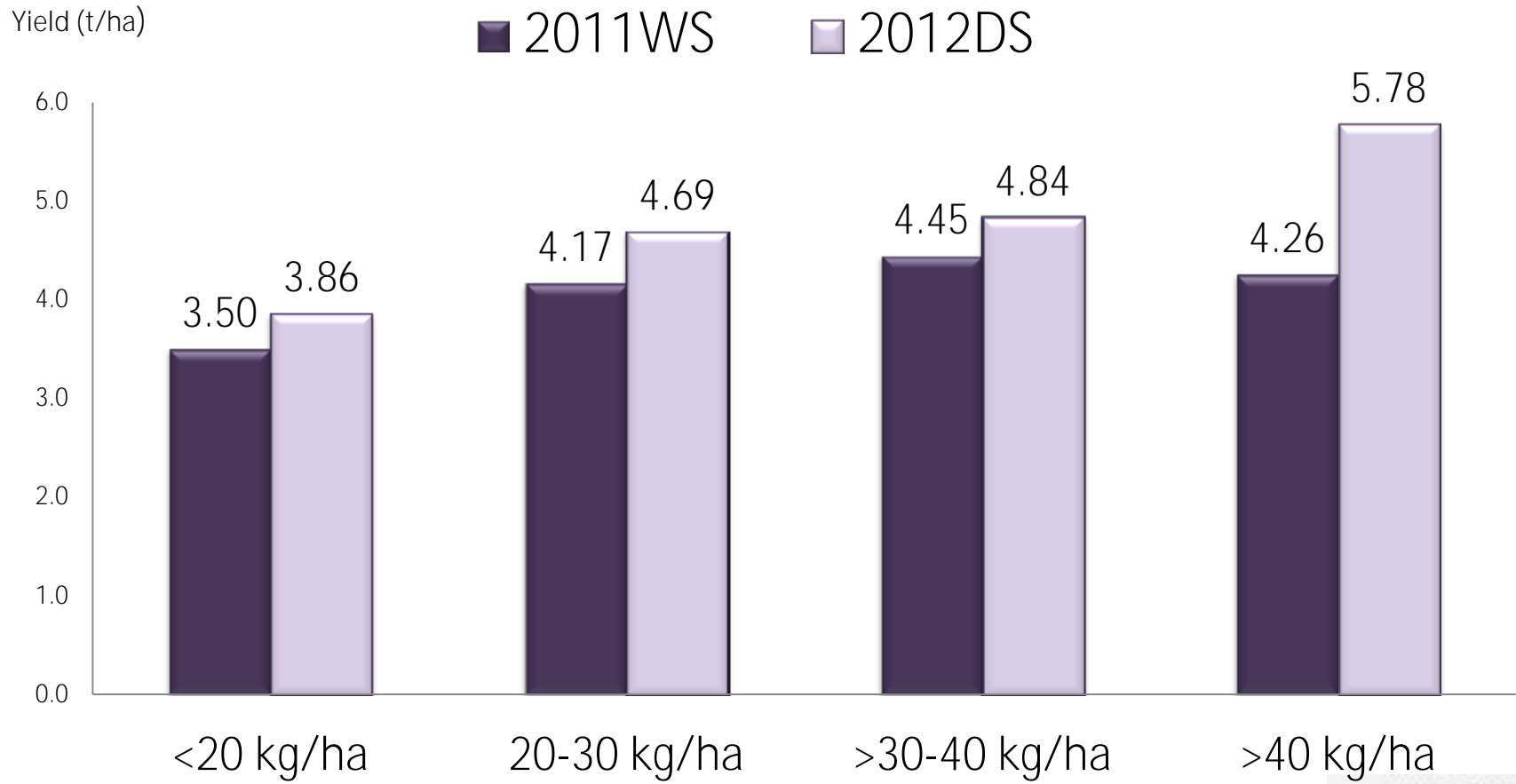
■ 2011WS ■ 2012DS



Yield in relation to Phosphate (P_2O_5) level

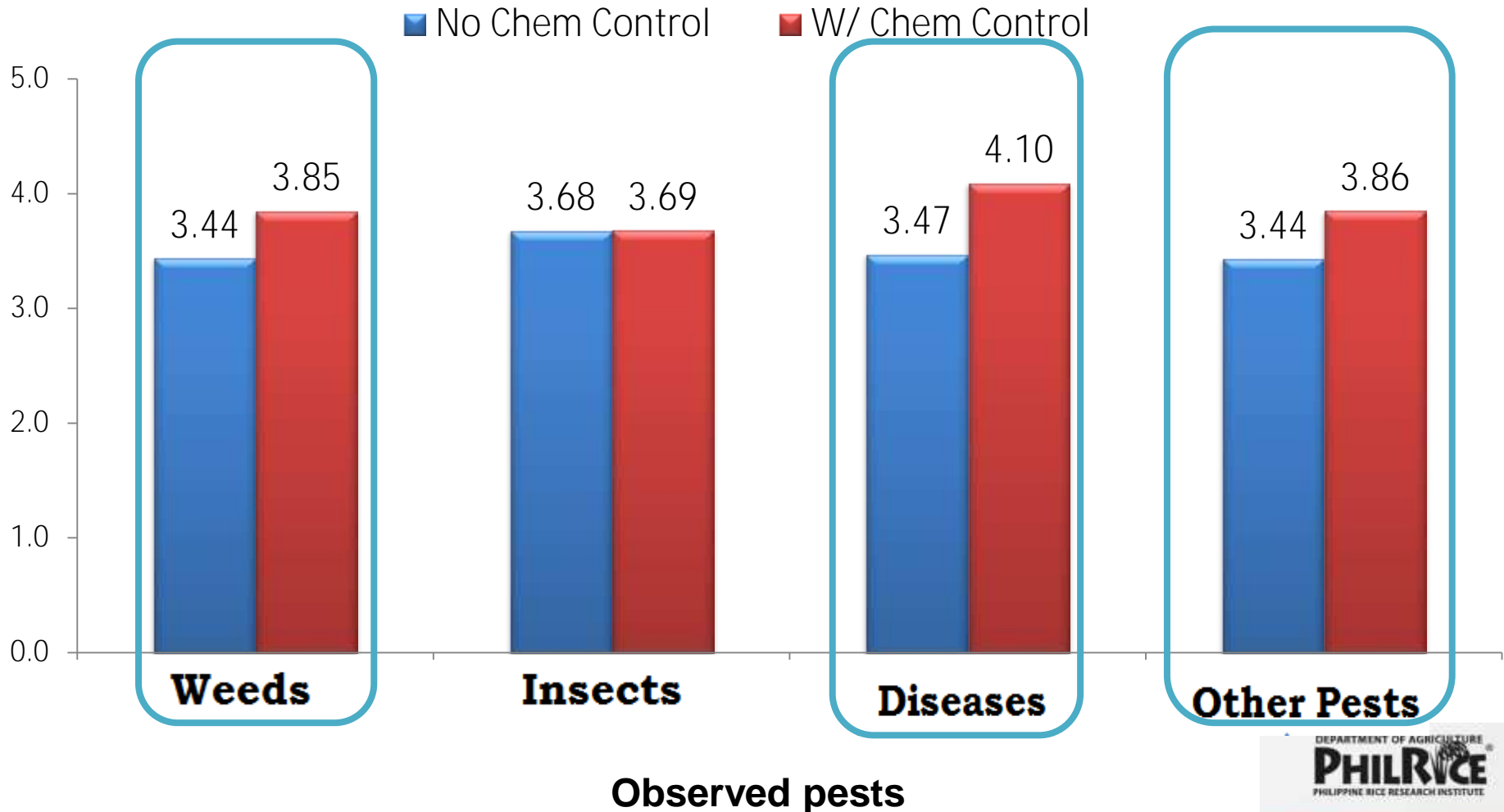


