

A Progressive Culture

- *Cocoa Production In The Americas*

Doug Hawkins

May 2016



The Outlook for Production Growth in the Americas:

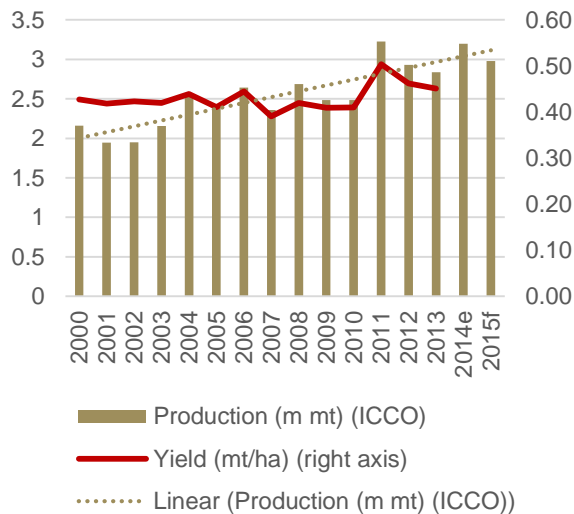
Mexico, Caribbean, Central America and South America

- We use long series data together with in country reports to project production in 2026 for the main producer countries
- We outline the conditioning factors:
 - Disease
 - Country risk
 - Investment risk/ Making the investment case
 - there are no audited accounts for cocoa as a profitable commercial crop under an agro industrial production system of which we are aware.
- We explore the developing structure of the producer sector and question:
 - Is the traditional sector focus on the subsistence farmer / smallholder (95% of global production) a path to sustainable production?
 - Should encouragement of the Small to Medium Size Farming Enterprise (SME) be a key element in the quest to achieve a stable sustainable supply of cocoa?
 - What is the role, contribution and likely size of the agro-industrial sector within the next 10 years?
- We note that a progressive cocoa culture is developing in The Americas / Ecuador
 - The high tech cluster developing in Ecuador's Cerecita region has been put under a spotlight by the recent Mars acquisition of Hacienda La Chola
 - A culture of scientific research and cocoa breeding: CRS -Trinidad & Tobago, CATIE- Costa Rica, INIAP – Ecuador, CEPLAC – Brazil, Fedecacao - Colombia.

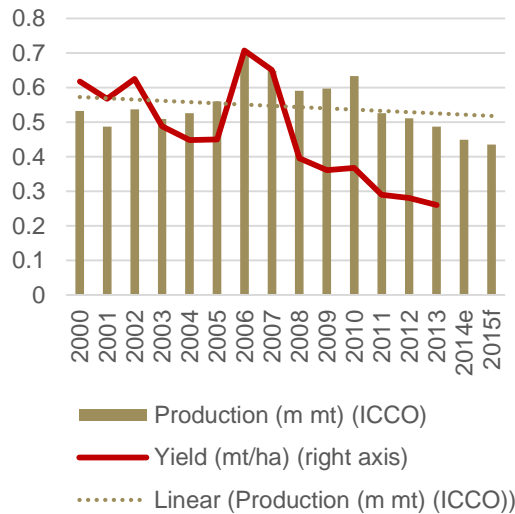
The Americas – 21st Century Rising Star

Americas Region Leads On Sustainable Growth – From a Low Base

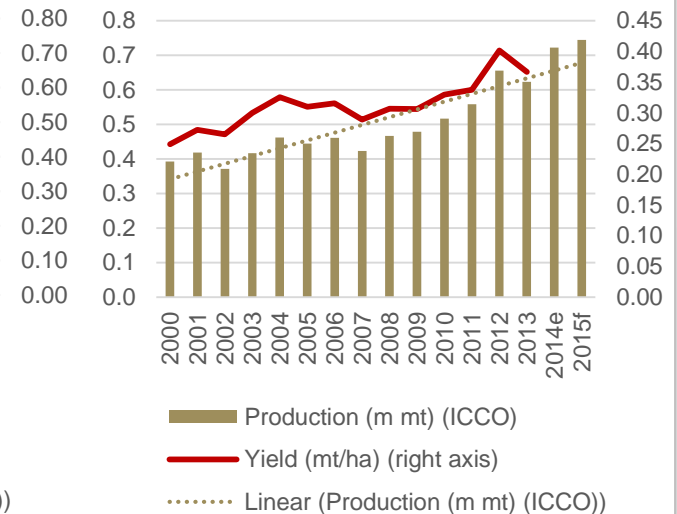
Africa – Engine of Growth



Asia – Spiraling Decline



Americas – Rising Star



- 2000-2014 production growth: **48%**
- Production rises by 817,400 mt
- African region yield trends flat

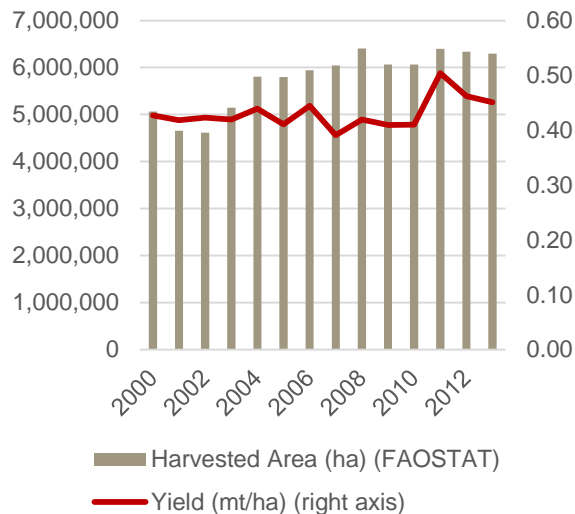
- 2000-2014 production growth: **-15.4%**
- Negative growth in yields
- Production declined by 97,000 mt

- 2000-2014 production growth: **84.2%**
- Yields trending up from low base
- Production rises by 300,000 mt

