

# Increasing tea 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 tea 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**

Millions of people are involved in the production and processing of tea, and many more rely on it indirectly for their income. The worldwide production of tea in 2011 totaled 4,299,000 tonnes<sup>1</sup>, of which black tea accounts for around 75% of the global production and over 90% of the consumer markets in Europe. For some time, large plantations have dominated tea production, but especially since the mid-1990s, production by smallholder farmers has been increasing. In the main tea exporting countries, about two thirds of all tea is cultivated on relatively small farms.<sup>2</sup>

Over the past decade, worldwide consumption of tea has steadily increased – 33% between 2002 and 2011. Global production has increased similarly and there are no indications that consumption growth will slow down in the coming years.<sup>3</sup> To be able to satisfy growing tea demand, finding sustainable solutions that stimulate production will play a crucial role.

Many smallholder tea farmers and plantation workers' incomes fall under the poverty line,<sup>4</sup> a lot of which lack access to nutritious food. Stimulating consumption of nutritious food will not only serve their social and health interests, but it will also serve broader commercial and developmental objectives by having a positive impact on productivity. In turn, increased productivity will keep up with growing worldwide demand for tea and increase the income of smallholders and workers.

This concept brief analyzes nutritional data in five major tea producing and exporting countries, which represent 75% of all black tea exports to Europe and North America<sup>5</sup>. It demonstrates the consequences of under-nutrition for the tea-producing sector. Maps initially present the dimensions of under-nutrition in tea producing areas in India, Indonesia, Sri Lanka, Kenya and Malawi. In sections 5 and 6, interventions for combining Good Agricultural Practices with Good Nutritional Practices are outlined. The final call for action shows the enormous potential that strengthening the link between the tea sector and improved nutrition has in positively affecting the lives of millions of people.

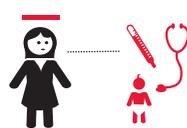
# Consequences of insufficient nutrition in value chains



Decreased productivity



Poor school performance



Poor health

**“1 % Reduction in height leads to 1.4 % reduction in productivity.”**<sup>12</sup>

**“1% Reduction in iron status (anemia) leads to 1% reduction in productivity.”**<sup>13</sup>

**“Adults that were undernourished as children have 15% less cognitive capacity.”**<sup>14</sup>

It has been assumed that increased food production, reducing food prices and increasing household incomes would contribute to poverty reduction and improved nutrition. However, in 2007 the World Bank demonstrated that simply increasing agricultural production and household income does not sufficiently reduce under-nutrition.<sup>6</sup> Despite estimates that under-nutrition causes losses in GDP of 2-3%<sup>7</sup>, IFPRI reported that improvements to nutrition often lag behind economic development.<sup>8</sup> FAO concluded in 2012 that agricultural growth will not necessarily result in better nutrition and calls for “nutrition-sensitive” agricultural growth to address under-nutrition and the related losses in GDP.<sup>9</sup>

Under-nutrition is not only caused by a shortage of energy intake (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 stunted 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>10</sup>

For the tea industry in particular, under-nutrition might lead to direct losses in tea productivity from:<sup>11</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 tea 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 tea producing areas show severe under-nutrition. The following maps illustrate the overlap of under-nutrition and tea production in India, Sri Lanka, Indonesia, Kenya and Malawi.<sup>15</sup>

