



How to get higher prices for Yunnan green coffee?

TECHNICAL REPORT

Mission to China from November 1st to 11th, 2010

Franck Galtier
CIRAD ES – UMR MOISA

Michel Jacquet
CIRAD PERSYT – UMR QUALISUD

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Executive summary

The Institute of Tropical and Subtropical Cash Crops (ITSCC), which is under the Yunnan Academy of Agricultural Sciences (YAAS) asked Cirad to conduct a survey on the following topic:

“Improving the marketing in order to get higher prices for exported coffee”

Two Cirad experts, Dr. Franck Galtier and Dr. Michel Jacquet, were sent to China and stayed in Yunnan from November 1st to 11th to be entrusted with this task.

After an analysis of the present situation, the Cirad experts were in position to present a scheme of the Coffee value chain in Yunnan; they also analysed the role and strategy of the actors involved in coffee sector.

Some succinct price structures were elaborated to evaluate the margin of exporting companies as well as the percentage of international price actually received by the producer.

In relation with data collected and observations, a SWOT analysis was established and used to formulate a set of recommendations with the aim of improving the Coffee value chain:

- Analysis of the relevance of different certification schemes to market the coffee from Yunnan;
- Proposals for improving the organisation of the marketing system that connect coffee growers to the international market.

The main conclusions are:

1. International market is the relevant target for Yunnan coffee (imported Robusta is more competitive to supply Chinese roasters)
2. As Yunnan coffee is mainly washed Arabica, it can potentially get high prices on international market.
3. However, as the main variety (Catimor) has a low potential for quality, getting higher process means switching to others varieties with good agronomic performances and high quality potential (such as Caturra)
4. New varieties should be tested in Yunnan from the point of view of agronomic performance, quality and buyers' willingness to pay. The best ones should be disseminated to the farmers
5. The post-harvest process is not always managed as it should be in order to get high quality green coffee
6. Equipment and knowledge have to be disseminated in order to improve the quality of post-harvest process
7. Improvement of varieties and post-harvest process are complementary: good varieties provide a potential for quality, but this potential can be destroyed by a bad post-harvest process. On the other hand, a good post-harvest process will lead to a high quality coffee only if the varieties used have a potential for quality. This means that the actions to improve the varieties and the post-harvest process are complementary and should be developed simultaneously.

8. In order to increase the quality of the varieties and the post-harvest process, it is necessary to provide *at the same time* the means to produce quality (knowledge and material) and the corresponding incentives. Indeed quality is costly and will be produced only if it is rewarded by a higher price on the market. The practical consequence of this is that actions on knowledge, material and equipment as well as incentives are complementary and should be developed simultaneously.
9. The best way to provide incentives is to introduce requirements in the Code of practices of the Geographical indications (we recommend to do it for good post-harvest practices) or criteria in the Classification scheme (we recommend to do it for varieties)
10. In addition to varieties and post-harvest practices, other attributes can be added to Yunnan coffee: environmental, social or symbolic attributes. In order to give a value to these attributes, it is possible to rely on existing labels such as Organic or Fair Trade. However, it is also possible to rely on Geographical indications (by including these attributes in the Code of practices).
11. The Geographical indications will play a key role in the quality improvement strategy. That is the reason why the coordination between the two Geographical indications should be improved. We recommend that the two GIs should use the same Classification scheme and should do the promotion jointly. A more ambitious scenario is to merge the two GIs (in this case the differences between the coffees of the two sub-regions can be maintained by introducing the sub-region as a criterion in the Classification scheme)

In accordance with the approaches already developed by the Institute of Tropical and Subtropical Cash Crops (ITSCC) in close cooperation with Coffee-bases and Coffee Associations, the experts recommended a research and development programme:

- A set of activities will be implemented to improve coffee quality through research and extension:
 - Introduction of high quality and productive germplasm,
 - Study of agronomical behaviour at field level for traditional and newly-introduced material in different environmental conditions,
 - Quality control of these materials in relation with post-harvest processing technology,
 - Estimation of the potential premium that can be obtained for the new varieties (well processed)
 - Elaboration of complete packages privileging quality and environment-friendly practices.
- Two applications for geographical Identification already launched by the Coffee Associations should be continued and strengthened. The components of the GIs (especially the Code of practices and the Classification scheme) should be completed. The coordination between the two GIs should be improved. At least, the Classification scheme should be the same for the two GIs and the promotion has to be made jointly.
- Agreements should be negotiated and signed between the Institute of Tropical and Subtropical Cash Crops (ITSCC) and Cirad to facilitate training directed to Chinese scientists working in coffee.
Cirad could also help ITSCC identifying other scientific and technical partners.

1. Introduction

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“Improving the marketing in order to get higher prices for exported coffee”

Two Cirad experts, Dr. Franck Galtier and Dr. Michel Jacquet, were sent to China and stayed in Yunnan from November 1st to 11th to be entrusted with this task: the present report presents their analysis and recommendations expressed after their field-work.

The ability to get high prices for an export commodity as coffee depends on:

- (i) The positioning on the product on specific market niches,
- (ii) The organization of the marketing system which links the farmers to the international market.

As part of their short-term assignment to Yunnan, the two experts met some prominent actors involved in the coffee sector and operating in the Project area, mainly Puer (Simao) and Baoshan Cities:

- Professional organizations,
- Farmers’ representatives,
- Intermediary traders (or middlemen),
- Commercial Companies and exporters,
- Roasters distributing coffee on domestic market.

Taking into account the information collected, the experts were in position to elaborate a scheme of the present Coffee value chain defining the role and strategy of the actors currently involved.

Some succinct price structures were also evaluated in accordance with the conventional marketing channels.

As a conclusion, a SWOT analysis has been deduced from this diagnosis.

Through this assessment, the experts were enabled to formulate a set of recommendations with the aim of improving the Coffee value chain in Yunnan:

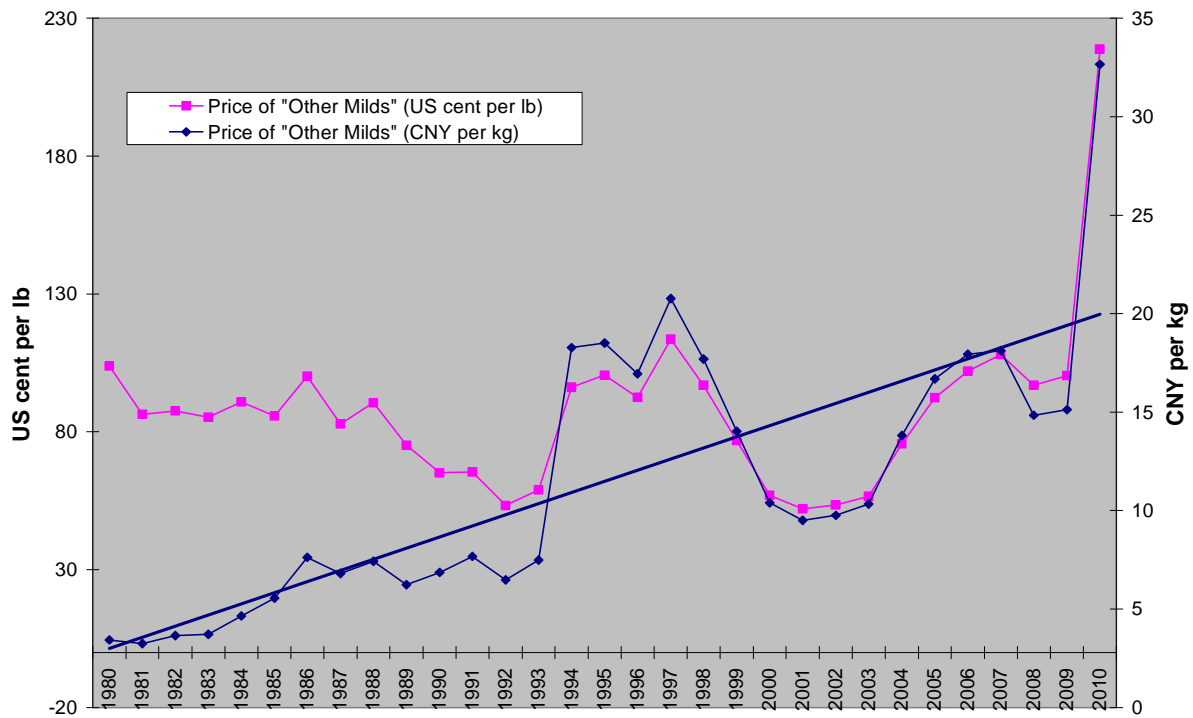
- Analysis of the relevance of different certification schemes to market the coffee from Yunnan;
- Proposals for improving the organisation of the marketing system that connect coffee growers to the international market.

2. Coffee production in P. R. China

2.1 Coffee production and consumption in P. R. China

Expressed in Chinese Yuan, the international price of coffee has followed an increasing trend from 1980 to 2010 (*cf.* graph 1). This is mainly due to the evolution of the exchange rate of the Chinese Yuan, especially during the period 1980 – 1994.

Graph 1: Evolution of the international coffee price (in US \$ and CNY)

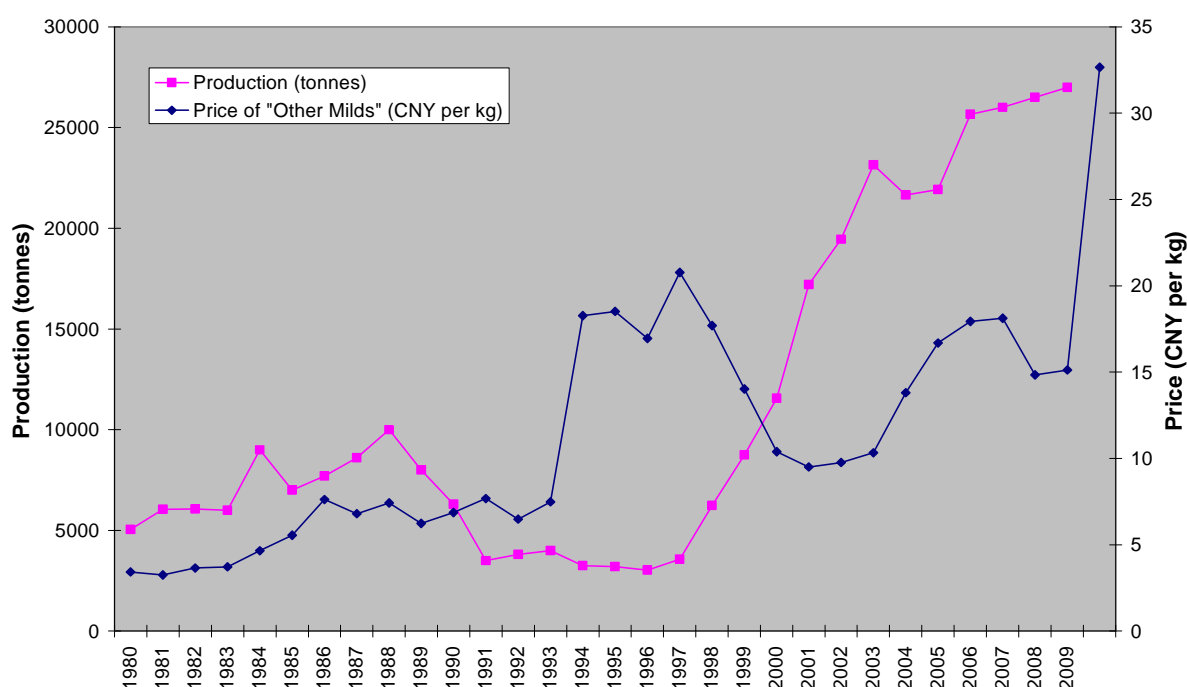


Source: ICCO

This positive trend of the coffee price (expressed in Chinese Yuan) gave a favourable environment for the development of coffee production in China. Nevertheless, the boom of coffee production has been induced by the strong increase in prices of the 1990s. Indeed, the production followed the positive trend of prices with a 5 years - lag (*cf.* graph 2). This lag is due to the time needed by the new coffee trees to begin to produce beans.

It should be noticed that the production level has *not* decreased with the decrease in prices occurred at the end of the 1990s level. Indeed, the production has continued to grow at a lower rate (*cf.* graph 2).