Area Expansion vs Yield Growth

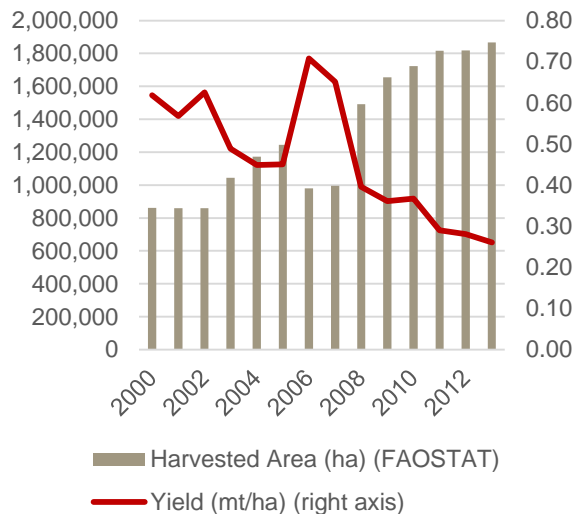
From A Low Base Americas Region Leads

Africa Harvested Area



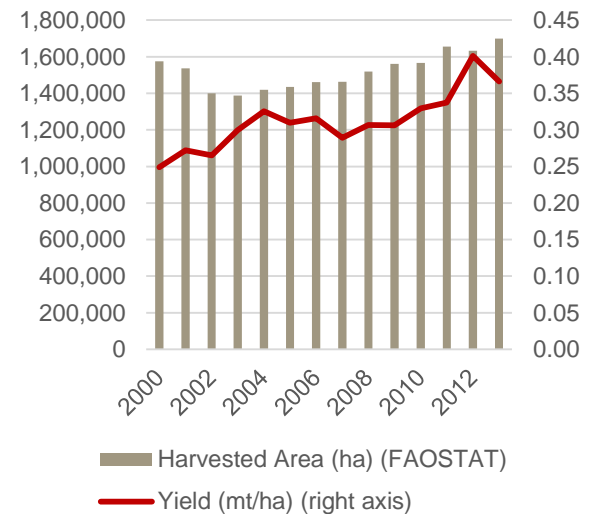
24% increase in land used
Another 1.23m hectares
Under 5% yield gain

Asia Harvested Area



Yield in steep decline
Land in use up by 1m ha
Land data looks anomalous

Americas Harvested Area



Yield rises 48% from low base
Land in use up by 124,000 ha
Land increase of under 8%

Americas Region: A Growth Century?

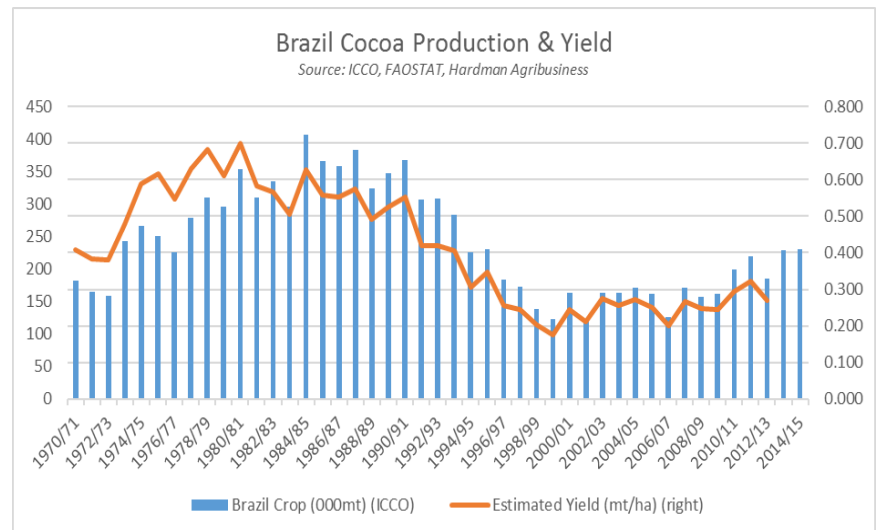
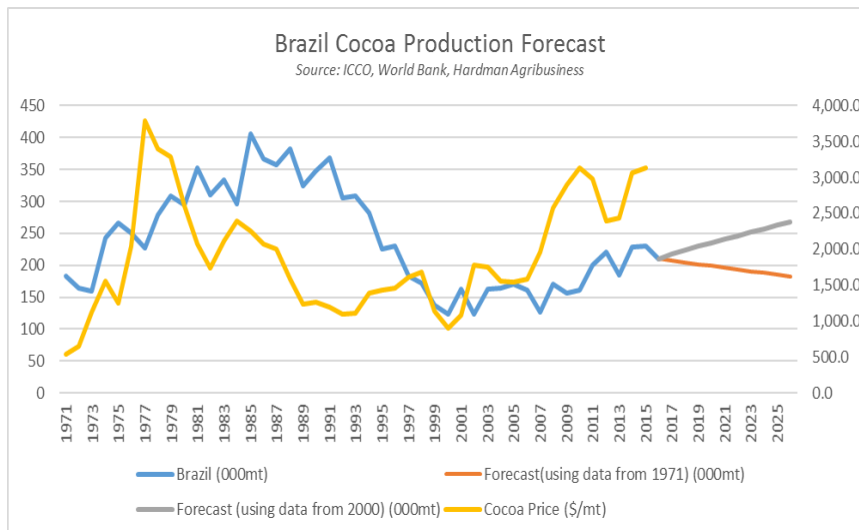
Promoting A Progressive Cocoa Economy

- South America 2026: 805,000 mt (626,000 mt 2015)
 - Ecuador is key
 - Brazil the 'wild card'
- Central America/Caribbean 2026: 125,000 mt (112,000 mt 2015)
 - Depends on Dominican Republic
- Americas region pushes through 0.9m tonnes by 2026 if
 - A multi-party focus on disease management
 - Brazil has yet to rebuild production to the levels achieved in 1980s (406,000 mt 1984/85)
 - Engaging professional SMEs
 - Upgrading performances of subsistence farmers / smallholders presents huge challenges
 - Encouragement of entrepreneurship, promoting and supporting commercial farmers seeking to develop productive, profitable and valuable businesses
 - Investment in new technology driven farms to boost production and to proliferate advanced agronomic practices
 - Lowest cost production models / commodity price volatility
 - Value added production models around quality, flavour, traceability, segregation
 - Management of labour productivity and labour as a component of cost
 - Promoting a progressive cocoa economy
 - Breeding, agronomy, value added, country/regional branding

Americas Region

Brazil – Direction of Travel Unclear?

