

# Increasing cocoa productivity through improved nutrition

## A call to action



Global Alliance for Improved Nutrition (GAIN)  
Centre for Development Innovation  
Wageningen University & Research Centre

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# Increasing cocoa productivity through improved nutrition

## A call to action

Concept Brief

## 2 | Introduction

**Under-nutrition is both a consequence and a cause of poverty. Childhood under-nutrition makes learning more difficult and ill health more likely, which hinders a child's capacity to secure a job as an adult, and the cycle of generational poverty and under-nutrition continues. UNICEF**

Chocolate produced from cocoa beans is an extremely popular food item consumed all over the world. Cocoa is cultivated in more than 40 countries across Africa, Asia and Latin America with 70% of world production coming from Ivory Coast, Ghana and Indonesia. Over 90% of global cocoa production is cultivated by an estimated 5.5 million smallholders with more than 20 million family members directly dependent on cocoa for their livelihoods.<sup>1</sup> Most cocoa smallholders live below the poverty line and lack access to nutritious food.

Over the past five years, the cocoa industry has raised farmers' income by increasing productivity through agricultural training programs - mostly related to certification programs - and provision of plant material, loans and fertilizers. However, productivity remains low and could be improved. It is often assumed that increased income, derived from cocoa export, will increase the food security and the nutritional status of households. The World Bank has shown that neither increased agricultural production nor increased income alone is sufficient to reduce under-nutrition. Agricultural policies, technology markets and changes in consumption patterns also identified as contributing factors.<sup>2</sup>

This concept brief analyzes cocoa production statistics compared with nutritional data in three major cocoa producing countries. It demonstrates the consequences of under-nutrition for the sector. Maps initially present the dimensions of under-nutrition in cocoa producing areas in Ivory Coast, Ghana and Indonesia. In sections 5 and 6, interventions for combining Good Agricultural Practice with Good Nutritional Practices are outlined. The final call for action shows the enormous potential that the cocoa sector has in positively affecting the lives of more than 20 million people.

# Consequences of insufficient nutrition in value chains



Decreased productivity

Poor school performance

Poor health

**“1 % Reduction in height leads to 1.4 % reduction in productivity.”**<sup>9</sup>

**“1% Reduction in iron status (anemia) leads to 1% reduction in productivity.”**<sup>10</sup>

**“Adults that were undernourished as children have 15% less cognitive capacity.”**<sup>11</sup>

It has been assumed that increased food production, reducing food prices and increasing income of households would contribute to poverty reduction and improved nutrition. However, in 2007 the World Bank demonstrated that increasing agricultural production and household income does not sufficiently reduce under-nutrition.<sup>3</sup> Despite estimates that under-nutrition causes losses in GDP of 2-3%<sup>4</sup>, IFPRI reported that improvements to nutrition often lag behind economic development.<sup>5</sup> FAO concluded in 2012 that agricultural growth will not necessarily result in better nutrition and call for “nutrition-sensitive” agricultural growth.<sup>6</sup>

Under-nutrition is not only caused by a shortage of intake of energy (quantity of the food) but also by a shortage of micronutrients (quality of the food). While too few calories (hunger) can be visible in individuals, the effects of micronutrient deficiencies (vitamins and minerals) are often hidden. Described as ‘hidden hunger’, this leads to underweight and stunting in children. A larger number of people suffer from micronutrient deficiencies due to a monotonous diet, mainly in the form of staples and limited nutrient rich foods such as fruits and vegetables and animal-sourced foods.

Under-nutrition early in life has a significant effect on an individual’s future development. A lack of essential vitamins and minerals before two years of age has negative consequences for physical and mental performance later in life. These consequences are irreversible. Under-nutrition is inherited from one generation to the other: an undernourished mother has a higher chance to deliver an undernourished child, which grows into an undernourished adult.<sup>7</sup>

For the cocoa industry in particular, under-nutrition might lead to direct losses in cocoa productivity from:<sup>8</sup>

1. Reduced labor output and physical productivity due to illness, fatigue and other health related problems.
2. Reduced cognitive development and educational performance due to malnutrition early in life.
3. Losses in household resources from increased health care costs.

# 6 ||| Mapping of under-nutrition in major cocoa production areas

## Stunting

**Children are too short for their age as result of poor diet and poor health circumstances.**

A score of 25% or higher = serious level of under-nutrition that needs interventions



## Child mortality

**Child mortality refers to death of infants and children under the age of five.**

In 2011, the world average was 5,1%.<sup>16</sup>

31 countries reported at least 10% of children under five died.