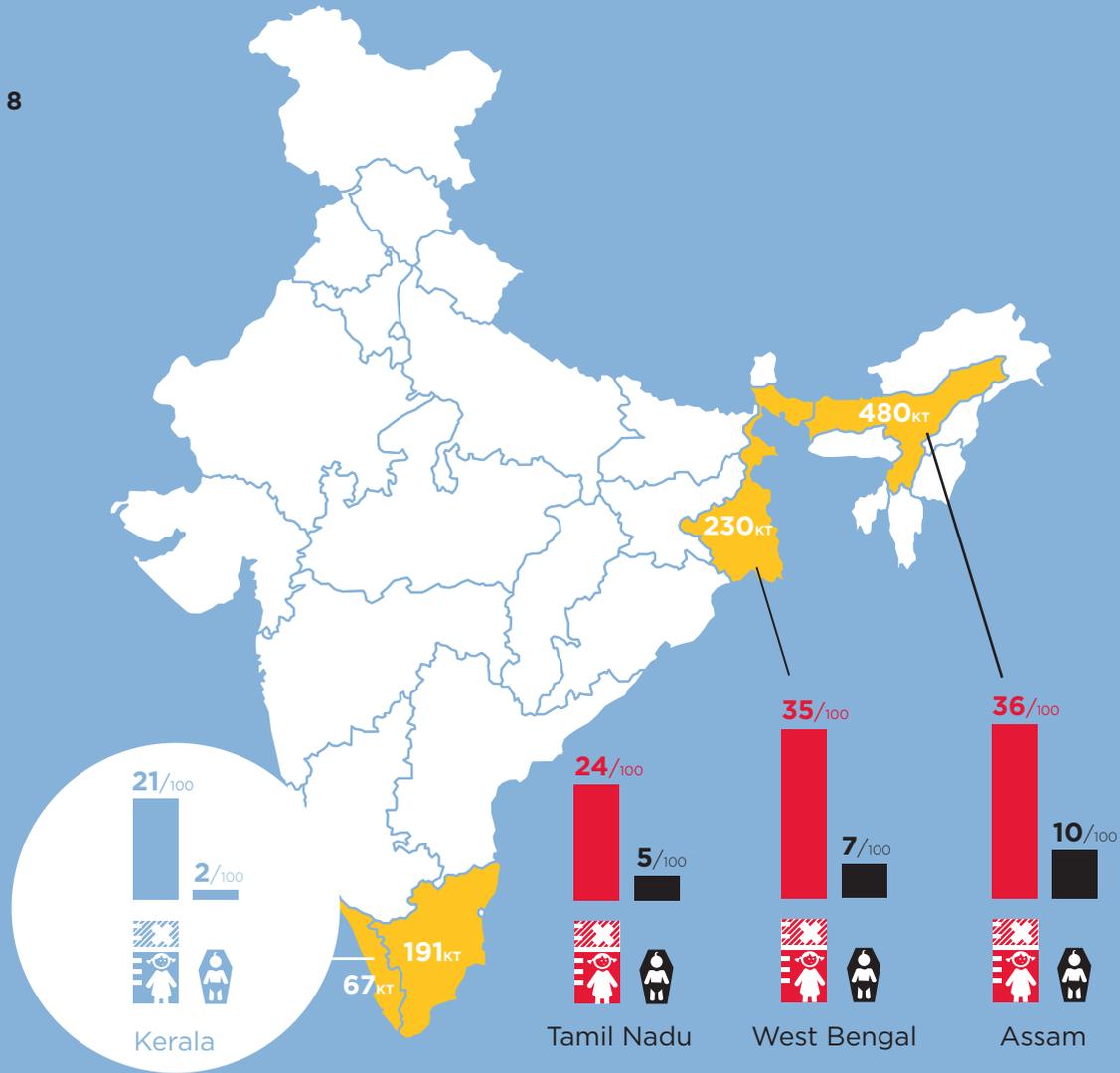
The most frequently used indicator for measuring under-nutrition is stunting, which is a visible sign of chronic malnutrition.<sup>17</sup> *Stunting* means that children under 5 years old are simply not growing as result of poor diet, and are therefore too short for their age. As a rule, *stunting* prevalence above 25% signifies 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. Nearly all tea producing provinces in India, Sri Lanka, Indonesia, Kenya and Malawi show *stunting* levels greater than 30%, which means there is an alarming prevalence of under-nutrition and that interventions are needed to address the problem. *Stunting* is particularly high in the tea growing areas in Malawi, reaching an alarming 50% (see map).

Under-nutrition causes people to be underweight, but it also affects immune and non-immune host defenses to infectious diseases making it an underlying cause of terminal infectious diseases. As much as 53% of child deaths can be attributed to being underweight making child mortality an important indicator in measuring under-nutrition.<sup>18</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>19</sup> These rates are particularly high in Africa. Looking at Malawi as a whole, more than 12% of infants die before they reach five years of age.<sup>20</sup> In tea producing provinces, the rate is even higher. The same trend is visible in Kenya. In the Asian countries included in this publication, the child mortality rate in tea producing provinces is similar to the average rate in the country.