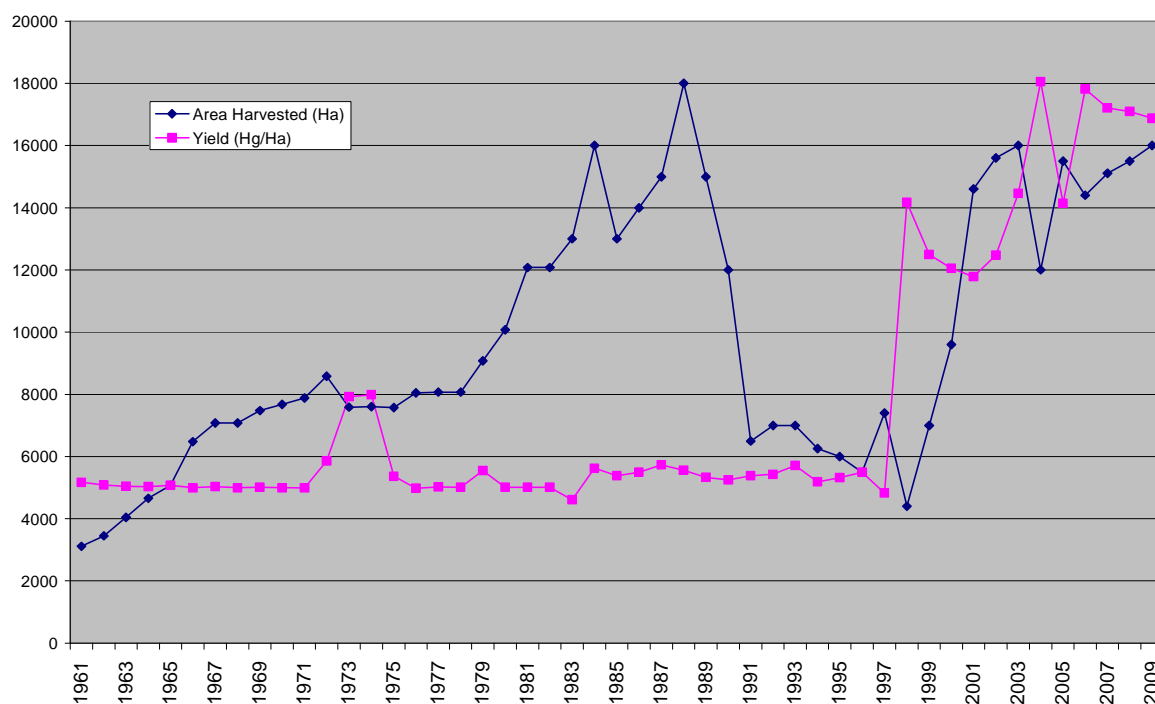
Graph 2: Evolution of the price and production of coffee in China



Sources: ICCO for prices and FAOSTAT for production

More detailed data suggest that, in the 1990s, the boom in coffee production was due to an increase of the coffee area *and* to an increase in yields (*cf.* graph 3). Both parameters (area and yields) have maintained their level in spite of the decline of price since the end of the 1990s.

Graph 3: Evolution of the coffee area and coffee yield in China



Source: FAOSTAT

The fact that area and yields have maintained their level in spite of the strong decline in price since the end of the 1990s suggests that coffee production is highly profitable in China or that it benefits for a strong political support.

At present, Chinese annual production represents 36 000 tons of marketable green coffee (in 2009):

- 30 % is sold on the domestic market,
- Approximately, 70 % is exported.

30 years ago, Hainan was the main Chinese coffee producing area but its production was almost annihilated due to repeated typhoons. Hainan coffee-land is currently reduced to 400 ha of *Canephora* coffee. At present, Yunnan accounts for 98 % of national production.

Only Arabica is grown in Yunnan, mainly in Puer and Simao Cities. Puer City alone produces 64 % of Chinese coffee on 15 000 ha.



On the other hand, China imports 40 000 tons of green coffee mainly from Vietnam, Brazil, Indonesia, Colombia and Africa. According to some sources, about 86% of coffee imports are coming from Vietnam (ITC 2010). This suggests that Vietnamese coffee is more competitive than Chinese coffee to supply Chinese roasters, in spite of taxes applied on green coffee imports and exports. The reason may be linked to the difference of quality between these coffees: Vietnamese *Canephora* coffee (Robusta) is much cheaper than the Chinese one which is Arabica. As coffee consumed in China is almost exclusively instant coffee, Robusta is a relevant input for Chinese roasting industry. This idea is supported by the fact that Robusta accounts for 85% to 95% of the green coffee imported by China (ITC 2010).

The current level of per capita consumption is very low in China (about 0.02 kg per year). However, as coffee is almost consumed only in cities, taking into the growing of Chinese urban population, it can be estimated that the per capita consumption will reach about 0.05 kg per year. However it does not represent a big opportunity for Chinese coffee farmers, as this consumption will more likely be satisfied by (imported) Robusta coffee.

Part of the locally grown coffee can feed the Yunnan roasting industry (for local consumption). But considering the size of this demand, it will remain a niche market for the Chinese coffee beans.

Therefore, it can be inferred that the main market opportunities for Yunnan coffee will be outside the country. **The challenge is to get higher prices for exported green coffee.**

According to some sources, a top level for green coffee production should eventually be reached within 7 years, provided that the Government facilitates the necessary support to coffee industry through land allocation to producers and coffee prioritization in crops to be promoted.

In Yunnan, 8 000 additional ha should be planted with coffee trees before 2015¹. Nevertheless, up to now, there is no plan to provide coffee-farmers with extra land. There is more land resources for coffee in Puer but Baoshan receives more rainfalls.

¹ Other sources mentioned much more ambitious objectives. According to Starbucks (which signed an agreement with YASS and People Government of Puer City in November 2010), the provincial government plans to invest CNY 3 billion in order to increase coffee production from 38,000 to 200,000 by 2020. At the same time, the coffee area is estimated to increase from its current level of 26,700 hectares to 100,000 ha in 2020.

2.2 Plantations and varieties cultivated

Yunnan coffee area is located at North latitudes ranging from 21.5 to 26.0° and an elevation of 800 - 1 200 m.

The size of coffee-farms ranges from 100 to 1 000 Mu (i.e. from 6.7 to 66.7 ha).

In 1988, coffee planting started from nurseries with official help. The vegetal material was originally introduced from abroad: Brazil, India Colombia and Portugal. The seeds and seedlings are distributed to producers from Coffee-bases operated as public enterprises by Coffee Associations, with a governmental support. Coffee-bases manage plantations and a set of facilities to process coffee and prepare seeds and seedlings.

Hongji Coffee Experimental and demonstration Base in Puer:

Hongji Coffee-base is in charge of producing and disseminating selected seeds and seedlings, which are sold to producers at very low prices. Seed delivery comes with a complete package of training in agronomic husbandry and post-harvest management.

The Coffee-base belongs to the Coffee Department and benefits from a financial support given by the Ministry of Agriculture as part of a Project, which is due to be ended in December 2010. Nevertheless, the activities will continue, since an additional funding will be received in the future for operational costs: the Project will be operated as a public enterprise.

Hongji Coffee-base manages coffee-land and a set of facilities:

- 200 ha of coffee plantations produce seeds but also dry parchment coffee to be marketed.
A high percentage of coffee trees corresponds to Catimor and S-288; Typica and Bourbon are also present but not too much.
- A set of facilities allows post-harvest processing to be conducted.

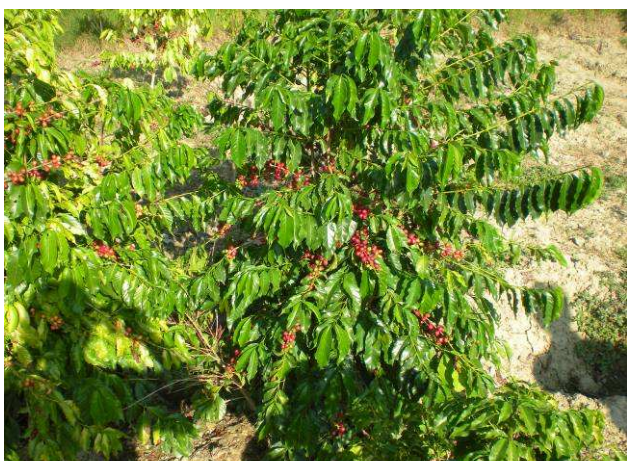
Coffee farms are mostly planted with Catimor and S-288 with a little percentage of Typica and Bourbon. In accordance with Base-experimentations, Catimor was recognized as more suitable for an elevation of 800 - 1 200 m with a better resistance to draught and coffee-rust. Although it is not a major constraint, coffee rust is difficult to control at farm level.

Fresh coffee cherries are harvested from October to March, with a peak period in November-December.

A majority of smallholders grows coffee in Lujiang Basin (Baoshan City) and it is difficult to unify them to organise collection.

Characteristics of coffee growing in Puer City:

- City superficies: 45 000 km²
- City population: 2.5 millions inhabitants
- Coffee area: 230 000 Mu (15 333.3 ha)
- Total yield: 23 200 tons of green coffee/ year
- Objectives within 5 years: 380 000 Mu (25 333.3) are targeted
With a total yield of 70 000 – 80 000 tons of green coffee/ year
- Average size of farms: From 100 to 1 000 Mu



Picture 1: Coffee tree with ripe cherries at ITSCC Coffee Base in Lujiang, Baoshan



Picture 2: Nursery at ITSCC Coffee Base in Lujiang, Baoshan

3. Description of coffee post-harvest processing and supply chain in Yunnan

All Arabica coffee cherries, harvested in Yunnan, are submitted to wet-processing.

3.1 Wet-processing at farm level

Some farmers own facilities and are able to process the fresh cherries from their orchards, generally through small-scale units including the following equipments:

- Pulpers driven mechanically or by hand, which are locally made or imported from Brazil or Colombia;
- Fermentation tanks fitted with transfer and washing channels;
- Raised-beds or concrete floors for sun-drying.

The facilities at farm level are often in poor conditions.

When wet-processed, the dry products are sold by the farmer to a middleman or a commercial company:

- Parchment coffee after sun-drying,
- Green coffee after sun-drying and hulling, generally subcontracted to a local entrepreneur.

The middleman eventually conducts or subcontracts hulling to a local entrepreneur; then he sells the green beans to a bigger commercial company.

The commercial company is able to carry out the full process and obtain the marketable green beans, which are subsequently directed to internal distribution or export.

3.2 Sale of fresh cherries by the farmers

When a farmer prefers to sell his fresh cherries immediately after picking, two options are possible:

- The cherries are delivered to another producer, who owns wet-processing facilities and operates as a middleman.
- A commercial company purchases the fresh cherries, carries out the full process and obtains marketable coffee for internal distribution or export.

The commercial companies own wet-processing facilities including the following equipments:

- Wet-processing machinery:
 - Dry-reception hoppers,
 - Elevators,
 - Electrically-driven pulping lines, often including machines imported from Colombia or Brazil: pulpers, re-passers and up-flow mucilage removers,
 - A set of tiled fermentation tanks with the corresponding transfer and washing channels;

- Large concrete sun-drying floors;
- Eventually, mechanical rotary dryers.

The facilities operated by the commercial companies are generally modern and properly maintained.



Picture 3: Pulper in bad condition operated by a middleman in Xing Zhai, Lujiang



Picture 4: Pulping unit imported from Colombia at UNI-Rise Tropical Crop Development in Lujiang



Picture 5: Parchment coffee sun-drying at Hongji Coffee Base in Puer



Picture 6: Large concrete sun-drying floor at Puer Sunlight Coffee Co. Ltd



Picture 7: Tiled fermentation tanks at UNI-Rise Tropical Crop Development in Lujiang, Baoshan



Picture 8: Mechanical rotary dryer at UNI-Rise Tropical Crop Development in Lujiang, Baoshan

3.3 Terminal processing to obtain marketable green coffee

As previously mentioned, the companies buy coffee in different forms:

- Fresh cherries from the producers,
- Parchment coffee or green beans from different sources: the producers themselves or the middlemen.