Yield in relation to Potassium oxide (K₂O) level



Yield in relation to Pests management

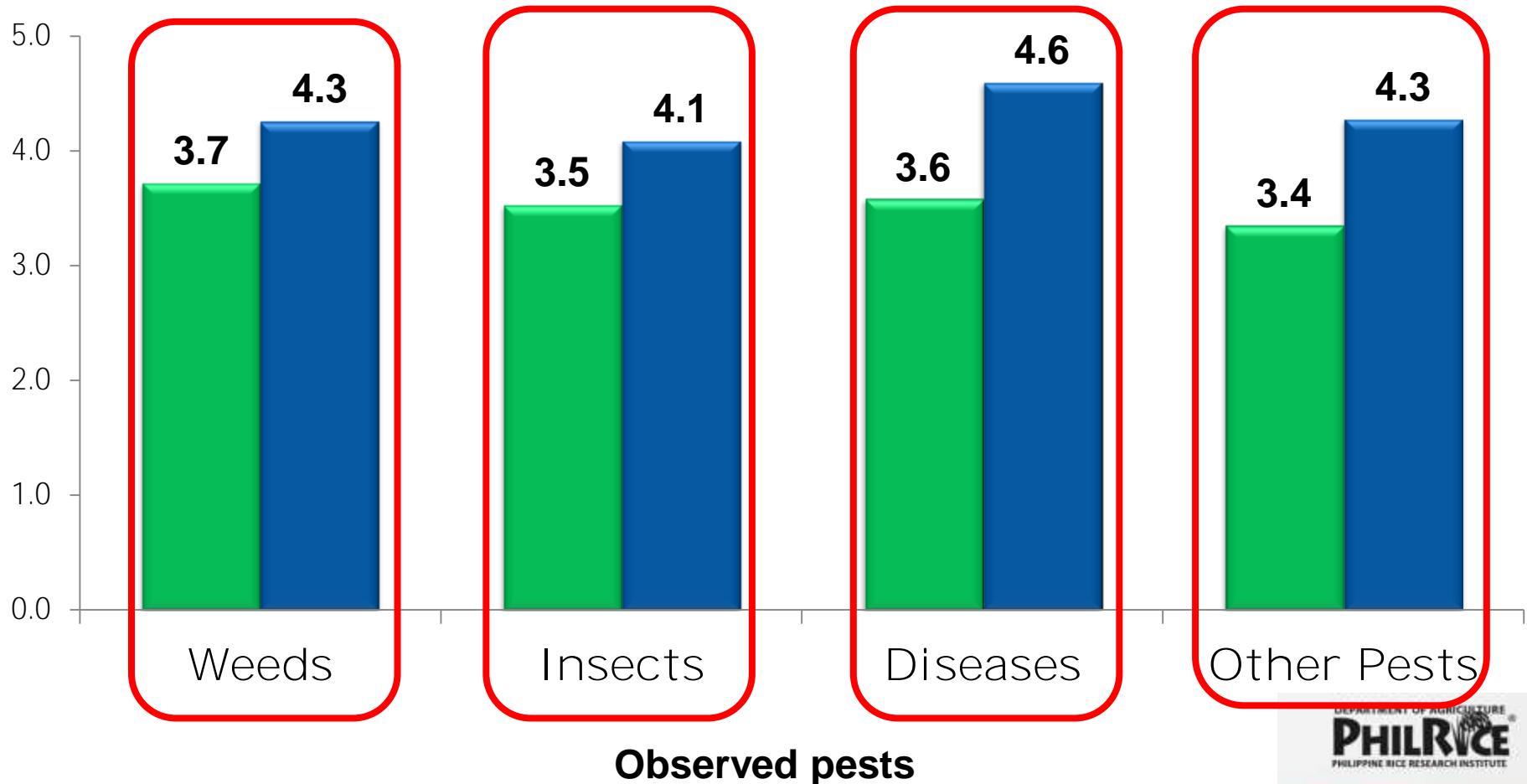
2011 Wet season



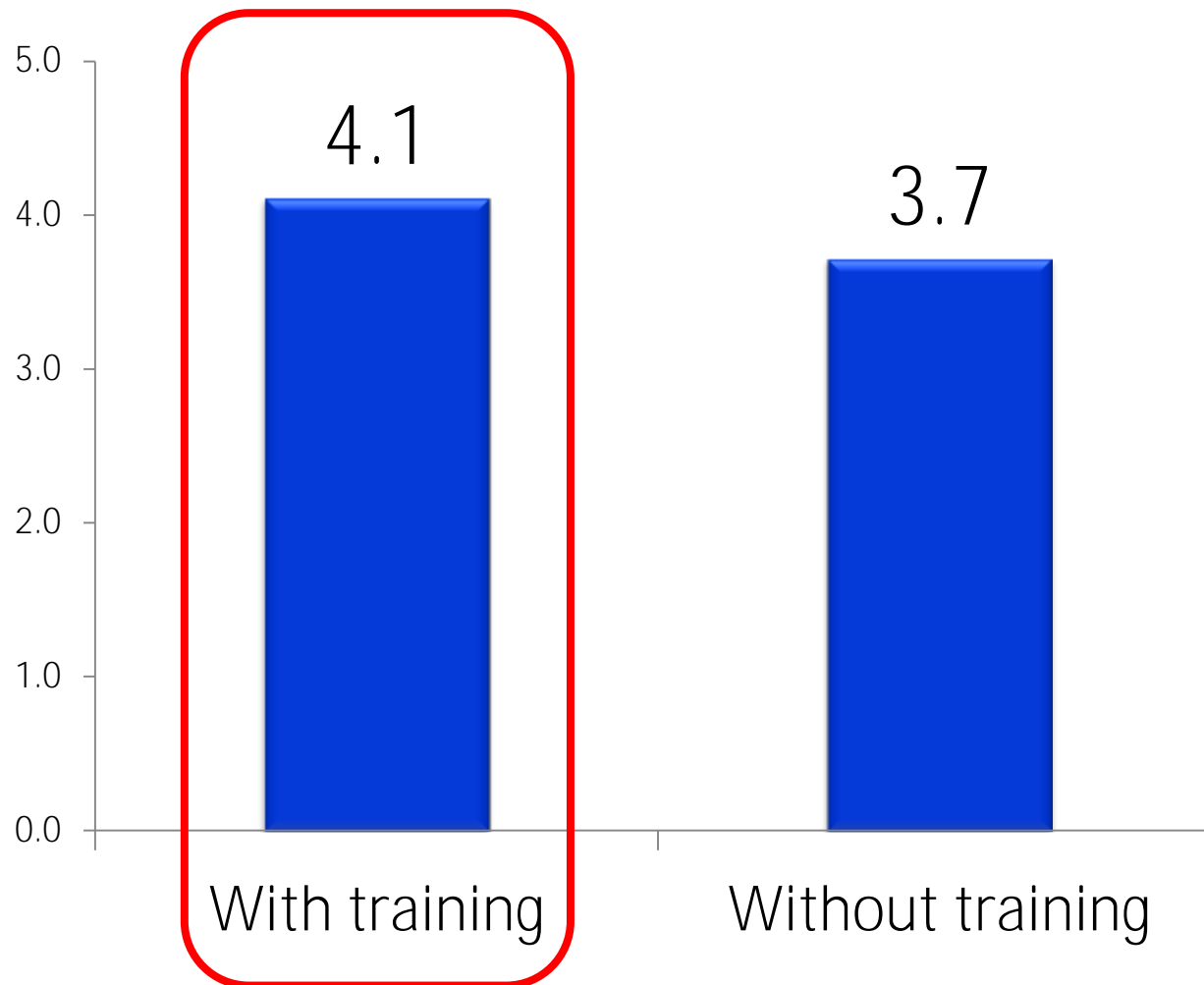