# 1 India

Under-nutrition and black tea production

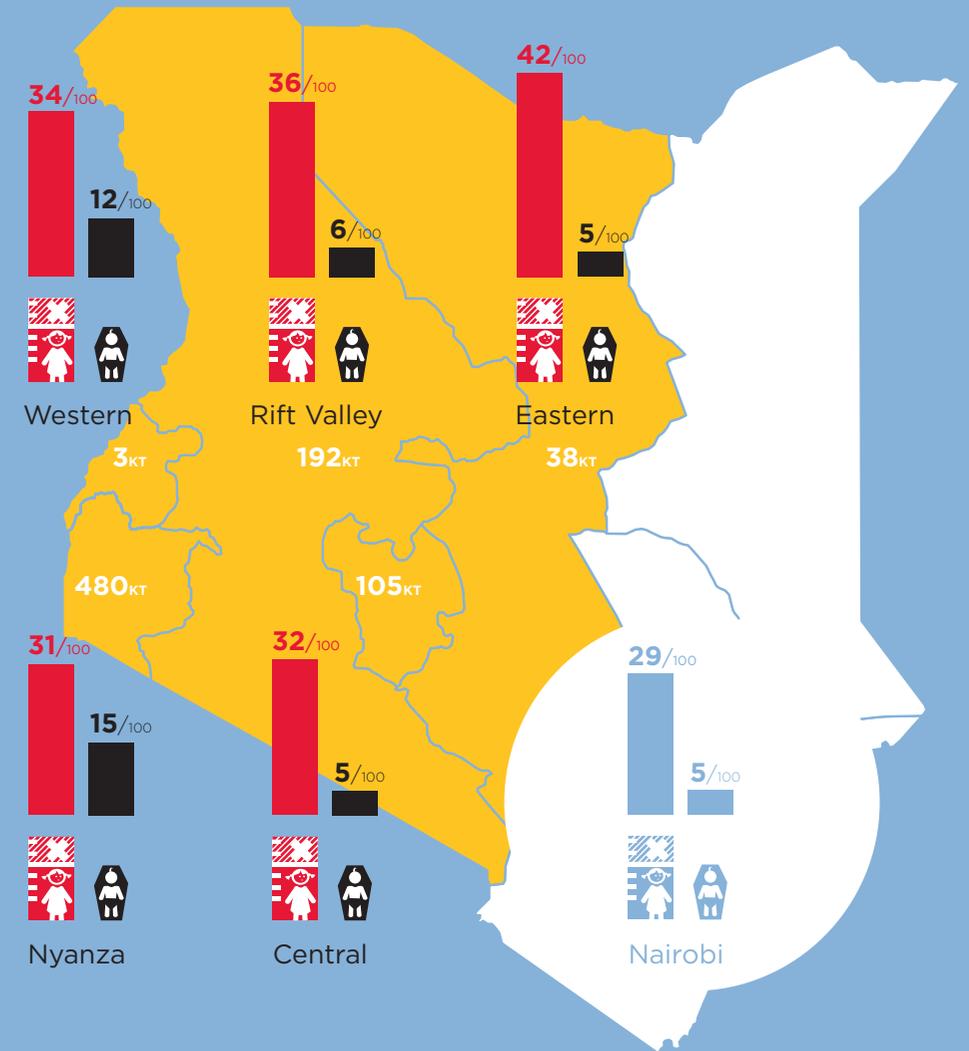
8



# 2 Kenya

Under-nutrition and black tea production

9



 **Stunting**  
reduced height of children

 **Child mortality**  
under the age of 5

 **Tea production area**  
Amount of production in KiloTonnes

 **Stunting**  
reduced height of children

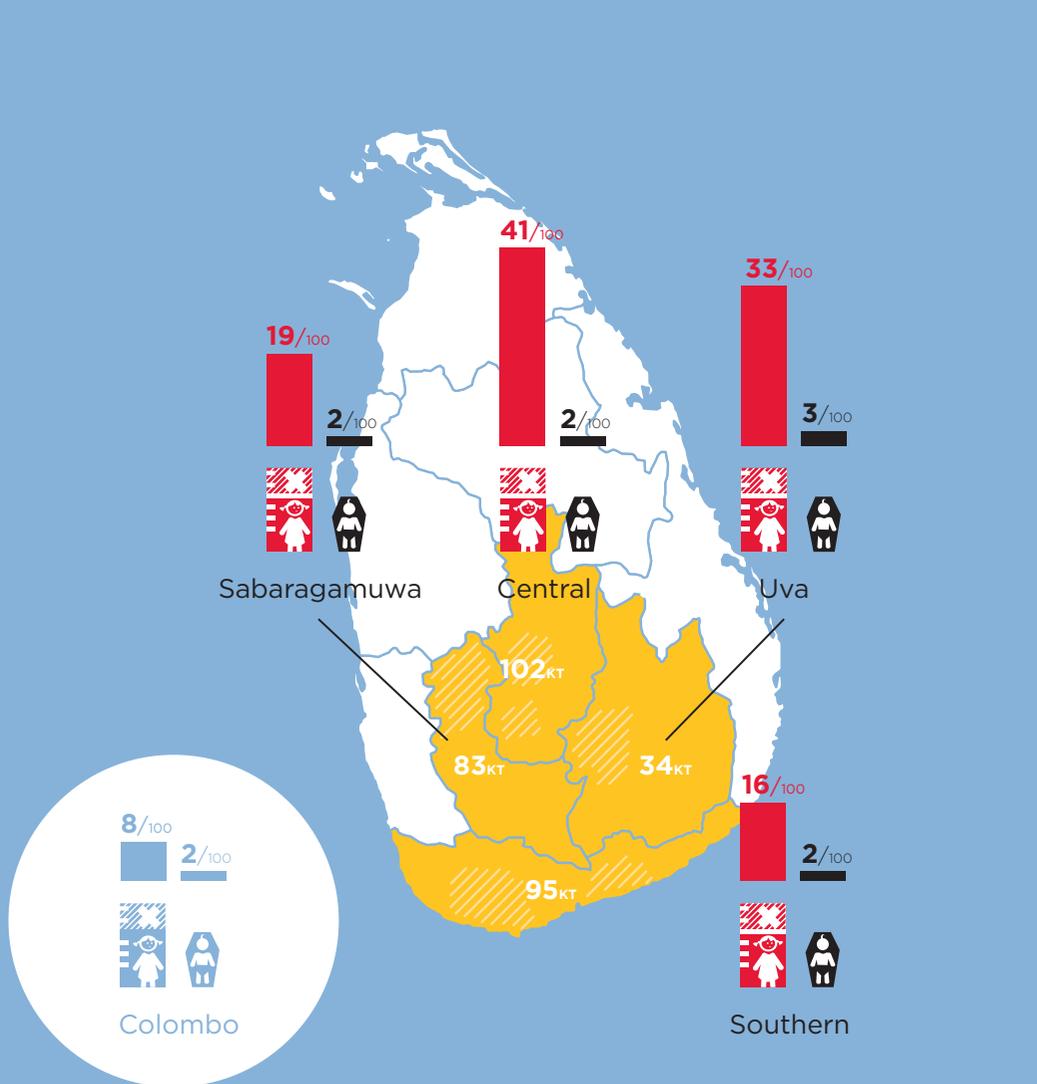
 **Child mortality**  
under the age of 5

