CONSULTATIVE BOARD ON THE WORLD COCOA ECONOMY
Twenty-ninth meeting

STUDY OF COCOA-BASED FARM MODELS
A CONCEPT NOTE

Philippe BASTIDE
London 15 September 2014
Cocoa production in the World

- Côte d'Ivoire: 39%
- Ghana: 20%
- Indonesia: 10%
- Brazil: 5%
- Dominican Rep: 2%
- Ecuador: 5%
- Peru: 2%
- Papua New Guinea: 1%
- Cameroon: 6%
- Others: 6%
- Nigeria: 5%
- Cameroon: 5%

Total production: 4.162.000 mt

Source: ICCO 2014
What are the challenges?
Challenges for the future of the cocoa

- To create a favourable environment in which farmers can significantly increase their income from cocoa-based farming, with a view to making cocoa-growing a sustainable and profitable business.

- To ensure conditions that will enable world supply to increase in such a way as to avoid the ongoing imbalance with respect to demand, which is growing at a rate of around 3% per annum.
For the producers
Challenges for the producers

• To cope with an increasing demand (+ 25% en 2020).

• To save en to enrich human, cultural heritages and hereditament.

• To live decently with incomes and revenues from sustainable cocoa farms.

• To innovate and develop new technologies to make cocoa cultivation for youth more attractive and more competitive and economically sustainable.
5 millions farmers, 4 millions mt/year, 10 millions hectares: is it sustainable? (today, at farm gate, 1 mt = 2400 $)
For the consumers
Challenges for cocoa Consumers

Industrials - Chocolatiers - final Consumers : 3 major pilars

➢ To comply with cocoa health-quality requirements : natural contaminants (mycotoxins, heavy metals) or chemicals (pesticides, herbicides, mineral oils and hydrocarbons, acrylamide...).

➢ To cope with product ethics increasing demand with a growing insistence on socially- and environmentally-sound farming systems;

➢ To increase and to secure cocoa product traceability and information from origins.
What we know from the fields
Agronomic traits and facts

• Tree Productivity very variable
  • From 3 to 200 pods per tree

• Production Costs very variable
  • De 100 à 4000 USD/ha/year

• Technical knowledge very variable
  • Empiricism, paradigm(s) and reality
  • From picking pods to tree crop management

= High Variability in Yields and farm management
from 80 kg/ha to 4,000 kg/ha

Word Average: ± 350 kg dry cacao/ha
Exemples d'associations

Cameroon

Brazil

Ecuador

Haïti
Intercropping and Agroforestry models
What we don’t know or we think to know

• 95% of 4,000,000 mt cocoa is produced by smallholders
  • Source of data?
  • Cultivated Surface? Yields?
  • Impact of pests and diseases

• Most of the fields are made of heterogeneous seeds from hybrids progenies
  • Real density facing the original investment?
  • Number or Rate of real productive trees?
  • Evaluation of competition between trees
  • Comparative studies about clones (grafting or cuttings) vs seedlings

• Relationship between Yield and Cocoa Beans Quality
  • Who knows about quality (organoleptic traits) and pods setting?
... and a few more questions to answer
... and paradigm to be fought

• Is a productive tree can really produce for more than (> 50 years).
  • What about the lessons learnt from others fruits crops

• Tree-selection criteria was -is already- largely based on vigour: is it efficient ?
  • Research in other fruit trees aimed at domesticating trees to reduce tree size and to increase fruit loads.

• What are the real efficiency of use of fertilisers and phytosanitary products and excessive water requirements by huge undomesticated trees ?
  • T. cacao is a tree with an high disequilibrium between vegetative growth and needs facing fruit production.
Two « opposite ways » yields gaps from 1 to 50

Conservative
Produce better to get more money

Innovative
Produce more to get more money

Productivity, Inputs, Costs

What are the good responses, the right keywords?

Sustainable development, Agroforestry, environmental services and biodiversity, Livelihood conditions, secured revenues.
It is now time to go deeply into a Cocoa-Based Farms Models study

• By the end, these two models –including all the intermediates- have rarely been compared and specific local and/or regional characteristics have largely been overlooked.
• It is very difficult to achieve a clear vision of how to move from one model to the other, particularly since they are often viewed in highly subjective terms.
• A number of tested and scientifically-validated solutions have been developed but they cannot be compared.
Cocoa-Based Farms Models Study

• Main Objective

Based on the use of state-of-the-art tools and an innovative diagnostic method, this study aims to provide a whole range of information for a better understanding on farms models to make cocoa farming more sustainable, more competitive and more remunerative, better adapted to the specific agricultural and socioeconomic contexts of different producing areas, and able to ensure the optimal use of space and inputs.
The study proposes to analyse the specific features of various cocoa-based farming models, in order to identify the factors governing the choices made and to identify solutions which are both technically and environmentally feasible and affordable for farmers,

Assumption 1: The domestication of cocoa trees leads to improved management going to fruits and reducing vegetative growth and development, which consumes large amounts of resources. The “carbon cost” of production has to be reduced.