Studies of populations in cocoa producing areas show severe under-nutrition. The following maps illustrate the overlap of under-nutrition and cocoa production in Ivory Coast, Ghana and Indonesia.<sup>12</sup>

The most frequently used indicator for measuring under-nutrition is *stunting*, which is a visible sign of chronic malnutrition.<sup>13</sup> *Stunting* means that children under 5 years old are simply not growing as result of poor diet, and are therefore too short for their age. *Stunting* prevalence above 25% is regarded as an area with severe under-nutrition problems. If under-nutrition is not addressed early, the physical and mental damage is irreversible and leads to adults with limited labor productivity. All cocoa production areas in Ivory Coast, Ghana and Indonesia show greater than 25% *stunting* and is ranked as having a serious level of under-nutrition that needs interventions. *Stunting* is particularly high in the cocoa growing areas in Indonesia reaching an alarming 40 % (see map).

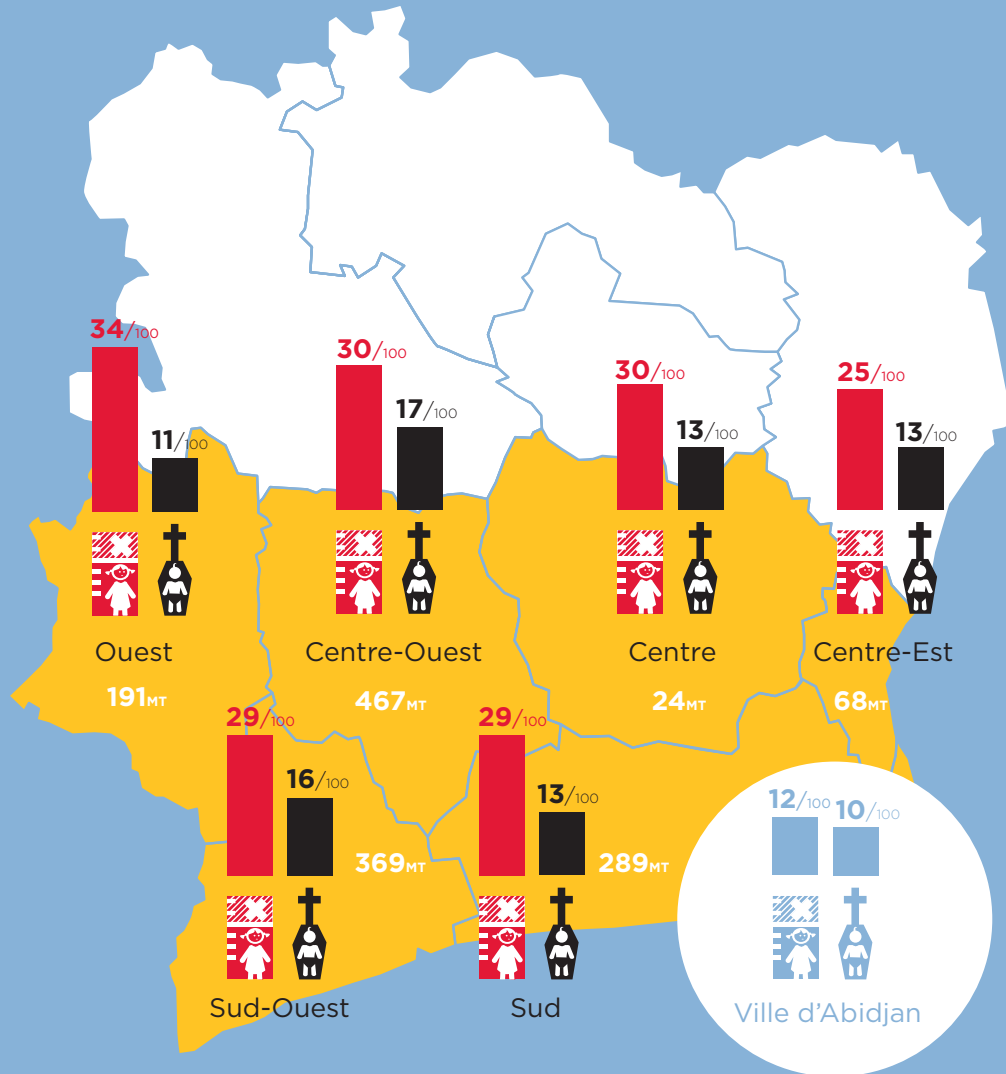
Undernourished children are more likely to die from preventable diseases, and therefore *child mortality* also features as an indicator in measuring under-nutrition.<sup>14</sup> *Child mortality* refers to death of infants and children under the age of five. In 2011, the world average was 5.1%, but 31 countries reported at least 10% of children under five died.<sup>15</sup> These rates are particularly high in Africa, especially in Ivory Coast where more than 16% infants of die before they reach five years of age.<sup>16</sup> Indonesia reports *child mortality* rates around the world average.