In all cases, a terminal processing aim at obtaining the marketable green coffee is operated at companies' level; the companies conduct a sequence of operations, as follows:

- The parchment coffee is firstly hulled and sorted through a set of machines:
 - Pre-cleaner de-stoners,
 - Hullers,
 - Polishers,
 - Size-graders,
 - Density sorters fitted with a set of screens,
 - Transport and storage equipments such as elevators, conveyors and hoppers.

These facilities are often imported from Brazil (P & A Marketing) or Vietnam (Thien Phat in Nha Trang).

- A terminal sorting is carried out with colorimetric sorters. A Chinese enterprise (Jie Xun Co.) is able to make and provide this equipment. After colorimetric sorting, the best grades are spread out on conveyor belt to be submitted to an additional hand-sorting by a team of ladies.



Picture 9: A set of hullers made in Vietnam by Thien Phat at Puer Sunlight Coffee Co. Ltd.



Picture 10: A huller made in Brazil by P. & A. Marketing, at UNI-Rise Tropical Crop Development Co. Ltd. in Lujiang, Baoshan



Picture 11: Grader made in Vietnam by Thien Phat at Puer Sunlight Coffee Co. Ltd.



Picture 12: Density sorter made in Vietnam by Thien Phat at Puer Sunlight Coffee Co. Ltd.



Picture 13: Colorimetric sorter made in China at Puer Sunlight Coffee Co. Ltd.



Picture 14: Colorimetric sorter made in China at UNI-Rise Crop development Co. Ltd. in Lujiang, Baoshan

3.4 Classification patterns

The companies use different classification systems, generally adopted in accordance with their buyers' requirements; however, the following patterns are currently recommended by the Puer Coffee Association:

Grade	Screen (Hole diameter in 1/64")	% of each grade of obtained in marketable coffee
AAA	> 18	20%
AA	> 16	60%
A	> 14	20%

4. The coffee value chain in P. R. China: actors and structure

Currently, a very small share of the coffee grown in Yunnan is devoted to Chinese consumption. According to some coffee actors' forecasts, this share may increase in the future as Chinese coffee consumption is expected to rise. It is true that the Chinese domestic market is increasing rapidly. However the idea that Chinese grown coffee will be more and more used for national consumption is not supported by the past evolution of production, consumption and international trade (see chapter 2). The most probable evolution is that the coffee grown in Yunnan will be mainly exported.

Therefore, regarding the objective of getting higher prices for Yunnan coffee, the most important part of the coffee market chain is the one linking farms to export companies.

The most important characteristic of this market chain is the lack of incentives for quality. The coffee is usually paid at the same price whatever its quality. Good varieties such as Typica or Bourbon received the same price as Catimor. Well processed coffees are usually not receiving a price premium. This does not give incentives to the farmers and the other stakeholders to choose high quality varieties and to adopt good practices for growing and processing their coffee.

As we will see later on in this chapter, currently, the only quality attributes which are (slightly) rewarded by the market are the elevation and the sub-region (see section 4.4.1). Indeed, Simao and Boashan coffees are separately marketed and Simao coffee usually obtains better prices, since it is generally preferred due to a specific flavour and higher acidity.

4.1 The actors of coffee value chain in P. R. China

Different groups of actors operate as part of coffee value chain in accordance with activities respectively related with production, wet-processing, terminal processing, marketing, export roasting and domestic distribution.

In this paragraph, the role of each group of actors involved in the coffee value chain is defined and described below:

4.1.1 The farmers

A producer owns a coffee-farms ranging from 6.7 to 66.7 ha; he grows coffee-trees and harvests ripe coffee cherries from October to March, with a peak period in November-December. The marketing campaign starts in early December.

- Farmers owning wet-processing facilities
Some farmers have wet-processing facilities at their disposal and are able to prepare dry parchment coffee.
In that case they can sell dry parchment coffee or raw green coffee, after subcontracting the hulling to a hulling-unit.

The farmer sells the dry products (dry parchment coffee or raw green coffee) to a middleman or a commercial company.

- Farmers without wet-processing facilities

In that case, the farmer sells the fresh cherries to a commercial company or another farmer located in the neighbourhood, who owns wet-processing facilities. In that case, the latter acts as a middleman.

4.1.2 The middlemen

The middlemen buy coffee from farmers; they own generally warehouses and vehicles for coffee transportation.

Some middlemen buy the dry products (dry parchment coffee or raw green coffee). Whereas he buys dry parchment coffee, the middleman operates or subcontracts hulling to a hulling-unit with the aim of obtaining the raw green coffee.

When the middleman owns wet-processing facilities, he is able to buy fresh cherries and process them up to raw green coffee.

The middlemen deliver the raw green coffee to commercial companies.

4.1.3 The hulling-units

Some hulling-units operate hulling as a service at farmers' or middlemen's request.

4.1.4 Commercial companies: Exporters, roasters and instant-coffee makers

In Yunnan, the number of the biggest companies involved in coffee marketing is 8-9 (50% are exporters, 50% roasters).

There are also other smaller-scale companies.

The biggest companies either distribute internally or export green coffee according to the opportunities.

(a) Exporters

The commercial companies buy all forms of coffee (cherries, dry parchment coffee or raw green coffee) from the middlemen or directly from the farmers.

Some companies manage large plantations and can also be considered as coffee producers.

Parchment coffee is purchased after sampling and control at the entrance of the factory:

- The physical aspect and defects are analysed.
- Some companies employ experienced cuppers to test the coffee they buy.

The companies operate large factories allowing them to conduct a full process: up to marketable green coffee:

- Wet-processing,
- Hulling,

- Grading and size-Sorting,
- Eventually Colorimetric sorting,
- Terminal hand- sorting.

The companies also own warehouses and trucks for coffee transportation.

When the marketable green coffee is obtained, two options are possible:

- The coffee beans are sold to a roaster to be distributed on the domestic market.
- The coffee beans are exported.

Two prominent Coffee Companies in Yunnan:

- **Puer Sunlight Coffee Co. Ltd.**
 - The Company started its activities in 2002.
 - Its present factory was constructed in Puer 6 years ago.
 - 10 000 tons of marketable green coffee were processed and marketed last year; the main part of this product was exported to UK, Belgium, Germany, the Netherlands and France.
 - The Company processes and commercialises one third of green coffee exported by China.
- **UNI-Rise Tropical Crop Development Co. Ltd.** is installed in Lujiang (Baoshan City) and owns:
 - A coffee base producing 1 000 tons of green coffee per year;
 - A set of processing facilities corresponding to a capacity of 5 000 tons of green coffee per year in Lujiang.

The company processes 2 000 – 3 000 tons of green coffee per year: its own production plus 1 000 – 2 000 tons bought from farmers and middlemen.

Coffee is exported or internally distributed. Exports are directed to the following Companies: Starbuck's, Nestle (in Japan), and European traders in UK, Germany and France.

In 2009, the Company obtained the “green-food” seal, an internal Chinese standard regarding pesticides residues and CO₂ emissions.

The Company belongs to a Group which owns:

- A similar but a little smaller factory in Simao carrying out the following operations:
 - Classification for export,
 - Packaging and sales directed to the domestic market or export.
- A roasting factory in Shanghai.

The Group imports green coffee from Colombia, Brazil, Indonesia and Africa, and then distributes it to other provinces and roasting factories.

The Group owns also coffee bars in Shanghai.



Picture 15: Small-scale roasters for coffee samples at UNI-Rise tropical Crop Development Co. Ltd. In Lujiang, Baoshan



Picture 16: Preparation of coffee for cupping at UNI-Rise tropical Crop Development Co. Ltd. In Lujiang, Baoshan

(b) Roasters

The quantities of roasted coffee elaborated in Yunnan are not very high; the biggest roasting enterprise operating in China is a state-owned company: Shanghai Coffee Factory.

Moreover, five other important roasters quoted in the following table are also active:

Location	Comments
Zhu Hai City (in Guang Dong Province) Close to Macao	The manager originates from Hong Kong and has an experience in marketing.
He Bei Province Close to Huang Ho River	This plant is operated by Chinese and Italian entrepreneurs.
Beijing	A firm, managed by a Japanese director is equipped with the latest machinery and elaborates a high quality roasted coffee.
Beijing	An enterprise is run by two American students.
	A Japanese company, called Yuseise.

The enterprises above mentioned roast mostly green coffee imported from other countries, but often they mix Yunnan coffee beans and imported origins.

We have already quoted that beside the 36 000 tons of green coffee produced in China 40 000 tons are imported to be roasted for domestic consumption.

In China, roasted coffee is distributed in supermarkets as well as in attractive coffee-shops. Coffee cups, espresso, cappuccino and latte are highly demanded in the bars.



Picture 17: Attractive coffee shop in Da Li, Yunnan



Picture 18: Attractive coffee shop in Da Li, Yunnan

The coffee value chain in Puer, Yunnan:

All coffee from Puer is wet-processed:

The total wet-processing capacity available in Puer reaches 120 000 tons of fresh cherries per year:

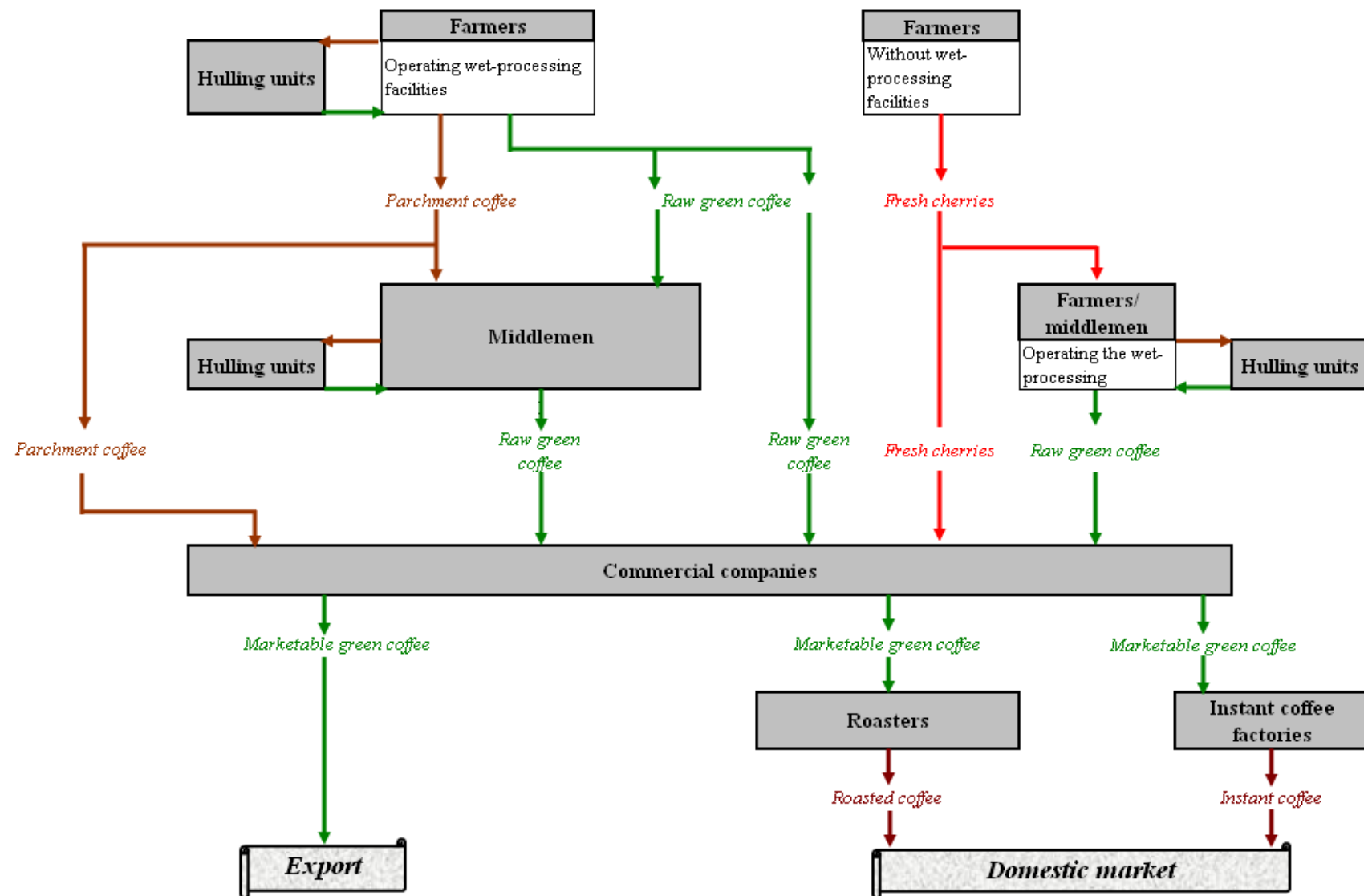
- Small holders process their fresh cherries through small scale equipments (sometimes hand-driven pulpers).
- Bigger farmers deliver their fresh cherries to a neighbouring plantation already equipped with processing facilities.
- Parchment coffee is always sun-dried.