 **Tea production area**  
Amount of production in KiloTonnes

# 3 Sri Lanka

Under-nutrition and black tea production

10



**Stunting**  
reduced height of children

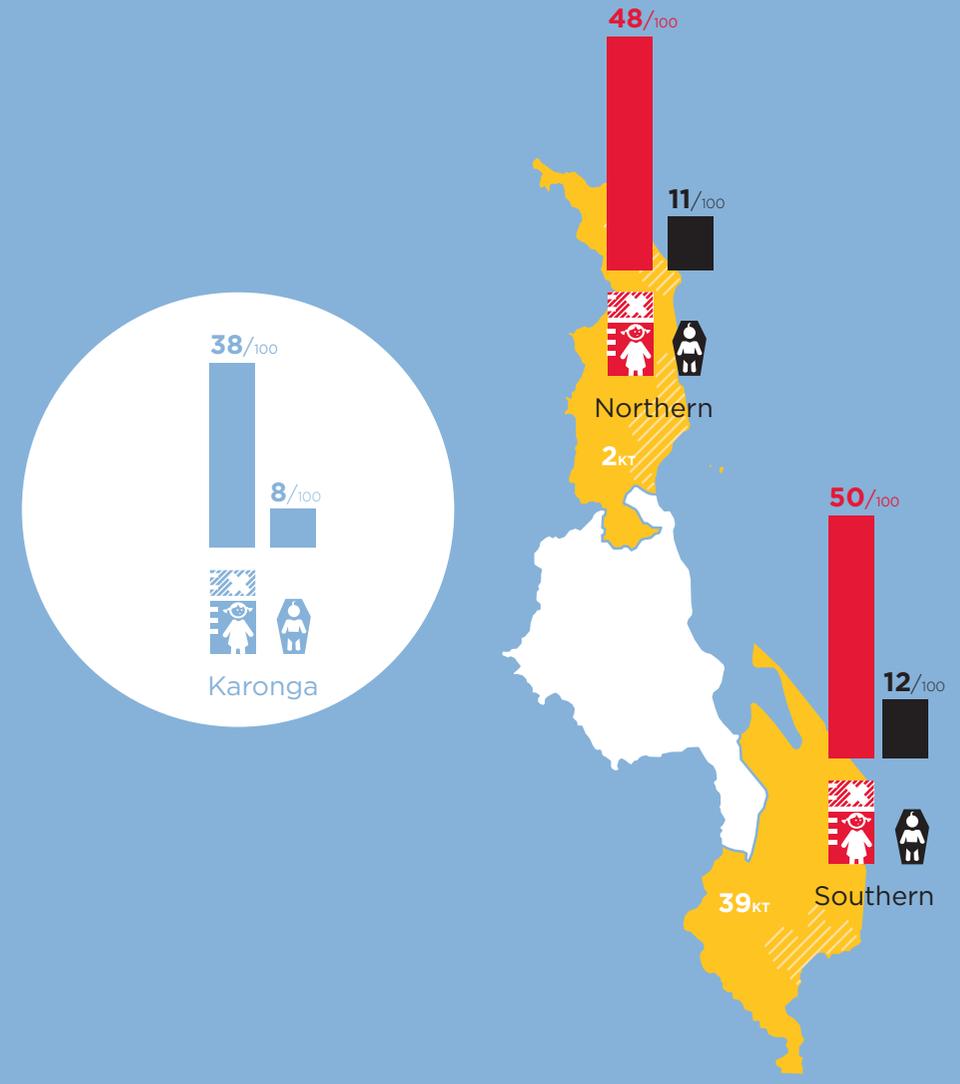
**Child mortality**  
under the age of 5

