



International Coffee Organization
Organización Internacional del Café
Organização Internacional do Café
Organisation Internationale du Café

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Study

Executive Board/
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Study on improving the global coffee supply/demand balance through measures designed to eliminate low-grade coffees

Background

1. At its meeting in January 2001 the Executive Board noted the ideas expressed by the Speciality Coffee Association of Europe (SCAE) for the improvement of the world coffee market situation and measures designed to eliminate the lowest quality coffees from the market (see paragraphs 29 to 31 of Decisions Adopted number 244, document EB-3772/01, and the press release issued by the SCAE, document ED-1767/01). The Board recommended that a study be conducted to examine in detail the implications of a scheme of this nature, both in terms of its impact on the improvement of quality and its effects on the market situation.
2. The present document presents the preliminary results of this study. It consists of an overview, followed by a study on economic aspects of a diversion programme (Annex I), in which diversion refers to the elimination of low-grade coffees from the market, a summary of the conclusions of the technical study on alternative uses for diverted coffee (Annex II), and a summary of responses from Members and Private Sector Consultative Board members (Annex III) on matters of possible relevance to the implementation of such a programme.
3. The economic study was carried out by the Economic and Social Institute of the Free University of Amsterdam by a team headed by Professor Christopher Gilbert. The study on alternative uses was conducted by the Natural Resources Institute, United Kingdom, by a team headed by Dr. R. T. Paterson.

I. ECONOMIC EFFECT

1. The full economic study is attached as Annex I. The Economic and Social Institute (ESI-VU) has made estimates, based on price/supply statistics over the 1990s about diversion (alternative uses, including physical destruction) that each million bags removed from the global market will raise prices by 2 US cents/lb. Table 2, giving estimates of costs and benefits related to export revenue in 2000/01, indicates that a diversion respectively of 5 million, 10 million, or 20 million bags will cost US\$401 million, US\$935 million and US\$2,399 million, but generate profits of US\$1,688 million, US\$3,243 million and US\$5,958 million respectively, with costs borne almost exclusively at the time the diverted coffee is purchased (where this is the case). The authors conclude that diversion is profitable in terms of market prices. Moreover their results may underestimate the value of diversion since they ignore:

- (a) revenue from alternative sources;
- (b) the potential higher price obtainable for higher quality coffee; and
- (c) the effect on modification of underlying bearish sentiment.

2. In addition, it may be concluded that the general availability of a higher quality product may itself provide an additional stimulus to demand.

3. Two models for implementing diversion are analysed:

- (a) ICO producing Member Governments can bear the responsibility of diverting a specified tonnage of their own production (or stock)¹.
- (b) ICO Member Governments (perhaps consumer as well as producer Governments) could contribute financially to provide funds for purchase of coffee for diversion.

4. In both cases free riding is seen as a potential problem – either because Governments will fail to implement agreed diversion procedures or fail to make agreed financial contributions. A further important factor – the cost of enforcement (monitoring and compliance) – is not considered.

5. The study concludes that, insofar as the current situation is due to an excess of production over demand, a diversion policy should be complemented by a long-term supply management strategy rather than function as a substitute for such a policy.

¹ *This approach avoids direct budgetary costs but typically imposes costs on farmers.*

II. ALTERNATIVE USES FOR COFFEE

6. This study has been summarized in Annex II and considers alternative uses for the purposes indicated below.

Feed

7. It is concluded that the effect of using the whole cherry is similar to using pulp and hulls in animal feed. Levels of 20 percent of DM (dry matter) in diets for large and small ruminants is possible. The effect of the scheme, apart from the removal of coffee, would provide additional feed resources in mixed and livestock farms.

Fuel

8. Use for direct combustion or briquetted fuel within an area of 100 km from the source is estimated as equivalent to the use of fuel wood or other biomass and would also be possible in applications using liquid fuels if their heat requirements are 1 MW or less with use of gasification or semi-pyrolytic combustors.

Extractives and mulch

9. The commercial potential for extracting and using chlorogenic acid as an antioxidant and for production of biogas is said to merit further investigation. Green coffee extracts may also offer alternatives in selected weed control systems for some crops.

III. IMPLEMENTATION/QUALITY CONTROL

10. The question of feasible implementation of a diversion scheme is illuminated in part by responses received to questionnaires sent by the Organization to Members (document ED-1771/01) and to the Private Sector Consultative Board (PSCB) (document PSCB No. 19/01). Responses were received from 13 Member countries, consisting of 10 exporting Members and 3 importing Members; 7 PSCB members: 3 associations in exporting Member countries and 4 associations in importing Member countries. Responses are given in Annex III.

11. The situation indicated from these responses is as follows:

(1) Existing minimum export/import regulations on quality

By and large, few specific regulations in importing Member countries but a number of varied regulatory provisions in exporting Member countries confirm that the concept exists. The SCAE suggests that regulations should be the responsibility of individual countries.

(2) Criteria to establish minimum export/import qualities

A consensus indicates that this should be the responsibility of producing countries. ISO standards are mentioned as a starting point and the possibility of upgrading existing standards by “one point”.

(3) Enforcement

Although the SCAE proposes standard and uniform regulations for all E.U. countries, this is not a general importing Member position. Existing rules involve enforcement by international agencies or Governments.

(4) Benefits of minimum quality regulations

Two different replies from private associations in importing Member countries: beneficial (SCAE) and not needed (AJCA). The latter makes the point that the consumer positions vary from country to country and with respect to coffee from different origins and types.

Enforcement of minimum quality regulations

One importing Member country agrees with such enforcement and one disagrees. The majority of exporting Member countries favours such regulations either through monitoring by ICO (exports inspected prior to export and report attached to Certificate of Origin or by random ICO inspections), or by introducing a degree of sub-standard exports. Internationally agreed standards are recommended by many but not all respondents.

(5) Domestic markets

No quality requirements are recommended for domestic markets by importing Member respondents but are supported by several exporting Members.

(6) Alternative uses

Confectionery, liqueurs, animal feed, organic fertilizers, cosmetics and cellulose paste are suggested by exporting Members.

(7) Costs/benefits of scheme

In general, short-term losses are seen to be more than compensated by medium to long-term gains.

(8) Attitude to scheme

Consumers: 3 positive, 1 negative

Producers: 9 positive, 1 negative

(9) Non-defect quality standards

A wide range is mentioned from moisture content to cupping.

(10) Penalties for low grades

Contaminated loads are rejected in Italy, destroyed in Nigeria and Jamaica and sent for re-processing in Ethiopia. In Colombia use and transport of “ripio” is penalised as smuggling. Otherwise no penalties.

(11) International definitions of defects

Almost unanimous support. US Green Coffee Association standards maintained.

(12) Internationally agreed standards on defects

In general supported, but standards to be set by coffee sector (Finland). Need to be practicable by exporting Members.

Comment

12. Quality control appears to be practised to varying degrees by regulatory agents in a number of exporting Member countries. In addition, of course, all exporting Members of the ICO are required to use Certificates of Origin for exports. This implies *prima facie* that quality standards are enforceable at origin and may be monitored by ICO analysis of Certificates of Origin.

IV. OVERALL CONCLUSIONS OF STUDY

13. It would seem technically possible to operate a system of diversion by establishing a global system of defects grading and ensuring that coffees below a certain minimum standard are diverted. This would be documented through Certificates of Origin with the grade checked by the Certifying Agency. Transitional provisions may apply to countries with large volumes of coffee below the minimum grade. With respect to financing a diversion scheme, it is likely that the obligations would need to be assumed by all exporting Member countries, either by refusing to accept low grade coffees from farmers or by purchasing low grade coffees. However, some technical assistance costs might be sought from international donors or the First Account of the Common Fund for Commodities to ensure that Certifying Agencies are able to fulfil their duties.

14. Such a scheme would benefit consumers by improving the overall level of coffee quality on the market (see paragraph (9) of Article 1 of the International Coffee Agreement 2001) and producers by contributing to the achievement of a reasonable balance between world supply and demand (see paragraph (2) of Article 1 of the International Coffee Agreement 2001). It would therefore seem to provide a potentially striking example of producer-consumer cooperation to benefit the overall coffee market in both Member categories. Nevertheless it would not preclude the need to review the matter of production capacity and scope for promoting demand growth in the longer term.