Despite increased income from cocoa production, *stunting* and *child mortality* rates remain seriously high. In comparison, *stunting* and *child mortality figures* are drastically reduced in other areas of the countries.

# 1 Ivory Coast

Under-nutrition and cocoa production

8



**Stunting**  
reduced height of children

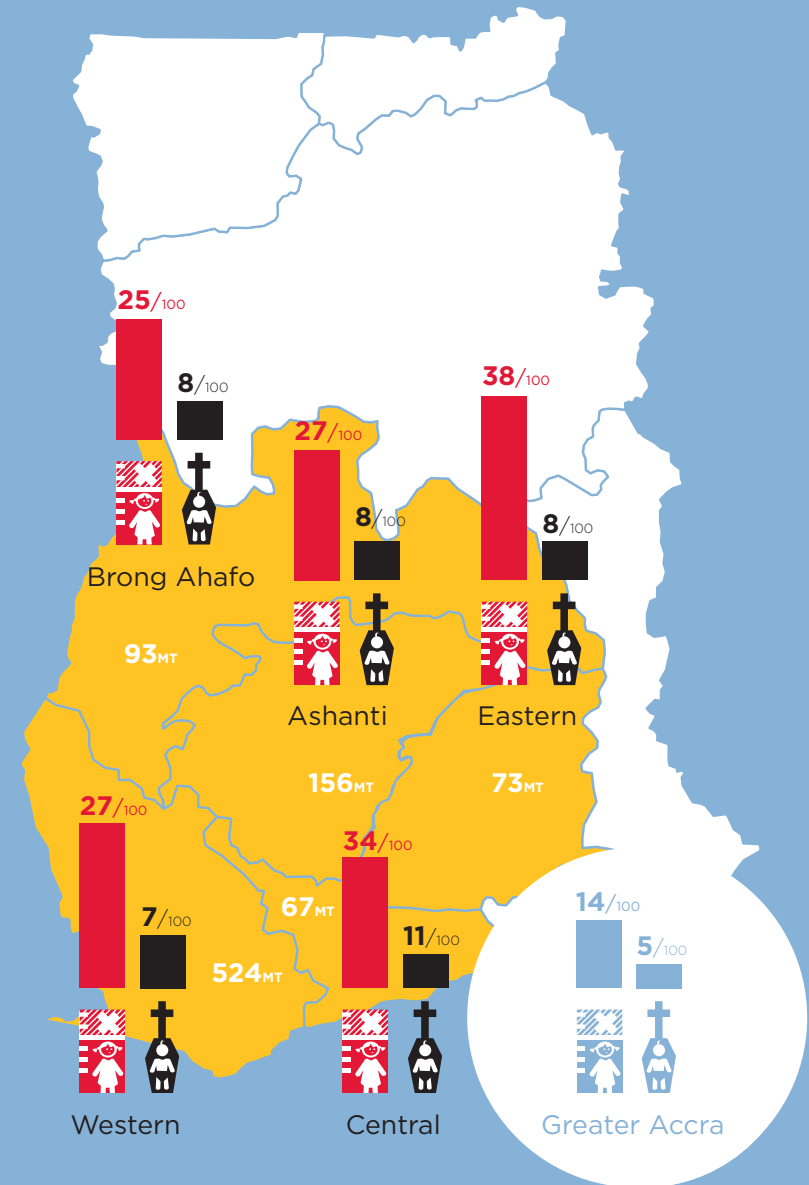
**Child mortality**  
under the age of 5