Assumption 2: Faced with a given reference model, it is the farmer must take the final decision; the farmer remains the key factor governing the final technical/economic choice. He decide on any technical solution.
Methodology to be implemented
How to compare cocoa cropping systems?

- Biotic constraints
  - Pests & diseases
- Socio-Economical Environment
- Abiotic Constraints
  - Soil - climate

Cropping System A

Technical practices
Management

Environmental Performance

Social and economical Performance
  - Revenues and Livelihood conditions
Methodology to be implemented

How to compare cocoa cropping systems?

• Main criteria
  • Agronomic criteria
    ▪ detailed description of environment and management of cocoa-based farming system in terms of land, soil and climate, activities, ...
    ▪ descriptors such as planting material, surface area, density, yield, presence of shade, pests and diseases, associated crops, ...
  • Social criteria
    ▪ description of the structure and organisation of the business/farm
  • Economical criteria
    ▪ Data to quantify input – output flows including information on land tenure, costs and transmission.

• Covariables: Public institutions and their policies, key stakeholders, Professional bodies, main private investors, funders and donors, ...
Methodology to be implemented

How to compare cocoa cropping systems?

1st step: to define a cacao farms typology in each major producing region.
Methodology to be implemented

How to compare cocoa cropping systems?

2nd step: to arrange cacao farms systems

Productivity (Profitability ?)

Evolution to higher yields (and Incomes ?)

Evolution to a new system

Performances
Expected Results and Outcomes

• Production of a technical manual with summary records of the major systems found (10 to 15). A multi-entry matrix table will allow cocoa based systems to be compared with each other on the basis of previously-defined key criteria.

• More in-depth case studies (3-4) to provide documented recommendations to farmers based on technical, social and economic criteria.

• Later, a second stage of the study could seek to develop business plans for the most economically socially and environmentally viable—small and medium size-cocoa farm models.
## Cost estimate for a 6 months study

### (in €)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Sub Total</th>
<th>5% Cont</th>
<th>Total Cost</th>
<th>ICCO</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>International consultant</td>
<td>days</td>
<td>60</td>
<td>600</td>
<td>36 000</td>
<td>1 800</td>
<td>37 800</td>
<td>37 800</td>
<td>37 800</td>
</tr>
<tr>
<td>B</td>
<td>Local consultants</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td></td>
<td>Indonesia</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td></td>
<td>Brazil</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td></td>
<td>Ecuador</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td></td>
<td>Côte d’Ivoire</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td></td>
<td>Ghana</td>
<td>days</td>
<td>15</td>
<td>400</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td>C</td>
<td>Review of litterature</td>
<td>Months</td>
<td>6</td>
<td>500</td>
<td>3 000</td>
<td>150</td>
<td>3 150</td>
<td>3 150</td>
<td>3 150</td>
</tr>
<tr>
<td>D</td>
<td>Meetings in London</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 100</td>
<td>2 100</td>
<td>2 100</td>
</tr>
<tr>
<td></td>
<td>International consultant - Flight</td>
<td>Unit</td>
<td>2</td>
<td>250</td>
<td>500</td>
<td>25</td>
<td>525</td>
<td>525</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International consultant - DSA</td>
<td>Unit</td>
<td>6</td>
<td>250</td>
<td>1 500</td>
<td>75</td>
<td>1 575</td>
<td>1 575</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Manual dissemination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9 450</td>
<td>9 450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Translation / French &amp; Spanish</td>
<td>Unit</td>
<td>2</td>
<td>1 000</td>
<td>2 000</td>
<td>100</td>
<td>2 100</td>
<td>2 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Printing with cover</td>
<td>Unit</td>
<td>300</td>
<td>20</td>
<td>6 000</td>
<td>300</td>
<td>6 300</td>
<td>6 300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dissemination</td>
<td>Unit</td>
<td>100</td>
<td>10</td>
<td>1 000</td>
<td>50</td>
<td>1 050</td>
<td>1 050</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GRAND TOTAL (A + B + C + D + E)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>84 000</strong></td>
<td><strong>27 300</strong></td>
<td><strong>56 700</strong></td>
</tr>
</tbody>
</table>

### Source of funding
- ICCO
- Others
Thank you for your attention