The following processing chains are installed in Puer:

- 160 hulling units, some are fitted with small-scale machines.
- 9 hulling and sorting factories belonging to commercial Companies.
- 3 coffee roasters.

(c) Instant-coffee makers

Nestle is strongly implanted in China and imports coffee from Vietnam to supply its instant coffee factory installed in Shanghai. Moreover, a national processor elaborates instant coffee in Yunnan.



Scheme 1: Coffee processing and supply chain in Yunnan, P. R. CHINA

4.2 The research Centres

The Institute of Tropical and Subtropical Cash Crops (ITSCC) is in charge of coffee in its development programmes.

The Institute of Tropical and Subtropical Cash Crops (ITSCC) is under Yunnan Academy of Agricultural Sciences (YAAS), which gathers 15 institutes.

ITSCC is located in Lujiang Basin (Baoshan County) and owns a collection of coffee-trees, mango and lychee-trees. The Institute can also work in close cooperation with a network of coffee-bases, which are currently used as demonstration tools for recommended practices from planting to post-harvest processing.

4.3 Coffee Associations in China: their role in branding and promotion

Three Associations exist in Yunnan:

- Coffee Association of Yunnan, set up in March 2009,
- Baoshan Coffee Association, set up in February 2002,
- Puer Coffee Association.

These associations gather all the actors of coffee value chains: producers (farmers and companies), processors, trading companies, the Research Centres and even coffee-machinery makers.

There is not currently a Coffee Association of China but there is a plan to create one. However, the Government is often reluctant about associations.

4.3.1 Coffee Association of Yunnan

Four purposes are addressed:

- (1) Dissemination of technical knowledge,
- (2) Funds allocation for farmers' support,
- (3) Promotion of selling channels,
- (4) Government advising about coffee matters and production.

There are some contacts with the bank, but they are only beginning. Anyway, the funds foreseen are mainly for companies, which are more easily able to repay them.

Last year there was a severe draught and the Association was entrusted with a survey in some areas to evaluate the losses.

Baoshan coffee's price is a little lower compared to Puer's:

- Minus CNY 1 000 per ton of green coffee,
- Or 4-5 % less.

The exporters deal generally with coffee from both areas.

The Association looks for commercial outlets internally; on the contrary, the companies look for and find out their commercial channels by themselves.

Currently, the Association receives participation from its members and a support from the Yunnan Regional Government, but it is not enough. The Association does not have too much money to publish books or organize training courses: this problem has not been successfully resolved.

4.3.2 Baoshan Coffee Association

Association's purposes are as follows:

- Look for potential buyers and good prices,
- Recommend Baoshan coffee to buyers and importers,
- Disseminate information on marketing and knowledge about coffee.

The Association negotiates with the bank to get funding by helping applicants. The Provincial Government plays also a significant role in these negotiations. To obtain a loan, an applicant needs a certificate guaranteeing his ability to repay.

The Association looks for commercial outlets, mainly on domestic market; it facilitates contacts between potential buyers and suppliers.

Moreover, the Association operates coffee roasting and packaging with equipment put at its disposal by to a company.

In 2008, Baoshan Association started an application for a Geographical Identification (GI): there is currently a competition between Baoshan and Simao in this respect, but Baoshan's application was the first.

The following scheme has to be followed to obtain the GI:

- A report is written by the Association, and then sent to the Provincial Government.
- The Provincial Government submits the report to the Quality and Inspection Office which is under the National Government.
- The Quality and Inspection Office analyses the report and eventually gives its approval.

The file contains awards from different national and international entities; for instance some awards were already received for Boashan coffee:

- In 1958, an award was given in London.
- The Central Government listed Baoshan as one of the main coffee producing area in China.
- In 1993, another award was obtained in Belize.

The report has to define a code of practices including a set of criteria:

Criteria	Comments
Environment data	Soils, water, and air are defined with the corresponding analysis.
	The areas already producing coffee and susceptible to become coffee-land are mapped and distinguished in accordance with elevation.
Seedlings	
Agronomy practices	
Plant protection against pests and diseases	
Method of picking	
Post-harvest processing technology	
Quality of green beans, including grading and the following aspects	<ul style="list-style-type: none"> • Appearance • Sensory characteristics; • Bean size; • Sanitary characters.

4.3.3 Puer Coffee Association

Puer Coffee Association is only a bridge between the Government and companies. The information given to the Government originates from Associations.

Quality standards have been developed in Puer and are due to be extended to the whole Yunnan province, then China; the following quality standards are currently recommended:

- AAA > screen of 18
- AA > screen of 16
- A < screen of 16

These standards are still in discussion taking into account the recommendations formulated by buyers.

On the other hand, food security deals with pesticide residues. Samples have been recently analyzed and no residues were found. Such samples meet with “Green-food” recommendations, an internal Chinese standard regarding pesticides and CO₂ emissions.

“Simao” (the name of Puer district) is a brand deposited in Japan and Germany.

Three brands are deposited for roasted coffee in China: “Ma Ya”, “Shao Pin” and “Bai Gui”. The Puer Coffee Association is currently applying for a Geographic Sign. Two names, “Simao” and “Puer”, will be deposited to define the same coffee.

Puer Coffee Association gather all the actors dealing with coffee sector, including machinery makers, there is also a similar Association in Bao Shan: both are under Yunnan Association, A China Coffee Association is present in Beijing.

It appears that there is a lack of coordination between the three associations, the Puer Coffee Association being weekly connected to the two others. It has some practical consequences for the marketing of the coffee, the more obvious being the lack of coordination between the two initiatives to develop Geographical Indications (the one of the Puer Association and the one of the Baoshan Association).

4.4. Coffee prices, technological ratios and operational costs – Price structures

4.4.1. Coffee prices at each step of the value chain – technological ratios

Assuming that coffee can be bought in different forms, the following COFFEE PRICES are currently paid in 2010 (in Baoshan area):

Type of product	<u>COFFEE PRICES</u> in CNY/ kg of green coffee in 2010 (In BAOSHAN Area)
Fresh coffee cherries	3.5
Dry parchment coffee	17
Raw green coffee	24

The following TECHNOLOGICAL RATIOS have to be considered:

Items	RATIOS	Comments
From cherries to green coffee	5-5.5 or 6 kg → 1 kg	*In accordance with quality and elevation *Including weight loss due to husk and defective beans removal
Green beans/ parchment coffee	18 – 32 %	In accordance with the moisture content of parchment coffee entering the factory
Weight loss including hulling and defective beans removal	20 – 25 %	
Weight loss from raw to marketable coffee: due to defective beans removal	8 %	For the lowest quality
	4 %	
	2 %	For the best quality

If three grades are prepared through grading and sorting, the following distribution is generally obtained in marketable coffee:

- AAA: 20%
- AA: 60%
- A: 20%

When exported, the AA type receives the international market price, whereas:

- The international price minus CNY 3 / kg for the A,
- The international price plus CNY 3 / kg for the AAA.

In addition to the grading, some additional factors are taken into account to reward the qualities:

- Assuming that the elevation of plantation ranges from 600 to 1 600 m, higher grown coffee is paid + CNY 0.5-1/ kg of fresh cherries which represents a premium of 15 to 30%. As Typica is usually grown in the highest elevations, it usually receives a slightly better price. However it is not paid more than the Catimor of the same elevation. This shows that it is not a premium for the variety but for the elevation.
- Simao coffee usually obtains higher prices, since it is generally preferred due to a specific flavour and higher acidity. The difference is about 1,000 CNY per tonne of green coffee, which represents a premium of about 3 to 5%

It is important to notice that many other attributes are very important for beverage quality but not rewarded by the market. Good varieties such as Typica or Bourbon receive the same price as Catimor. It is the same for properly and improperly processed coffees. This is very important because quality is not just a matter of material, equipment, knowledge and know-how but also of incentives to impulse efforts. If quality is not rewarded by the market, it will not been produced.

Another important remark is that the two attributes rewarded by the market (elevation and sub-region) are easy to identify. Coffees from different elevation are not harvested at the same time. Coffees from Simao and Baoshan are marketed separately. In order to allow the market to reward other quality attributes, it is necessary to make these attributes easy to identify. As we will see later on, it is the role of quality signs such as geographical indications (see section 6.3).

4.4.2. Operational costs

The sequence of operations, which leads from fresh cherries up to marketable green coffee, entails a series of operational costs supported by the factory in charge of processing; these expenditures are summarised in the following table:

Operation		<u>COSTS of PROCESSING</u> In Yuan per ton of green coffee
Wet-processing	From cherries to dry parchment coffee	200
Hulling	From parchment coffee to green coffee Eventually subcontracted to a "Hulling-unit"	60
Grading, sorting and packaging	From raw green coffee to marketable green coffee	200
Extra hand-sorting	Operated by ladies, after colorimetric sorting	600

Moreover, it can be mentioned that:

- A 17 % tax is levied by the Government on exported green coffee.
- In accordance with agreements negotiated by Chinese exporters, the internal transportation and maritime freight are generally paid by the buyers.

4.4.3. Price structures

Taking into account the data collected about prices, technological ratios and operational costs in Baoshan area, we present below prices structures evaluated in accordance with the three following options:

- Purchase of fresh cherries by a company from a farmer,
- Purchase of dry parchment coffee by a company from a farmer,
- Purchase of raw green coffee by a company from a farmer,

In the case of each option, marketable coffee is prepared and exported.

Thanks to the prices structures, we can evaluate the company's margin and the percentage of international price received by the farmers: these results are summarised in the table below:

Type of coffee purchased	Company's margin In CNY/ kg of green coffee	Percentage of international price received by the farmer
Cherries	2.045	73.8 %
Parchment	5.148	65.2 %
Raw green coffee	1.880	75.0 %

PRICE STRUCTURE - Washed Arabica Coffee in Boashan, Yunnan (CHINA)

Nov-10

Table 1 : Purchase of fresh cherries

US \$ 1 = **CNY 6,654**

RATIOS:

Cherries -----> Parchment coffee	5-6 kg of Cherries -----> 1 kg of Parchment coffee	18,18%
Weight losses	By hulling + defects sorting: 20-25%	22,50%
GRADES	% of AAA	20%
	% of AA	60%
	% of A	20%

Marketable coffee equivalent

CNY/ kg

US \$/ Lb

NY International price

33,67

2,297

Premium for the AAA	CNY/ kg of green coffee	3,00
Discount for the A	CNY/ kg of green coffee	-3,00

Company's margin:

2,045

Sale of coffee by the company

Sale of AAA	20 % of sorted coffee
60% of AA	60 % of sorted coffee
20% of A	20 % of sorted coffee

33,67

7,18

20,20

6,28

(1) Processing & export charges

6,783

Export tax	17% of export price
Extra hand-sorting	CNY 600 / t of green coffee
Grading, sorting & packaging	CNY 200/ t of green coffee
Hulling	CNY 60/ t of green coffee
Wet-processing	CNY 200/ t of green coffee

5,723

0,600

0,200

0,060

0,200

(2) Purchase of green coffee equivalent

Including weight losses

24,839

(3) Purchase of fresh cherries from the farmer (CNY)

CNY/ kg of Fresh cherries

3,50

% of international price received by the farmer

73,8%

PRICE STRUCTURE - Washed Arabica Coffee in Boashan, Yunnan (CHINA)

Nov-10

Table 2: Purchase of dry parchment coffee

US \$ 1 = CNY 6,654

RATIOS:

Weight losses	By hulling + defects sorting: 20-25%	22,50%
GRADES	% of AAA	20%
	% of AA	60%
	% of A	20%