15. In order to proceed further on this matter the Executive Board may wish to consider whether it is desirable in principle to develop a diversion scheme. If so, the following matters may need to be considered for recommendation to the Council:

- (a) a formal resolution or decision of acceptance in principle;
- (b) the use of Certificates of Origin as a monitoring mechanism;
- (c) the use of interim ISO defects standards or US Green Coffee Association standards as a reference point to determine low-grade coffee (to be replaced by final ISO – or ICO – standards when ready);
- (d) the use of other criteria such as moisture content or mouldy beans;
- (e) the need for technical support for quality control procedures of national agencies;
- (f) possible cooperation by importing Members;
- (g) possible sources of financing other than from each exporting Member;
- (h) reporting on volumes of diverted coffee;
- (i) involvement of third party supervisory agencies;
- (j) the volume of diversion to be sought; and
- (k) the reference grade(s) or standard(s) to be used.

RESTORING BALANCE BY DIVERSION IN THE WORLD COFFEE MARKET

(Free University of Amsterdam)

1. Background and Context

Over the eleven year post-intervention period October 1989 to September 2000, the ICO indicator price averaged 93c/lb. In real terms, the average price was 103c/lb at 2000 prices.¹ Excluding the 18 month period April 1994 through September 1995, during which prices were distorted by the effects of the Brazilian frost and the subsequent speculative fever, the average nominal price was 84c/lb, equivalent to an average real price (at 2000 values) of 93c/lb. The March 2001 ICO indicator price of 48.5c/lb was only slightly above half this level.

At the same time and despite low prices, there is growing disquiet on the part of the coffee processing industry in relation to the quality of coffee available on world markets. These worries are variously attributed to the effects of market liberalization, increased competition and on pressures to bulk coffee for transportation.² The coffee diversion proposal is aimed at both problems.

2. Nature of the Price Problem

We consider three possible explanations for the current low level of coffee prices:

- a) The market is over-supplied and is expected to remain over-supplied. We discuss this below.
- b) The high value of the dollar relative to many producing country currencies implies that dollar values over-estimate the price decline. Our estimate is that currency depreciation among coffee-producing countries (most notably Brazil, Indonesia, Thailand and Uganda) is responsible for a significant proportion of the decline in the dollar price. If current dollar exchange rates had prevailed during the entire post-intervention period, we believe that the average real price would have been only 78c/lb.³ On that basis, the March 2001 price was 62.5% of our estimated long term sustainable level.
- c) Productivity growth has lowered the prices producers can expect. Productivity in most commodities is growing at around 1%-2% per annum. We assume a 1½% rate of productivity advance in coffee over the 1990s, although this cannot be estimated accurately. The implication is that, with the same production and stock levels, prices would be 16½% lower in 2000 relative to 1990.

¹ We have deflated by the US wholesale price index for industrial goods. Other choices of deflator give similar but not identical results.

² These explanations of the perceived decline in coffee quality have been disputed.

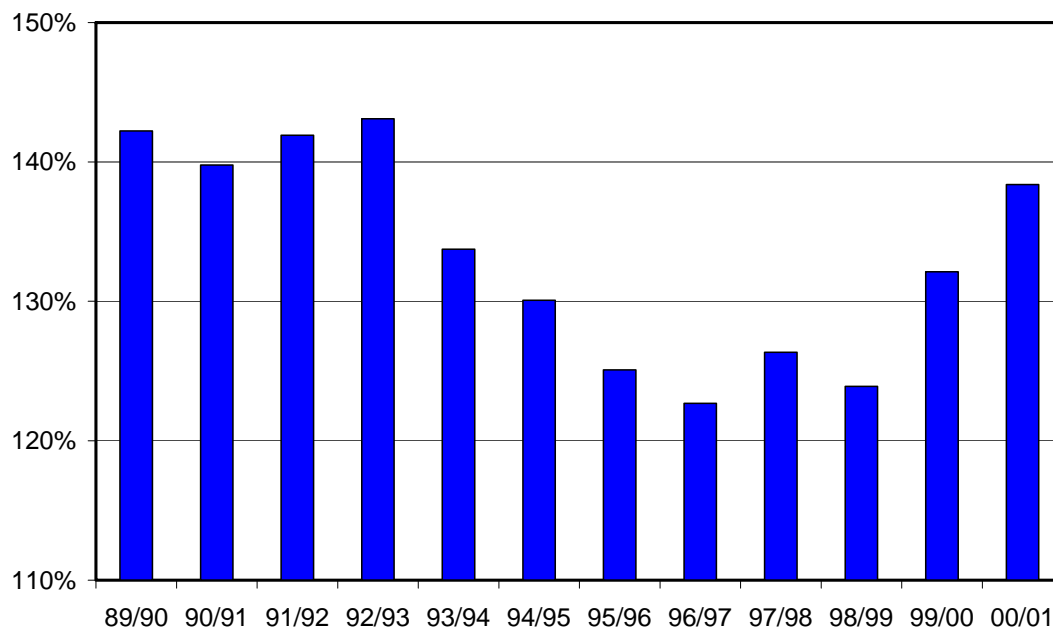
³ We have constructed an index of the dollar exchange rates (source: IMF, *International Financial Statistics*, March 2001) of all ICO producing members with 1999-2000 production in excess of 1,000,000 bags. The index was weighted by 1999-2000 production (source: ICO, *Coffee Statistics*, June 2000). We suppose that a 1% increase in this index results in a 1% decline in the dollar coffee price - this is consistent with the data. We experimented with a similar index for ICO coffee importing countries, but this did not aid in explaining coffee price movements.

3. Coffee Prices in the Post Intervention Coffee Market

Agricultural economists often link prices to availability, defined as current production plus carryover from previous years. This approach may be rationalized if production exhibits very little responsiveness to prices in the short term, with the implication that the market is balanced by changes in stocks and consumption. This approach appears to work well in the coffee industry with the following two modifications:

- i) We replace production by an average of production in the current crop year, the preceding year, and expected production in the following year. Expected production is seen as constant over the period 1989-90 to 1995-96, but as rising at slightly over 2½% per annum thereafter.
- ii) We give producer stocks a weight of one half in constructing the availability measure. This can be justified on the argument that producers are not always prepared to make stocks available for export. However, consumer stocks (which are evidently available for consumption) enter with the same weight as production.⁴

Figure 1: Coffee Availability - 1989-90 to 2000-01



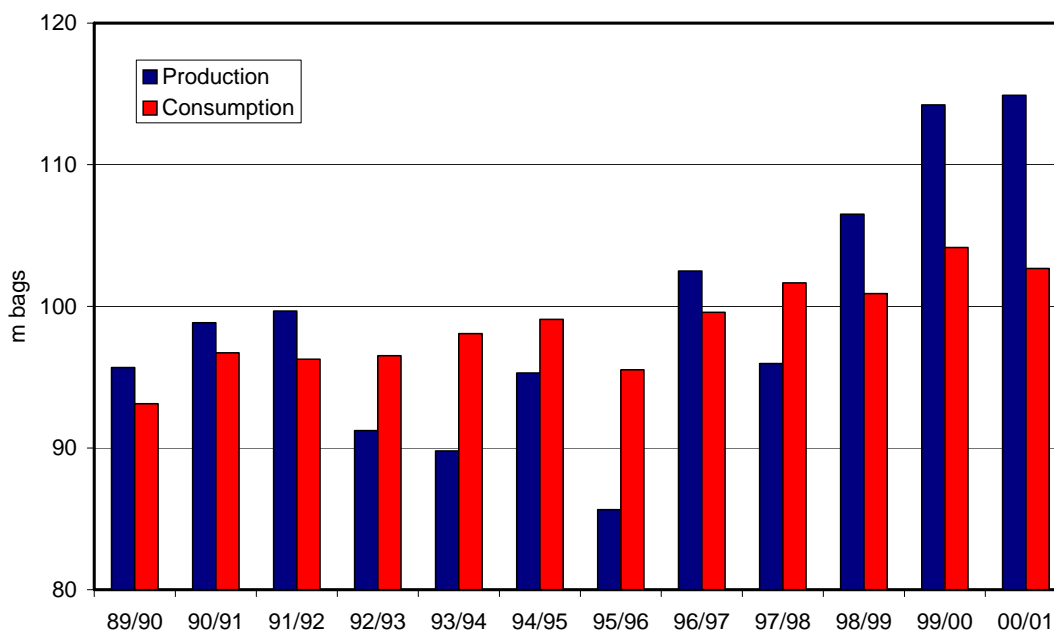
The resulting availability series is graphed in Figure 1. It shows high levels of availability in the initial four post-control years (1989-90 to 1992-93), thereafter declining to much lower levels to reach a minimum in 1996-97, followed by reversion to the levels of the early 1990s in 1999-2000 and 2000-01.

