

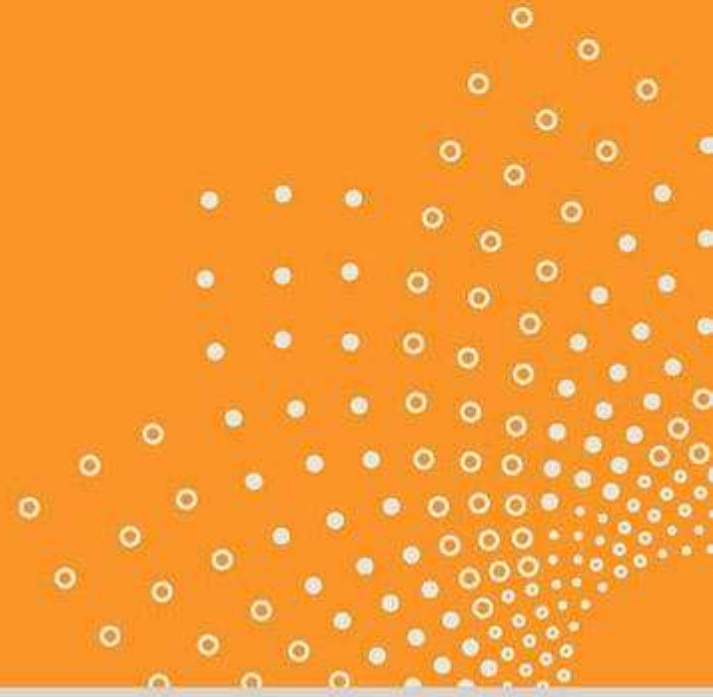
PPP Coffee

Opportunities and Challenges

Nguyen Quang Ngan
Marketing & Value Chain Manager
Yara Vietnam



Yara at a glance



Born in Norway, we have pioneered agricultural growth and production for >100 years

1900-1905



Birkeland's invention

Birkeland's discovery that hydroelectric power could be used to extract nitrogen from the air led to Norsk Hydro opening December 2, 1905.



1906-1939



Attracting Royal attention

New large scale production plants opening and under construction in Notodden and Rjukan respectively are visited by King Chulalongorn of Siam. The plant at Herøya established in 1928. First production of regular NPK fertilizer in 1938.



1940-1959



Extending our reach

Stockholm is home to a new sales office and the USA becomes a customer. The Glomfjord plant opens using hydroelectric power to upgrade ammonia to calcium nitrate and NPK.



1960-2003



Going global

Qafco JV established in 1969. Yara acquires companies in the Netherlands, Sweden, Germany, the UK, France, Italy and China and establishes an office in Zimbabwe. Adubos Trevo is acquired in Brazil.



2004-2014



Going public - industry shaper

March 25, 2004, Yara is listed on the Oslo Stock Exchange. The tagline 'Knowledge grows' introduced.

Yara offers solutions and work with public and private partners to create profitable and sustainable growth both for shareholders, stakeholders and society at large



Knowledge grows

2015 →



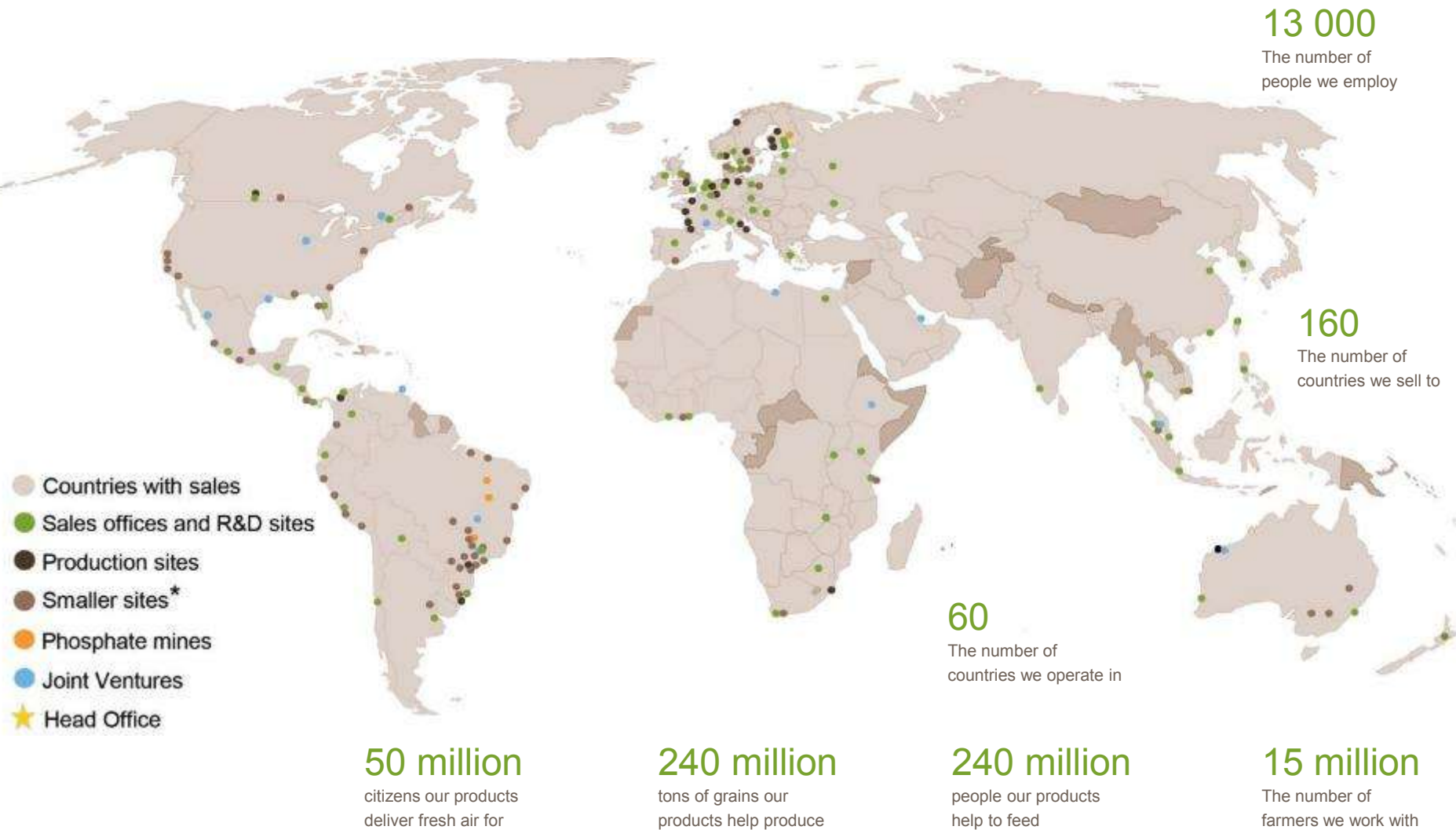
Knowledge grows — providing shared value