Marketable coffee equivalent	
CNY/ kg	US \$/ Lb

NY International price

33,67

2,297

Premium for the AAA	CNY/ kg of green coffee	3,00
Discount for the A	CNY/ kg of green coffee	-3,00

Company's margin:

5,148

Sale of coffee by the company

Sale of AAA	20 % of sorted coffee
60% of AA	60 % of sorted coffee
20% of A	20 % of sorted coffee

33,67
7,18
20,20
6,28

(1) Processing & export charges

6,583

Export tax	17% of export price
Extra hand-sorting	CNY 600 / t of green coffee
Grading, sorting & packaging	CNY 200/ t of green coffee
Hulling	CNY 60/ t of green coffee

5,723
0,600
0,200
0,060

(2) Purchase of green coffee equivalent

Including weight losses

21,935

(3) Purchase of parchment coffee from the farmer (CNY)

Per kg of parchment coffee

17,00

% of international price received by the farmer

65,2%

PRICE STRUCTURE - Washed Arabica Coffee in Baoshan, Yunnan (CHINA)

Nov-10

Table 3: Purchase of raw green coffee

 US \$ 1 = **CNY 6,654**
RATIOS:

Weight losses	Raw beans/ sorted beans: Good: 2%, Medium: 4%, Bad: 8%	5%
GRADES	% of AAA	20%
	% of AA	60%
	% of A	20%

Marketable coffee equivalent

CNY/ kg	US \$/ Lb
---------	-----------

NY International price
33,67
2,297

Premium for the AAA	CNY/ kg of green coffee	3,00
Discount for the A	CNY/ kg of green coffee	-3,00

Company's margin:
1,880
Sale of coffee by the company
33,67

Sale of AAA	20 % of sorted coffee	7,18
60% of AA	60 % of sorted coffee	20,20
20% of A	20 % of sorted coffee	6,28

(1) Processing & export charges
6,523

Export tax	17% of export price	5,723
Extra hand-sorting	CNY 600 / t of green coffee	0,600
Grading, sorting & packaging	CNY 200/ t of green coffee	0,200

(2) Purchase of green coffee equivalent

Including weight losses

25,263
(3) Purchase of raw green coffee from the farmer (CNY)

Per kg of raw green coffee

24,00
% of international price received by the farmer
75,0%

5. SWOT analysis of coffee value chain in Yunnan, P. R. CHINA

The data collected as part of the fieldworks allowed the experts to elaborate a SWOT analysis of the coffee value chain, which is presented below:

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong political support to the coffee sector by the local government. • Commercial companies own modern and properly operated facilities: <ul style="list-style-type: none"> - For wet-processing, - For hulling and sorting. • Coffee associations already exist for Baoshan, Simao and Yunnan. • <i>Simao</i> is a brand already deposited in Japan and Germany • Two Geographical Identifications (<i>Simao</i> and <i>Baoshan</i>) are currently under application. • Roasting companies of Yunnan (<i>Ma Ya</i>, <i>Shao Pin</i> and <i>Bai Gui</i>) are already using coffee beans produced in Yunnan 	<ul style="list-style-type: none"> • The main variety (Catimor) has a low potential for quality. • There is a lack of available varieties and a lack of knowledge on the performance of varieties (in terms of yields and quality) • There is a lack of incentives for quality (low premiums for good coffees) • Harvest quality is too poor (with a significant percentage of green or overripe cherries). • Post-harvest process is sometimes improperly operated). (i) The time between cherries picking and pulping could be too long due to transport constraints. (ii) In smaller farms, the wet-processing facilities are generally obsolete and no carefully maintained. • There is lack a coordination between the coffee associations about Geographical Identifications
Opportunities	Threats
<ul style="list-style-type: none"> • Coffee-land expansion provides opportunities to plant varieties leading to a good quality cup (especially Caturra). • International demand for niche-coffees is rapidly growing • High international prices gives means and incentives to invest in coffee production and processing 	<ul style="list-style-type: none"> • An eventual wide-spreading of diseases could endanger coffee growing • The volatility of international prices is a major and permanent constraint. • Coffee growing could be threatened by more profitable crops.

6. Recommendations for getting higher prices for exported coffee: a quality-based approach

Based on our analysis of the Chinese coffee system, we recommend a quality-based approach to increase the prices received by Chinese coffee. This approach means an improvement in quality but also an improvement in marketing of coffee qualities, what can be done through quality signs (see section 6.3.4).

In this chapter, we will first consider the scope of options to increase quality i.e. the different quality attributes that can be targeted by a quality-based approach (section 6.1). We will then present the quality attributes that seem to be the most relevant in the case of Yunnan coffee (section 6.2). Finally, we will consider what should be done in order to improve these quality attributes (section 6.3)

6.1 What is coffee quality

Coffee quality is defined by a set of attributes related to different aspects. Attributes are characteristics that are demanded by consumers and, as a result, that can get a reward on market (higher price). In the traditional approach, these attributes are related to the product itself: they are attributes of the green coffee beans. But a broader modern approach shows that quality can also be related to attributes of the process of production.

6.1.1 The traditional approach: quality green coffee beans

Quality attributes related to the product mainly refers to the physical characteristic of the beans (size, density, colour, number of defects...) and to sensorial attributes (acidity, body, flavours...). The physical characteristics of the beans are objectively measurable through physical analysis. They are the base of quality classification in different grades (sorted by export companies). The sensorial attributes are measured by cup testing. Both the grades and the cup testing are traditionally used by international trading companies to fix their buying price.

Other attributes are more difficult (and costly) to measure since they are related to the chemical content of the beans. These attributes are related for instance to caffeine content, to fatty material content or to Ochratoxin content. Because of the cost to measure them, until recently, these attributes have been very few taken into account by international buyers.

However, this is changing rapidly especially for sanitary attributes, due to the development of sanitary regulations by importing countries (*cf.* the norms on Ochratoxins implemented by the European Union). The interest of consumers themselves for the nutritional content of what they eat and drink is also playing a role.

Table 4: Quality attributes related to green coffee beans:

Physical Attributes: <i>Measured by visual observation or sorting equipments</i>	Sensorial attributes: <i>Measured by cup-testing</i>	Chemical attributes: <i>Measured by chemical analysis</i>
<ul style="list-style-type: none"> • <u>Beans size</u> • <u>Beans density</u> • <u>Beans color</u> • <u>Number of defects</u> • ... 	<ul style="list-style-type: none"> • <u>Acidity</u> • <u>Body</u> • <u>Astringency</u> • <u>Bitterness</u> • <u>Off-flavours</u>: <i>greenish, burnt, sour, stinker...</i> • <u>Specific aromas</u>: <i>fruity, flowery...</i> • ... 	<p><u>Sanitary</u></p> <ul style="list-style-type: none"> • <u>Ochratoxin</u> content • Presence of <u>heavy metals</u> • <u>Pesticide</u> residues • ... <p>Others</p> <ul style="list-style-type: none"> • <u>Caffeine</u> content • <u>Fatty material</u> content • ...

6.1.2 A broader approach: taking into account the quality of the production process

Traditionally, the process of production is considered as important for quality because it affects the characteristics of coffee beans. For instance, the varieties or the shade will affect sensorial attributes.

Moreover, as recently recognised, the process of production itself is part of the quality. Indeed, apart from its impact on the quality of beans, some consumers are willing to pay more for a coffee that has been grown in a specific country or region, that as been sun dried (what is supposed to be more “natural”), that has not contaminated the rivers or that has been harvested by children.

Table 5: Quality attributes related to the process of production of coffee beans:

Geographical attributes	Technical attributes	Environmental attributes	Social attributes
<ul style="list-style-type: none"> • Producing region or country • Elevation • Latitude • ... 	<ul style="list-style-type: none"> • Varieties grown • Type of fertilization • Coffee trees cultivated under shade • Type of harvesting • Mucilage removing or fermentation • Method of drying (sun-drying of coffee) • ... 	<ul style="list-style-type: none"> • No contamination of waterways • Protection of forest and soil fertility • Preservation of biodiversity • Protection of birds • ... 	<ul style="list-style-type: none"> • Respect of social rights (<i>e.g.: non-involvement of children in labour</i>) • Level and stability of prices paid to producers • Existence of an open & democratic producers' association • ...

In order to get a reward on the market, these attributes related to the process of production have to be identified by the buyers. Nevertheless, most of these attributes can not be identified by any kind of analysis of the coffee beans. That is the reason why, in order to give a value to these attributes, some kind of quality signs or labels are necessary. These quality signs must include a process of control and certification in order to guarantee that the coffee beans sold under the sign have been produced through a process which complies with some specific requirements. The most famous labels for coffee are “organic” (focused on environmental attributes) and “fair trade” (focused on social attributes). However, as we will see later on, Geographical Indications (GI) are also a way to give a value to attributes linked to the process of production.

6.2 What are the most relevant quality attributes for Yunnan coffee?

As we already mentioned it, the most relevant market for the green coffee produced in Yunnan is the international market. This means that the attributes to be targeted are the attributes demanded by the international market.

Our analysis suggests that the most relevant attributes to be targeted for Yunnan coffee are:

Varieties

Almost all the green coffee produced in China is Arabica. Assuming that this coffee is almost processed through wet method, it enters into the category of “washed Arabicas” which is the one that received the highest prices on international markets. However, most of the green coffee stems from the variety Catimor. As with this variety, it is impossible to obtain a full flavoured coffee, this is a major constraint for getting high prices for Chinese green coffee.

Post-harvest process

Although some big factories own high quality equipment to process the cherries and the beans, they coexist with many little factories that are not always well equipped and well managed. On average, it seems that an important part of the coffee beans are still harvested and processed in a way that does not guaranty the quality of the exported green coffee beans.

Social, environmental and symbolic attributes

Although the mission was too short to allow us to check this point, it seems that Yunnan coffee possess some social, environmental and symbolic attributes that can be marketed in order to increase the price received by exported coffee.

6.3 How to improve the quality of Yunnan coffee

A successful quality-improvement strategy is based on three pillars:

- The stakeholders should have access to the **material** or the **equipment** necessary to grow or to process a high quality coffee.
- The stakeholders should have the **knowledge on the practices required** to get a high quality coffee.
- The stakeholders should receive **incentives** to produce a high quality coffee. Indeed, producing quality requires some efforts and usually implies higher production costs. Therefore, the farmers and the processors will produce a high quality coffee only if they are rewarded for their efforts by receiving a higher price.

These three pillars should be implemented for the three identified categories of attributes: (i) varieties, (ii) post harvest process and (iii) social, environmental and symbolic attributes).

6.3.1 Improving the vegetal material

a) Material.

Currently, varieties cultivated by Yunnan farmers are Catimor, Bourbon and Typica. Catimor is dominant. The main characteristics of Catimor are (i) its agronomic performances and (ii) its low quality. The characteristic of Bourbon and Typica are symmetric: well managed they can give a very high quality coffee but, for the agronomic point of view, they are more vulnerable and less productive. As there is currently no difference in prices among the varieties, farmers prefer Catimor, what explains that this variety is dominant.

The striking point is that the pool of varieties available for Yunnan farmers are very limited (Catimor, Bourbon and Typica). Others varieties like Caturra present very slight differences in quality compared to Typica whereas their agronomic performances are higher.

Of course, the point is not to change coffee trees but, as the coffee-land is expected to grow in the next years, it is urgent to provide the farmers with an access to other varieties characterised by a high quality potential as well as good agronomic performances.

Therefore, there is a need to test new varieties (like Caturra) in Yunnan and, if the test is successful, to widespread them in Yunnan province.

b) Knowledge.

Before wide-spreading new varieties in Yunnan, it is necessary to test the performance of these varieties in the Yunnan context (yields, vulnerability to pest and disease and quality). Some researches are needed in order to generate this knowledge.

Apart for the scientific knowledge, some information is needed on the market value of the varieties such as Caturra when grown in Yunnan. This can be done in an informal way by asking to exporters to send samples to their clients and to ask them the premium they are willing to pay for such coffees. However, we think that a more systematic approach (following scientific methods) would be much better. This implies to select a wide list of traders, to send to all of them exactly the same samples of coffee and to perform an econometrical analysis of their answers.

c) Incentives.