Yield in relation to Pests management

2012 Dry Season

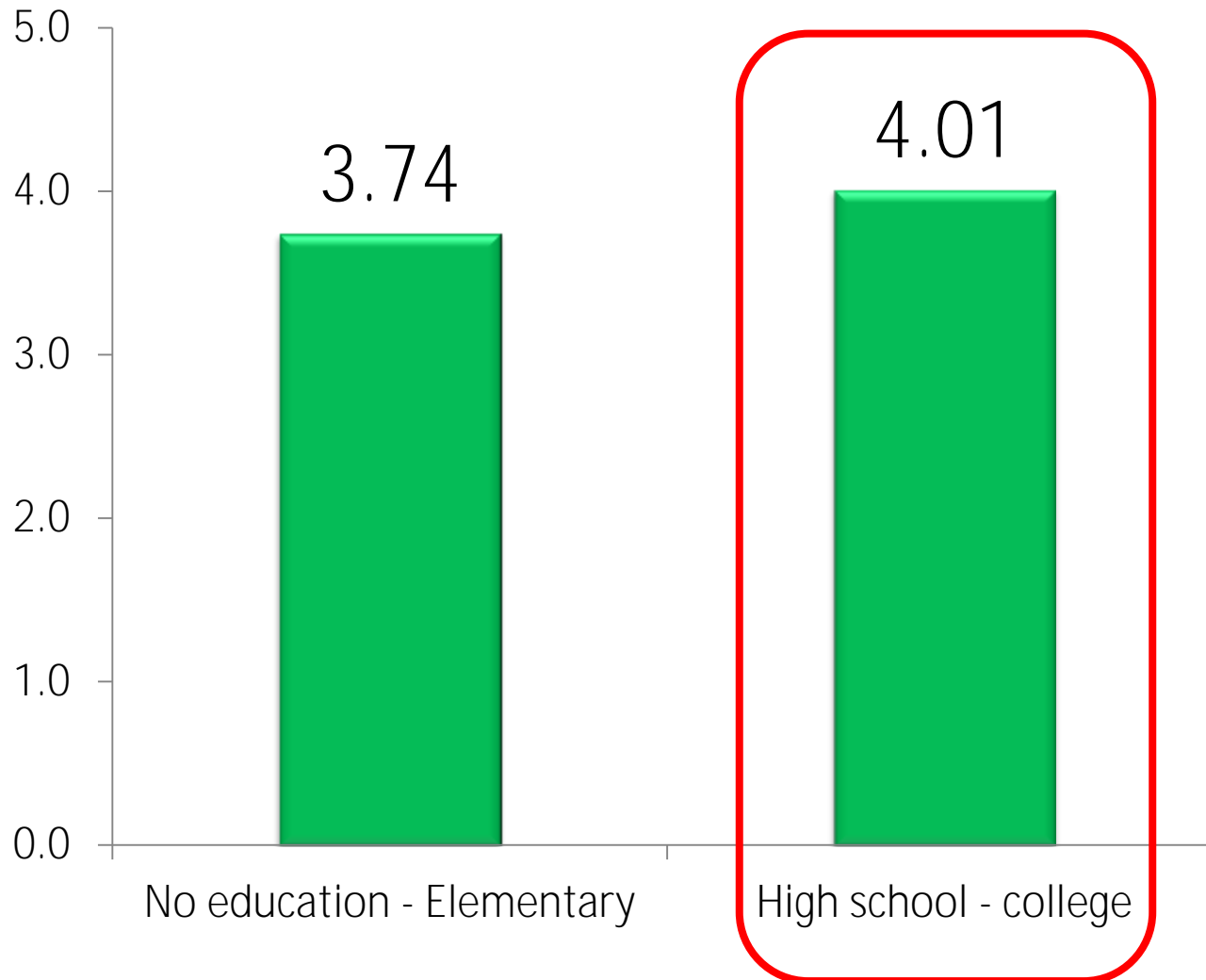
■ No Chemical Control ■ With Chemical Control