Yara's knowledge, products and solutions grow farmers', distributors' and industrial customers' businesses profitably and responsibly while protecting the earth's resources, food and environment.



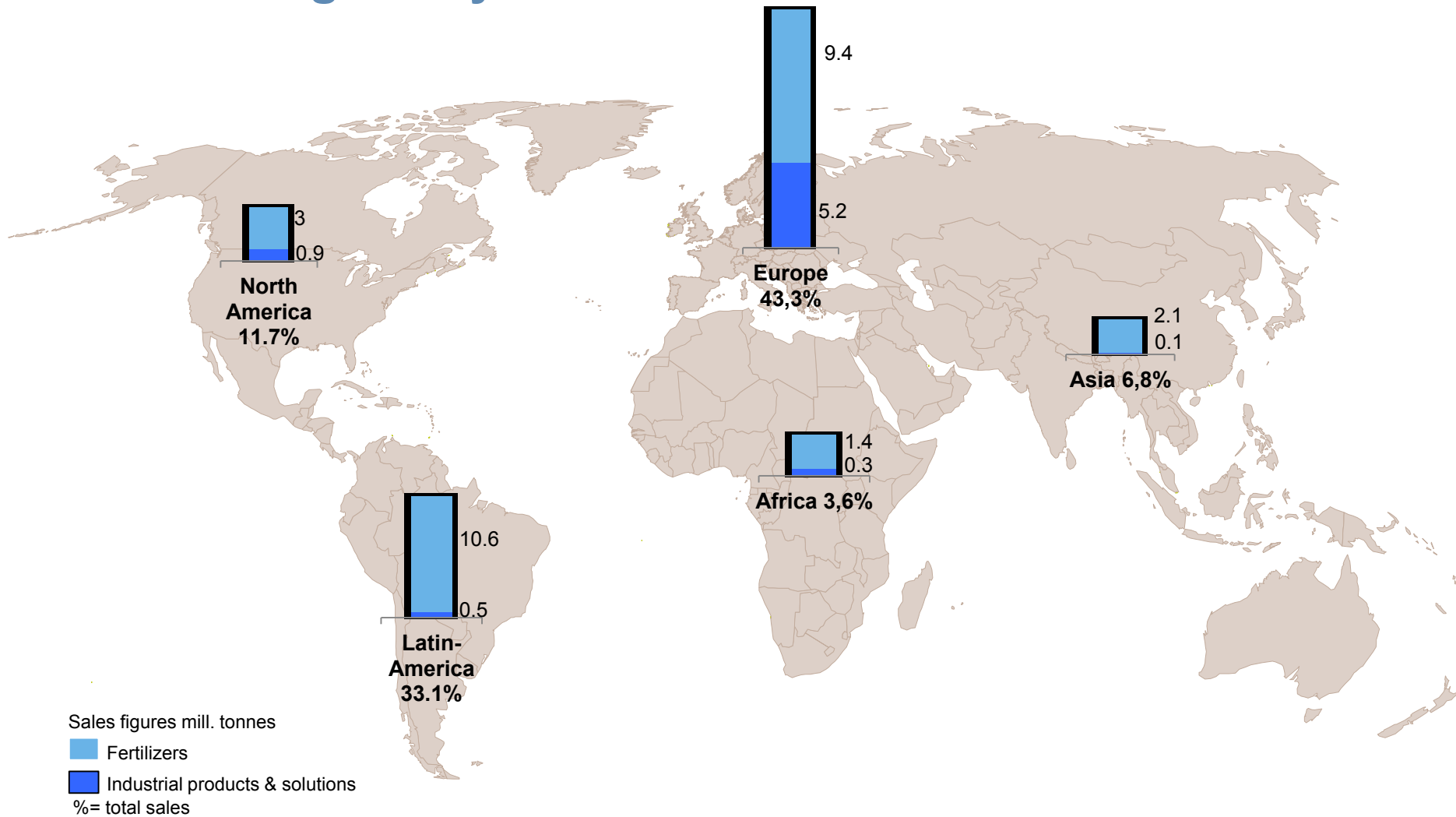
Knowledge grows

Our global presence is growing



* Yara operated terminals and logistical production sites

We sold 33 million tonnes of products & solutions globally in 2015



*Ammonia trade not included

Why PPP?