**Cocoa production area**  
Amount of production in 1000 MetricTon

# 2 Ghana

Under-nutrition and cocoa production

9



**Stunting**  
reduced height of children

**Child mortality**  
under the age of 5

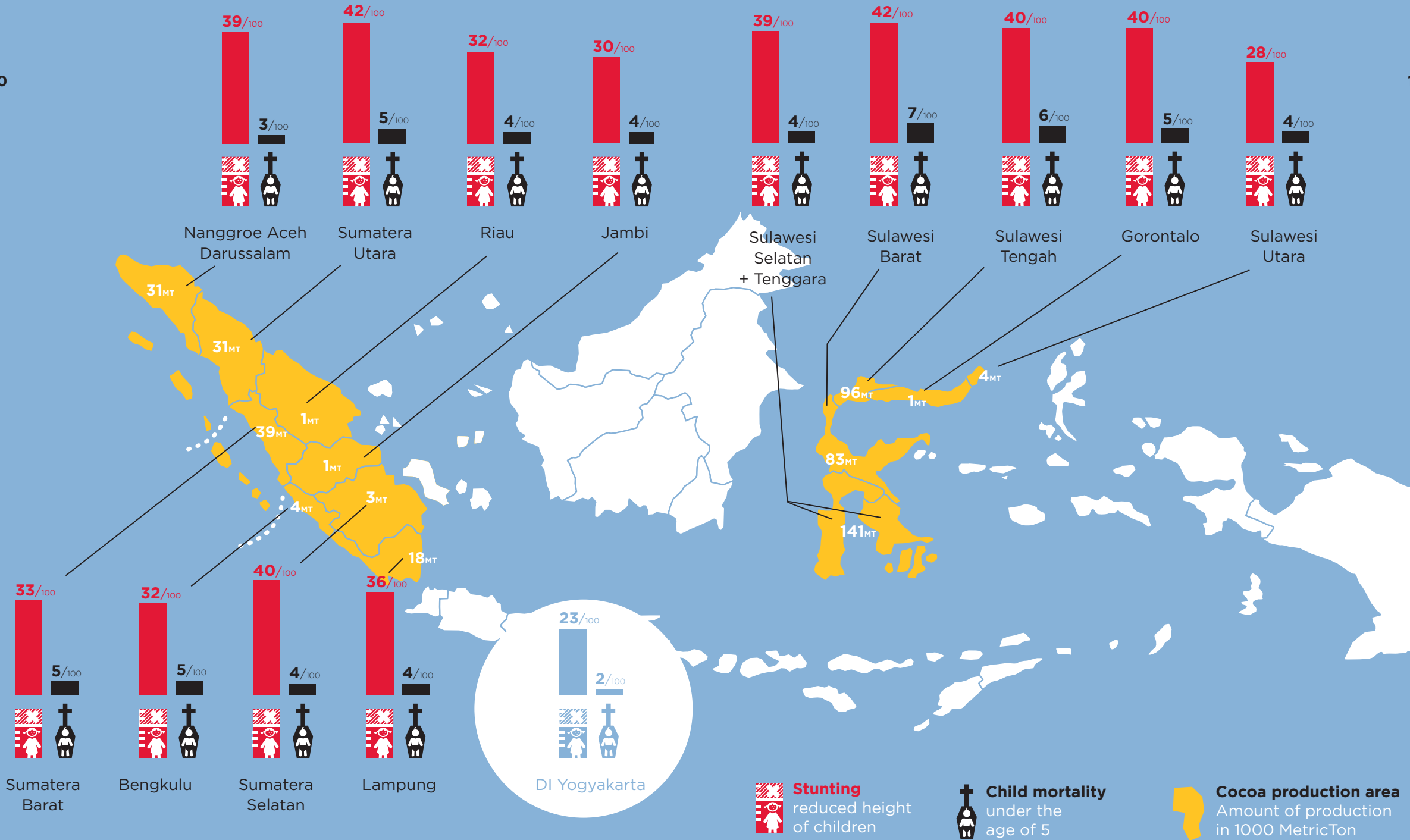
**Cocoa production area**  
Amount of production in 1000 MetricTon