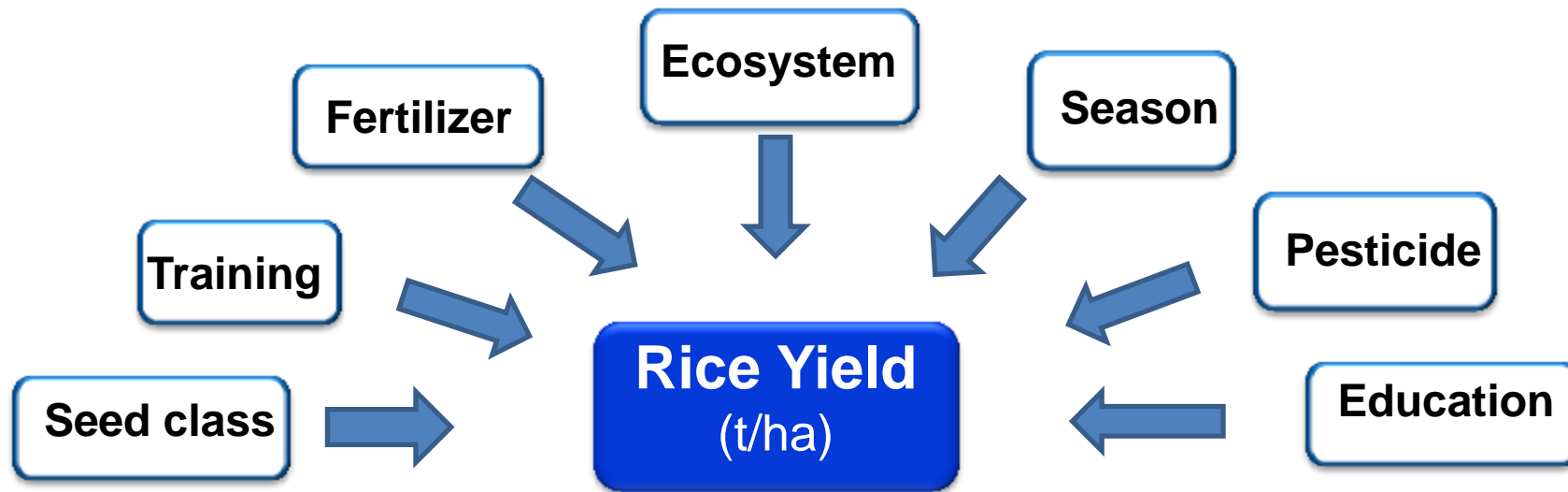


Yield in relation to Training participation



Yield in relation to Education





WHAT IF?

$$\text{Rice Yield (t/ha)} = \text{All possible factors affecting yield}$$

YIELD FUNCTION

Yield	Coefficient	
N	0.0052	***
P ₂ O ₅	-0.0001	
K ₂ O	0.0021	***
Herbicide	0.0028	***
Insecticide	-0.0028	***
Fungicide	0.0028	***
Other pesticides	-0.0013	**
Man-day	0.3446	***
Machine-day	0.0090	***
Seeds quantity	0.1197	***
NIS/CIS (1=yes)	0.2610	***
SSIS/natural (1=yes)	0.1396	***
Hybrid (1=yes)	0.3945	***
RS/CS (1=yes)	0.0879	***
Education (1=HS and up)	0.0013	
Training (1=yes)	0.0278	***
Season (1=DS)	0.1213	***
Farming experience (1= ≥15yrs)	0.0196	

** Significant at 10%

*** Significant at 5%

>> indicates 0.005% increase in yield for every 1% increase in nitrogen (kg/ha)

indicates that yield is 30% higher for NIS/CIS users relative to non-users

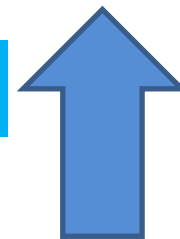
>> indicates that yield is 48% higher for hybrid seeds users relative to non-users