**Tea production area**  
Amount of production in KiloTonnes

# 4 Malawi

Under-nutrition and black tea production

11



**Stunting**  
reduced height of children

**Child mortality**  
under the age of 5

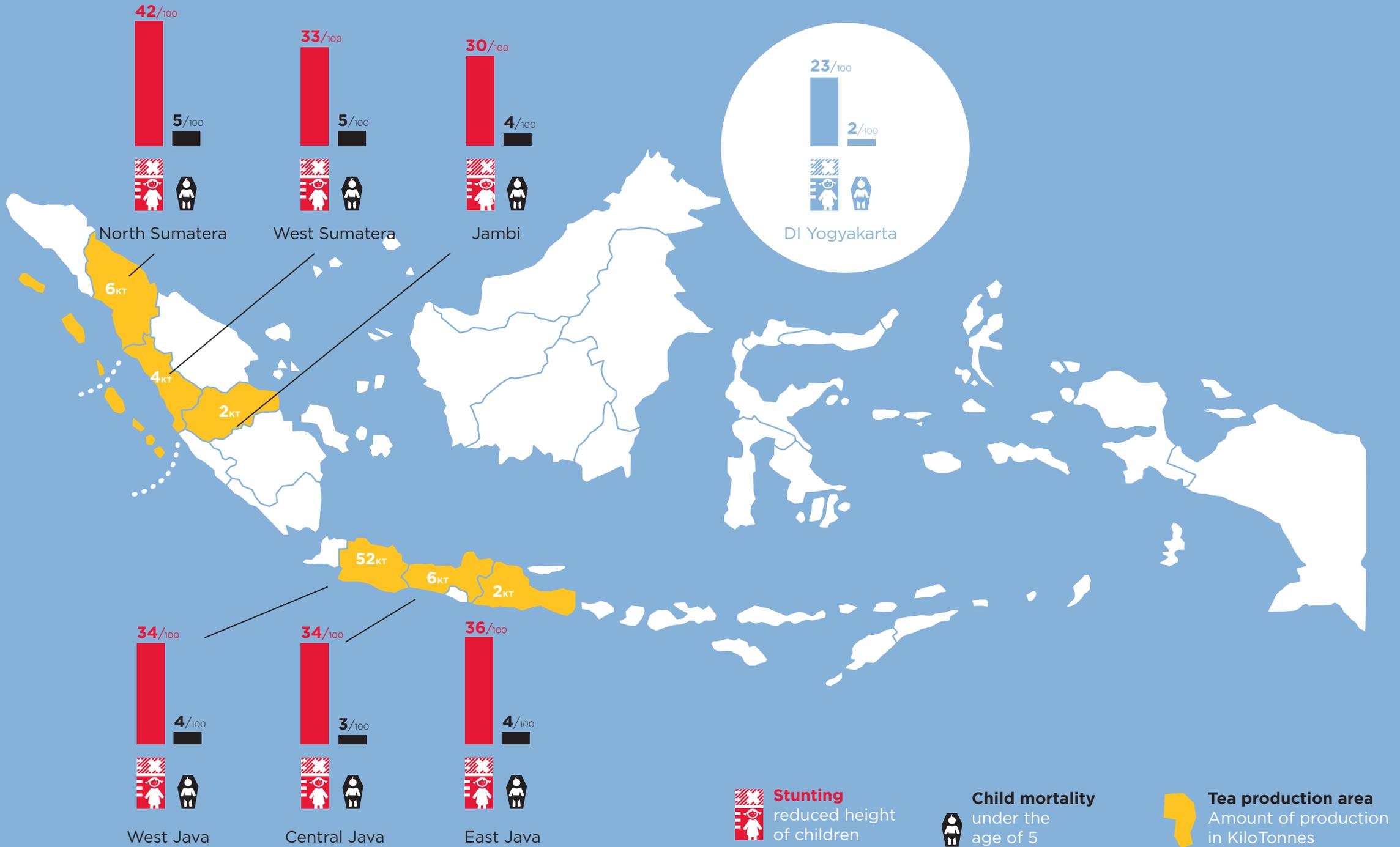
**Tea production area**  
Amount of production in KiloTonnes

# 5 Indonesia

Under-nutrition and black tea production

12

13



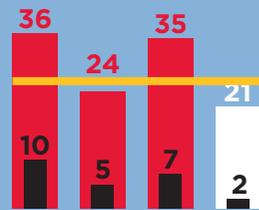
# Overview

Under-nutrition and black tea production

**Stunting**  
reduced height of children

**Child mortality**  
under the age of 5

14 India



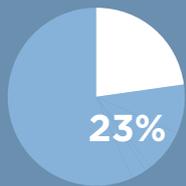
480  
Assam

191  
Tamil Nadu

230  
West Bengal

67  
Kerala

Percentage of world production <sup>22</sup>



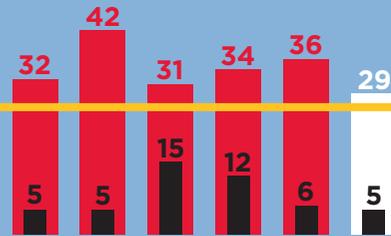
988 KT

Production 2011 <sup>21</sup>

Smallholder/Estate <sup>23</sup>

27 | 73

Kenya



105  
Central

38  
Eastern

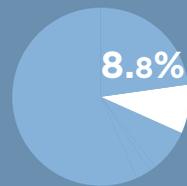
480  
Nyanza

3  
Western

192  
Rift Valley

0  
Nairobi

Percentage of world production <sup>22</sup>



378 KT

Production 2011 <sup>21</sup>

Smallholder/Estate <sup>23</sup>

60 | 40

Sri Lanka



102  
Central

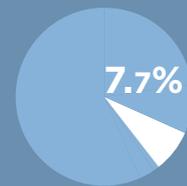
95  
Southern

34  
Uva

83  
Sabaragamuwa

0  
Colombo

Percentage of world production <sup>22</sup>



329 KT

Production 2011 <sup>21</sup>

Smallholder/Estate <sup>23</sup>

65 | 35

Malawi

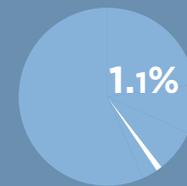


2  
Northern

39  
Southern

0  
Karonga

Percentage of world production <sup>22</sup>



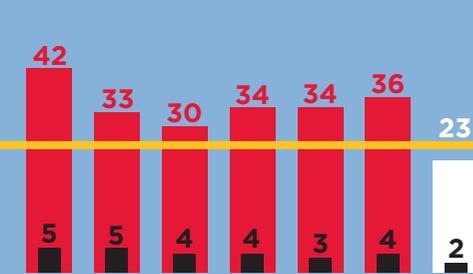
47 KT

Production 2011 <sup>21</sup>

Smallholder/Estate <sup>23,25</sup>

7 | 93

Indonesia



6  
North Sumatra

4  
West Sumatra

2  
Jambi

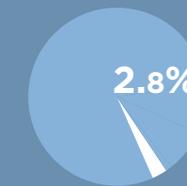
52  
West Java

6  
Central Java

2  
East Java

0  
DI Yogyakarta

Percentage of world production <sup>22</sup>



120 KT

Production 2011 <sup>21</sup>

Smallholder/Estate <sup>23,24</sup>

29 | 71

15

Stunting over 25:  
Intervention needed!