# 3 Indonesia

Under-nutrition and cocoa production

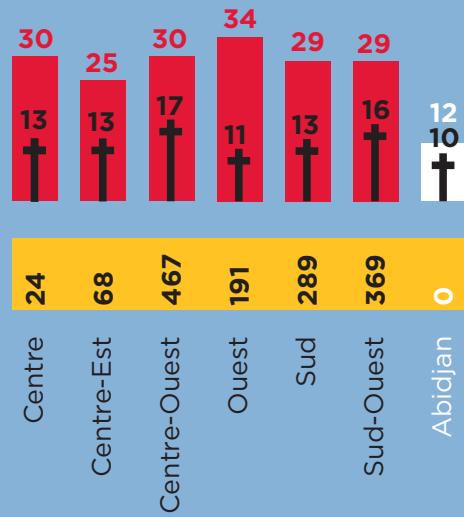
10

11

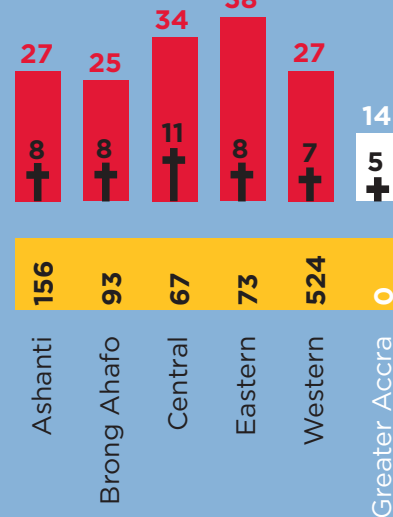


# 4 Production and earnings

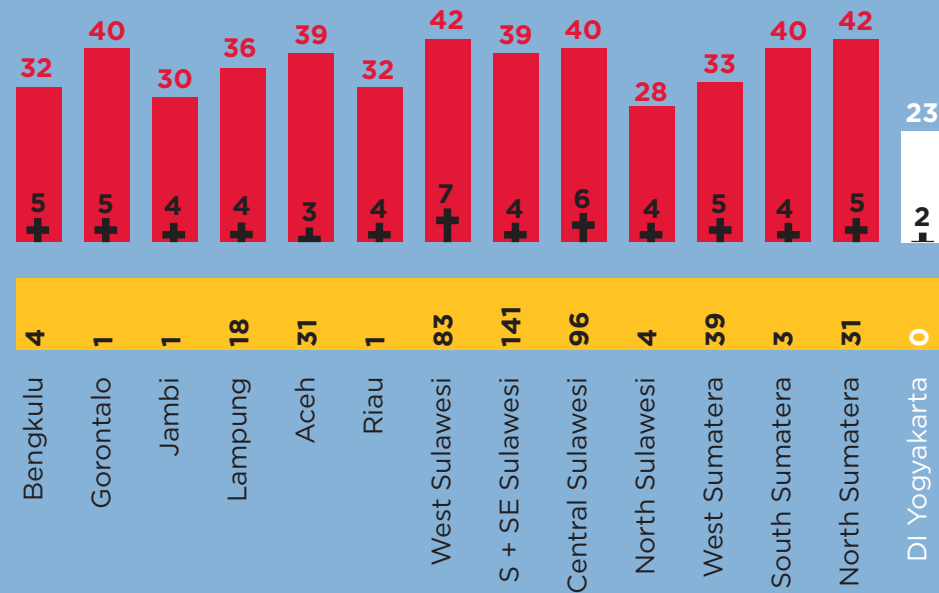
## Ivory Coast



## Ghana



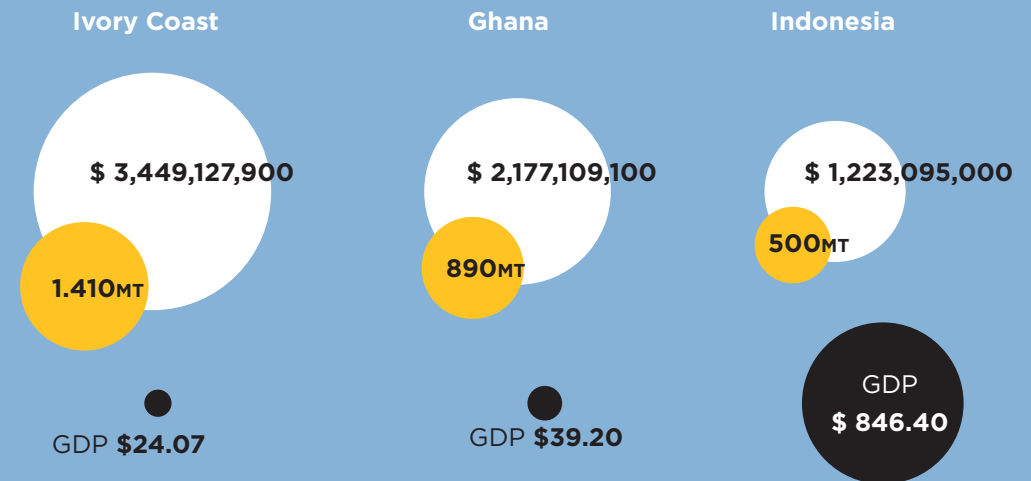
## Indonesia



**Stunting**  
reduced height of children

† **Child mortality**  
under the age of 5

**Cocoa production**  
Production in 1000 MetricTon



● Earnings = production x ICCO daily price (04.10.2012)