PUBLIC



MARD



WASI



NAEC

PRIVATE



syngenta

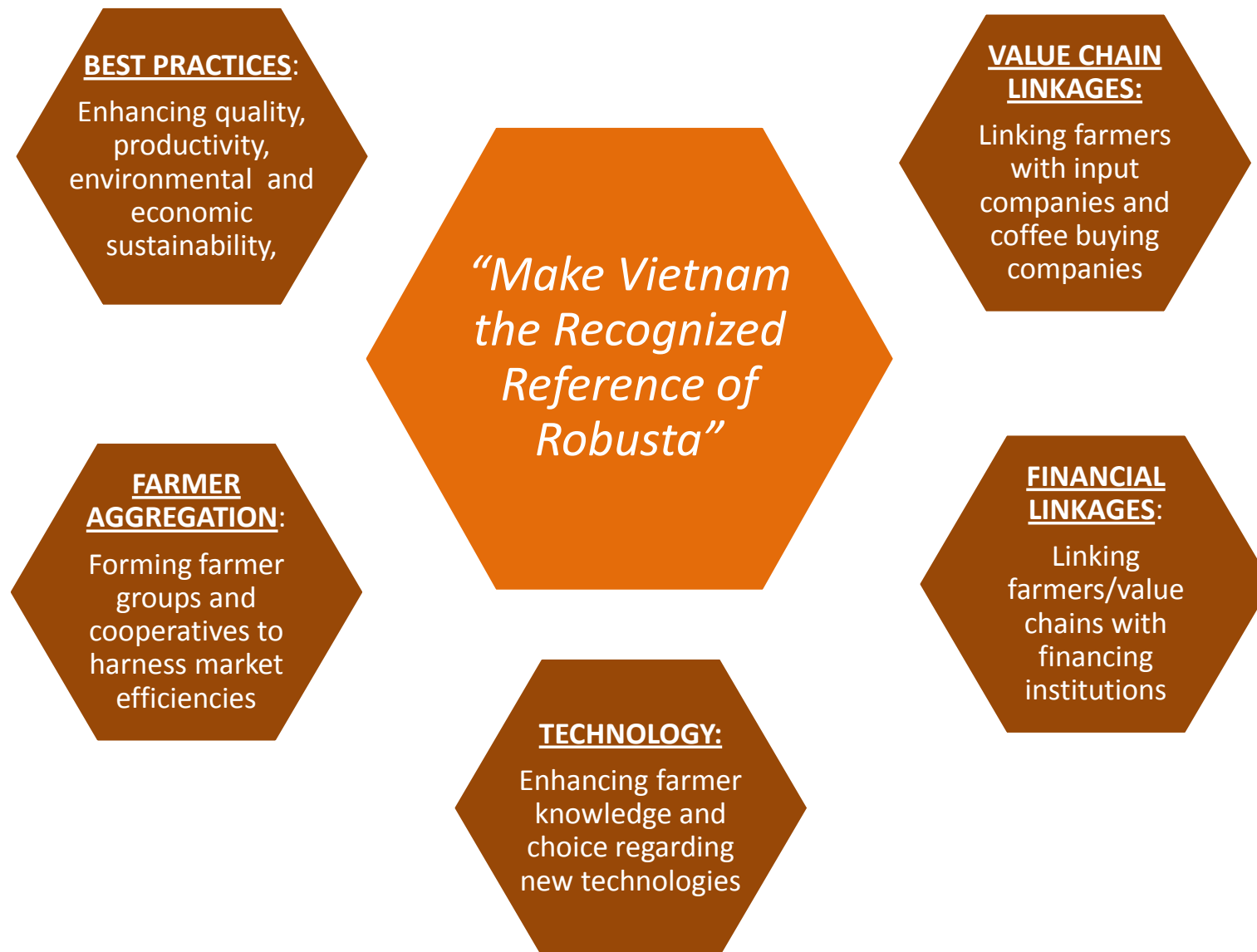


BACONCO

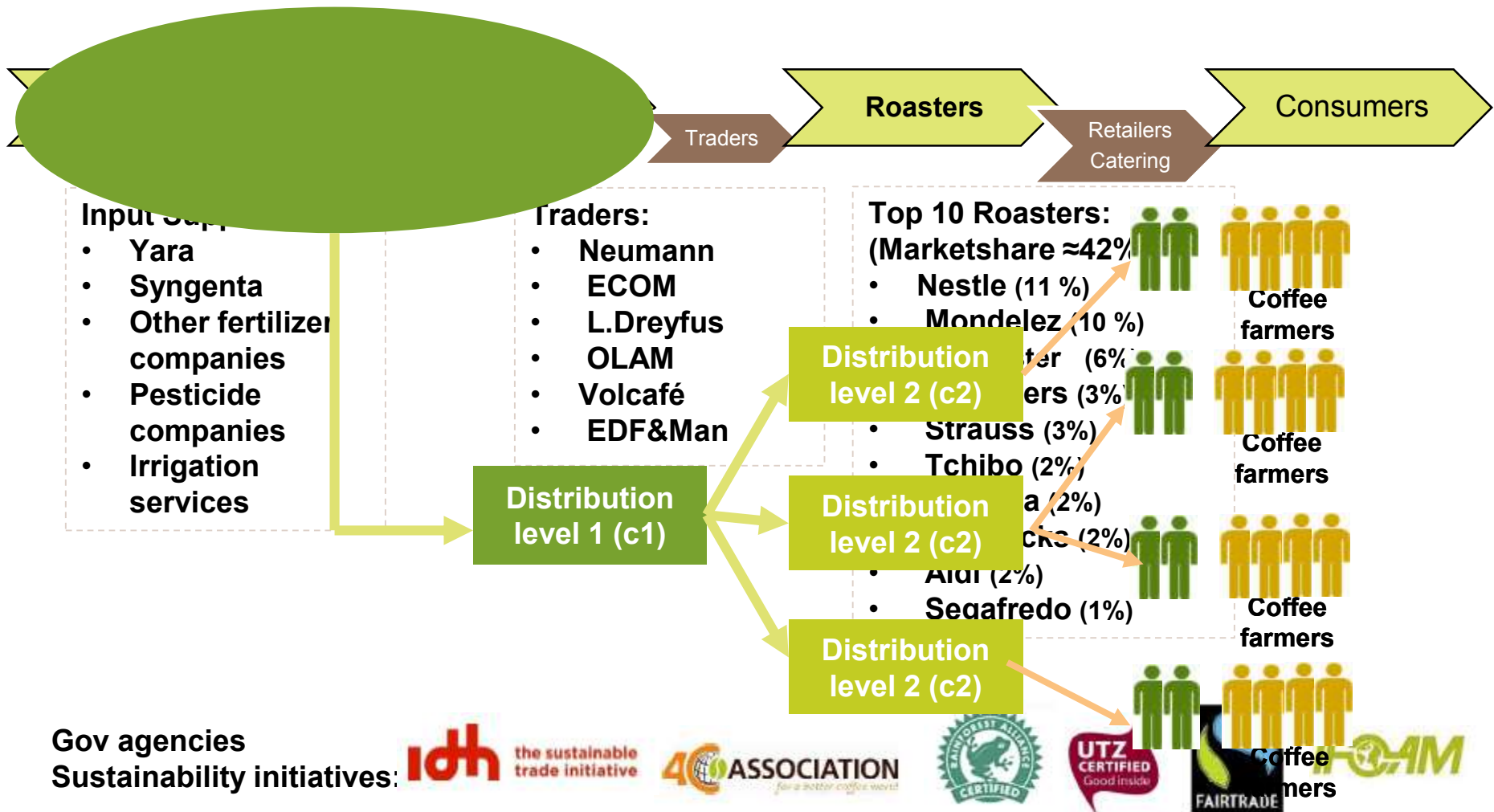
PARTNERSHIP



PPP Coffee Task Force Objectives

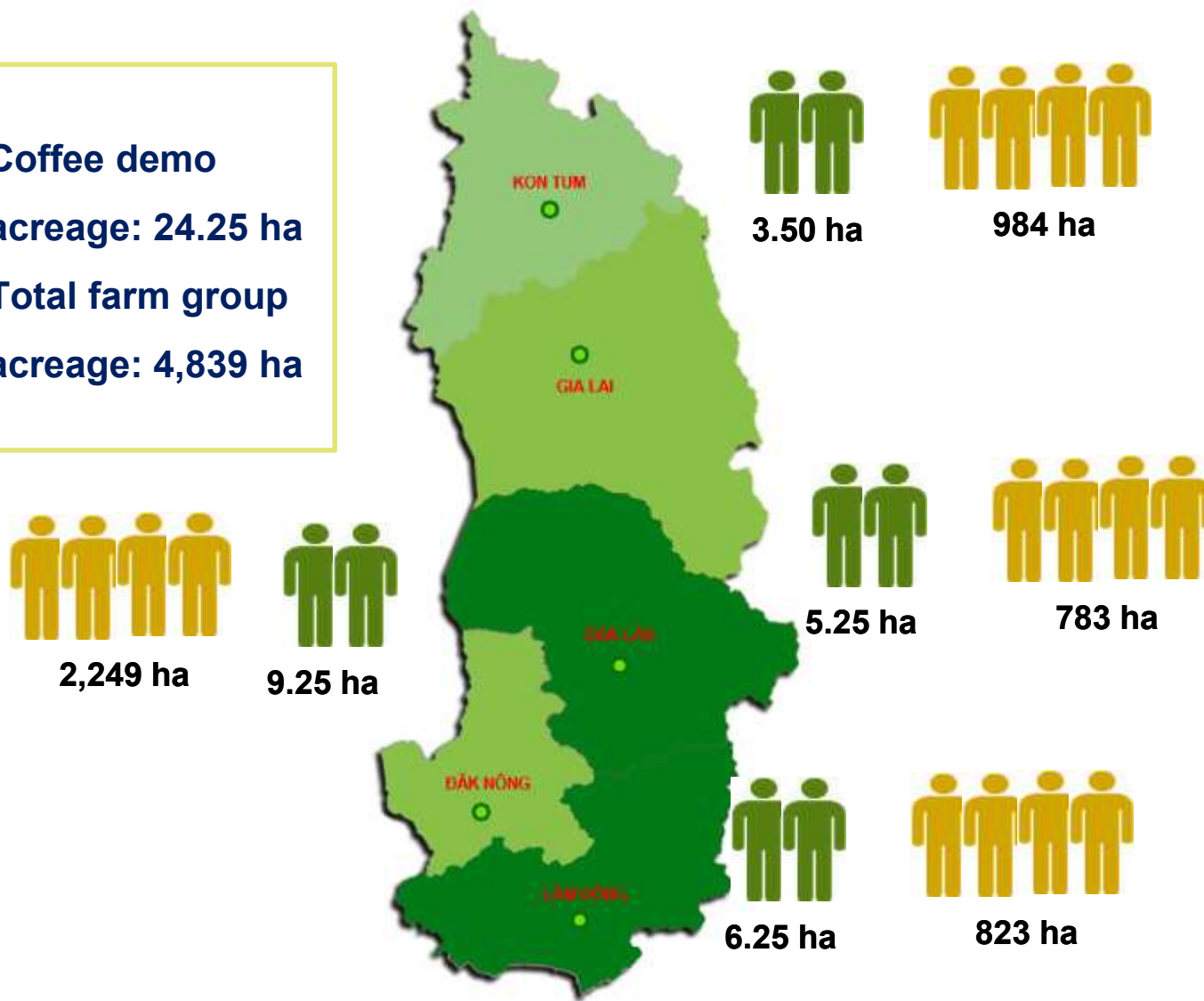