The increase in availability over the past three crop years is due to a surge in production against the background of only modest increases in consumption – see Figure 2. The increase in production is now becoming reflected in an increase in stocks, particularly stocks held in consumer countries, but this is an effect and not the cause of the current imbalance. However, so long as consumer stock levels remain

⁴ Producer stocks are end-crop year stocks in ICO producing member countries. Consumer stocks are June stocks of green coffee in ICO consuming member countries.

high, the current excess of production over consumption will continue to weigh on the coffee price.

Figure 2: Total ICO Production and Consumption



This availability measure provides a reasonable explanation for prices except in the frost year 1994-95 – see Figure 3. The Figure relates the average real price in the designated crop year, corrected for exchange rate changes and productivity growth, to production averaged across that year, the preceding year and an estimate for the following year, together with the stock level at the start of the crop year.

Figure 3 shows three groups of points.

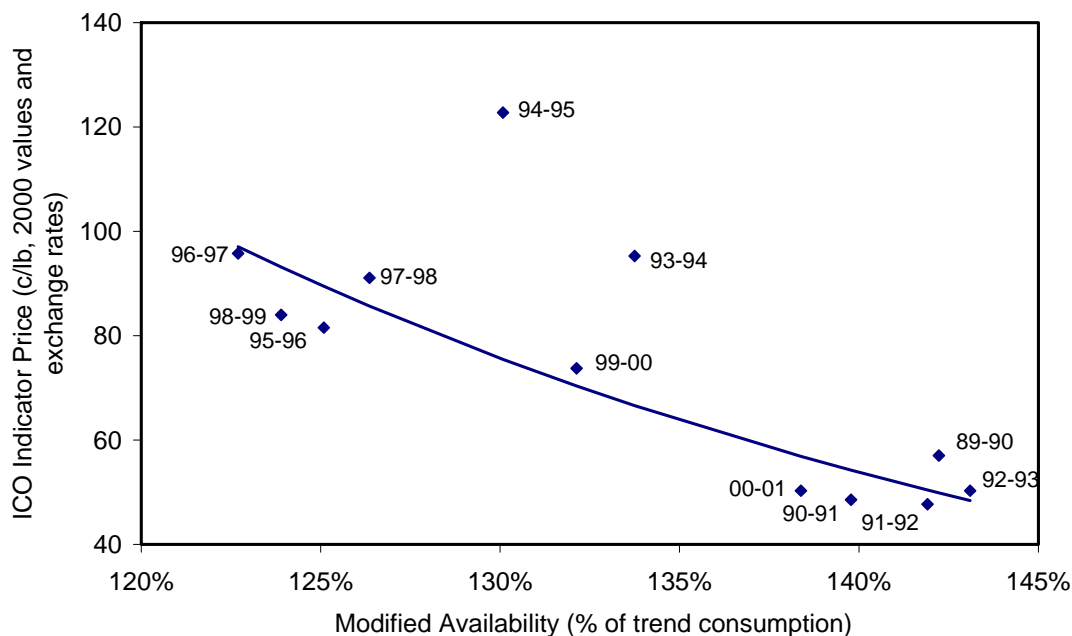
- a) Four years in which availability was low and the coffee price was correspondingly high (1995-96, 1996-97, 1997-98 and 1998-99).
- b) Three years of moderate availability (1993-94, 1994-95 and 1999-2000) in two of which (1993-94 and 1994-95) the price was distorted upward by the effects of the severe Brazilian frosts of in June-July 1994.
- c) Five years in which availability was high and price was low (1989-90, 1990-91, 1991-92, 1992-93 and 2000-01).

The figure suggests that the current market situation is broadly comparable with that in the early 1990s when coffee prices were depressed by the stock overhang available to the market as the consequence of the ending of ICA export controls. Although current prices appear lower than those prevailing a decade ago, this is in part the impact of the high dollar, and in part the consequence of cumulated productivity advance.

The model which Figure 3 is based was estimated over the eleven year period 1989-90 – 1999-2000. We calculate a (provisional) modified availability figure of 138.4% for 2000-01. On this basis, the model predicts a price of 56c/lb for the 2000-01 crop year. This is approximately 7c/lb higher than the average for first six months

of the year (the point illustrated in Figure 1). The discrepancy might arise either from an under-estimate of the physical position, or from the impact of “fund” speculation.

Figure 3: Exchange Rate-Adjusted Deflated Price versus Availability



4. Coffee Diversion: How Much is Required to Restore Balance?

Coffee diversion has two objectives: restoration of market balance and improvement of coffee quality. Market balance requires that both production and stock levels are in line with coffee consumption. It is now generally seen as preferable to aim for balance through intermediate quantity objectives rather than price objectives – judgments on market balance made in quantity rather than price terms are both simpler and less likely to become politicized. An appropriate quantity objective would be to reduce stocks to normal levels and to balance export availability with consumption.

The model illustrated in Figure 3 implies an approximate 2c/lb increase in the ICO Indicator Price for every one million bags of coffee removed from the market. Over this eleven year period, the availability measure developed in section 2 averaged 133.3%. We may take this as providing an estimate of “normal” market conditions. At current exchange rates and productivity levels, this level of availability is consistent with a price of 69c/lb.

Table 1 gives our estimates of the quantity of diversion required to restore market balance in the sense defined above. We assume trend growth in consumption but maintain production constant at its 2000-01 level. The implied required quantity to be diverted is estimated at 10½ million bags in 2001-02, falling to an average of 4.8 million bags in the following years.

The impact of diversion is calculated as a north-westerly move along the line in Figure 3. In general, observations are above or below the line. In principle, diversion may be accompanied by a move closer to or away from the line. In the current situation, in which the 2000-01 price appears well below the theoretical line, the

impact of diversion, measured by the slope of the line, might be somewhat larger than 2c/lb per million bags diverted if it also reverses bear “fund” speculation. This indicates that an initial diversion level of somewhat less than the 10½ million bags implied by Table 1 might be sufficient for 2001-02.

Table 1							
Restoration of Coffee Market Balance by Diversion							
Millions of bags (60 Kg.), October to September							
	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Opening stocks in coffee-producing countries	23.5	22.3	25.2	25.2	25.2	25.2	25.2
Total production	114.9	111.3	111.3	111.3	111.3	111.3	111.3
Total availability	138.4	133.5	136.5	136.5	136.5	136.5	136.5
Consumption of coffee-producing countries	24.6	26.0	26.3	26.5	26.7	26.9	27.1
Consumption of non-coffee producing countries	79.0	77.1	77.8	78.4	79.1	79.7	80.4
Total consumption	103.6	103.2	104.1	104.9	105.8	106.7	107.5
Closing stocks in coffee producing countries	25.2	25.2	25.2	25.2	25.2	25.2	25.2
Quantity to be diverted			10.6	6.1	5.2	4.3	3.4

The concept of *price flexibility* helps understand the circumstances in which diversion will be effective in raising the coffee price. The price flexibility of a market measures the price impact of a 1% reduction in availability. If the price flexibility exceeds unity, a 1% reduction in availability increases the price by more than 1%. It therefore increases aggregate revenues by more than the cost of diversion. The flexibility underlying Figure 3 is (almost exactly) two, so this condition is satisfied. However, the price flexibility of a market is simply the inverse of the sum of the demand and supply price elasticities. Since elasticities tend to be higher in the long term than the short term, the market price flexibility will be lower in the long term than the short term. This is because, over time, at least part of the diverted supply will be offset by increased production, at least relative to the no diversion situation. The implication is that a sustained diversion programme will have a smaller price impact than a once-for-all diversion policy. This suggests that diversion may need to exceed 5 million bags in later years to achieve the required objective.