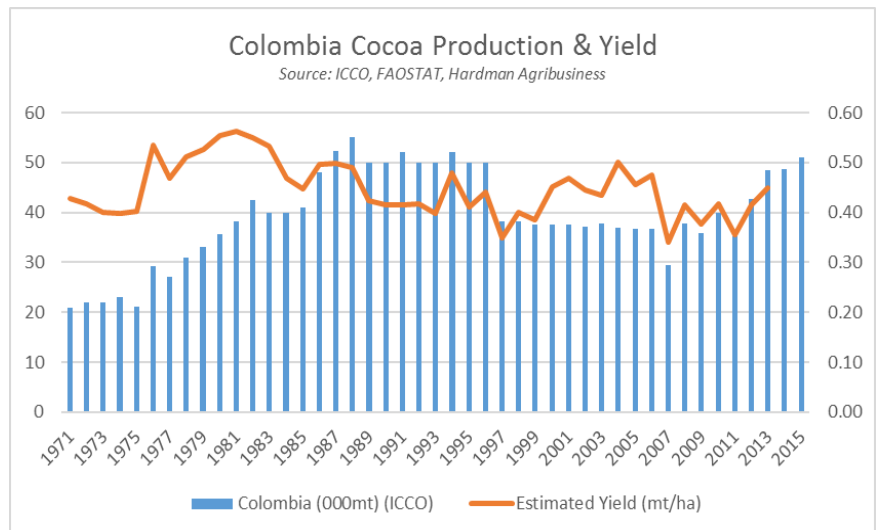
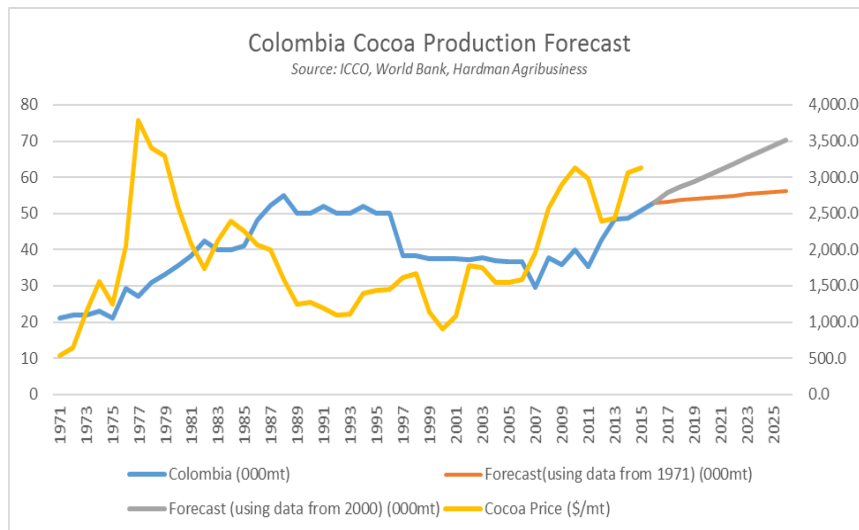
- A weak response to rising commodity price and sluggish yield enhancement
- Can Brazil recover to past glories? Ecuador looks likely to extend its lead
- High labour rates and inadequate logistics
- 2014 Ministry of Agriculture projected further decline to just 216,000 mt 2023/24
- We project 225,000 mt to 2026



Americas Region

Colombia – Responding Well to Higher Prices

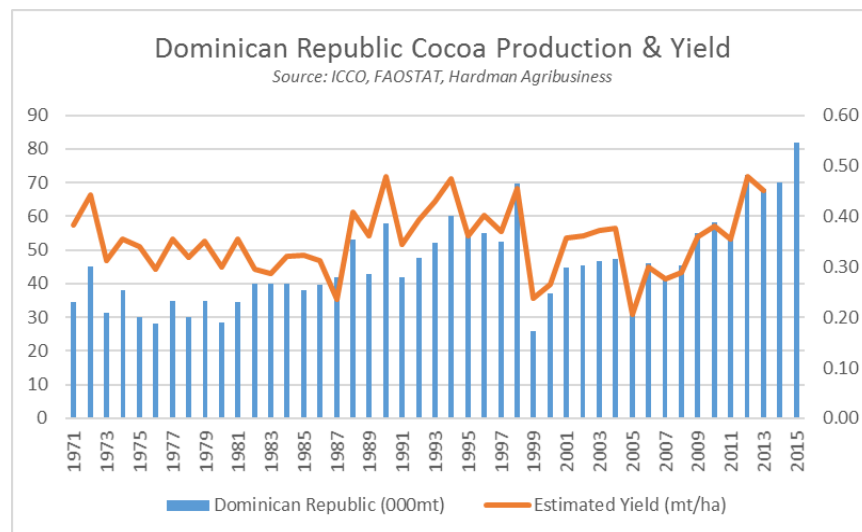
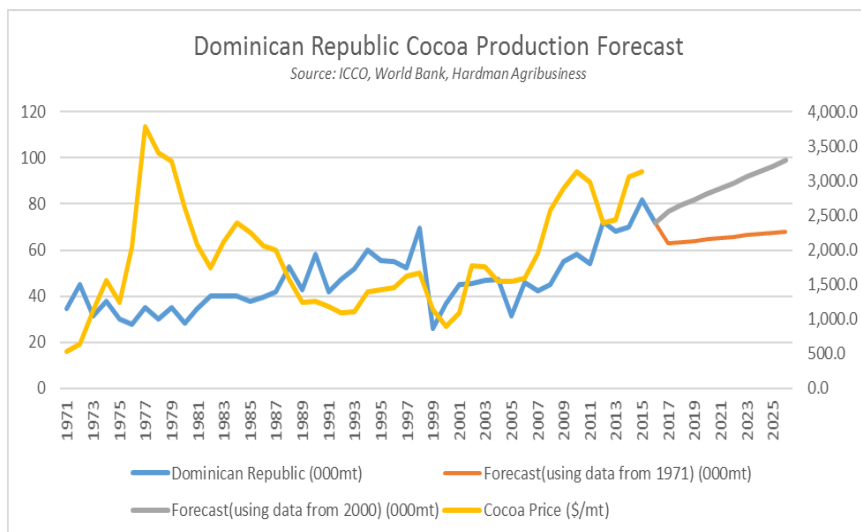
- A strong response to the rising commodity price
- Yield data conforms to pattern of smallholder production – but should improve as new players enter the sector
- In a post conflict environment government policies aimed at rural economic development will support cocoa expansion
- We project 65,000 mt by 2026