Tea production  
Amount of production  
in KiloTonnes

# IV Nutrition status of producing families

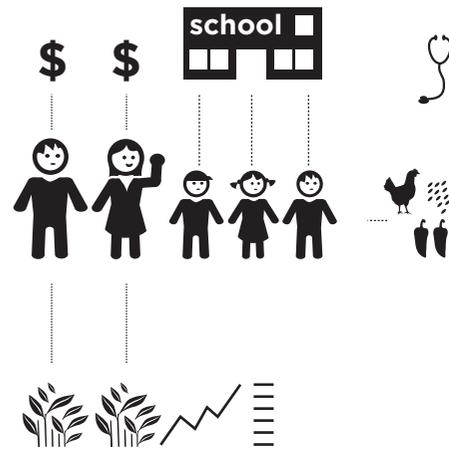
However, families in the tea producing provinces in India, Sri Lanka, Indonesia, Kenya and Malawi face high under-nutrition leading to poor health, reduced educational potential, and diminished immediate and future income.

## 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**

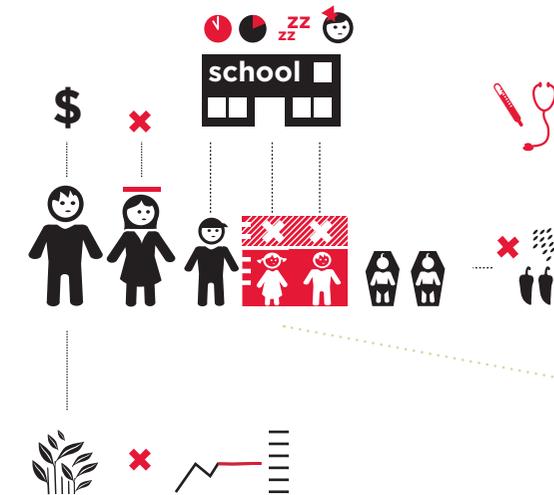
Agricultural production is improved due to higher labor productivity

Looking at a healthy farming household one can see that overall, improved nutrition can increase productivity and reduce poverty through improved physical work capacity, cognitive development, school performance, and health.

## Tea farming family facing under-nutrition

**POOR SCHOOL PERFORMANCE**

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



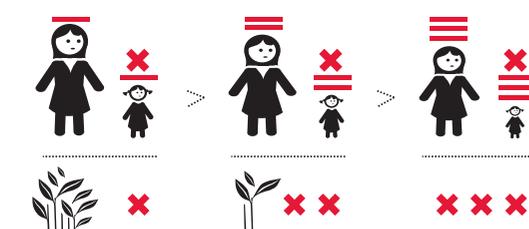
**POOR HEALTH**

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 tea due to reduced labour productivity



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

# V How to remedy this?



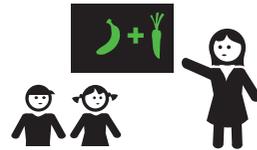
Nutrition sensitive value chains for local products



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 tea and the production process has been assessed, and both confirm to the requirements specified by the standard systems. Being part of a certification program provides many opportunities for the producer. A few examples include training, access to markets, and enhanced efficiency and revenues. Four global certification standards are relevant for the tea sector, namely: Fairtrade, Organic, Rainforest Alliance and UTZ Certified. Global certification programs are becoming more widespread in the past few years.<sup>26</sup> A fifth influential collective standard is the Ethical Tea Partnership (ETP). Tea-packing companies initiated ETP to promote social responsibility and encourage gradual improvement where necessary.

Additional productivity gains might be achievable in the tea sector if it invests in interventions promoting human nutrition security through a certification incentive. The following four interrelated interventions are designed to achieve improved nutrition for smallholder farmers in the tea value chain and their households.<sup>27,28</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 first increasing local production, then preserving and marketing affordable 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 through commercially viable value chains with push and pull factors.

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

Promoting household food 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. A comprehensive behavioural change campaign will support this intervention.

## 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 about good nutrition, health and sanitation practices through education programs.

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

The four given interventions particularly fit the context in which smallholder farmers operate and live. However, under-nutrition is a serious problem among plantation workers as well.<sup>29</sup> As a leading underlying cause for disease, there is a clear link between under-nutrition and the relatively high prevalence of plantation workers who stay home because they are sick. When plantation workers do come to work, it is often in a weak physical condition due to a lack of consumption of healthy food. This could be overcome, for example, by providing affordable nutritious meals on the plantation site.