● Production: ICCO Forecast 2011/12 (in 1000 MT)

● GDP: World Bank world development indicators (in billions)



# IV Nutrition status of producing families

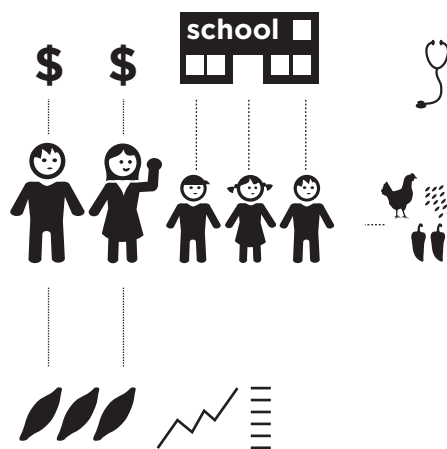
However, families producing cocoa in Ivory Coast, Ghana or Indonesia face high under-nutrition leading to poor health, reduced educational potential, and diminished immediate and future income.

## Healthy farming family

**FEMALE EMPOWERMENT**  
The mother has decision-making power on expenditures

**GOOD SCHOOL ATTENDANCE**

Children attend school and are active



**GOOD HEALTH**

The family is healthy and not frequenting depending on medical services

**GOOD FOOD**

The family eats a wide variety of food daily (rice/maize, vegetables and animal products)

**INCREASED PRODUCTIVITY**

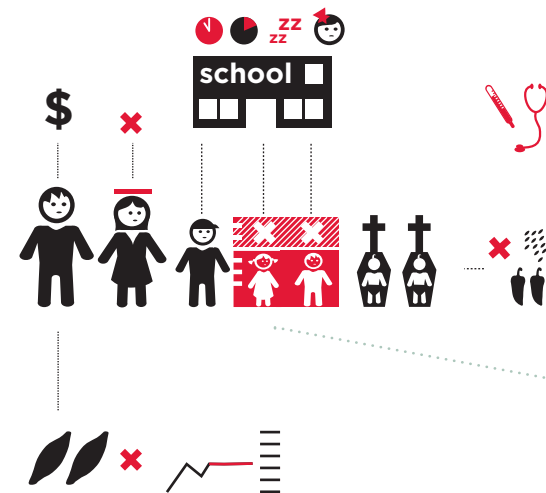
Agricultural production is improved due to higher labor productivity

Looking at a healthy farming household we can see the following picture. Overall, improved nutrition can increase productivity and reduce poverty through improved physical work capacity, cognitive development, school performance, and health.

## Cocoa farming family facing under-nutrition

**POOR SCHOOL PERFORMANCE**

Children attend school at a higher age, doubling of classes, often dropping out



**LACK OF FEMALE EMPOWERMENT**  
as women have less labor productivity and time for family care

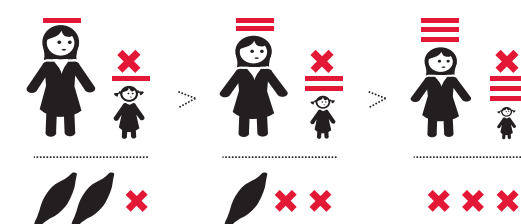
**POOR HEALTH**

Family members are more susceptible to illness and experience higher mortality rates from minor illnesses such as diarrhea

**MALNOURISHED CHILDREN** who are too small for their age, are often tired and inactive

**DECREASED PRODUCTIVITY**

Farmer produces less cocoa due to reduced labour productivity



**INTERGENERATIONAL CYCLE** Undernourished children grow into undernourished adults

# V How to remedy this?



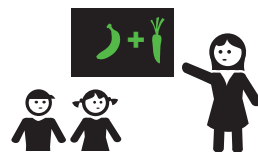
Nutrition sensitive value chains for local products



Increased nutritious food consumption through food diversification



Strengthening the role of women



Nutrition education

**Certification** is a procedure whereby an independent third party certification body gives a written assurance that the quality of the cocoa and the production process has been assessed, and both confirm to the requirements specified by the standard systems. Being part of certification program provides many opportunities for the producer, for example training, access to markets, and enhanced efficiency and revenues. Four global certification standards are relevant for the cocoa sector, namely Fairtrade, Organic, Rainforest Alliance and UTZ Certified. Global certification programs are becoming more widespread in the last years.<sup>17</sup>