Americas Region

Dominican Republic – Steepening Trend But Structural Frailties

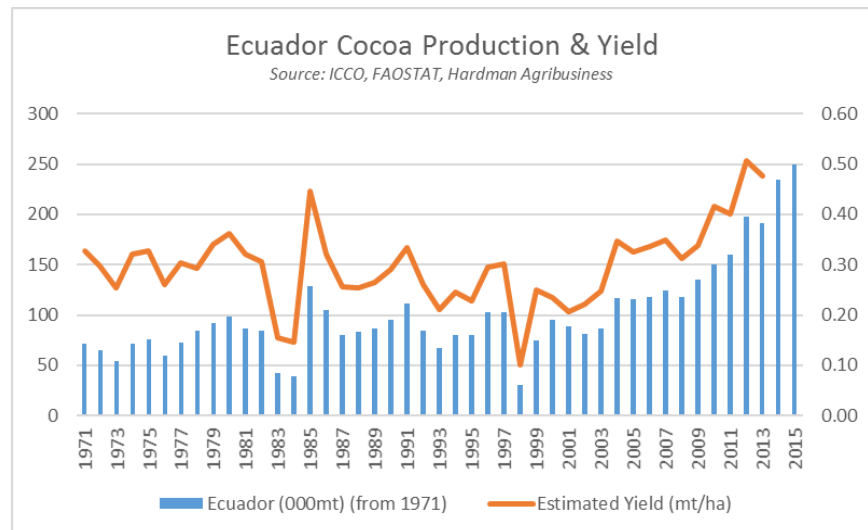
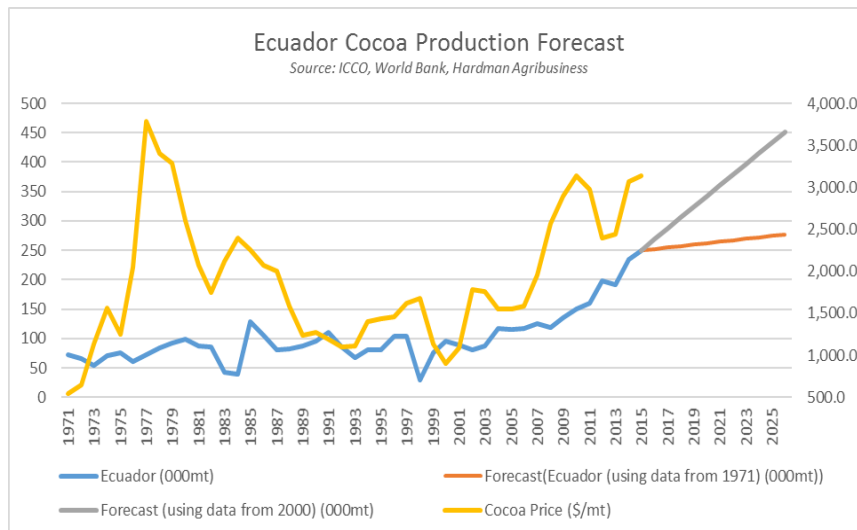
- A strong response to the rising commodity price with positive gains in productivity
- Trending data suggests 100,000 mt by 2026: increased investment + a lower age profile for farmers will be prerequisites
- Agriculture of declining importance in national economy
- We project 80,000 mt for 2026 – inhibited by long term data based projections and structural concerns