Coffee Value Chain



Work directly with 5,000 farmers in Highlands

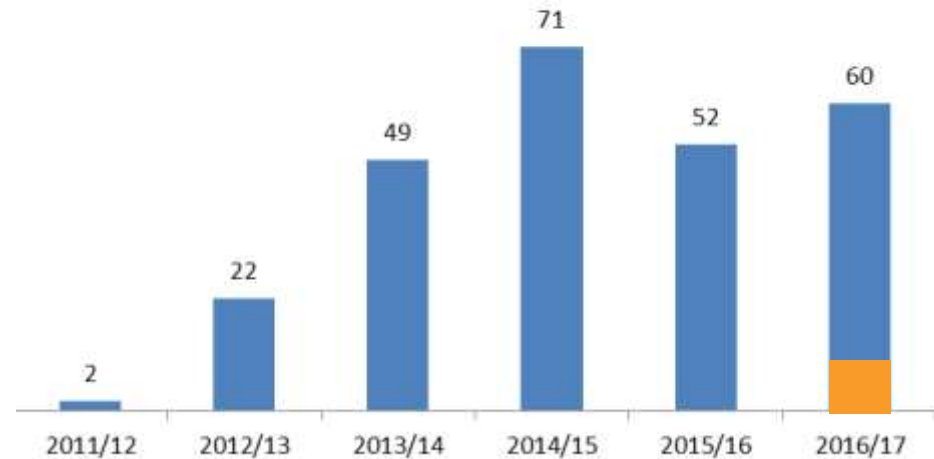
- Coffee demo acreage: 24.25 ha
- Total farm group acreage: 4,839 ha



PPP grows GAP on coffee



PPP Coffee Demos by Years