There is currently no incentive for the best quality coffees (such as Bourbon and Typica) because the farmers receive a similar price than for Catimor. This is easy to understand as these varieties are mixed by the processors and exporters.

In order to allow the different qualities to be paid at different prices, it is necessary to market them separately. The best way to do this seems to add the variety as a criterion in the classification scheme of the geographical indications (GI).

It should be noticed that the three areas of action are complementary. Without knowledge, the disposal of the material (plants) would not be sufficient. Without incentive, material and knowledge would not be sufficient either.

6.3.2 Improving the post-harvest process

a) Material.

As already mentioned, although some big factories are well-equipped to process cherries and beans, it is not always the case for the small factories. An effort has to be made in order to fill this gap.

b) Knowledge.

Some theoretical knowledge exists on the way to process the cherries and the beans in order to maximize the quality of the cup (see the following tables for a set of recommendations aiming at improving the quality of the beans from Yunnan coffee growing areas).

Recommendations for improving coffee quality

Priority	Recommendations	Comments
1st	Only ripe cherries should be carefully and selectively hand-picked	<p><u>Impurities</u> such as earth, dust or pieces of wood in the harvested cherries induce <i>earthy</i> and <i>dusty</i> tastes in the cup.</p> <p><u>Unripe cherries</u> lead to:</p> <ul style="list-style-type: none">• Immature beans (with <i>greenish</i> taste in the cup),• Black beans (with <i>bitter</i> taste in the cup). <p><u>Cherries fallen down and dried on soil</u> as well as those <u>dried directly on the tree</u> lead to:</p> <ul style="list-style-type: none">• Black beans (with <i>bitter</i> taste in the cup),• A beverage with <i>phenol</i> taste.• Overripe cherries lead to a beverage with <i>alcoholic</i> taste.

2nd	Fresh cherries should be pulped as soon as possible after picking	<p>After picking, it is not recommendable to store the fresh cherries more than 10 hours before pulping.</p> <p>An excessive storage induces a heating due to an undesirable fermentation of entire cherries which originates:</p> <ul style="list-style-type: none"> • A reddish parchment coffee with dirty furrows, • Beans with a waxy aspect, • A beverage with over-fermented or stinker off-flavours.
3rd	A suitable post-harvest wet-processing should be carried out	<ul style="list-style-type: none"> • Separate floaters before pulping • Adjust properly the pulper • Dry-pulping should be prioritised to minimise water-consumption • Stop fermentation as soon as the mucilage can be easily removed from the wet parchment coffee by washing. • Wash wet parchment coffee in clean water, immediately after fermentation. • Use good quality water and maintain all equipments and facilities perfectly clean

Wet-processing has a Positive impact of wet-processing on coffee quality, provided that some basic precautions are taken:

Positive impact of wet-processing on cup quality:

Positive impact of wet-processing on coffee quality	Precautions to be taken
The proliferation of micro-organisms generates a more acidic flavour in the cup.	<p>The fermentation time should be careful determined in accordance with environmental conditions and then carefully respected:</p> <p>An insufficient fermentation leaves a remainder of mucilage stuck around parchment:</p> <ul style="list-style-type: none"> • Parchment becomes reddish. • The proliferation of undesirable micro-organisms during drying induces a fermented taste in the cup. <p>A too long fermentation generates sour, over-fermented or even stinker off-flavours in the cup.</p>
In the process of washing, the contact between wet parchment coffee and water induces a dilution of bitter substances making the beverage milder.	

Some efforts are necessary to widespread this knowledge to the farmers and processors.

Moreover, this theoretical knowledge requires being fine-tuned to take into account the specificities of the Yunnan context. Ideally, it will be nice to adapt the technical recommendations on the post harvest process for each of the new varieties that will be introduced in Yunnan.

c) Incentives.

There are currently little incentives to process well the cherries and the beans. More precisely, the farmers and processors are currently incentivised to make just the efforts necessary (i) to increase the technical ratios from cherries to parchment and from parchment to green coffee and (ii) to increase the percentage of coffee in the highest grades. But these incentives are not sufficient to lead them to process the coffee as it should be to get a high quality.

In order to allow the different qualities to be paid at different prices, it is necessary to control the post-harvest process and to pay more the well-processed coffees.

The best way to do this seems to be to add some criterion on the post-harvest process in the code of practice of the geographical indications (GI). These criteria should be linked to the recommendations synthesized in the two above presented tables. The compliance of farmers and processors with these criteria should be controlled regularly. Only the coffees which comply with the criteria should be allowed to be sold under the Geographical Indication.

6.3.3 Adding social , environmental and symbolic attributes

The main characteristic of these attributes is that they are difficult and costly to identify. But the consumers (and as a result) the traders who buy green coffee will be reluctant to pay more for a coffee without being sure that this coffee effectively contains the mentioned attributes. How to be sure that a batch of coffee beans has not been harvested by children? How to be sure that pulping as not generated the contamination of some rivers? How to be sure that this coffee has been grown in the Puer region?

In order to give a value to these social, environmental and symbolic quality attributes, it is necessary to give some guaranty to the buyers.

This can be done through quality signs (labels) with third-party certification. Basically two strategies can be developed. The first one is to use existing quality signs. The second one is to create new quality signs, especially Geographical Indications.

Using existing quality signs

In the coffee world, six important quality signs already exist and are widely recognized, namely:

- Organic,
- Fair-trade,
- Bird-friendly
- UTZ certified
- Rainforest Alliance certified
- Starbucks Coffee and Farmer equity (C.A.F.E) Practices

Each of these labels provides a list of requirements that should be satisfied in order to allow the coffee sellers to use the name of the label. The requirements are all linked with environmental and/or social attributes. The compliance with the criteria is usually guaranteed by a third party certification (the body which control and certified is not the one which manage the label). If we consider, as an example, the case of the *organic label*, the most important requirements to be fulfilled are: (i) no contamination of waterways, (ii) protection of forest and soil fertility (iii) restricted use of pesticides. It is not possible to enter here in more details for each of these labels (the lists of requirements for each of them can be found easily on their web sites). It should be noticed that for organic label, each country has its own law. Therefore the requirements to be fulfilled to export organic coffee in Japan, USA or European Union will be a little different.

Using geographical indications to certify social, environmental and symbolic attributes

This means to include social, environmental and symbolic attributes in the code of practices of the GI.

In the case of Yunnan coffee, what is the best approach? Using existing signs? Or including social, environmental and symbolic attributes in the code of practices of the GIs? The following table synthesizes the main advantages of each approach.

Table 6: Advantages of the different approaches to guaranty social, environmental and symbolic attributes

Approach	Corresponding quality signs	Advantages of each approach
Using quality signs already existing	Organic	<ul style="list-style-type: none"> • Easier to develop • The consumers already know the quality sign
	Fair trade	
	Bird-friendly	
	Rainforests certified	
	UTZ certified	
	Starbucks Coffee and Farmer equity (C.A.F.E) Practices	
Developing new quality signs	Geographical Identifications	<ul style="list-style-type: none"> • Uniqueness of quality sign • But the sign has to be built and its reputation to be developed

However the two approaches are complementary and can be developed jointly. A coffee can be sold with various certification (for instance as an organic coffee and a GI-certified coffee).

As two GI processes have been launched, it would be easy to add some requirements in the codes of practices in order to add social, environmental and symbolic attributes to Yunnan coffee.

At the same time, it would be possible to develop the use of existing labels such as organic, fair trade or Starbucks C.A.F.E. Practices (that Starbucks is supposed to be implemented very soon in Yunnan).

Until now, in order to give a value to social, environmental and symbolic attributes, we have insisted mainly on the necessity to create **incentives** to the farmers by giving guaranty to the buyers in order to allow them to pay more for the coffee which contain these attributes. This led us to insist on the necessity to use existing quality signs and/or to develop GIs. But obviously, the other components of the quality-improvement strategy are also crucial. It will be necessary to give the **knowledge** to the farmers on the requirements of the different quality signs and on the advantages that can be expected from them. In some case, some investment will be necessary for instance to develop the **equipments** necessary to recycle the coffee pulp.

6.3.4 Synthesis: an integrated approach of quality improvement

The strategy we propose to improve the quality of Yunnan coffee (presented in the three previous sections) is synthesized in the following table.

Table 7: The quality improvement strategy

Groups of targeted attributes	Varieties	Post-harvest process	Social, environmental and symbolic attributes
Areas of action			
Knowledge	Test new varieties (Caturra...) to assess their agronomic performance, their quality and the price buyers are willing to pay for them)	Develop research in order to fine-tune the recommendations to the specificities of Yunnan coffee (ideally for each of the new varieties to be introduced). Transfer the knowledge on good practices to the farmers and processors.	Transfer the knowledge to the farmers on the requirements of the different quality signs and on the advantages that can be expected from them
Materials/Equipment	Introduce new varieties (Caturra...)	Improve the equipment of small factories	Help the farmers to make the investments needed to comply with social or environmental requirements
Incentives	Add the variety as a criterion in the classification schemes of the GIs	Add requirements on good practices for the post-harvest process in the code of practices of the GIs	Use existing quality signs and/or add requirements in the code of practices of the GIs (for social and environmental attributes) or in the delimited area (for symbolic attributes linked to the coffee area).

The approach is based on three groups of attributes (variety; post-harvest process; social, environmental and symbolic attributes) and on three areas of actions (material/equipment; knowledge; incentives).

What should be emphasized is that **the different areas of action and the different attributes are complementary and should be developed simultaneously.**

Indeed the focus on varieties et and post-harvest process are highly complementary (social, environmental and symbolic attributes are more optional). Good varieties provide a potential for quality. This potential will be expressed or destroyed depending on the post-harvest process. On the other hand, a good post-harvest process will lead to a high quality coffee only if the varieties used have a potential for quality. This means that the actions to improve the varieties and the post-harvest process are complementary and should be developed simultaneously.

The different areas of action are also highly complementary. Knowledge and material are necessary to allow the farmers and processors to improve quality. Incentives are necessary in order to make it profitable for them to do it. Material and knowledge without incentives will be useless. On the other hand, incentives will not generate quality if the farmers and processors have not the means (material + knowledge) to do it. It is an illusion to believe that quality can be produced first and marketed later on. Quality will be produced only if there is a market (and a reward) for quality. The practical consequence of this is that actions on knowledge, material and equipment and incentives are complementary and should be developed simultaneously.

This table also shows **the decisive role of Geographical Identifications (GI) in providing incentives to improve quality.** The success of the quality improvement strategy highly depends on the success of the Geographical Identifications in process for the coffee from Simao and Baoshan. In the following section we developed some specific recommendations for the design of the Geographical Identifications.

6.3.5 Specific recommendations for the design of Geographical Identification

The creation of a Geographical Identification (GI) involves three aspects:

- *A delimited area* (only the coffee grown in this area can use the GI);
- *A code of practices* for growing, harvesting and post-harvest process (only the coffee which comply with the requirements defined in the code of practices can use the GI);
- *A classification scheme* (grades and standards) which defines the different types of coffee sold with the name of the GI. This classification scheme defined which coffees will be mixed and which coffees will be sold separately (at different prices).

The key GI's ability to generate high prices is linked to the design of these 3 components by:

- An increase of quality level and homogeneity;
- A reputation-building process.

a) The delimited area.

In the case of Yunnan coffee, three distinct scenarios could be possible:

- 1st Scenario: Two Geographical Identifications (GI) could be obtained: one for Simao (Puer) coffee and another one for Baoshan coffee. It is the current on-going scenario.
- 2nd Scenario: Only one Geographical Identification (GI) would be obtained for Yunnan coffee
- 3rd Scenario: More areas would be delimited.

The criteria of choice to be adopted would be:

- The difference in quality (we have already mentioned that Simao coffee is paid 5 % more than Baoshan coffee);
- The existence of local associations;
- The fame of the name abroad (for example, the name Yunnan is better-known than Simao or Baoshan).

It should be emphasized that the current scenario (two different GIs with a weak coordination between them) is not efficient. It will be difficult to understand from abroad. It will not allow joining the efforts of the two sub-regions (Simao and Baoshan) to make the promotion of Yunnan coffee (brochures, international coffee fairs...).

Our proposal is to **build links between the two initiatives.**

One option will be to build only one GI for all the Yunnan coffee. The distinction between the two sub-regions (Simao or Baoshan) could be maintained by putting the sub-region as a criterion in the classification scheme.