This has implications for the objectives of the diversion policy. The problem facing the coffee market in the early 1990s was a stock overhang as the consequence of producer stocks, retained under the ICA export control regime, becoming available to the market. Although production was running slightly ahead of consumption – see Figure 2 – a once-for-all diversion programme would have substantially relieved the market imbalance. Currently, the market imbalance originates in the substantial excess of production over consumption rather than in an accumulated stock overhang. Diversion is likely to be less effective in dealing with this situation – it effectively validates excess production by raising prices to ensure profitability, but in so doing, it fails to address the fundamental problem of excess production.

The same conclusion applies to retention. Furthermore, in the absence of a continuing control regime, retained stocks continue to be available to the market if demand is sufficiently high. We should therefore expect the impact of diversion of a given quantity of coffee to be greater than that following retention of the same quantity.⁵ The most appropriate policy for dealing with an imbalance of production over consumption is for countries to provide incentives for reduction of the area under coffee cultivation. The overall conclusion is that diversion of coffee to alternative uses can be an effective means of raising prices, but it does not address the problem of long term market imbalance. Coffee diversion should therefore be seen as a means of augmenting a long term supply management strategy rather than as a substitute for such a policy.

Perceptions as to whether or not the diversion policy is sustainable might influence the market outcome. In practice, this implies that if schemes to restrict supply are well supported by participants in the market, the actual increase in prices will occur in advance of implementation. A survey of ICO members there suggests that there is support for such policies.

5. How Might Coffee Diversion be Organized?

Retention and diversion share the objective of removing coffee from the world market thereby raising prices. Diversion has an advantage over retention that it can also result in an improvement in coffee quality. The two policies also face similar enforcement and monitoring problems⁶. Diversion to alternative uses has the advantage over retention that the quantities involved are permanently removed from the market. Retention will only lift prices to the extent that retained stocks are regarded as unavailable the two schemes will have quite different effects on consumer stockholding – retention will result in consumers reducing stocks, since coffee will be available from producers, while diversion should increase consumer stockholding because of the increased potential for subsequent excess demand and / or price rises. Diversion and retention have the potential to complement and reinforce one another since diversion of retained stock will increase the price impact of producer stocks.

Diversion may be organized in either of two ways:

- i) ICO producing member governments can bear the responsibility of diverting a specified tonnage of their own production (or stock).
- ii) ICO member governments (perhaps consumer as well as producer governments) could contribute financially to provide funds for purchase of coffee for diversion.

The first approach avoids direct budgetary costs but typically imposes costs on farmers. A simple scheme would be for each country to be responsible for diverting 10% of its production. However, the scheme would face the same monitoring problems as the ACPC retention scheme –in particular, countries which lack suitable mechanisms and institutions and for this or other reasons might free ride on those who do divert. Monitoring is much easier if firms contribute financially to a diversion scheme – it is clear who has and who has not contributed.

⁵ Our model implies that diversion is twice as effective as retention. However, this estimate is necessarily somewhat conjectural.

⁶ The ACPC coffee retention plan contains a large section on controls, involving inspection, ratification, verification etc. of agreed retention, and a section on sanctions if countries fail to comply with the rules.

The second approach has a number of advantages:

- To the extent that diverted stock was purchased on one or other of the coffee terminal markets, it would have immediate and direct market impact. However, the budgetary cost of the scheme would fall directly on governments. By contrast, if governments retain responsibility for diversion, they have the potential to push the cost of intervention back onto farmers – for example, by obliging exporters to divert specified tonnages of coffee to designated uses at their own cost. But in either case, free riding will be a potential problem – either because government will fail to implement agreed diversion procedures, or because they will fail to make agreed financial contributions.
- The other major objective of coffee diversion is that of raising the average quality of the coffee on the world market. There are a number of technical measures of coffee quality, in particular relating to defect content. It is widely considered that the market specifies minimum quality standards. Diversion is one means by which these quality objectives might be attained. A complicating factor is that different producing countries have different proportions of poor quality coffee, depending on their marketing systems, the types of coffee they produce and their existing quality controls. This lack of balance argues in favour of a contribution-based diversion system rather than a system in which each country maintains responsibility for diversion of its own production since the former method could be more efficiently adapted to the uneven distribution of lower quality coffee.

There is no clear superiority of either approach, and ICO member governments will need to carefully weigh the various considerations.

6. Cost-Benefit Analysis

We estimate that diversion of coffee will be profitable. The calculations are shown in Table 2 assuming diversion levels of respectively 1 million, 5 million, 10 million and 20 million bags. Revenue benefits are in terms of ICO export revenues rather than total sales revenues since any increase in revenues from sale to domestic consumers is simply a transfer within the producing countries. The calculations suppose that diverted coffee has zero value.

Quantity diverted (m bags)	1	5	10	20
Post-diversion price (c/lb)	53	61	71	91
Diversion cost (\$m)	70	401	935	2399
Increase in 2001-02 Export Revenue (\$m)	214	1071	2143	4286
Increase in Discounted Future Revenues (\$m)	204	1018	2036	4071
Profit from Diversion (\$m)	348	1688	3243	5958
Profit per lb diverted (\$/lb)	2.63	2.55	2.45	2.25

If we ignore monitoring costs and compliance costs, the costs of diversion are borne entirely at the time the diverted coffee is purchased. Benefits extend over time through the impact of lower stock levels. Table 2 gives estimates both of the immediate additional revenue from diversion, and the discounted value of the

additional revenue over the succeeding four crop years.⁷ The calculations show that diversion is clearly and substantially profitable.

It should be emphasized that these calculations are subject to a wide margin of error, both because there are currently only eleven years of usable data on price determination in an uncontrolled coffee market and because diversion is an untried policy, which makes its effects difficult to estimate. In particular, the figures in Table 2 may underestimate the benefits of diversion for a number of reasons:

- a) It is likely that coffee taken off the market will have positive value in other uses. We have not attempted to estimate this value. It is important to be aware of the incentives for purchase of diverted coffee for resale in the world market - any such sales will offset the value obtained from diverting coffee to alternate uses.
- b) To the extent that lower quality coffee is diverted to alternative uses, the average quality of coffee available for consumption will rise. This should imply a higher attained price and also a higher level of consumer satisfaction.
- c) As noted above, by changing the current bearish market sentiment, a diversion programme may lift prices by more than the 2c/lb per million bags implied by our model.

There are other factors which go in the opposite direction. Nevertheless, we are confident that if properly executed, a diversion programme would both generate positive revenues to coffee-producing countries and raise the quality of coffee on world markets.

7. Summary and Conclusions

Diversion of coffee to alternative uses can be an effective means of raising prices. We estimate that every million bags diverted raises coffee prices by around 2c/lb. If monitoring and compliance costs are ignored, this figure implies that the revenue benefits from diversion substantially exceed diversion costs. However, the major problem currently facing the coffee market is a continuing excess of production over consumption. An imbalance of this sort is not addressed by a diversion policy alone. If diversion is to be effective, there must be a continuing programme, but in that case, it is likely that, over time, diversion will discourage reductions in capacity and thereby reduce the effectiveness of the programme. Coffee diversion should therefore be seen as a means of augmenting a long term supply management strategy rather than as a substitute for such a policy.

Amsterdam, 7 May 2001
Christopher L. Gilbert, Wouter Zant

⁷ We discount at 10% per annum.

**POTENTIAL NON-BEVERAGE USES FOR SUB-STANDARD
COFFEE CHERRIES: A REVIEW OF THE LITERATURE
WITH EMPHASIS ON LIVESTOCK, FUEL, EXTRACTIVES AND MULCH
(Natural Resources Institute U.K.)**

Summary

**Section I – Foreword
Peter Greenhalgh**

The coffee sector is in crisis as an excess of supply over demand has led to the lowest prices for thirty years, with many producers now failing to cover production costs. Coffee is of vital importance to many countries as a source of both employment and foreign exchange earnings. Coffee, after oil, is the largest valued commodity in international trade, with the annual value of export revenues in recent years having exceeded \$ 10 billion, while annual retail sales of coffee are estimated at approximately \$50 billion. Moreover, it is a highly labour intensive industry, employing an estimated 100 million people in over 60 developing countries. The dependence is greatest in Africa, where there are some 25 coffee exporting countries and where smallholders account for the majority of production.