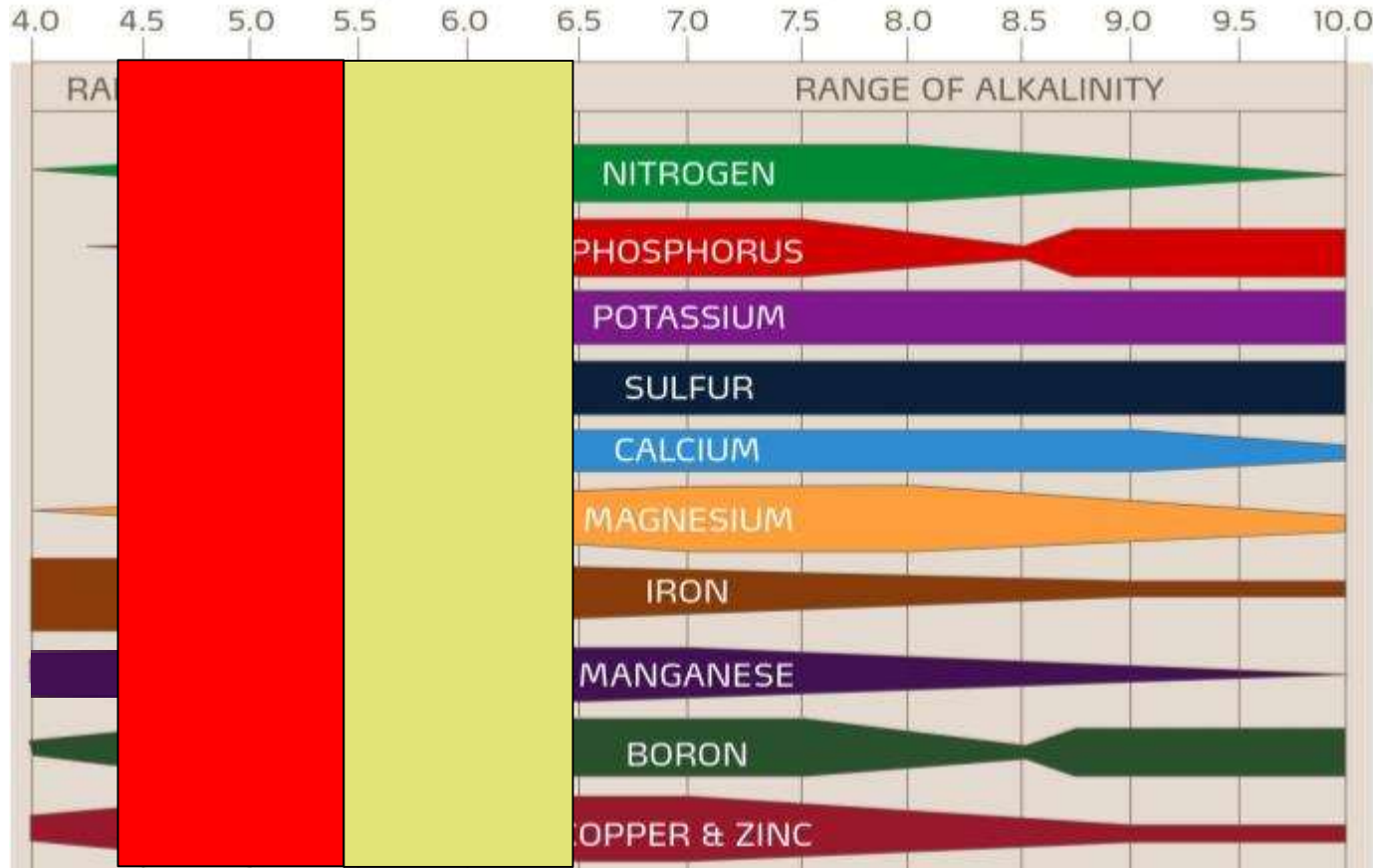


In **2016/17 PPP** coffee taskforce have 60 demos start working with Role Model of recruiting Medium/large farms to diversify ways to push farmers to scale up PPP model with:

- + Farm leave & soil analysis to adjust plant needs
- + Improve nutritional solution package (foliar & new micro nutrients)
- + Confirm link between water saving and fertilizers quality/solubility

>>> Sustainable Coffee Production: Analyze Soil Samples of Demos

Analyze soil pH and compare to optimum soil pH for coffee to uptake nutrients



pH soil analysis on PPP demos & Control demos show issue on soil management:

- Central Highland soil has low pH, high acidity, meant that negatively impact to nutrient uptake to coffee tree
- For nutrition management, farmers need to apply dolomite or Nitrate (NO_3^-) based NPK to increase efficiency of nutrient uptake

>>>Sustainable Coffee Production: Analyze Leave Samples of Demo

Analyze soil pH and compare to optimum soil pH for coffee to uptake nutrients

LEAF ANALYSIS REPORT :

Elements (%) :	Lam Ha	B.M.T
Nitrogen	2,70	2,48
Phosphorus	0,14	0,11
Potassium	2,24	2,01
Calcium	1,08	1,37
Magnesium	0,19	0,21
Sulfur	0,20	0,20
Aluminum	267	74
Iron	505	108
Boron	36	36
Copper	6,1	6,7
Manganese	90	214
Molybdenum	0,44	1,47
Zinc	9,3	8,6

Guidelines :

	= low
	= slightly below optimum
	= optimum
	= high

- Imbalance nutrients in leave with high Aluminum and Iron
- Low Magnesium in both Lam Dong and Dak Lak
- Lack of micro nutrients

Source:

Hanningshof R&D center, Yara International, Germany
and IAS lab, HCMC, Vietnam

On farm training



ToT training Jul 2016

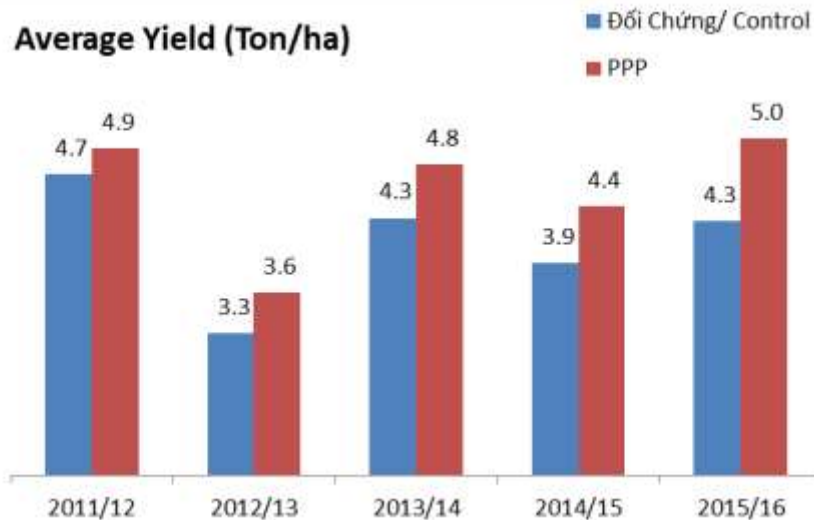


Tech tour visit Oct 2016



2015/16 PPP Demos – Results continue speaking its sustainable impact

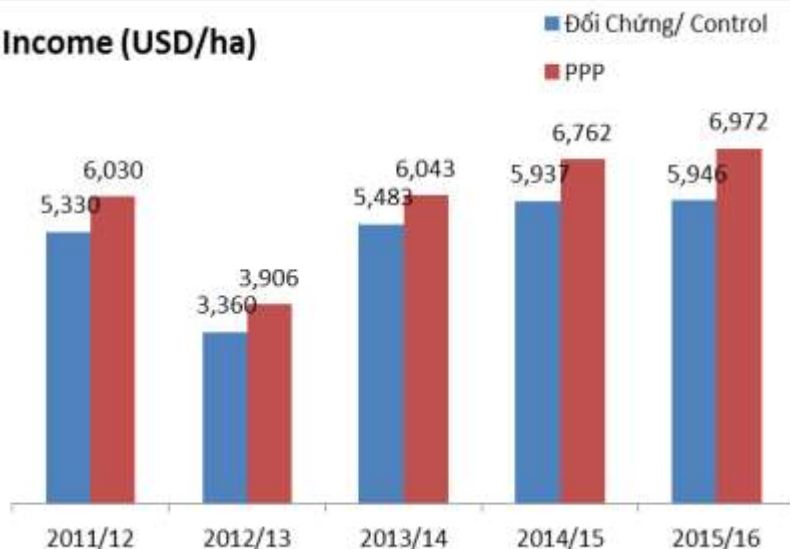
Average Yield (Ton/ha)



- Yield comparison on PPP demos & Control demos in 2010-2014: **12% Higher**
- **+17% higher yield:** comparison of PPP demos & control demos in the year 2015/16:

Increase the yield from Balanced Crop Nutrition needs long term improved practices - 5 years.