Americas Region

Ecuador – Regional Leader in Production & Culture

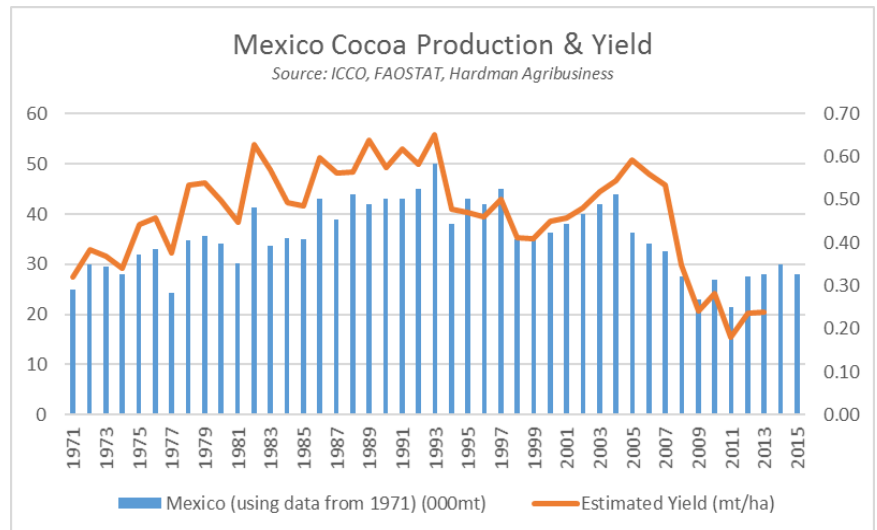
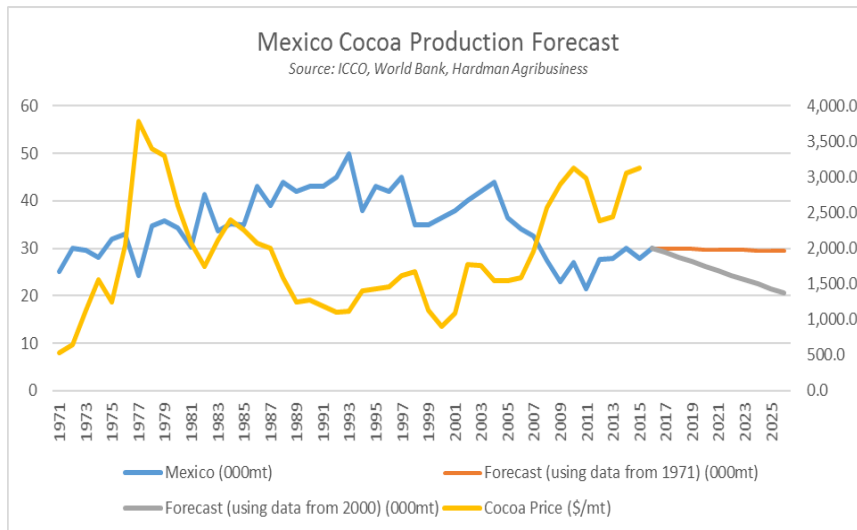
- Growth in output correlates well with commodity price gains and yield development has been solid this century
- Strengthening yield profile underpinned by positive contagion of practices
- Sector actors recognise important role of SMEs
- We project 400,000 mt by 2026 and yields pushing to 1.0mt/ha on positive momentum



Americas Region

Mexico – Negative Indicators

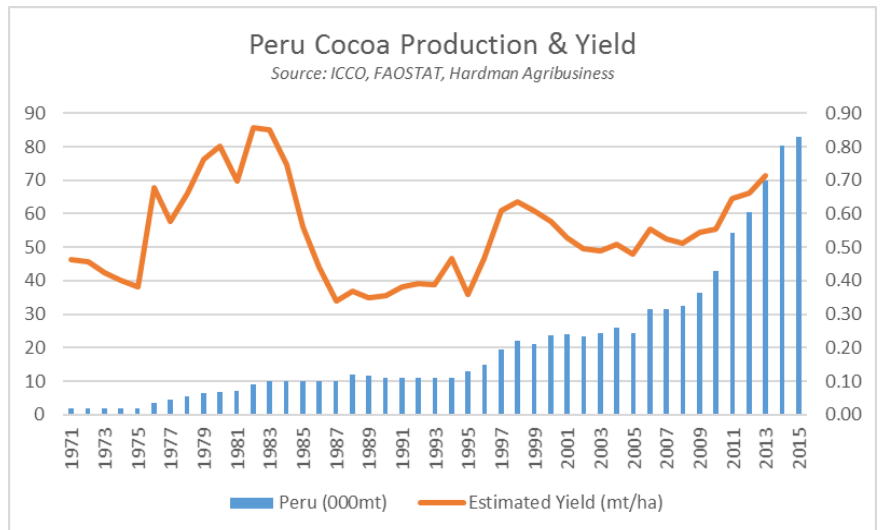
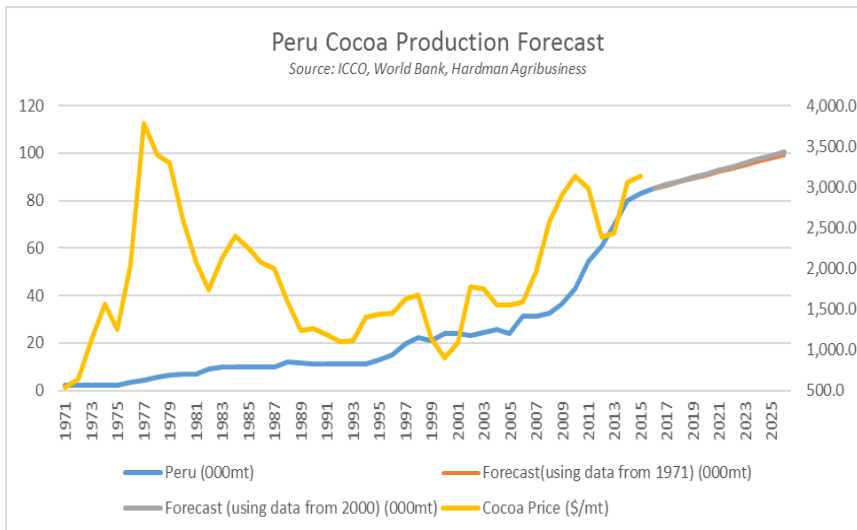
- Every indicator is negative in these data sets
- Ageing trees, disease spread, under investment are given as explanations
- Country risk factors may play a role
- We project unchanged to declining production by 2026 (30,000 mt)



Americas Region

Peru – Trend Consensus

- In contrast to Mexico, every indicator is positive
- Planted area projected to 140,000 ha
- Yields projected to 1.0mt / ha
- We project production of 100,000 mt by 2026