Part II

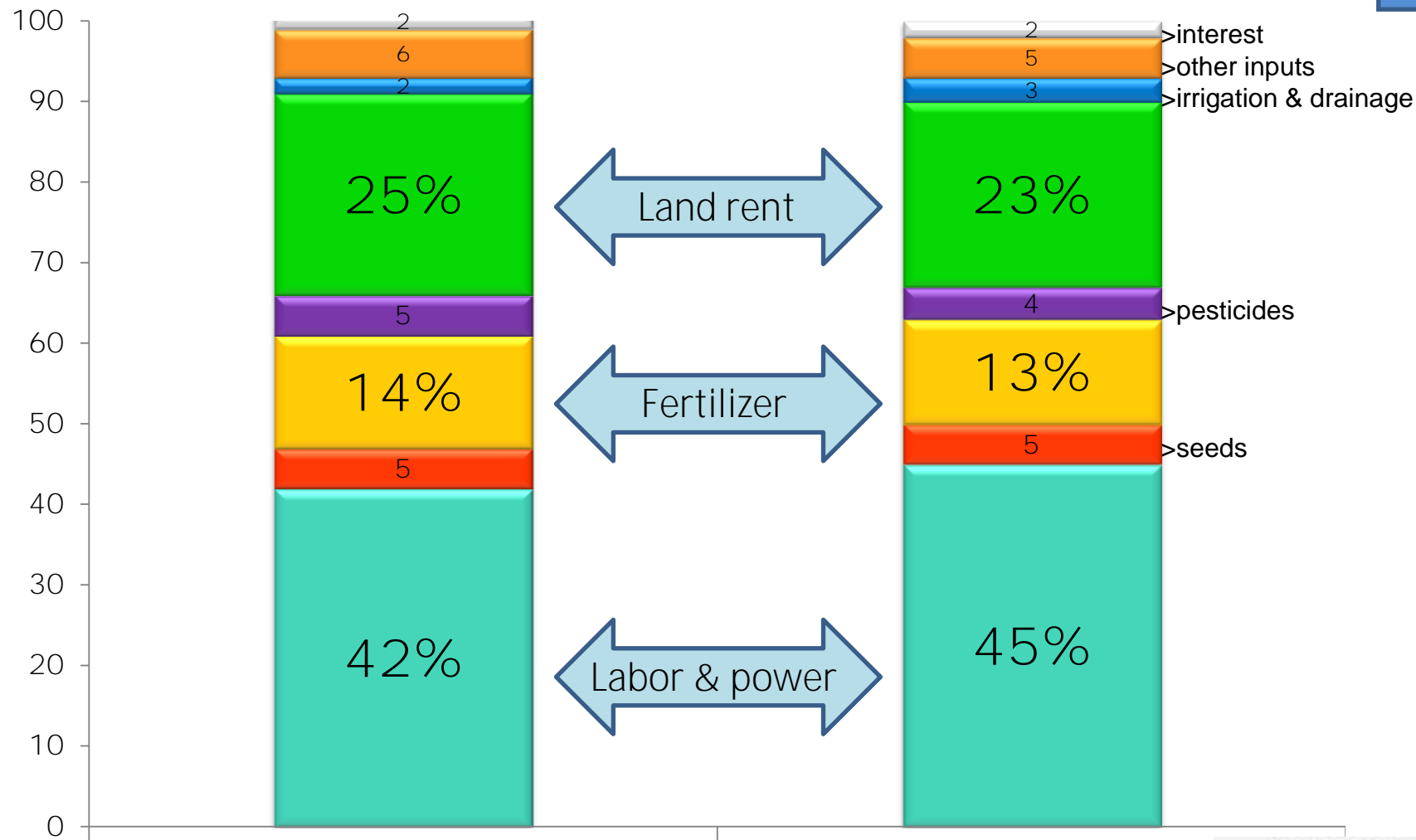
Production Cost

2011WS = PhP 42,201

2012DS = PhP 44,908



% Cost share

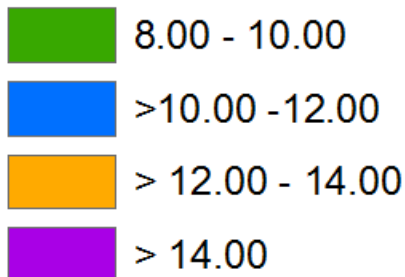


2011WS = Php11.49/kg

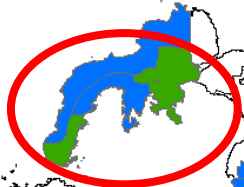
2012DS = Php10.88/kg



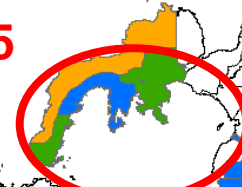
Unit cost (PhP/kg)