Another option (more light) will be to coordinate the two GIs. In our view, this coordination should function mainly on two aspects:

- the homogenization of the classification schemes of the two GIs (same criteria, same modalities for the criteria).
- the promotion wish should be made at the level of Yunnan in order to reduce the cost (economies of scale) and increase the visibility of Yunnan coffee. Promotion may be developed through a web site, brochures and participation to international coffee fairs (especially the one of the SCAA).

b) The code of practices

The codes of practices should specify the practices that are mandatory in order to use the GI. The practices to be covered are related to growing, harvesting and post-harvest process. Other requirements linked to social and environmental attributes can eventually be added in order to give a value to these attributes.

The design of the code of practice is very important for the success of the GI. However, it is also a difficult step because there is a trade-off between different parameters. If the level of requirements is too low, quality is likely to be too bad. In this case, it will be difficult to build a reputation for Yunnan coffee. However, if the requirements are too high, too many producers would be excluded and low quantities of product could be obtained. This would

reduce the benefits of the GI and can also impede the implementation of an ambitious strategy of promotion (there are high economies of scale on promotional activities). A good empirical criterion is to put the level of requirements a little above of what the farmers and processors are currently doing.

This will increase (and homogenize) the quality without including too much farmers (as it would be the case if the gap between current practices and required practices is too large).

As we already mentioned it, in the case of Yunnan coffee, it is especially important **to improve the post-harvest process (by putting relevant requirements in the code of practices)**.

c) The classification scheme

Different attributes are usually covered by classification schemes:

- Beans attributes as size density colour, number of defectives beans;
- Cup attributes as acidity, body, bitterness, astringency and special flavours.

In the case of Yunnan coffee, other criteria have to be added: the variety (if a single GI is created for all Yunnan coffee) and the location (sub-regions of Simao and Baoshan). The elevation of plantation can eventually be added.

d) Synthesis on the potential attributes covered by the Geographical Identifications (GI)

The graph on the following page shows the link between the different attributes and the different components of the GI (delimited area, code of practices and classification scheme).

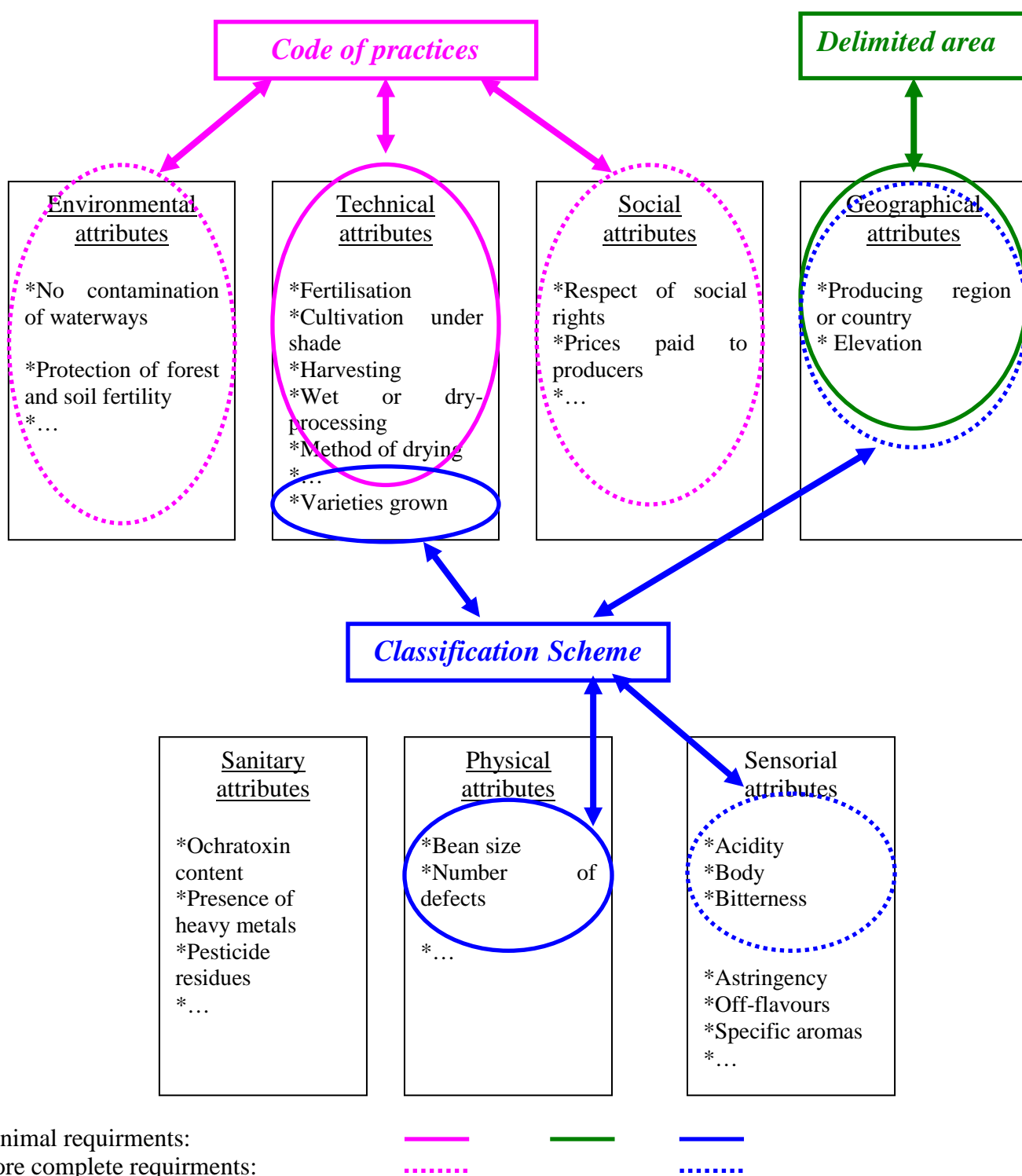
The code of practices is mainly related to the production techniques (“technical attributes”) but it can also include social and environmental dimensions of this production process. The variety can eventually be included in the code of practice. In this case, only the coffee of a specific list of varieties can use the GI. However, in the case of Yunnan coffee, excluding varieties with lower quality potential (as Catimor) from the use of the GI would imply excluding many farmers and a big part of the current coffee area. It seems more relevant to use the variety as a criterion in the classification scheme. In this case, Catimor will be able to use the GI but they will be sold separately of the better varieties.

The delimited area is of course related to the geographical attributes. One option is to delimitate strictly the GI area in order to exclude all the coffee from low elevation zones. Indeed elevation is very important for coffee quality: a high quality coffee can hardly be produced in a low elevation even if good varieties are grown and a good post-harvest process is operated. However, as for varieties, another approach (more inclusive) is to accept low elevation coffee inside the GI, but to sell it separately. In this case, the elevation should be added as a criterion in the classification scheme. If two GIs are created, the delimited area of each one will be the borders of the two sub-regions (Simao and Baoshan). In the case a single GI is created for Yunnan coffee, the sub-region can eventually be added as a criterion in the classification scheme.

The classification scheme should include physical attributes. Indeed, these attributed are proxies of sensorial attributes and are easy to measures (the coffee is classified by size, density or colour by machines; hand sorting can be added to fine-tune the classification). However, high size of beans, high density and low number of defects are only partially correlated with sensorial attributes. Therefore, it is a good idea to use also cup tasting to classify the coffee. As the lack of incentives for good varieties is one of the main obstacles to get high prices with Yunnan coffee, varieties has to be added in the classification scheme of the GIs.

As already mentioned, it is also possible to add geographical attributes in the classification scheme in order to maintain a differentiation of the coffees from Baoshan and Simao. Elevation can also been included, although coffees from different elevation will usually been discriminated by density sorting and cup tasting.

Graph 4: The components of the GIs and the covered attributes



In this chapter we have highlighted our recommendations to increase quality and marketing of Yunnan coffee.

The next step will be aimed at translating such recommendations into a programme to be developed.

It is what is done in the next chapter.

7. Programmes to be developed

With the aim of improving the marketing in order to get higher prices for exported coffee, a programme should be developed and address respectively research, development and marketing aspects.

Overall objective:
<ul style="list-style-type: none"> Improving the marketing in order to get higher prices for exported coffee
Specific objectives:
<ul style="list-style-type: none"> Improving Yunnan coffee quality Maximising export prices through this improvement of quality Promote environment protection
Target population (stakeholders):
Coffee producers and especially smallholders
Project area in Yunnan (China):
<ul style="list-style-type: none"> Puer City (Simao) Baoshan City.
Yunnan coffee sector deserves a strong support in accordance with 3 (three) components:
(1) Research and extension of complete technical packages, with a special attention paid to varieties, post-harvest processing and protection of environment (2) Coffee promotion by strengthening the development of Geographical Identifications (3) Training
Operating bodies:
<ul style="list-style-type: none"> Institute of Tropical and Subtropical Cash Crops (ITSCC) operating in close cooperation with Coffee-bases for research, demonstration and extension Coffee Association of Yunnan Baoshan Coffee Association Puer Coffee Association
Duration: 3-5 (three-five) years

1st Component: Research and extension of complete technical packages

Stakeholders:

- Coffee producers
- Actors of Yunnan coffee sector

Operating bodies:

- Institute of Tropical and Subtropical Cash Crops (ITSCC)
- Coffee-bases
- Coffee Associations

Activities to be implemented:

The main priority is to introduce a germplasm corresponding to quality and productive varieties from abroad: mainly Caturra, Typica and Bourbon.

The varieties already cultivated in Yunnan as well as newly-introduced materials should be systematically experimented by the Institute of Tropical and Subtropical Cash Crop (ITSCC) with the assistance of Coffee-bases.

The agronomical behaviour at field level will be checked for each material in the different environmental conditions, which can be found in Simao and Baoshan areas; a special attention will be paid to the following parameters:

- Productivity,
- Tolerance to pests and diseases

The varieties which will prove to be satisfactory from the point of view of productivity and tolerance (for each location) will enter into the second step of analysis.

During this second step, their market potential will be assessed through two parameters:

- Quality (physical and sensorial)
- Willingness to pay of the potential international buyers

The quality will be assessed in laboratories by sorting and cup testing. In order to estimate the premiums that can be obtained from the different varieties, a systematic study with potential buyers has to be implemented. This implies to select a wide list of traders, to send to all of them exactly the same samples of coffee, to ask them the premiums they are willing to pay for such coffees and to perform an econometrical analysis of their answers.

For each variety different post-harvest processing methods will be compared:

- Traditional wet-processing:
 - Previous floatation (preferably in a small siphon-hopper),
 - Pulping,
 - Different times of fermentation,
 - Washing,
 - Sun-drying with an eventual mechanical completion.

- Ecological wet-processing methods:
 - Previous floatation (in a small siphon-hopper),
 - Dry-pulping,
 - Mechanical mucilage removing,
 - Additional soaking,
 - Sun-drying with an eventual mechanical completion.

The conclusions of these experimentations will allow the Institute of Tropical and Subtropical Cash Crop (ITSCC) to elaborate complete packages securing the production of high quality coffee in profitable conditions and including:

- The type of material to be disseminated,
- The corresponding farming practices,
- The most suitable processing method.

In each case the most environment-friendly recommendations should be privileged:

- Minimisation of agrochemical inputs,
- Reduction of water consumption through ecological wet-processing methods.

The complete packages will be afterwards disseminated to the farmers by the Coffee-bases under ITSCC's supervision.

2nd Component: Strengthening the development of Geographical Identifications

Stakeholders:

- Coffee producers
- Actors of Yunnan coffee sector

Operating bodies:

- Coffee Associations
- Institute of Tropical and Subtropical Cash Crop (ITSCC)

Activities to be implemented:

Both Baoshan and Puer Associations have already applied for Geographical Identifications (GI) respectively under the names “Baoshan” and “Simao” (or “Puer”). At present, all the procedures have not been fully completed and the Geographical Identifications not yet obtained.