In an effort to assist in the alleviation of the current crisis, the International Coffee Organization (ICO) is conducting a study to determine the viability of eliminating low- grade coffees from the world market, with the aim of improving both the overall quality of coffee and the global supply/demand balance. Reducing the current excess supply would benefit producers by improving prices and reducing the considerable economic hardships they face. For consumers, the removal of low-grade coffee could safeguard and improve overall quality and reduce the risk of contamination by husks, mould formation, etc. Moreover improved availability of better quality coffees may facilitate an increase in consumption.

Most coffee is consumed outside the country of production and invariably is consumed as a beverage. Others uses for coffee are currently negligible. Thus over 75% of world coffee output enters international trade in the form of green beans which are then initially roasted, the vast majority in the country of final consumption. The roasted beans are then consumed in a variety of forms including roast and ground coffees or as soluble or instant coffees.

The purpose of this study is to provide an initial assessment of the potential options for alternative (non-beverage) uses of low-grade coffee beans. Potential outlets for this material include (but are not limited to) the use of coffee beans as feed for livestock, as fuel for domestic and industrial applications and as an organic fertiliser or mulch to improve soil conditions. Although it appears that most of the work so far conducted has been on the use of coffee pulp, rather than sub-standard beans, some work has been done, particularly in Africa and Latin America, along these lines.

Much of the information is, however, in the form of grey literature. There is a need for a review of the available information, in order to establish avenues for future activities.

Based on NRI's technical expertise in a wide range of post harvest aspects of renewable natural resources it was approached by the ICO to undertake this initial assessment. The study was funded by the Department for International Development (DFID) through an ASSC (Advisory and Support Services Contract). The ICO provided counterpart facilities to assist this work through the time and expertise of its information staff and library and database facilities.

It must be stressed that the contents of this study represent a preliminary assessment of available information on alternative uses based on a limited time input and with the objective of providing a summary document for presentation to the ICO's Executive Board meeting from 21-24 May 2001. As the report concludes, additional research needs to be undertaken to develop potential alternative uses for low grade coffee beans and the NRI would be willing to assist the ICO in preparing project proposals to assist in obtaining additional research funding in this area. By developing alternative uses for low grade beans it is anticipated that in the longer term this would feed into a research proposal which could provide farmers and coffee co-operatives with some return from the presently low value or wasted fraction of the crop, either through the sale of the discarded material, or through direct use on the farm, to reduce expenditure on animal feed, fuel, fertiliser/mulch, etc.

Detailed economic assessments of the various alternative uses have not been undertaken but it is unlikely that these alternative uses will be viable in their own right, in the sense that they will not cover the production costs of the beans. However, this is not relevant in the context of the overall ICO study, in part because current FAQ (fair average quality) coffee prices in many cases do not cover production costs and in part because it is hoped that sales of FAQ coffee at higher prices would help finance the costs of diverting low grade coffee to alternative uses (since important volumes will have been removed from the regular market), and the return would only need to be better than total destruction.

Following this introductory section, there are three technical literature reviews, followed by a brief, final chapter. The second section assesses the use of coffee cherries as a livestock feed. Much of the coffee crop in the developing world is produced on small-scale, mixed crop-livestock farms, where animal feed is always in short supply. It is known that coffee products cannot be included in rations at high inclusion levels, since they will reduce intake and animal production. Nevertheless, if used at low levels in conjunction with poor quality feeds, there is the potential to utilise them in livestock production. Available information on the effects of feeding of coffee cherries are reviewed to pinpoint gaps in the existing knowledge that may require further study. In addition to the sub-standard cherries, a major waste fraction during the processing of coffee is the pulp that surrounds the bean and which must be removed during processing. This material should also have some potential for inclusion in livestock rations. If this were possible, potential benefits might include

the provision of an economic return from the waste fraction; the identification of an additional feed resource in areas where animal feed limits the productivity of the whole farming system; and the removal of an important source of water-course contamination and environmental degradation. This could benefit the whole community, rich and poor, coffee producers or not, in areas where coffee is produced and processed.

The third section provides an analysis of use of low quality coffee cherries as a fuel for industrial applications. The successful use of coffee for this purpose depends on a number of factors. In order to assess the potential for directly burning cherries, the section provides examples of the combustion systems that are suitable for using the raw material as a fuel; as well as assessing the criteria for assessing potential applications.

An alternative to direct combustion is the production of briquetted fuel from the cherries. The technology for this approach is widely available. In recent years, a local industry for making briquettes from rice husk has developed in Bangladesh. The machines for this are simple, cheap, and easy to maintain and may also be suitable for producing briquettes from coffee beans. In this context the following is discussed: namely the types of machines available for briquetting biomass materials and using Bangladesh as an example, the economics of a typical briquetting operation. In many parts of the developing world, firewood is scarce and expensive and the potential exists to make an alternative fuel available to poor people who, at present, lack ready access to conventional energy sources.

The fourth section reviews data on the chemical composition of coffee beans, in an attempt to identify any high-value components that could potentially be extracted and concentrated for commercial use. While this would be to the direct benefit of the processors, it could also assist the producers of the beans, by providing a source of income from the sub-standard fraction of their harvest. The section also reviews the potential use of sub-standard beans as slowly degrading mulch on farmland. This material could be returned to the coffee plots, or applied to other areas of the farm, in order to recycle nutrients and to assist in weed control and moisture loss. Here, the potential benefit would most likely be to the small-scale coffee producer, who would be encouraged, by the alternative utilisation mechanism, to contribute to improved coffee quality and price stability through selecting out the poorer beans before sending his crop to the processors. In all these potential uses, it is anticipated that it will be necessary to select out the sub-standard cherries prior to processing, in order to have an effect on the quality of the finished product.

The concluding fifth section summarises some conclusions from the previous sections and makes some recommendations for future work. The authors and colleagues in NRI would be in a position to assist directly in some, but not all of this research, since the suggested topics are generic and not restricted to those which would involve the activities of the Institute.

Section II – The use of the coffee crop for livestock production

Rob Paterson

Introduction

In many countries, coffee is grown on small-scale, mixed crop-livestock farms, where animal feed is always in short supply, particularly during the dry seasons. If the poor quality fraction of the coffee crop and some of its by-products could find a use in animal production, it would improve the productivity of the whole mixed farming system, while contributing to price stability in the coffee industry, by ensuring that only high quality beans reached the market. At the same time, it could help to reduce the environmental contamination caused by the industry and recycle some of the nutrients contained in the crop, to the benefit of all members of society. The following paragraphs contain a review of current knowledge and published information on the use of coffee in livestock production, as a contribution to this important topic.

Use of the entire cherry

In general terms, the presence of a fleshy layer around the seed of a plant is intended to assist in seed dissemination by making the fruits attractive to animals and birds. The soft outer part serves as food, while in most cases, the seed passes unharmed through the digestive tract of the animal, to germinate at a distance from the original plant. The situation with coffee is slightly different, however, since the flavour of the pulp is not universally attractive, while the presence of polyphenolics and caffeine in the pulp can provoke hyperactivity and even death in small animals, including rats and domestic poultry, if ingested at levels above about 15% of the diet (Bressani *et al.*, 1973). Despite this, Calvert (1999) asserts that sheep and goats are important in the dissemination of naturally occurring populations of coffee and this suggests that the bean is not readily digested, even by ruminants. It would therefore appear to be safe to assume that, despite the potentially damaging effects of the high levels of anti-nutritive factors in the green seed, the effect of feeding entire coffee cherries to livestock would be similar to that of including the components (pulp and hulls) in animal diets.