PhP8.22

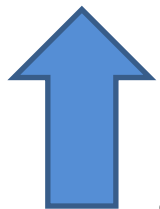


PhP9.05



Unit cost_2011 WS

Unit cost_2012 DS



Irrigated = PhP 46,029

Rainfed = PhP 33,978

% Cost share

100

90

80

70

60

50

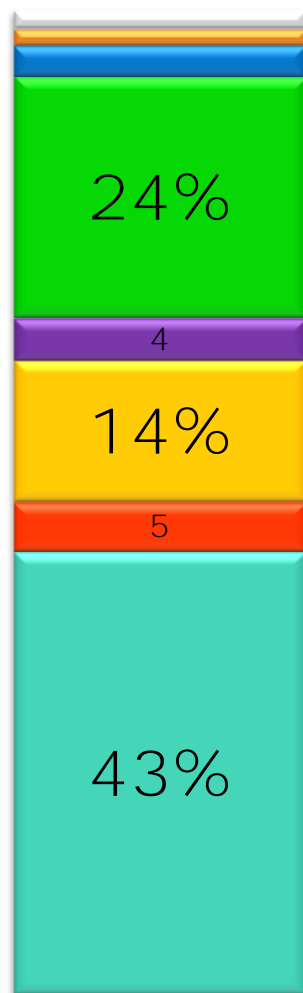
40

30

20

10

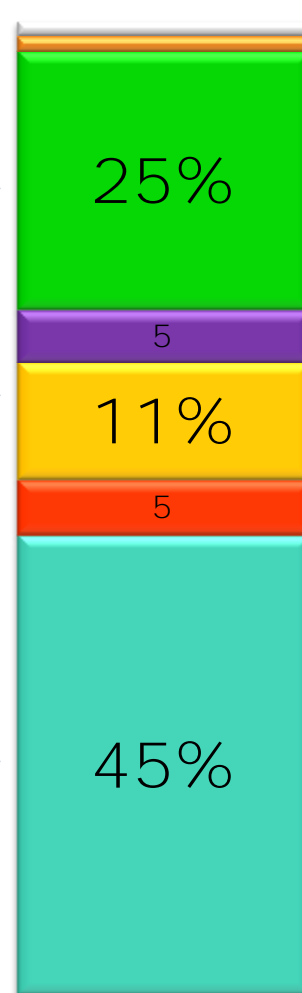
0



Land rent

Fertilizer

Labor & power



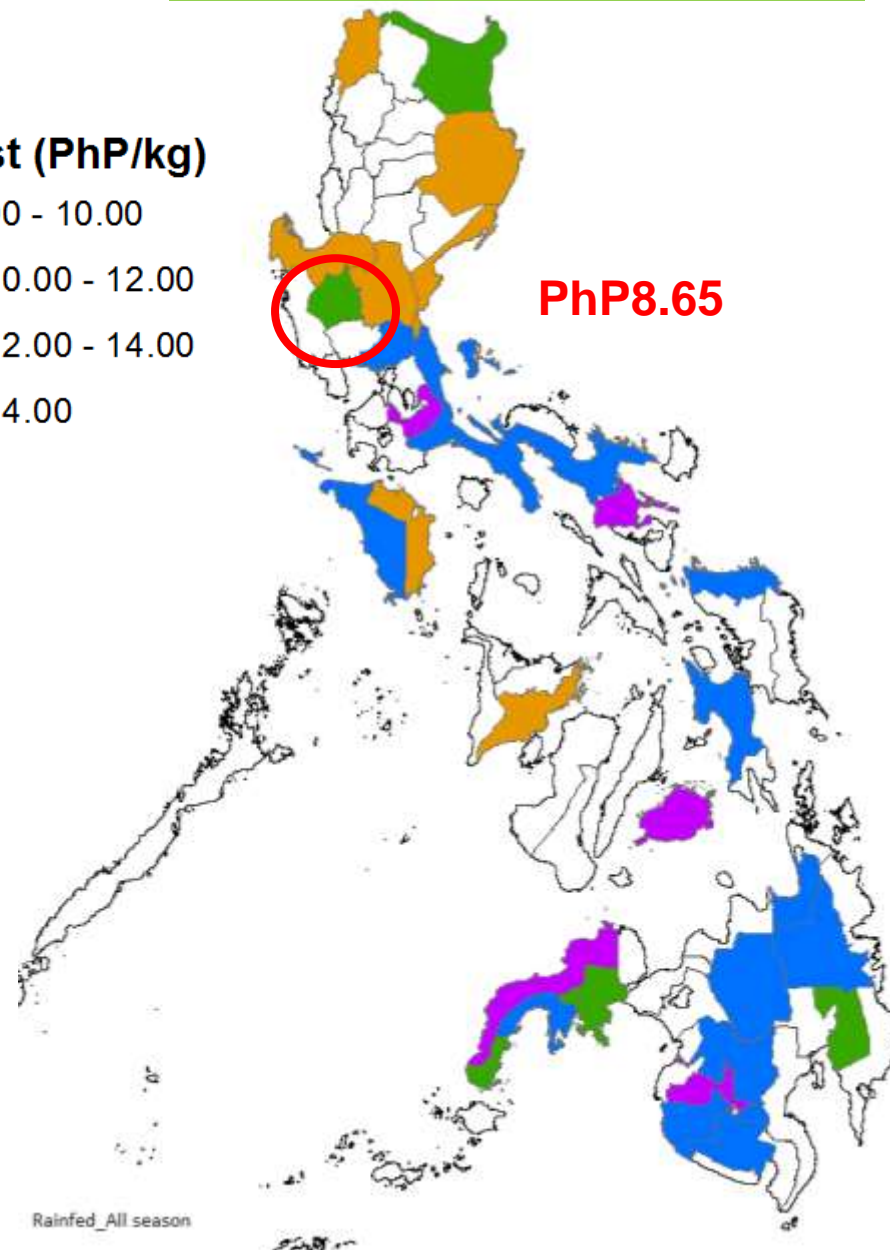
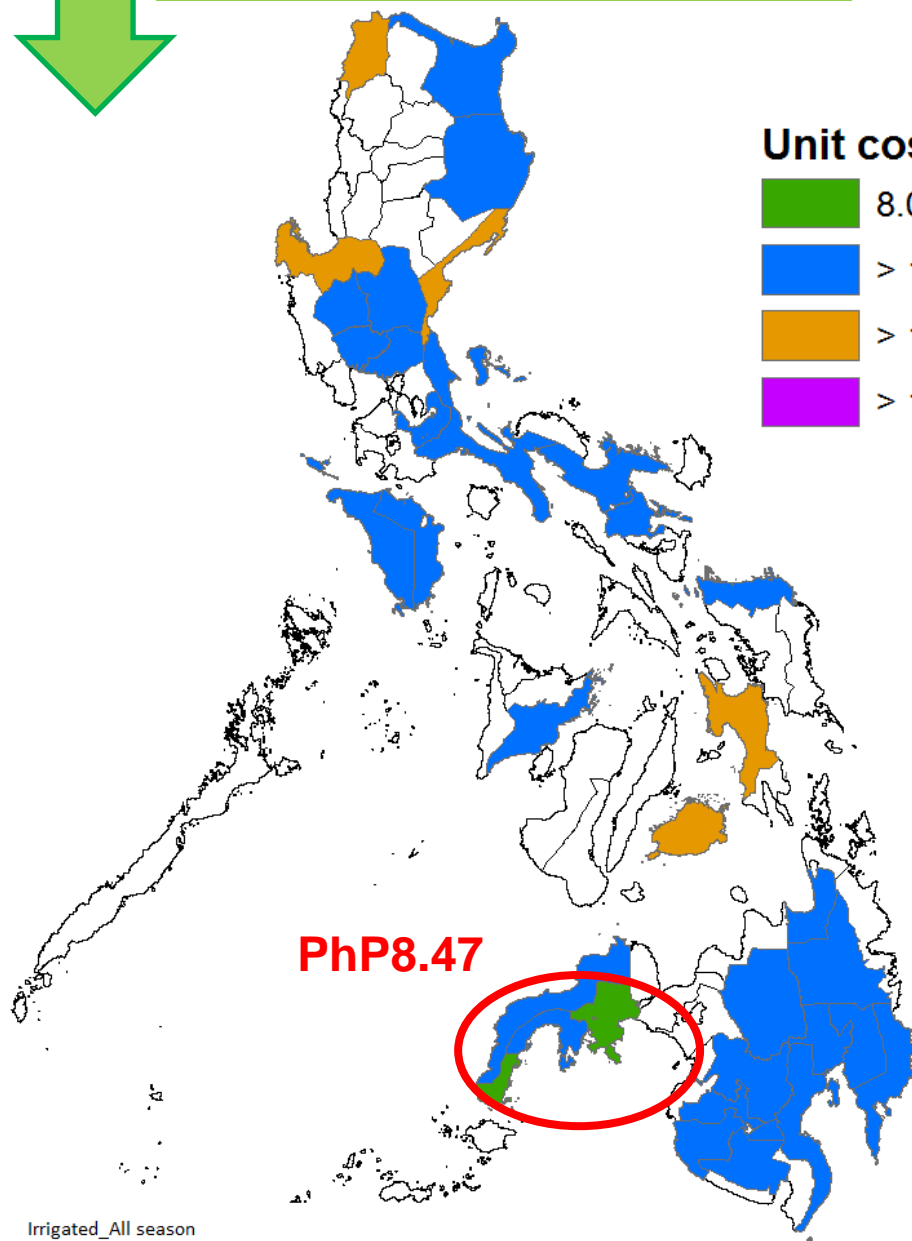
>interest
>other inputs