The approaches already ongoing should be continued and strengthened in accordance with the choices fixed by the Associations and the results of experimentations conducted by the Institute of Tropical and Subtropical Cash Crops (ITSCC) with the assistance of Coffee-bases, as part of the 1st Component; consequently, the following activities will be conducted:

1) Complete the design of the GIs

- The **Code of practices** will be completed by specifying the quality attributes and their level of requirement for:
 - Production practices,
 - Harvesting practices
 - Post-harvest processing
 - Environmental conditions,
 - Social attributes (eventually).

As we already mentioned it, a specific attention has to be paid to the requirements related to the post-harvest process.

- Complete the **Classification scheme**.
This scheme should include criterions:
 - Based on beans’ physical attributes (size, density, colour, number of defects...)
 - Based on sensorial attributes (cup testing)
 - Based on the varieties
 - Based on the sub-region (eventually)
 - Based on the elevation (eventually)

As already mentioned, a specific attention has to be paid to varieties.

- Provide an accurate mapping of the **Delimited area** for “Baoshan” and “Simao” (or “Puer”) areas (eventually).

2) Strengthen the coordination between the two GI process

- The names “Baoshan” and “Simao” (or “Puer”) have to be kept but it should be relevant to add the name of the Province, “Yunnan”, which is worldwide renowned and considered as attractive.
- **The classification scheme of the two GIs have to be similar** (same criteria, same modalities for the criteria)
- **The promotion has to be conducted jointly** in order to benefit for economies of scale

This coordination can be reached by connecting more the GIs or by merging the two GIs (in the last case the subregion –Baoshan or Simao- can be added as a criterion in the classification scheme).

3) Develop a collective promotion strategy

Obtaining Geographical Identifications is only a start. A next step is to reap the benefits for the producers. A strategy of promotion based on the GIs should then be implemented. Its main components could be: a web site, flyers, leaflets, participation in international fairs (such as the one of the Speciality Coffee Association of America or SCAA).

It could also be very useful to develop sales of Yunnan GI-certified coffees as “pure origin coffees”. The whole exercise of registering Geographical Identifications is to ensure traceability. The Coffee Associations will be in position to grant agreements to retailers keen on identifying the corresponding coffees by their names in retailing, so that consumers could recognise their specific characteristics. Consequently, buyers, roasters and retailers will be targeted and approached in China and abroad, so that a wide promotion of Baoshan and Simao coffees could afterwards be conducted.

3rd Component: Training of scientists

Stakeholders:

- Institute of Tropical and Subtropical Cash Crop (ITSCC)
- Coffee-bases
- Actors of Yunnan coffee sector

Operating bodies:

- Cirad
- Eventually other International Research Centres

Activities to be implemented:

A strong request formulated by ITSCC's leaders refers to the training of scientists through:

- Short term assignation of foreign specialists in Yunnan,
- Stays of Chinese scientists in Research Centres abroad.

Agreements should be negotiated and signed between the Institute of Tropical and Subtropical Cash Crops (ITSCC) and Cirad to facilitate these activities. Thank to its experience and knowledge about Coffee Research Centres in the world especially in producing countries, Cirad could also help ITSCC identifying other scientific and technical partners.

8. Conclusions

After their short-assignment to China from November 1st to 11th, 2010, the Cirad experts were in position to present a scheme of the present Coffee value chain in Yunnan. They also analysed the role and strategy of the actors involved.

Some succinct price structures were elaborated to evaluate the margin of exporting companies as well as the percentage of international price actually received by the producer.

In relation with these data and observations, a SWOT analysis was established and used to formulate a set of recommendations with the aim of improving the Coffee value chain in Yunnan:

- Analysis of the relevance of different certification schemes to market the coffee from Yunnan;
- Proposals for improving the organisation of the marketing system that connect coffee growers to the international market.

The main conclusions are:

1. International market is the relevant target for Yunnan coffee (imported Robusta is more competitive to supply Chinese roasters)
2. As Yunnan coffee is mainly washed Arabica, it can potentially get high prices on international market.
3. However, as the main variety (Catimor) has a low potential for quality, getting higher process means switching to others varieties with good agronomic performances and high quality potential (such as Caturra)
4. New varieties should be tested in Yunnan from the point of view of agronomic performance, quality and buyers' willingness to pay. The best ones should be disseminated to the farmers
5. The post-harvest process is not always managed as it should be in order to get high quality green coffee
6. Equipment and knowledge have to be disseminated in order to improve the quality of post-harvest process
7. Improvement of varieties and post-harvest process are complementary: good varieties provide a potential for quality, but this potential can be destroyed by a bad post-harvest process. On the other hand, a good post-harvest process will lead to a high quality coffee only if the varieties used have a potential for quality. This means that the actions to improve the varieties and the post-harvest process are complementary and should be developed simultaneously.
8. In order to increase the quality of the varieties and the post-harvest process, it is necessary to provide *at the same time* the means to produce quality (knowledge and material) and the corresponding incentives. Indeed quality is costly and will be produced only if it is rewarded by a higher price on the market. The practical consequence of this is that actions on knowledge, material and equipment as well as incentives are complementary and should be developed simultaneously.
9. The best way to provide incentives is to introduce requirements in the Code of practices of the Geographical indications (we recommend to do it for good post-harvest practices) or criteria in the Classification scheme (we recommend to do it for varieties)

10. In addition to varieties and post-harvest practices, other attributes can be added to Yunnan coffee: environmental, social or symbolic attributes. In order to give a value to these attributes, it is possible to rely on existing labels such as Organic or Fair Trade. However, it is also possible to rely on Geographical indications (by including these attributes in the Code of practices).
11. The Geographical indications will play a key role in the quality improvement strategy. That is the reason why the coordination between the two Geographical indications should be improved. We recommend that the two GIs should use the same Classification scheme and should do the promotion jointly. A more ambitious scenario is to merge the two GIs (in this case the differences between the coffees of the two sub-regions can be maintained by introducing the sub-region as a criterion in the Classification scheme)

In accordance with the approaches already developed by the Institute of Tropical and Subtropical Cash Crops (ITSCC) in close cooperation with Coffee-bases and Coffee Associations, the experts recommended a programme to be implemented:

- A set of activities will be implemented to improve coffee quality through research and extension:
 - Introduction of high quality and productive germplasm,
 - Study of agronomical behaviour at field level for traditional and newly-introduced material in the different environmental conditions,
 - Quality control of these materials in relation with post-harvest processing technology,
 - Estimation of the potential premium that can be obtained for the new varieties (well processed)
 - Elaboration of complete packages privileging quality and environment-friendly practices.
- Two applications for geographical Identification already launched by the Coffee associations should be continued and strengthened. The components of the GIs (especially the Code of practices and the Classification scheme) should be completed. The coordination between the two GIs should be improved. At least, the Classification scheme should be the same for the two GIs and the promotion has to be made jointly.
- Agreements should be negotiated and signed between the Institute of Tropical and Subtropical Cash Crops (ITSCC) and Cirad to facilitate training directed to Chinese scientists working in coffee. Cirad could also help ITSCC identifying other scientific and technical partners.

A close cooperation developed between the Institute of Tropical and Subtropical Cash Crops (ITSCC) and Cirad could help elaborating and promoting a full Project, so that international Funding Agencies could be approached and a financial support subsequently obtained.

ANNEX 1: Work programme in China

Date	Place	Activities
Oct. 31 & Nov. 1, 10		Air-travel: Montpellier/ Paris-CDG/ Shanghai/ Kunming
Nov. 1, 10	Kunming	Kickoff meeting with Professor Liu Guanghua and ITSCC team
Nov. 2, 10		Transfer by car from Kunming to Puer
Nov. 3, 10	Puer	Visit of Hongji Coffee Experimental Base with Mr. Liu Biao
		Visit of Puer Sunlight Coffee Co. Ltd. with Mr. Li Xian Rong
		Meeting with ITSCC team and other interlocutors: Mr. Liu Biao, Mr. Li Xian Rong, Mrs. Shirley Liu (Simao Arabica-SM Coffee Co. Ltd.) and Mrs. Jasmine Zhiang (Puer Livesun Coffee Co. Ltd.)
Nov. 4 & 5, 10		Transfer by car from Puer to Baoshan, via Jing Dong and Da Li
Nov. 6, 10		Transfer by car from Baoshan to Lujiang
	Lujang Xing Zhai	Arrival at ITSCC Meeting with Mr. Fan, coffee producer and middleman
Nov. 7, 10	Lujiang	Visit of UNI-Rise Tropical Crop Development Co. Ltd.: Interview of Mr. Frank Chen and Mr. Lung-Sheng Chien
		Visit of ITSCC Coffee Base
Nov. 8, 10	Lujiang	Opening of a Workshop held by ITSCC
		Meeting with: <ul style="list-style-type: none"> • Mr. Dong Zhi Hua and Mr. Li Gongqin (Coffee Association of Yunnan), • Mr. Qing Gang (Dry-hot Valley Bioengineering Co. Ltd., Panzihua)
Nov. 9, 10	Lujiang	“Improvement of coffee marketing” Presentation by F. Galtier and M. Jacquet, as part of the Workshop held by ITSCC
		Meeting with Mr. Dong Zuliang (Baoshan Coffee Association)
Nov. 10, 10	Lujiang	Wrap-up meeting with: <ul style="list-style-type: none"> • <u>ITSCC team</u>: Mr. Huang Jia Xiong, Mr. Liu Guanghua, Mr. Luo Xinping, Mr. Li, Mr. Wang Wandon and Miss Yang Bei • <u>Baoshan Coffee Association</u>: Mr. Dong Zuliang
		Transfer by car from Lujiang to Kunming
Nov. 11 & 12, 10		Air travel: Kunming/ Shanghai/ Paris-CDG/ Montpellier

ANNEX 2: Addresses of entities and interlocutors met in China

Name	Address	Phone, fax & Email	Contacts
Coffee Association of Yunnan	N° 1 Yunnan Province Science & technology Archives West Cuihu Road Kunming Zip code: 650091 P. R. China	Mob: 13908844870 Ph: 0871 5369550 dzhhua@yeah.net	Mr. Dong Zhi Hua Deputy Secretary General
		Mob: 13888434848 Ph: 0871 5369550 ligongqin01@163.com	Mr. Li Gongqin
Dry-hot Valley Bioengineering Co. Ltd. Panzihua		Mob: 13388303033 Ph: 0812 2221887	Mr. Qin Gang Chairman of the Board
Puer Livesun Coffee Co. Ltd.	N° 64 Mingli Lane of Shiji Square Simao District 665000 Puer City Yunnan – P. R. China	Ph: +86 879 2120900 Mob: +86 13577938068 livesuncoffee@yahoo.com.cn	Mrs. Jasmine Zhang Sales Manager
Puer Sunlight Coffee Co. Ltd.		Ph: 0879 2127988 Mob: 13769938958 lixianrong88@yahoo.com.cn	Mr. Li Xian Rong
Simao ArabicaSM Coffee Co. Ltd.	N° 130 South Huangcheng Road Puer Yunnan – P. R. China	Mob: +86 131 8792 6668 Ph: +86 879 213 4222/ 214 8371 shirleyliu617@hotmail.com	Mrs. Shirley Liu General Manager
UNI-Rise Tropical crop Development Co. Ltd.	N° 18 Paomashan, Dongjiao Kunming Yunnan – P. R. China	Mob: 13769136299 Ph: 86 871 7357881 frank@uni-rise.com	Mr. Frank Chen President
	Lujiang Lon Yang District Baoshan Yunnan – P. R. China	Mob: 13908755389 Ph: 86 875 2810699	Mr. Lung-Shen Chien Vice-president

Name	Address	Phone, fax & Email	Contacts
Yunnan Academy of Agricultural Sciences (YAAS) Institute of Tropical and Subtropical Cash Crops (ITSCC)	Baoshan City Yunnan Province P. R. China Postcode: 678025	Ph: 0086 875 2810555 Mob: 13887833898 huangjiaxiong@163.com	Mr. Huang Jia Xiong Director Vice-professor
		Ph: 86 875 2811194 rjslxp@126.com	Mr. Luo Xinping Associate Professor
	Baoshan Experimental Station of Modern Agro-industry Lujiang Town of Baoshan City 678025 Yunnan P. R. China	Ph: +86 875 2811124/2811176 Mob: 13529558689 rjslgh@126.com rjslgh@sina.com	Mr. Liu Gang-hua Vice-director Associate Researcher Station-master