Structural Change and Investment Requirement

How It Might Look

	2015	2026e
Americas Harvested Area (ha)	Now	Assuming land grows at a constant rate of 0.6% plus SMEs
Total HAB Estimate (incl Agro-industrial)	1,719,064	1,857,664
Current (2015)	1,575,757	1,575,757
Agro-industrial (in production by 2026)	143,307	168,307
Land use grows at a constant rate of 0.6% p.a.		113,600
Total Crop (mt)	760,200	930,000
Average Estimated Yield Per ha (mt)	0.44	0.50
Productivity Increase Required		13.2%
Assume:		
New Professional Farms in Production by 2026(ha) (5,000 ha pa 2016-20 inclusive)		25,000
Average yield mt/ha		1.5
Contribution to 900,000 mt		37,500
Yield at current Agro-industrial (2015) (mt/ha)	1.2	1.2
Contribution from existing Agro-industrial	171,968	171,968
Contribution from SMEs & smallholders (mt)	588,232	720,532
Implied avg SMEs & smallholder yield per ha (mt/ha)	0.37	0.43
Assume 90% of area has unchanged performance on 2015 and growth area (ha)		1,520,421
Unimproved Smallholder Yield per ha (mt)		0.37
Crop (mt)		567,575
Contribution of 10% Renovated & Growth Holdings (mt)		152,957
Renovated Harvested Area & new added area (ha)		168,936
Yield per ha (mt)		0.91

Investment Proposition

Yet To Be Made

- Where are the audited financial data to show that investment in commercial cocoa production can produce acceptable returns?
- To secure the support of investors, commercial lenders and other financial stakeholders, cocoa production must be able to generate:
 - the cash flows to service capital
 - acceptable investment returns
 - adequate yields
 - supportive prices
 - economic cost of production
- Current thinking for high tech farms: 3mt / ha plus \$3,000/mt
- Financial stakeholders will be watching the data

Regional Production

Largely Depends on Smallholder / Subsistence Cocoa Farmers

Top Five Americas Producer Countries	Professional Cocoa Farms (Over 100 ha)	Area Cultivated By Professional Farms (approx ha)	Total Planted Area (ha)	Professional Cultivations as % of National Cocoa Area
Brazil	631	114,500	700,000	16.4%
Ecuador	13	16,700	400,000	4.2%
Colombia	5	1,820	152,000	1.2%
Peru	4	4,500	91,000	4.9%
Dominican Republic	3	3,760	153,000	2.5%
Other Americas	17	2,027	204,000	1.0%
Total/Average	673	143,307	1,700,000	8.4%
HAB Estimates/FAO Data				

- Of the 1.7m hectares planted with cacao across The Americas, professional agro-industrial production occupies perhaps 143,000 ha (8.4%)
- Cocoa production is still largely a component in a subsistence mixed farming system across the region
- Regional yield performance is actually unexceptional
- Pockets of excellence need to radiate regionally

Smallholder Cocoa Farmers in Focus

Yields Remain Stubbornly Low



Raising Smallholder Productivity

Long-term Complex Challenge

- The considerable achievements of the last 20 years in the cocoa sector have not significantly enhanced the attractiveness of the industry in the eyes of farmers
- Although high prices since 2009 have stimulated interest in cocoa cultivation among some farmers, the overall perceptions of the cocoa industry indicate a decline rather than an increase in interest, especially on the part of younger generations.
- The lack of appeal of cocoa largely relates to the question of incomes. Because productivity rates are low, even when the prices at farm level are high, they are not enough to provide a living wage to farmers.
- Efforts which could boost production, such as replanting or pruning, are not carried out frequently enough. They are undermined by cost and inaccurate beliefs, fuelling a vicious circle of underinvestment and low productivity.
- In focus groups farmers argued that their primary need was not assistance with development projects but rather financial assistance to acquire more land as the only way to increase production.
- Promoting the idea that increasing productivity will be more effective in poverty reduction than trying to acquire more land is likely to be a challenging process.
- ***Cocoa Production in the Dominican Republic: Sustainability, Challenges and Opportunities – Mondelez Cocoa Life Programme***

A New Focus On SMEs

Stakeholder Observations

- “...our pruning craftsman planted 5 hectares with CCN-51 and has achieved yields of 2.5 mt average without irrigation or other hi-tech inputs...he has a great location with sub-surface water and sunlight...now he has planted all 30 hectares of the family farm”.
 - *Ecuadorean plantation manager*
- “...we should be encouraging trained farmers to develop new technologically driven farms on the perimeter of large high tech plantations...”
 - *Cocoa value chain professional Central America*
- “...after 26 years I detect a new culture emerging : the new breed of farmer is interested in value addition to make his enterprise highly productive, diversified downstream and lucrative”.
 - *Caribbean region senior cocoa scientist*
- “...a very successful co-operative (the Montserrat Cocoa Farmers Society Ltd) comprises about 50 farmers, many retired 'professionals' with expertise, capital and business acumen...”
 - *Senior cocoa sector scientist Caribbean region*
- “...it might be easier to engage SMEs to increase national figures....whereas national programs can be helpful...ultimately private sector leadership is needed”.
 - *Value chain developer Central America*

Constrains on Regional Ambition

Disease!!!

■ Witches' Broom:

Moniliophthora perniciosa, co-evolved with cacao in the Amazon Basin. First noted in Suriname in 1895, it progressed to Bolivia, Colombia, Ecuador, The Guyanas, Grenada, Peru, Venezuela, and Trinidad & Tobago. Brazil 1989!



■ Frosty Pod:

An invasive disease caused by the fungus *Moniliophthora roreri* ranks with any of the other major cacao pathogens in terms of its economic impact. It has invariably become the main yield limiting factor for cacao production in the affected countries



■ Black Pod:

is caused by the fungus *Phytophthora* spp. Three or possibly four fungal species of the same genus are responsible including *P. palmivora*, *P. megakarya* and *P. capsici*. It causes global yield loss of 20-30% and tree deaths of 10% annually



Constrains on Regional Ambition

Political, Social & Economic

- Anti-social influences: violent crime, insurgency, narco-economics, inequality
- Weak Infrastructure: transport, utilities, education, labour force
- Corruption