>pesticides

>seeds

Irrigated = PhP11.09/kg

Rainfed = PhP11.73/kg



COST FUNCTION

Cost/kg	Coefficient	
Yield	-0.679	***
Seed price	0.054	***
N price	0.012	**
P ₂ O ₅ price	-0.008	
K ₂ O price	0.022	***
Herbicide price	-0.003	
Other pesticides price	-0.002	
Insecticide price	-0.009	***
Fungicide	0.003	
Man-day price	0.098	***
Machine-day price	-0.009	***
NIS/CIS (1=yes)	0.145	***
SSIS/natural (1=yes)	0.085	***
Hybrid (1=yes)	-0.079	***
RSCS (1=yes)	0.002	
Education (1= HS and up)	0.005	
Training (1=yes)	0.004	
Season (1=DS)	0.017	***
Farming experience (1= ≥15yrs)	-0.005	
_cons	7.311	***

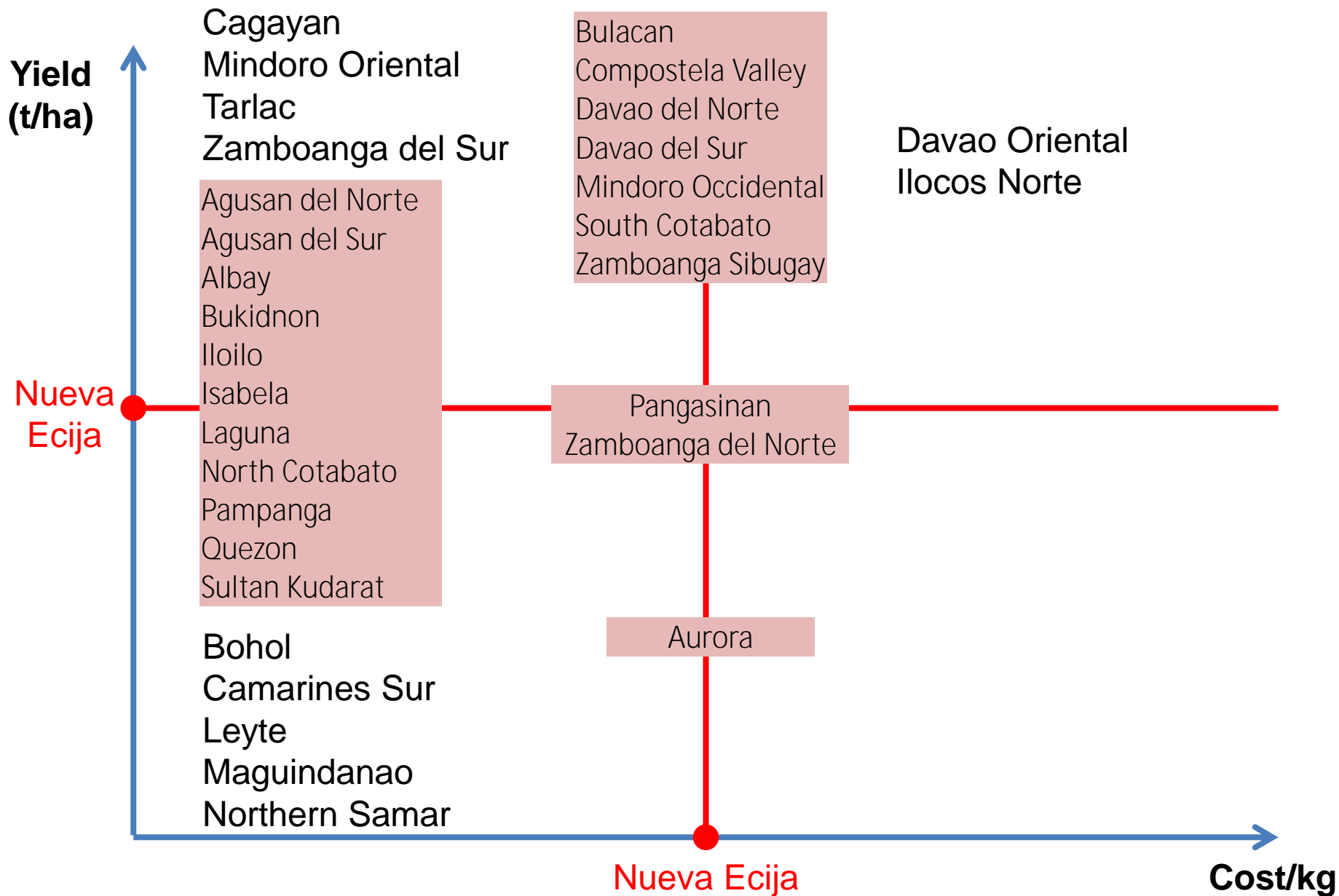
** Significant at 10%

***Significant at 5%

>> indicates 0.679% decrease in cost/kg for every 1% increase in yield

>> 0.009% decrease in cost/kg for every 1% increase in machine-day price

>> cost/kg is 7.6% lower for hybrid seeds users relative to non-users





Part III



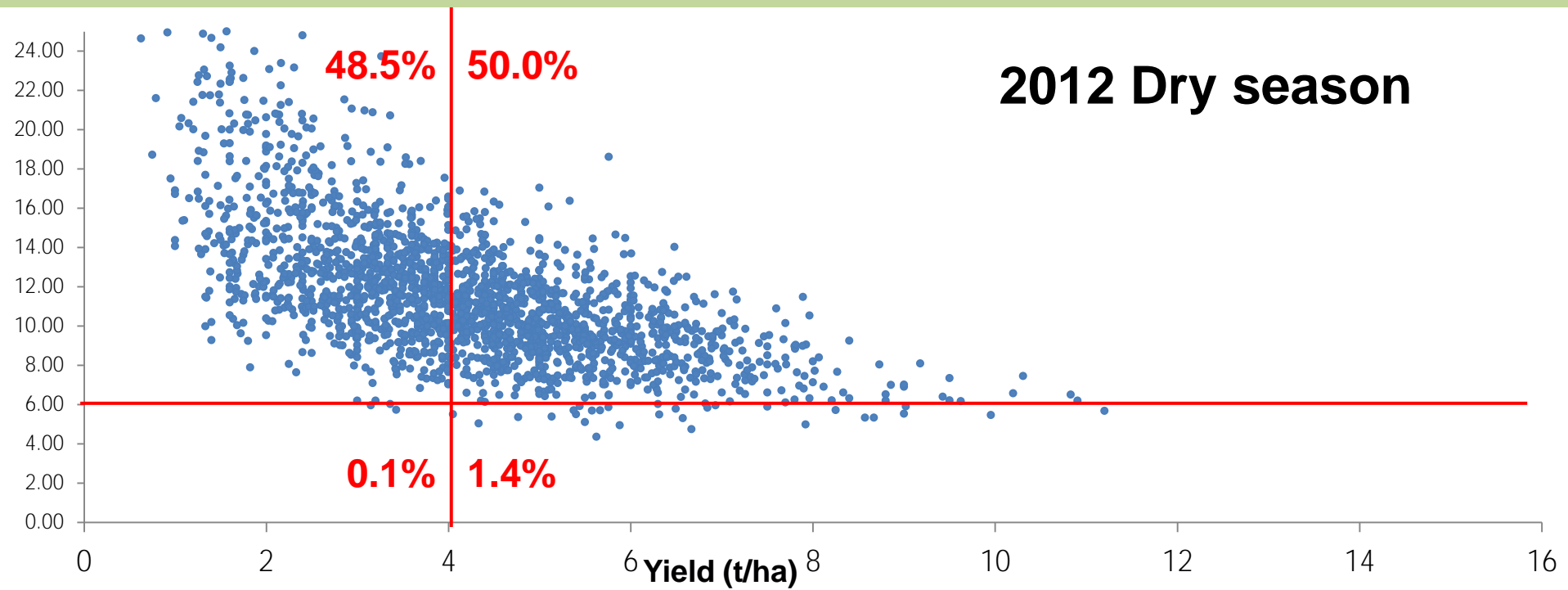
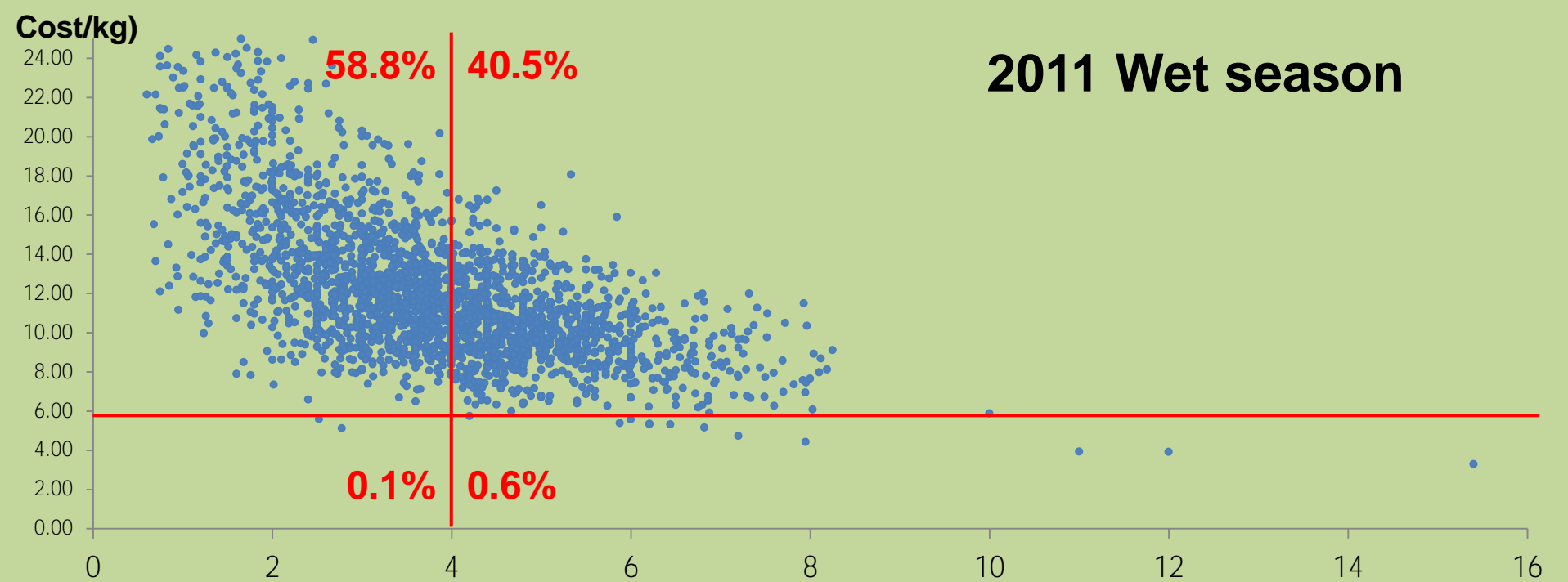
Costs & Returns from Rice Production

Returns from Rice Production by season

ITEMS	2011 WS	2012 DS
Yield (kg/ha)	3,673	4,129
Price per kg (PhP/kg)	13.23	14.23
Gross Revenue (PhP/ha)	48,582	58,777
Total Production Cost (PhP/ha)	42,201	44,908
Net profit		
from Rice Farming (PhP/ha)	6,381	13,868