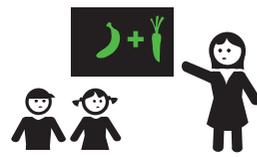
Encouraging backyard farming



Increased access to nutrient supplements by linking with public health services



Strengthening the role of women



Nutrition education

As plantations supply approximately 40% of tea in the world,<sup>30</sup> addressing these problems and at the same time increasing plantation workers' productivity will have a significant impact in raising worldwide production to meet growing demand, Four interrelated interventions proposed are:

#### 1. Encouraging backyard farming:

Plantation workers may not have as much land of their own as smallholder farmers do, but they do have small plots surrounding their own houses where it is possible to grow vegetables and fruits or keep small animals. Encouraging plantation workers to produce the five most nutritious vegetables as well as raising chicken in their backyard for their own consumption can make a difference in improving diets for their households.

#### 2. Strengthening the link with public health services for access to micronutrient supplementation:

Promoting programs in which plantation workers are provided with micronutrient supplements (Vitamin A, iron, zinc and iodine) have already sparked positive results at the plantation level for both worker health and productivity.<sup>31</sup> Plantation owners/management will have to cooperate with public health institutions. In some cases, like in India, programs for supplementation already exist and it is a matter of awareness and coordination of programs.<sup>32</sup>

#### 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 about good nutrition, health and sanitation practices through education programs.

By addressing the interventions described in combination with Good Agricultural Practices, local diets will be diversified and more nutritious resulting in healthier and more productive tea farmers and plantation workers. Ultimately, the industry benefits from a more productive future generation of tea farmers and plantation workers and, consequently, a more sustainable tea value chain.

## VI An example:

Nutrition and Food Security Component in the Lestari Sustainable Tea Program in Indonesia addressing 32,000 farmers and reaching more than 160,000 household members

Combining good tea producing practices with Good Nutritional Practices is the key to further improvement in rural communities. The Embassy of the Kingdom of the Netherlands in Jakarta will support this approach in financing the Food and Nutrition Component in the Lestari Sustainable Tea Program run by Business Watch Indonesia, IDH - The Sustainable Trade Initiative, Center for Development and Innovation (University Wageningen) and the Global Alliance for Improved Nutrition (GAIN). The intervention follows four parallel tracks to achieve nutrition improvement: nutrition sensitive value chains for local availability of nutritious foods, increasing household production of nutritious foods, strengthening role of women, and nutrition education for increased consumption of nutritious foods. The program aims to develop tools for increased availability and accessibility of nutritious foods in local markets, combined with an increased awareness of the benefits of consuming healthy meals for more than 160,000 household members.

With these 32,000 farmers already organized into farmer groups participating in local tea certification programs, this intervention is able to deliver the message of good nutritional practices to the decision makers of the households. Therefore the program is embedded into the tea farmer group training programs supported by the IDH Sustainable Trade Initiative. The program aims to increase consumption of nutritious foods for 32,000 farmers and their families; 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 tea value chains and more secure long-term access to quality raw materials.

## 24 **VII Call to action**

Michiel Leijnse, Global Brand Development Director, Unilever:

**Certified,  
sustainable tea  
is here to stay!**<sup>33</sup>

25

Today the tea sector in most producing countries is confronted with diminishing yields while the worldwide demand for tea grows steadily. But under-nutrition plagues the majority of producers in the major producing countries such as Indonesia, India, Kenya, Sri Lanka and Malawi. Unremitting under-nutrition leads to a vicious cycle of under-nourished tea families over generations. As a consequence, under-nutrition contributes to continuing productivity losses in the tea sector.

Looking at trends in the tea sector, around 11% of the global tea production is currently certified. Due to the extensive commitments from major tea companies, this share is estimated to reach 20% by 2016. This is largely influenced by Unilever's commitment, with a market share of 12%, to source all of their tea sustainably by 2020.<sup>34</sup> Ideally certification standards will integrate training tools on nutrition security as a mandatory element in their curriculum in areas of high malnutrition and tea production for smallholders and plantation workers.

Addressing nutrition security can be achieved by combining Good Agricultural Practices with Good Nutritional Practices, developing nutrition sensitive value chains for local products, increasing household based production of nutritious foods, strengthening the role of women and educating people about the importance of nutrition.

Investments in better nutrition have an exceptionally high benefits to cost ratio.<sup>35</sup> We encourage the tea industry to invest in nutrition sensitive tea chains in areas experiencing high rates of malnutrition to prevent future generations of undernourished tea producers and plantation workers with decreased productivity.