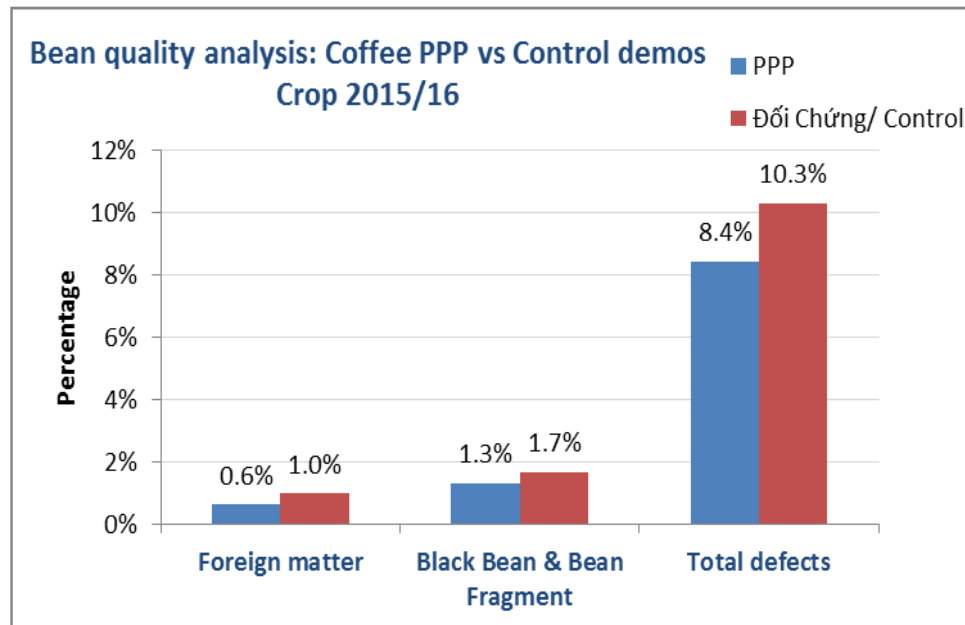
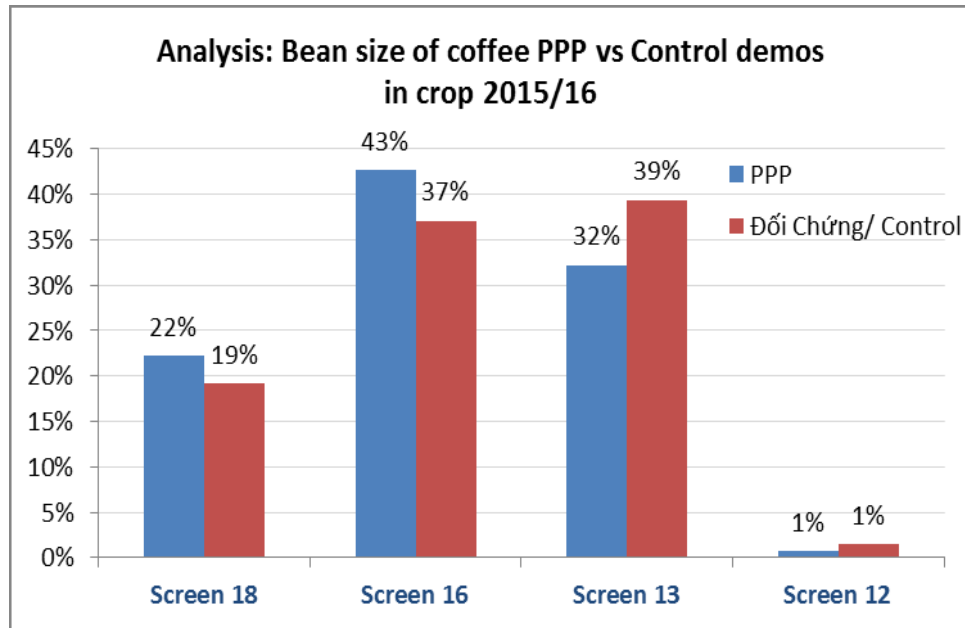
Farm Income (USD/ha)



+14% farm income higher

Average of 5 years comparison of PPP demos & Conventional Coffee Production demos

>>> 2015/16: PPP demos - We prove the quality by years



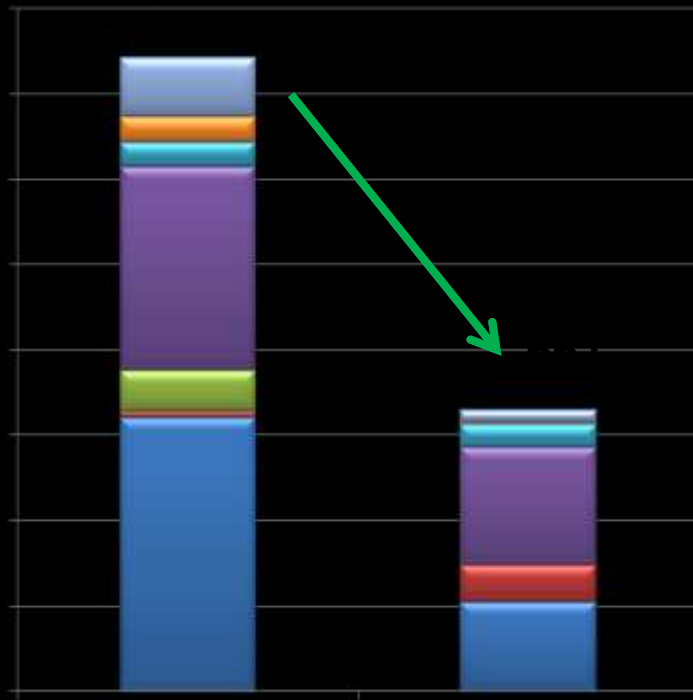
Improve ripening & bean size



Source: Bean data shared by Nestle VN, 2016

Maintaining crop program to reduce 55% of Fertilizer Carbon Footprint

PPP are working to introduce Greenhouse Gas Emissions with participation of all the coffee value chain