from Rice Farming + Returns to Own Labor, Land, and Capital (PhP/ha)	20,788	29,116

Returns from Rice Production by ecosystem

ITEMS	Irrigated	Rainfed
Yield (kg/ha)	4,152	2,896
Price per kg (PhP/kg)	13.78	13.38
Gross Revenue (PhP/ha)	57,206	38,740
Total Production Cost (PhP/ha)	46,029	33,978
Net profit		
from Rice Farming (PhP/ha)	11,177	4,762
from Rice Farming + Returns to Own Labor, Land, and Capital (PhP/ha)	26,576	17,339



Part IV

SUMMARY & CONCLUSION

Summary

Yield Enhancing

Use of high quality seeds
N & P₂O₅ fertilizer
application
Pesticide (except
insecticide) application
Access to irrigation
Training
Season

Cost Reducing

Higher yield
Machine-day price
Use of hybrid seeds
Insecticide AI price

Conclusion

The use of high quality seeds is still a significant factor (across season) that can further improve the yield.

Sufficient water supply also contributes to a significant increase in yield.

Efficient pests management, nutrient management and farmer's knowledge can also improve the yield.

Reducing labor cost, particularly harvesting and threshing, can lead to lower unit cost.

Given that farmers are spending this much for rice farming, increasing their yield is still a good strategy that can result to lower cost/kg.

Thank you.