Risk Factor For Investment	Government Intervention In Economy	Corruption	Violent Crime /Insurgency/ Drug Trade	Poor Protection Of Foreign Investor Rights	Weak Judicial System	Land Acquisition & Ownership Risk	Poor Record of Economic Management	Poorly Diversified Economy	Inadequate Infrastructure / Logistics	High Labour Costs / Rigid Labour Laws	Score (Number of Negatives Out of 10)	Fitch Credit Rating May 2016
Brazil	×	×	×						×	×	5	BB Negative
Colombia			×			×			×		3	BBB Stable
Dominican Republic		×	×						×		3	B+ Positive
Ecuador	×							×	×	×	4	B Stable
Mexico		×	×						×		3	BBB+ Stable
Peru			×						×		2	BBB+ Stable
Venezuela	×	×	×	×	×	×	×	×	×	×	10	CCC

Constrains on Regional Ambition

Labour Cost Challenge

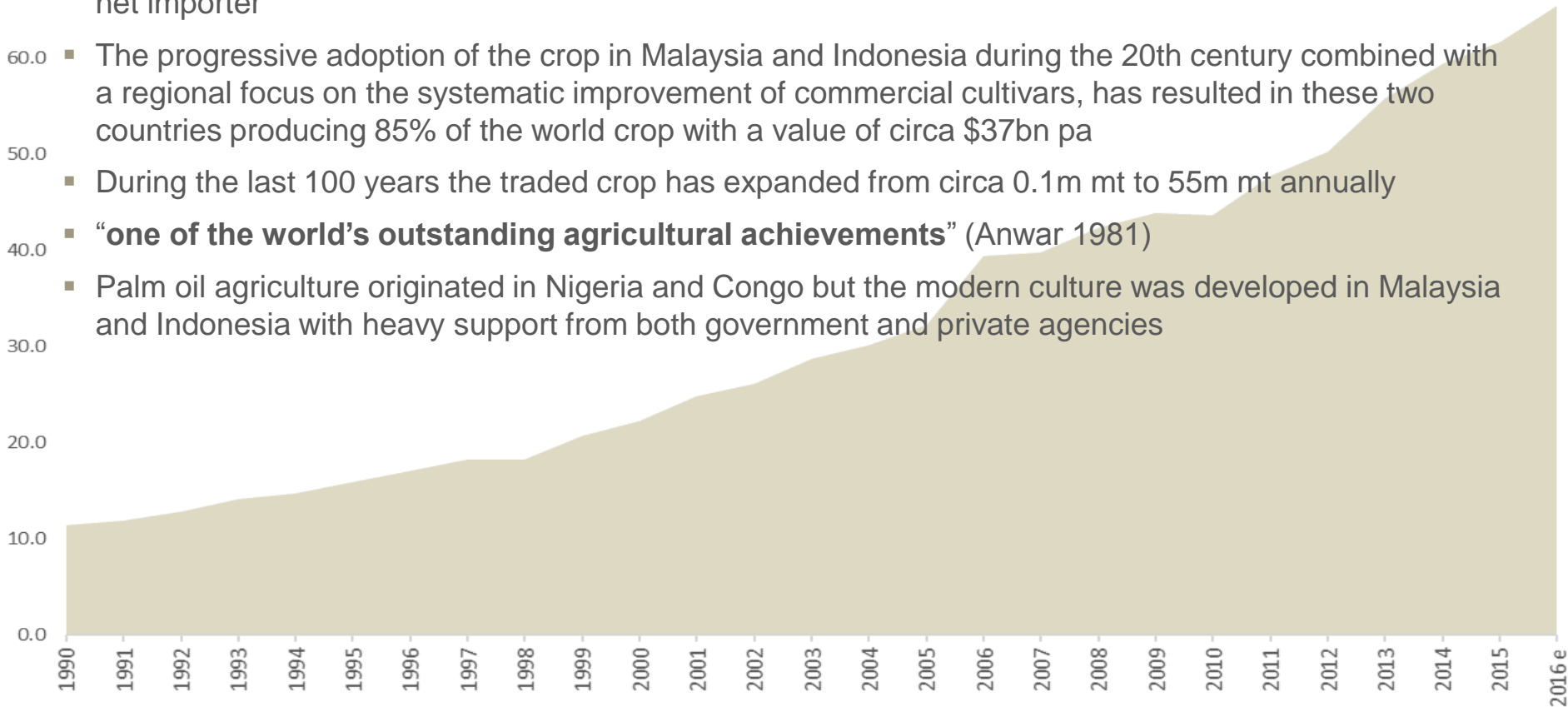
- Choice of cultivation site
- Plantation architecture
- Investment in labour productivity

Country	Brazil	Colombia	Costa Rica	Dominican Republic	Ecuador	Peru	Source
Minimum Legal Monthly Wage (\$)	255	383	434	148	368	256	Trading Economics
Monthly Wage Reported by Cocoa Farms (\$)	511	383	700	258	504	348	HAB Sources
Reported Day Rate (\$)	19.81	14.84	27.13	10.00	23.44	12.89	HAB Sources
<i>Includes</i>	Overtime	Welfare / Benefits	Social Welfare	Food	Welfare/Social Security	Food Allowance of \$81	HAB Sources
2014 GDP per Capita (\$)	6,000	4,550	5,962	5,101	3,782	4,151	Trading Economics
Reported Annual Wage as % of GDP per Capita	102.2%	101.0%	140.9%	60.7%	159.9%	100.6%	
Observations	Monthly Wage Reported up to \$600	Rural labour can be hard to find		Abundant local and Haitian labour pool	Leader in cocoa farm mechanisation	Abundant Labour Pool	

The Importance of 'Culture'

Asian Palm Oil

- In the early years of the 20th Century, Nigeria was the world's leading producer of palm oil, today it is a net importer
- The progressive adoption of the crop in Malaysia and Indonesia during the 20th century combined with a regional focus on the systematic improvement of commercial cultivars, has resulted in these two countries producing 85% of the world crop with a value of circa \$37bn pa
- During the last 100 years the traded crop has expanded from circa 0.1m mt to 55m mt annually
- **"one of the world's outstanding agricultural achievements"** (Anwar 1981)
- Palm oil agriculture originated in Nigeria and Congo but the modern culture was developed in Malaysia and Indonesia with heavy support from both government and private agencies



The Importance of 'Culture'