Additional productivity gains might be achievable in the cocoa sector if it invests in interventions to promote human nutrition security through a certification incentive. The following four interrelated interventions are designed to achieve improved nutrition in the cocoa value chain.<sup>18,19</sup> Together they constitute a smart combination of Good Agricultural Practices and Good Nutritional Practices:

## 1. Nutrition sensitive value chains for local products:

Building nutrition sensitive value chains beginning by increasing the local production, preservation and marketing of affordable nutritious, nutrient dense foods (vegetables, fruits, animal based food products) to be sold in local markets. Sustainable improvements in the food basket can best be brought about by commercially viable value chains with push and pull factors.

## 2. Increased nutritious food consumption through food diversification:

Promoting household production that includes: a diversified basket of nutrient rich crops such as fruits and vegetables, and animal source foods such as eggs, chicken, fish and dairy products.

## 3. Strengthening the role of women:

Ensuring women are empowered to make household decisions, especially to spend resources on improving nutrition for all family members at all stages of the lifecycle.

## 4. Nutrition education:

Raising awareness on good nutrition, health and sanitation practices through education programs.

These interventions can be integrated in cocoa certification training programs. Organized farmer groups are the entry point for a) promoting household production of nutrient-rich crops, b) for developing viable local value chains for animal-sources food products, and c) empowering women for better nutrition decision making that benefits families. In addition, cocoa farmer groups provide a platform for linking nutrition education to agricultural production.

As a result of addressing the four interventions in combination with Good Agricultural Practices, the local diet will be diversified and more nutritious resulting in healthier and more productive cocoa farmers. Ultimately, industry benefits from a more productive future generation of cocoa farmers and, consequently, a more sustainable cocoa value chain.

## VI An example:

Nutrition and Food Security Component in the Sustainable Cocoa Production Program in Indonesia addressing 40,000 farmers and reaching more than 200,000 household members

Combining good cocoa producing practices with Good Nutritional Practices is the key to further improvement in rural communities. The Dutch Embassy in Jakarta supports this approach in financing the Food and Nutrition Component in the Indonesian Sustainable Cocoa Production Program of Swisscontact, the Sustainable Trade Initiative, Rabobank Foundation, Wageningen University and Research Centre and the Global Alliance for Improved Nutrition. The intervention follows four parallel tracks to achieve nutrition improvement: Nutrition sensitive value chains for local availability of nutritious foods, increased household production of nutritious foods, strengthening the role of women and nutrition education for increased consumption of nutritious foods. The program aims to develop tools for an increased availability and accessibility of nutritious foods in local markets, combined with an increased awareness of consuming healthy meals for more than 200,000 household members.

The use of 40,000 farmers that are already organized into farmer groups in certification programs delivers the synergies to transfer the message of good nutritional practices to the decision makers in the households. Therefore the program is embedded into the cocoa farmer group training programs supported by the Swiss State Secretariat for Economic Affairs and the Dutch Sustainable Trade Initiative.

The program aims to increase consumption of nutritious foods for 40,000 farmers at the household level; increase disposable incomes by reducing the amount of money farmers spend on food; improve the nutritional status of households; improve the local economy by selling surplus food in local markets; and strengthen the role of women who produce, process, and prepare food.

The industry will benefit from more sustainable cocoa value chains and more secure long-term access to quality raw materials.

## <sup>20</sup> **VII Call to action**

Mars stated at the World Cocoa Foundation meeting in Washington 2010:

**We do not  
certify poverty!**<sup>20</sup>

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Today the cocoa sector in most producing countries is confronted with diminishing yields while the worldwide demand for cocoa beans grows steadily, outpacing production. But under-nutrition plagues the majority of producers in the major producing countries as Indonesia, Ivory Coast and Ghana. Unremitting under-nutrition leads to a vicious cycle of under-nourished cocoa families over generations. As a consequence, under-nutrition contributes to continuing productivity losses in the cocoa sector.

Looking at trends in the cocoa sector, it is expected 25% of the total cocoa production to be certified in 2015 and 50% in 2020. Mars, one of the largest global manufacturers of chocolate products clearly stated: “We do not certify poverty!”<sup>20</sup> Ideally, certification standards will integrate training tools developed in the Sustainable Cocoa Production Program on nutrition security as a mandatory element in their curriculum in areas of high malnutrition and cocoa production.