As has been noted above, coffee pulp is potentially useful as an ingredient of animal feeds, while the hulls are also well utilized by ruminants. In the absence of evidence to the contrary, it would appear that entire cherries could be used at levels of perhaps about 20% of the 13M in diets for both large and small ruminants, although the inclusion levels for swine should be much lower, and possibly not above 10%. The potential for the use of coffee cherries with poultry is even less. Even if they were to be readily consumed, which because of their size is not a foregone conclusion, they should probably not exceed 1 or 2% of the total diet on a 13M basis. While the use of coffee pulp is already commercialised in Central America, this is a practice that could be introduced into other countries, in order to reduce the environmental contamination arising from the processing of the crop. There would also appear to be potential for the use of sub-standard coffee cherries in ruminant livestock production. In a situation where coffee is produced on small-scale, mixed crop-livestock farms, as in East

Africa, for example, animal feed is often in short supply, particularly during the dry seasons. Promotion of the use of poor quality coffee as animal feed could serve two important, concurrent purposes. It would remove the poorest cherries (both over- and under-mature fruits) from the processing stream, which should improve the quality of the finished product when it reaches the world market. At the same time, it would make a substantial contribution to the feed resources available for livestock production. The net effect of this should be an improved return from the coffee enterprise, as consistent high quality should attract a premium price on the open market, together with greater animal productivity from animals enjoying additional feed resources. The benefits of such a scenario to resource-poor, small scale farmers, are obvious.

Section III – The use of sub-standard coffee beans as fuel **A S Tariq**

Sub-standard coffee beans could be removed from the market if they were used as fuel. The two practical possibilities are:

- i) Direct combustion in industrial applications.
- ii) Conversion of beans to briquetted fuel, for use as a substitute for fuel wood for domestic cooking purposes.

The small size of coffee beans is advantageous for both the above applications and size reduction should not be necessary.

One of the important considerations for viability of any biomass fuel is the transport distance from source to application. This results from the fact that the volumetric heat content of biomass fuels is so much less than that for fossil fuels. For comparison the values of volumetric heat contents are:

Biomass fuels 7.8 G
J/M³
Fuel oil 38.5 GJ/M³
Coal 22 GJ/M³

The difference in the volumetric heat contents impose high transport costs for biomass fuels in terms of the delivered units of energy. Typically, distances greater than about 100 km are considered uneconomic for transporting fuel wood and other biomass fuels. Therefore an assessment of potential industrial applications (small- and larger-scale) within relatively small radii of the sources of coffee beans would be required to devise a viable strategy. This assessment should include:

- i) Distributions of users.
- ii) Size of combustion plant and fuel used.
- iii) Type of the combustion plant.

The industrial applications currently using fuel wood or other biomass fuels will be particularly easy targets. Other applications using liquid fuels may also be relatively easily converted to firing with coffee beans if their heat requirements are of the order of 1 MW (or less) with use of 'gasification' or 'semi-pyrolytic' combustors.

Section IV – The use of low-grade coffee for extractives and mulching **J D Wood**

Conclusions

The findings from this brief literature search indicate that there are no simple applications for low grade coffee beans based on their chemical composition. The literature on these topics is sparse, indicating that either there has been little commercial interest in the subject, or the results of confidential trials by the coffee industry have been sufficiently negative to prevent them from promoting coffee residues as a mulch or other horticultural product. Alternatively, the studies on coffee residues may have been conducted in countries which are coffee processors rather than producers.

Of the options discussed, the commercial potential for extracting and utilising chlorogenic acid as an antioxidant, and the production of biogas, may be worthy of more detailed investigation. The soluble phenolics in coffee appear to have a negative impact in seed rooting and thus the direct application of undigested coffee to horticultural crops is generally undesirable. However for some crops, green coffee extracts may offer opportunities in selected weed control systems.

Section V – Recommendations for further work

While there is extensive literature available on some aspects of alternative uses of coffee by-products, there is much less published information on potential, non-beverage uses of sub-standard cherries. As a result of this, in the foregoing sections of this review, it has been necessary to extrapolate from the known situation in order to reach conclusions, some of which are preliminary and tentative. During this process, a number of glaring gaps in the published information were identified and these are highlighted below. Further research along the lines indicated are recommended, in order to improve the understanding of the potential for the use of the coffee crop in novel ways. Depending on the topics studied, the research should be of benefit to producers of both the raw material and the processed beans, through both price stabilisation of processed coffee on the international market and the provision of important inputs into other production and social systems in the rural areas of developing countries. The suggested work would then be justifiable from the points of view of poverty alleviation, food security and income generation.

Livestock

While there is information available relating to the use of components and by-products of the coffee crop, the present review has highlighted the total lack of published findings relating to the use of entire coffee cherries for animal production. The following themes are seen as priority areas for further research:

- While the potential for the use of poor quality, entire fruits as feed for non-ruminants would appear to be slight, there is a clear need for well-designed studies to show the effects of feeding them to both large (beef and dairy cattle) and small (sheep and goats) ruminants. This work should concentrate on inclusion levels and any potential health problems which may be associated with production rations.
- Aqueous extracts of coffee pulp have beneficial effects on lactation, maternal behaviour and the occurrence of mammary tumours in mice. Research should be conducted to test whether similar effects can be detected from the use of either entire cherries or extracts in commercial livestock, including pigs and ruminants.
- Entire cherries will only become available to livestock at the time of the harvest of the crop. There is, therefore, a need to examine the potential to store them for a period of several months, possibly as either sun-dried feed or as silage, until the optimum time for their use. This will probably be during the dry season, when other, more conventional feeds, are in short supply. Priority should be given to the effects of storage on the presence of anti-nutritive factors in the feed, and on the digestibility of the bean by the animals.
- The point above would imply the need for systems analysis to determine the point at which the maximum benefit could be obtained from the feeding of the cherries to a range of domestic livestock. Clearly, this would have to be repeated at a number of sites or countries, in order to cover the range of situations found throughout the coffee-producing areas of the world.

Fuel

The following work is recommended in order to promote the successful use of coffee cherries as fuel for either direct combustion or for briquetting.

- There is no published information on the fuel properties of entire coffee cherries. The combustion characteristics should be determined for a range of coffee species in a number of producer countries where it is thought that sub-standard cherries might find a use as fuel.
- At the time of assessment of the combustion characteristics, it would be necessary to determine the existing potential for use in direct combustion, in terms of:

- i) Distribution of potential users.
 - ii) Size of existing combustion plants and fuel currently used.
 - iii) Type of existing combustion plants.
- Entire coffee cherries should be tested for their suitability for briquetting in the cheap screw presses which are currently used for rice husks in Bangladesh. Some optimisation of the process in terms of screw pitch and taper may be necessary to increase the efficiency of the process.

Extractives and Mulch

From a logistical and economic perspective it is desirable to utilise green coffee cherries within the coffee plantation. It is known that cellular damage can lead to loss of chlorogenic acid, possibly due to reaction with tissue proteins or other compounds. However, the potential for extracting and utilising caffeine and phenolic compounds for use as weed controlling agents, due to possible allelopathic mechanisms, requires further research. The work which has so far been done indicates negative reactions in general horticulture, but it did not consider the industry which had produced the coffee wastes.

Studies should include the following:

- Methods of extraction of solubles which can prevent their reaction during the extraction phase.
- Techniques to separate potential reactive compounds.
- Effects of individual and combined extracts on the coffee plant, weeds, important soil organisms, fungi, nematodes etc.
- Effects of recommended treatments on productivity of coffee plants over several seasons, including leaching, environmental changes to active compounds due to environmental conditions, cumulative build up of compounds in the soil etc.
- Economic analysis of the preparation of allelopathic compounds and their use within coffee production.

**SUMMARY OF THE REPLIES RECEIVED FROM
ALL MEMBERS AND THE PSCB
ON THE STUDY ON IMPROVING
THE GLOBAL COFFEE SUPPLY/DEMAND BALANCE
THROUGH THE ELIMINATION OF LOW GRADE COFFEES**

1. Please provide information about any existing minimum export/import regulations on coffee quality and their enforcement in your country.