New Zealand Dairying

- 1814 • First dairy cows arrive NZ from UK
- 1880 • 66 years later milk processing factories open in Waikato and Taranaki 'Cluster' regions
- 1882 • 68 years after importing cows from UK, NZ ships refrigerated milk to UK
- 1890 • A network of co-operative dairy processing and logistics facilities had been established
- 1890 • Technologies introduced to measure milk quality benefiting consumers and herd selection
- 1909 • Routine herd testing for milk quality introduced
- 1934 • Artificial breeding instituted – enabled by herd testing
- 1930 • Low voltage electric fencing revolutionized NZ grassland management
- 1950 • Technologies to freeze bovine semen transformed NZ dairy genetics; now permits 3 million inseminations annually

- New Zealand – a nation of 4m at the bottom of the Southern Hemisphere is the World's largest exporter of dairy products
 - 17% total market share
 - 48% share of whole milk powder
 - 41% share of butter
- Fonterra, NZ's leading dairy co-operative and global marketing company, is the World's largest milk processor
 - Annual revenues (to July 2014) of US\$15bn

A Regional Focus On Science & Breeding

An Established Culture of Research & Development

- CATIE- Costa Rica
 - Since 1944 the custodian of the IC3 cocoa germplasm collection - a significant representation of the genetic diversity that the species possesses in tropical America.
 - Provides material for genetic enhancement studies and for breeding programmes
- CEPLAC – Brazil
 - A national cacao research and extension agency - it manages Brazil's cacao germplasm library.
- Cocoa Research Centre (UWI) -Trinidad & Tobago
 - Cocoa research initiated 1930 at the Imperial College of Tropical Agriculture, a predecessor institute to the University of the West Indies.
- Cocoa Research Section (Research Division in the Ministry of Food Production) -Trinidad & Tobago
 - The La Reunion Estate comprises 200 ha of research cocoa fields.
 - Noted for the development of the Trinidad Selected Hybrids, the successors to the earlier Imperial College Selection (ICS). These TSH varieties are reported to show high resistance to disease, are early fruiting, have a low pod index and display excellent fine or flavour characteristics.
- INIAP – Ecuador
 - Founded in 1959 to support the development of agriculture in Ecuador, conducts scientific research, knowledge transfer and development of agronomic technologies
- Fedecacao - Colombia

Ecuador's Progressive Cocoa Culture

Supportive Institutions

- The National Agricultural Research Institute
 - Described by one leading producer as “a fast, efficient factory for superior cacao genetics”,
- APROCAFA
 - Strongly linked with the advancement of CCN-51 and with the evolution of the country's “High Tech Cacao Culture”, this association of cocoa producers established by Ministerial Decree seeks to:
 - improve farmer productivity - promote research and technology transfer -encourage sustainable farming
 - The development of CCN-51 testifies to Ecuador's culture of cocoa research and development
 - 1960s Homero Castro, an independent researcher based on the ‘Theobroma plantation’ in Naranjal, crossed IMC-67 x ICS-95 with a cacao accession collected in Valle de los Canelos
- ANECACAO
 - established to “support the entire agro-industrial and commercial chain of Ecuadorian cocoa from bean-to-bar producers and exports...”
 - provides technical assistance to producers, disseminating knowledge and techniques developed by INIAP and APROCAFA.



‘Cerecita Cluster’

Promoting Excellence

- NZ’s Waikato Region Dairy Cluster
 - 35% of NZ dairy herds
 - Fertile soils, flat land, and a temperate climate with proximity to two major ports
 - a hub for research, technology providers, education and generations of home bred farming talent
- In the dry coastal region of Guayas Province near the Cerecita commune, a cluster of farms approaching 5,000 ha has come to be known as the ‘Cerecita Cluster’ .
 - Farming made possible by a government sponsored water transfer system to supply the Santa Elena Peninsula.
- Agronomists and plantation directors are targeting estate level productivity 2.0 mt/ha plus and striving for 3.0mt/ha plus
- A sharp focus on tree management
 - height (2.0-3.0 metres); number of branches (3-5 branches); 24,000 linear metres / ha of fruiting branches
- These ‘high-tech’ farms have introduced mechanisation as standard farm practice
 - for pruning and field maintenance; the use of smart irrigation systems complete with fertigation and chemigation for automated crop management.
- In April 2016, Mars Inc acquired Hacienda La Chola in Cerecita, describing it as:
 - *One of the world’s leading farms for cocoa yield and farm management practices*
 - *Demonstrating innovation in both technology and farm management techniques.*

Conclusions

Exceptionalism In The Americas

- 2000-2014 The Americas has led sector growth with production climbing by more than 84%
- We project 2026 production of 930,000 mt
 - Brazil – risk could be to the upside?
 - Ecuador – risk could be to the downside?
 - Requires a rebalancing away from 90% plus reliance on subsistence / smallholder production model
 - We look for development of the SME sector
 - Requires extreme vigilance on disease and a focus on breeding resistance
 - Country / regional risk factors have scope to thwart progress
 - Sector must invest in labour productivity
 - Americas production growth likely requires \$1bn of investment
 - Where is the model to encourage investors and stakeholders to make this commitment?
- The exceptional agri-achievements of NZ and Malaysia/Indonesia point to the importance of ‘culture’
 - From zero to hero in a century
 - Ecuador has strong foundations for developing and disseminating a progressive cocoa culture

Exceptionalism in the Americas from breeding to agronomy and investment in professional production, offers hope for sustainable growth and an end to the customary reliance on area expansion as the primary instrument of growth



How to contact us

Hardman Agribusiness

11/12 Tokenhouse Yard
London
EC2R 7AS

Doug Hawkins

dh@hardmanagribusiness.com

Direct Line: +44 (0)1323 831 657

Mobile: +44 (0)7584 285 170

Yingheng Chen

yc@hardmanagribusiness.com

Direct Line: +44 (0)207 1480 547

Switchboard: +44 (0)207 929 3399

www.hardmanagribusiness.com