Addressing nutrition security can be achieved by combining Good Agricultural Practices with Good Nutritional Practices through the development of nutrition sensitive value chains for local products, increased household based production of nutritious foods, strengthening the role of women and nutrition education.

Investments in better nutrition have an exceptionally high benefits to cost ratio.<sup>21</sup> We encourage the cocoa industry to invest in nutrition sensitive cocoa chains in areas that experience high rates of malnutrition to prevent future generations of undernourished cocoa farmers with decreased productivity.

## VIII Footnotes

- 1 Weiligmann, B. , Verbraak, G. and Van Reenen M. (2010): Cocoa Barometer 2010, Tropical Commodity Coalition
- 2 World Bank (2007): From agriculture to nutrition: Components, Synergies and Outcomes, Report No. 40196-GLB
- 3 World Bank (2007): From agriculture to nutrition: Pathways, Synergies and Outcomes, Report No. 40196-GLB
- 4 Copenhagen Consensus 2012:  
<http://www.copenhagenconsensus.com/Projects/CC12.aspx>
- 5 IFPRI (2011): Global Hunger Index
- 6 FAO (2012): State of Food Insecurity in the World 2012
- 7 This inter-generational cycle can be broken by good nutrition to mother and child. This window of opportunity to address under-nutrition is known as the 'first 1000 days', from conception until 2 years of age.
- 8 Copenhagen Consensus 2012:  
<http://www.copenhagenconsensus.com/Projects/CC12.aspx>
- 9 Behrman and Rozenzweig (2001) / Hunt (2005) The strongest and best documented productivity-nutrition relationships are those related to human capital development in early life. Height has unequivocally been shown to be related to productivity, and final height is determined in large part by nutrition from conception to age two. A 1% loss in adult height as a result of childhood stunting is associated with a 1.4 percent loss in productivity.
- 10 Behrman and Rozenzweig (2001) / Hunt (2005)
- 11 Grantham-McGregor, Fernald, and Sethurahman (1999): Malnutrition leads to indirect losses in productivity from poor cognitive development and schooling. Low birthweight may reduce a person's IQ by 5 percentage points, stunting may reduce it by 5 to 11 points, and iodine deficiency by as much as 10 to 15 points

- 12 Data are collected from the following sources:

Nutrition Cote d'Ivoire:

*Stunting Côte d'Ivoire*: DHS 2011-12 - Preliminary Report (French)

<http://www.measuredhs.com/publications/publication-PR21-Preliminary-Reports.cfm>

*Child mortality Cote d'Ivoire*: AIS, 2005 - Final Report (French)

<http://www.measuredhs.com/publications/publication-AIS5-AIS-Final-Reports.cfm>

Nutrition Ghana

*Stunting and child mortality*

Ghana: DHS, 2008 - Final Report (English)

<http://www.measuredhs.com/publications/publication-FR221-DHS-Final-Reports.cfm>

Nutrition Indonesia

*Stunting Riset Kesehatan Dasar*, Riskesdas 2010.

<http://www.riskesdas.litbang.depkes.go.id/download/TabelRiskesdas2010.pdf>

*Child mortality Indonesia*: DHS, 2007 - Final Report (English)

<http://www.measuredhs.com/publications/publication-FR218-DHS-Final-Reports.cfm>

- 13 WHO reference median: Percentage of children stunted is the percentage of children under five years who have a height-for-age below minus two standard deviations of the National Center for Health Statistics
- 14 According to Rob Black (2008) in Lancet Series 35% of child mortality is caused by under-nutrition
- 15 [http://en.wikipedia.org/wiki/Child\\_mortality](http://en.wikipedia.org/wiki/Child_mortality)
- 16 Province Centre-Quest in Ivory Coast, DHS report 2011
- 17 Weiligmann, B. , Verbraak, G. and Van Reenen M. (2010): Cocoa Barometer 2010, Tropical Commodity Coalition
- 18 Wiegers, E., Van Dorp, M., Torgerson, S. (2011): Improving nutrition through Agriculture.
- 19 Van Dorp, M., Oenema, S., Verdonk, I. (2011) Agriculture - nutrition linkages.
- 20 World Cocoa Foundation meeting Washington, 2010
- 21 <http://www.copenhagenconsensus.com/Projects/Copenhagen%20Consensus%202004/Outcome.aspx>

## 24 Colophon

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