Importing Members/PSCB

- Presidential decree signed on 16 February 1973 – Italy
- To be dealt with by each country separately - SCAE
- No specific regulation – Germany and Finland (EU regulations apply)
- 4 types of regulation: plant protection; food sanitation; standardization & proper labelling; and, fair competition - Japan

Exporting Members/PSCB

- TCB standards. Treatment for moisture, weight, bagging material and fumigation is restricted before export – Tanzania
- Strict CIC regulations to be followed by every registered exporter; green coffee exports regulated by National Standards Council – PNG
- Internal Trade Department since March 1999 for the purpose of promotion and development of quality – Thailand
- Quality regulations and specifications for Green, Roasted and Soluble coffee with quality tests for each – Mexico
- Fair average quality: < 25% defects and <= 8% defects – Nigeria
- Compliance with AFNIC standards, however, triage + black beans are exported with special government permits – Cameroon
- Certification standards set out by the Regulatory Division of the CIB – Jamaica
- OCIR issues certificates of quality/origin – Rwanda
- Phyto sanitary certificate only – Zimbabwe
- Green export regulation on moisture content, odour (toxic smell free), colour, number of defects, bean size; also cup taste quality – Ethiopia
- As long as the coffee can be identified for its quality (superior, natural, inferior) there is no export restriction – El Salvador
- No regulations in force but exporters have to provide specific characteristics for the coffee being exported ISO regulations – Cameroon/CICC
- Standards for both internal and external markets on cup quality, number of defects, water content, beans size/weight – FNC/Colombia

2. *What criteria (if any) would you suggest should be used to establish minimum export/import qualities?*

Importing Members/PSCB

- As provided by the national regulations – Italy CIC
- Producing Members to upgrade their minimum standards by “one” point (i.e. Brazil NY 6/7 from current 7/8) – Italy (Trieste Coffee Association/Qualicaf Trieste)
- Use of ISO standards as starting point; exporting Members to raise their standards; introduce well defined specifications for triage – SCAE
- Procedure to be set by producing countries and importers to be left with the decision of purchase on commercial basis – Japan
- None - Germany

Exporting Members/PSCB

- Rejects and Hand Picked Tax and cherry beans should be banned from exports and directed to the domestic market only – Tanzania
- ISO standards should provide a very useful starting point – PNG
- Same as FAQ requirements: moisture content <13% and defects <7% - Thailand
- There should be minimum export criteria based on type of coffee; processing method; cup quality; physical aspects (defects present); chemical components; sanitation – Mexico
- Minimum requirements set: coffee free from extraneous matter and clean dry beans free from mustiness: < 20% defective beans and <4% black beans – Nigeria
- Standards by size of beans; level of defects; cup quality; colour/appearance – Jamaica & Rwanda
- As currently followed by the country – Ethiopia
- Minimum requirements should be set for acceptable cup quality and coffee that does not meet the criteria would be labelled sub-product – El Salvador
- Agreement between exporter/importer to define minimum acceptable quality – Cameroon/CICC
- To establish more stringent quality specifications for both Arabica and Robustas based on similar criteria (see #1)

3. *How are the regulations on quality enforced nationally, or if not enforced, how could they be enforced?*

Importing Members/PSCB

- Introduction of standard and uniform regulations in all EU countries – Italy + SCAE
- No regulations on quality. Customs labs could control imports EU regulations on ochratoxin apply – Finland
- Impossible to introduce regulation on quality – Japan
- None - Germany

Exporting Members/PSCB

- Inspection carried out on every lot auctioned + form to confirm quantity and verify what is being exported – Tanzania
- Taken from ISO standards. Exporters receive annual licenses and are subject to CIC regulations – PNG
- No regulation on standards – only guidelines – Thailand
- National law establishes authorities to enforce regulations and standards (i.e. quality); national evaluation centres credentialed by the coffee authority – Mexico
- Regulations enforced by national statutory established government agencies on quality and certification of all products; these agencies follow national laws, regulations and guidelines – Nigeria
- Regulatory body to monitor cup tasting; defects count; assessment of bean size/colour; cultural practices, processing and handling to ensure coffee quality; certification of both exports and imports – Jamaica
- Ministerial decree establishing all conditions for coffee exports; all coffee is sampled and analysed prior to shipment for quality – Rwanda
- Buyers receive samples prior to purchase – Zimbabwe
- Government authority body regulates quality for auction, export and domestic market – Ethiopia
- CSC takes samples to confirm whether the coffee to be exported complies with internal system (standard, high grown and strictly high grown) – El Salvador
- See #1 + CICC members have to comply with internal quality regulations although these are not widely respected – Cameroon/CICC
- Through a comprehensive legal scheme that regulates the coffee exports; plus a cash incentive paid to farmers and preventive control from seed to cup - FNC

4. Does your Association consider that regulations on minimum quality would be beneficial?

PSCB

- Yes – Trieste Coffee Association/SCAE
- No, as coffee from different origins have different characteristics and consumers tastes vary from country to country – All Japan Coffee Association
- Yes, based on their own experience and it is important that similar standards are applied in all countries – FNC/Colombia

4. How would you suggest that regulations on quality could be enforced internationally?

Importing Members

- No international regulations on quality required; EU regulations on contamination are in effect – Finland
- On presentation of product for import in accordance with form (??) chosen by importing country + existing controls at origin – Italy
- By producers only - Germany

Exporting Members

- By setting up similar standards for all countries (for Mild/Hard beans) – Tanzania
- By introducing a system of inspection prior to export where a certificate/report would be issued and attached to C/O; when quality of the coffee fails to comply with description on certificate/report the authorities in EM would be informed so that appropriate action would be taken – PNG
- By establishing common policy regulations on international quality standards implemented/monitored by ICO (?) – Thailand; Jamaica
- + Random quality audits on stocks of coffee carried out by ICO (?) and certification system in line with ISO 9000 - Jamaica
- By adopting rules with international standards on quality – Mexico
- Should be up to importers to conduct quality tests in the presence of government representatives from EM – Nigeria
- By defining international standards for coffee exports/imports – Rwanda
- Not believed to be possible – Zimbabwe
- By setting minimum export/import standards for each type of coffee and the processing method it receives to be followed by all countries – Ethiopia
- Exporting countries could introduce a tax for coffee exported below set standards; importing countries could identify the coffees of lower standards that have been exported despite controls at origin – El Salvador
- Price can determine quality, i.e., when the gap between two grades is large than growers would favour quality without any regulation – Cameroon/CICC

5. *Should quality regulations be established with reference to domestic markets?*

Importing Members/PSCB

- In producing countries only - Germany
- NO – from all other replies

Exporting Members/PSCB

- Yes [regulations to be followed by all local roasters] – Thailand; Mexico, [Tanzania]
- No – PNG
- Yes, to ensure that the domestic market is supplied with good quality coffee otherwise poor quality coffee would be consumed locally – Nigeria; Jamaica; Rwanda
- No, domestic market is too small (a traditional tea drinking country) – Zimbabwe
- No, lower quality coffee is destined for internal consumption whereas better quality coffees are exported – Ethiopia
- Yes, following Brazil's example where internal consumption increased with better coffee for the domestic market – El Salvador
- Domestic market is very small and the rules are based on international regulations – Cameroon/CICC
- Exporting countries should establish their own regulations for quality concerning the supply for domestic market – FNC/Colombia

6. *Has your country previously investigated (or had any experience of) using coffee for alternative uses? If so, it would be helpful if you could describe this and provide further information where available.*

Importing Members/PSCB

- NO – Finland; Italy; Germany SCAE; Japan
- Some comments on what other countries are doing + personal comments – Trieste Coffee Association

Exporting Members/PSCB

- No – Tanzania; PNG; Thailand; Rwanda; Zimbabwe, El Salvador and Cameroon/CICC
- Wine – Nigeria
- Liqueurs; rum cream; confectioneries and pastry – Jamaica

- Confectioneries and alcoholic beverages and other uses are being researched by institutions and research centres; in addition, as a by-product, the grain can be used to extract caffeine; as cattle feed; organic fertilizer; cellulose paste; alcohol and pectin from the mucilage also used as pig fattening feed – Mexico
- Yes, for local consumption – Ethiopia
- National research centre (CENICAFE) has carried out some work to find alternative uses for coffee and its by-products; use by industry on liqueurs, dairy products, cosmetics, marmalades, confectionaries; plus the use of the lowest quality coffee (ripio) as source of energy and animal feed – FNC/Colombia

7. *What would be the likely costs (or benefits) to the coffee sector in your country if low quality coffees were removed from the market?*