## VIII Footnotes

- 1 International Tea Committee (2012), *ITC Report 2012*, page 51.
- 2 Van Reenen, M., Panhuysen, S., Weiligmann, B. (2010) *Tea Barometer 2010, Tropical Commodity Coalition*
- 3 International Tea Committee (2012), *ITC Report 2012*, page 139.
- 4 SOMO (2008), *Sustainability Issues in the Tea Sector*
- 5 China is the main tea producing country, but with a high domestic consumption and main export to North-America. Type of tea produced is mainly green tea. Therefore not included in our country-overview.
- 6 World Bank (2007): *From agriculture to nutrition: Pathways, Synergies and Outcomes*, Report No. 40196-GLB
- 7 Copenhagen Consensus (2012): <http://www.copenhagenconsensus.com/Projects/CC12.aspx>
- 8 IFPRI (2011): *Global Hunger Index*
- 9 FAO (2012) *State of Food Insecurity in the World 2012*
- 10 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.
- 11 Copenhagen Consensus (2012): <http://www.copenhagenconsensus.com/Projects/CC12.aspx>
- 12 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.
- 13 Behrman and Rozenzweig (2001) / Hunt (2005)
- 14 Grantham-McGregor, Fernald, and Sethuraman (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

- 15 See references
- 16 [http://en.wikipedia.org/wiki/Child\\_mortality](http://en.wikipedia.org/wiki/Child_mortality)
- 17 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 Statistic
- 18 Black, R.E., Morris, S.S. and Bryce, J. (2003) *Where and why are 10 million children dying every year?*
- 19 United Nations (2012), *Levels & Trends in Child Mortality Report 2012*. (Accessed March 13, 2013) [http://en.wikipedia.org/wiki/Child\\_mortality](http://en.wikipedia.org/wiki/Child_mortality)
- 20 DHS (2010): Malawi: Demographic and Health Survey 2010.
- 21 International Tea Committee (2012), *ITC Report 2012*, page 51.
- 22 Ibid
- 23 Van Reenen, M., Panhuysen, S., Weiligmann, B. (2010) *Tea Barometer 2010, Tropical Commodity Coalition*
- 24 SOMO (2005), *Research on Supply Chain in the Tea Sector in Indonesia*. [http://somo.nl/publications-nl/Publication\\_3093-nl](http://somo.nl/publications-nl/Publication_3093-nl)
- 25 SOMO (2007), *Malawi Tea Research Project*.
- 26 Van Reenen, M., Panhuysen, S., Weiligmann, B. (2010) *Tea Barometer 2010, Tropical Commodity Coalition*
- 27 Wiegers, E., Van Dorp, M., Torgerson, S. (2011): *Improving nutrition through Agriculture*.
- 28 Van Dorp, M., Oenema, S., Verdonk, I. (2011) *Agriculture – Nutrition Linkages*.
- 29 Biswas, S. et al. (2005), *Nutritional Survey of Tea Workers on Closed, Re-Opened, and Open Tea Plantations of the Dooars Region, West Bengal, India*.
- 30 Van Reenen, M., Panhuysen, S., Weiligmann, B. (2010) *Tea Barometer 2010, Tropical Commodity Coalition*
- 31 Scholz B.D. et al., *Anaemia is associated with reduced productivity of women workers even in less-physically-strenuous tasks*, *The British journal of nutrition* 1997;77:47-57.
- 32 West Bengal Agricultural Workers' Association, International Union of Foodworkers and the American Jewish World Service (2005): *Nutritional Survey of Tea Workers on Closed, Re-Opened, and Open Tea Plantations of the Dooars Region, West Bengal, India*, p. 11.
- 33 Unilever: *Lipton Sustainable Tea Farming Video*. <http://www.unilever.com/brands-in-action/detail/Lipton/292025/?WT.contenttype=view%20brands>
- 34 Unilever: *Unilever Sustainable Living Plan*. <http://www.unilever.com/sustainable-living/>
- 35 Copenhagen Consensus (2004): <http://www.copenhagenconsensus.com/Projects/Copenhagen%20Consensus%202004/Outcome.aspx>

# IX References

Data are collected from the following sources:

## Malnutrition Data

### Child Mortality

**UNICEF (2011):** *The Situation of Children in India: A Profile.*

**DHS (2007):** *Indonesia: Demographic and Health Survey 2007.*

**DHS (2007):** *Sri Lanka: Demographic and Health Survey 2007.*

**DHS (2008/2009):** *Kenya: Demographic and Health Survey 2008 & 2009.*

**DHS (2010):** *Malawi: Demographic and Health Survey 2010.*

### Stunting

**WFP (2008):** *Report on the State of Food Insecurity in Rural India.*

**Riskesdas Indonesia (2010):** *Riset Kesehatan Dasar: Badan Penelitian Dan Pengembangan Kesehatan Kementerian Kesehatan RI Tahun 2010.*

**DHS (2007):** *Sri Lanka: Demographic and Health Survey 2007.*

**DHS (2008/2009):** *Kenya: Demographic and Health Survey 2008 & 2009.*

**DHS (2010):** *Malawi: Demographic and Health Survey 2010.*

## Black Tea Production Data

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## Colophon

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At the Centre for Development Innovation (CDI) we focus on the global challenges of food & nutrition security, sustainable markets, adaptive agriculture, ecosystem governance and conflict, disaster & reconstruction. CDI has forty scientific staff members that are active within these particular themes and are supported by 20 project support staff members. We link cutting-edge processes of innovation and learning with Wageningen UR's world-leading scientific and technical expertise.

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Driven by a vision of a world without malnutrition, GAIN was created in 2002 at a Special Session of the U.N. General Assembly on Children. GAIN supports public-private partnerships to increase access to the missing nutrients in diets necessary for people, communities and economies to be stronger and healthier. With a current daily reach of over 667 million people in more than 30 countries, GAIN's goal is to improve the lives of one billion people by 2015 within the most vulnerable populations around the world through access to sustainable nutrition solutions.

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