Control program:
484 kg N/ha
4.8 t.g.b./ha

PPP program:
304 kg N/ha
5.2 t.g.b./ha

From : **Yara Research Center**,
Haninghof, Germany

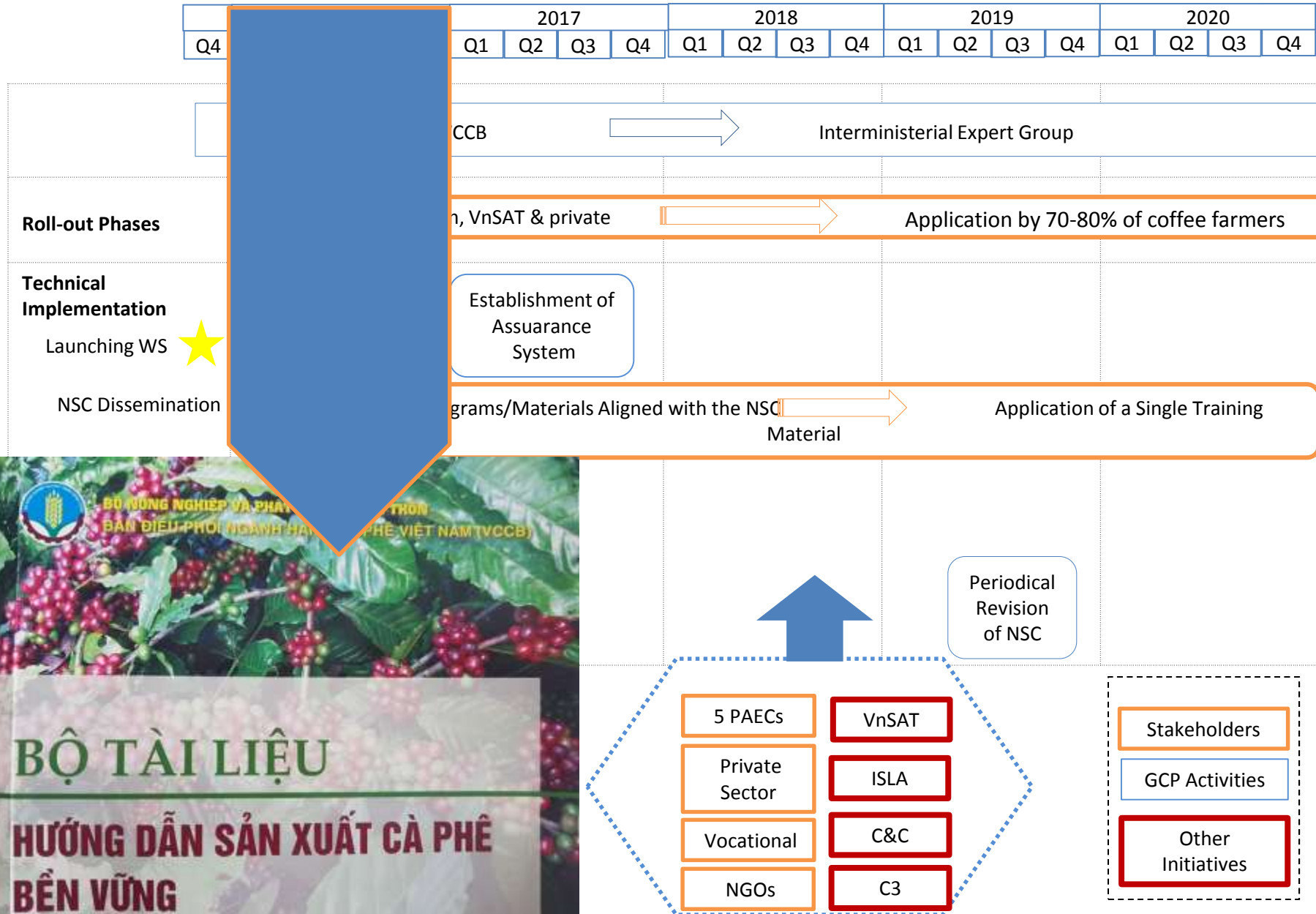
Align/share data & method of
GhG Calculation for Agri
Strategic Planning



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PPP Progress Update: Demos are showing encouraging results



« saving labour cost, no need to bury the fertilizer »

« better fertilizer solubility »

« greener leaves, longer branches »

« expected Yield : 4,5 T/ha »

« less fruit drops this year »

« homegenous flowering & fruit set »

« bigger cherries »

« Expected Yield : > 4 T/ha »



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... Still, PPP face challenges to go further

Empower the Farmers

- Credit for farmers to save cost from qualified input materials
- Re-balance the relationship of the Growers & Retailers

Knowledge transfer:

- NSC
- Procedure for farmer meetings for foreign experts

Environmental Friendly/Sustainability:

- Carbon footprint for Urea, SA
- Water saving in link with qualified agro-inputs

Access to high technology/ quality inputs:

- Tax of Nitrate based fertilizer vs SA/Urea
- Tax on irrigation technology product
- Managing low quality Agro inputs production

Communication

- State media programs
- Recommendation from research sectors



Thank you!



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