Importing Members/PSCB

- Draw backs from the enforcement of quality standards not foreseen – Italy
- Consumers' idea of coffee price would not be affected – Finland
- Improvement on quality would increase consumption trend – Trieste Coffee Ass.
- Better quality would lead to faster consumption growth and thereby raising prices to growers – SCAE
- Unable to assess - Germany
- Charge of Y\$20/kg for destroying coffee in Yokohoma – Japan

Exporting Members/PSCB

- Growers would lose out as lower quality coffees are auctioned at lower prices. However, if consumed locally only top quality would be exported – Tanzania
- US\$4.5 million. However, if ALL producing countries decided to act together on this issue prices could be expected to rise by 10% or more and this would generate an additional US\$7.5 million in total revenue from the remainder exportable production – PNG
- Supply of high quality coffee is not sufficient to generate high income for farmers – Thailand
- Coffee would fetch a higher premium in the international market and importers would develop more confidence in quality supplied – Nigeria
- Pros: improvement in quality; better supply of higher quality coffee to consumers
- Cons: lack of income to producer; lack of investment in production/xxx; price rise for consumers – Mexico
- No supply of low quality coffee to the market – Jamaica
- US\$550,000 – Rwanda
- As 99% of production is exported who would make up the loss to local producers?
- - Zimbabwe

- Exportable quality would improve, farmers would be encouraged to produce better quality coffees; improvement in Government policy on quality; stabilise local market consumption – Ethiopia
- Only 3.6% of coffee is qualified as inferior quality and this coffee only fetches 25% of the price for standard quality coffee – El Salvador
- On short term, everyone would worse off and domestic market is not able to absorb the coffee which would have to be destroyed; medium/long term this would be beneficial for the overall quality of coffees which would have its value enhanced – Cameroon/CICC
- See #8 below – FNC/Colombia

8. *What would be attitude of your Government towards this initiative?*

Importing Members/PSCB

- An open attitude as the legislation in force also cover sanitation aspects – Italy
- It is assumed it will be negative – Finland
- Highly positive; willing to assist with expert advice if needed– Trieste Coffee Ass.
- Very positive – SCAE
- Hopefully liberal - Germany
- Against exports of low quality; restrictions should be initiated at origin – Japan

Exporting Members/PSCB

- There should be government support as it would increase prices but there should also be promotion of low grades for internal consumption before the initiative is implemented – Tanzania
- Potentially positive if adopted by all EM and if reasonable solutions can be found to alternative uses; it would also depend upon the adoption of a creditable international procedure – PNG
- Full support on any fair measures on quality adopted by all EM; current plans to encourage quality improvement to meet FAQ standards are in place – Thailand
- Policies have been put in place to meet international standards through staff training, provision of modern equipment and better grading techniques – Nigeria
- Government is considering decisions made by the ACPC plans and discussions with Guatemala, Costa Rica, Colombia, El Salvador, Honduras and Nicaragua are taking place with a view to implementing a retention plan and destruction of 5% of production is on the cards – Mexico
- Full support as the initiative envisages the improvement of the prices – Rwanda

- [sent to Government authorities for comment – although it is believed that there could be some concern due to loss in foreign export earnings] – Zimbabwe
- Very positive – Ethiopia
- Total support by the private and public sector – El Salvador
- See #7 above – Cameroon/CICC
- Very positive once a decrease in supply can be reached with improvements on quality, increase on consumption leading to better prices – FNC/Colombia

9. *Apart from defect grades, are there any other quality standards applied in your country (please attach a copy, if relevant).*

Importing Members/PSCB

- Moisture contents and limits on OTA contamination – Italy
- Guidelines to roasters/traders included – Trieste Coffee Assoc.
- Under consideration – SCAE
- Kaffee-Verordnung – Germany
- No official standards: left to each private company to set – Japan

Exporting Members/PSCB

- No – Tanzania; Thailand
- All coffee traded according to grading in PNGS 1693 – PNG
- All consignments are fumigated and pest free – Nigeria
- The following aspects are regulated: grain size and density, roasting evaluation, colour and uniformity (for green and roasted), altitude grown; phytosanitary conditions, physical/chemical/microbiological analysis for roasted and soluble coffee and coffee extracts/concentrates, labour regulations throughout the production chain (from production to industrial level) – Mexico
- Quality standards included – Jamaica; Rwanda
- ISO standards applied – Zimbabwe
- Cup quality evaluation – Ethiopia
- For gourmet and organic coffee (copy provided ??) – El Salvador
- No, the CICC only monitors that the rules are being observed during the transaction not on the product – Cameroon/CICC
- ISO 9000 + ISO 17025 – FNC/Colombia

10. *Are there any penalties levied on low grade coffees?*

Importing Members/PSCB

- Imports of coffee that do not conform with standards are not allowed; OTA contaminated lots are rejected – Italy
- None – Finland; SCAE; Germany; Japan

Exporting Members/PSCB

- No – Tanzania; PNG; Thailand; Mexico, Zimbabwe; El Salvador and Cameroon/CICC
- Not at present, an export tax used to be imposed in the past - Rwanda
- Poor quality coffee is impounded by the Government regulatory agency and returned for reprocessing; extremely poor quality coffee is destroyed and exporter could be prosecuted – Nigeria
- Poor quality coffee is seized and destroyed if found in market place – offending party is warned for prosecution and export license revoked – Jamaica
- Coffee that does not meet export quality standard is sent for reprocessing incurring further costs to exporter/producer – Ethiopia
- Yes, the use and transport of “ripio” is prohibited and penalized as smuggling activities – FNC/Colombia

11. Would it be useful to have an internationally agreed definition of what a defect is for purposes of coffee grading?

Importing Members/PSCB

- Yes, something felt to be necessary; a revision to article 2 of ICA 2001 should be done as preliminary step; a “glossary” to be revised and completed – Italy
- Yes, an international code would be useful and should combine producers definitions and stock exchanges – Finland
- Yes, felt to be “compulsory”; task for ISO – Trieste Coffee Assoc.
- Yes, but traders worldwide agree on what constitutes a defect; for green Arabica the description is provided by the US Green Coffee Assoc. – SCAE
- Existing ISO Standards – Germany
- Perceived as difficult to have internationally agreed definitions – Japan

Exporting Members/PSCB

- 150 definitions to be applied to all EM: from organoleptic profile of cup and those with economic aspects – Tanzania
- Yes, but traders worldwide agree on what constitutes a defect; for green Arabica the description is provided by the US Green Coffee Assoc. – PNG
- Yes, but time would be required so farmers can get used to the agreed definitions – Thailand
- Yes, total agreement on this issue – Nigeria, Jamaica, Rwanda, Ethiopia
- Yes, with importing and exporting countries in full agreement on rules and standards which should include legal and trading guidelines in order to obtain fair price and quality – Mexico
- Already in effect: if coffee does not meet buyers’ requirements it does not get exported – Zimbabwe
- Yes, it would make the trade more efficient and transparent – El Salvador

- Yes, as it would allow harmonization on quality standards – Cameroon/CICC
- Certainly, ISO 10470 Green Coffee Defect Reference Chart is now being reviewed at the ISO Coffee Committee under FNC's leadership – FNC/Colombia

12. *Would you be in favour of internationally agreed standards on defects grading?*

Importing Members/PSCB

- Yes – Italy; SCAE; Germany
- Would rather have the coffee sector to agree on this - Finland
- Yes, total number of defects taken from a 300g sample; to have the standard rules as compulsory guidelines set by ICO – Trieste Coffee Assoc.
- To be left to EM to be more strict on compliance with their own quality standards and not to export low grade coffees – Japan

Exporting Members/PSCB

- Yes, but cup quality should also be graded – Tanzania
- Yes, [but must be practical and practicable by EM] – PNG, Thailand, Nigeria, Mexico, Jamaica, Rwanda, Ethiopia
- Not able to comment until a draft is prepared and how it would affect local producers – Zimbabwe
- Yes – El Salvador
- Yes, if these standards were defined by experts from both producing and consuming countries – Cameroon/CICC
- Yes, it will help to establish a better understanding of the defects found in the processing methods and it would be a useful tool to the handling of a standardised language in the coffee sector – FNC/Colombia