

Review of Coffee Quality / Safety Management and Control in India

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Report of the National Consultant

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The views expressed in this report are those of the author(s) and do not necessarily reflect the views of the Food and Agriculture Organization of the United Nations.

Executive Summary

Coffee Board, set up under the Coffee Act 1942 is the sole organization involved in the development/control of Coffee industry under the Control of the Union Government. A new Food Safety and Standards Bill 2005 constituting the Food Safety and Standards Authority of India, with provisions of compulsory licensing of import/export, setting standards for food articles and regulate their manufacture, storage, distribution, sale and import/export to ensure availability of safe and wholesome food, repealing many of the Food laws of the country such as the Prevention of Food Adulteration Act (PFA), was placed before the Parliament during August 2005. Besides Coffee Board and its Central Coffee Research Institute, there are several National research and training Institutes, Private Analytical Laboratories and Management Institutes involved in advice and training on matters related to Coffee quality and Safety. Thus the infrastructure of Laboratory facilities and human resources of trained technical manpower needed for the Control and management of Coffee are available in the country.

A series of measures are needed to be undertaken mostly by the Coffee Board for improving the Quality and Safety of Coffee in totality. The measures suggested include i) ensuring that farmers harvest correctly, traders don't buy wet coffee, curing works check quality of incoming lots, processors/ exporters have GMP programme, adequate storage facilities are available ii) programme to control moisture through out the coffee chain iii) prescribing limits for Ochratoxins in Coffee under the PFA Act iv) organizing awareness and training programme for stockholders v) Introducing mandatory and voluntary programs for regulation of coffee quality and safety vi) Enforcing and assisting in enforcement of Food Safety/ Standardization Bill as applicable to coffee. All stakeholders need to be involved in prevention, control and participating in Codex matters. The cost of all the measures suggested including up gradation of the laboratories is expected to cost around Indian Rupees 30 million or US\$ 673,000.

A coffee quality and safety task force entrusted with the responsibility for follow up of the recommendations need to be constituted by the Coffee Board. An outline of a poster highlighting the extent of problem of quality/safety in terms of moisture and Ochratoxin contamination is indicated. These measures should result in enhanced international reputation for Indian coffee not only from the cup taste and grading, but from total quality and safety.

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Executive Summary

Introduction (Background of the mission, TOR how implemented, Consultancy Period, Acknowledgements)

Main findings and conclusions (including recommendations as per TOR 8)

General Recommendations

Annexes:

1. Terms of Reference
2. Partial list of Institutions visited / persons met

Introduction

Coffee is one of the important plantation crops of India cultivated in 3,54, 840 hectares mainly in the southern states of Karnataka (57.6%), Kerala (23.9%), Tamilnadu (8.6%) and to a small extent in other non traditional and non conventional areas such as Coastal tribal Andhra Pradesh and Orissa and North Eastern Region (9.9%). The production in 2004-5 is estimated to be 2,75, 500 Metric tones. Coffee in India is cultivated by a large number of small holders (holding less than 10 acres), numbering 1,78,308 accounting for 71.84 % of area under coffee and the rest cultivated in 2833 large holdings. Most of the Coffee produced in India is exported and India has a share of 4.38% in the world market. During the first half of 2005 India exported 84,749 M tones of Coffee as against the average normal yearly export of around 2,18,737 M tones during 2004. Indian coffee is exported to over 40 countries but the top six markets are Russian federation, EU countries like Italy, Germany, Belgium, Spain and USA accounting for 70% of Indian Coffee exports. The specialty coffee exports from India are comprised of Malabar Monsoon Coffee, Mysore Nuggets extra bold, Robusta Kapi Royale. Major ports of export are Cochin, Chennai and Tuticorin. During recent years small quantity of coffee from Indonesia and Vietnam are imported to India. Domestic consumption is mostly in the states of Tamilnadu and Karnataka.

According to the Coffee profile of India published by the Coffee Board in April 2005, the domestic consumption during 2003 was 70,000 tonnes with a per capita consumption of 65 gms. The current growth rate is 10% per annum but the Coffee Board is launching soon a nationwide multimedia, generic campaign to boost domestic consumption by 20% a year. Through the popularity of cafes in the metros in recent years, coffee is establishing itself as a life style product. However, the consultant observed that, the popularity of coffee in the largest coffee consuming state viz., Tamil Nadu is declining.

The emphasis in pattern of coffee growing in India is shifting from economic viability in terms of profits and returns to environmental aspect of sustainability. There is a move towards growing more of differentiated subset of sustainable coffees like “organic, fair trade and eco friendly”, and value based products on accounts of distinct origin, specialized processes or exceptional characteristics such as superior taste or zero defects. It is in this context, in India, the problem of improvement of “Coffee safety” in addition to “coffee quality” is to be considered.

Traditionally, in India the coffee quality meant only the organoleptic quality based on cup tasting, physical grading and level of moisture. However as a sequel to the European concern on Ochratoxins as an important contaminant of Coffee moving in the International trade in the mid 90's, the Consultant had carried out work on Ochratoxins in Indian Coffee during late 90's at the National

Institute of Nutrition, Hyderabad and the Coffee Board continued the work from 2001 onwards under a global project supported by the FAO.

The Consultant implemented the Task assigned (TOR in Annexure I) by undertaking a tour of major coffee growing area of Karnataka State which produces 72.1% of Coffee in India and visited the Headquarters of the Coffee Board in Bangalore, Coffee Research Institute at Balehonnur, Coffee estates, Coffee processing units such as curing works, soluble coffee manufacturing units, specialty coffee preparation establishments and Analytical Laboratories. He met officials, researchers, growers, exporters, and representatives of Federation/Association of Growers, traders, and cooperatives. Besides Karnataka State, he visited Tamilnadu the largest coffee consuming state and met Government analyst and Consumer Organization representatives. Also he visited Delhi and consulted Senior Food Control officials of i) the Ministries of Health, Food Processing Industry, ii)the developmental agencies such as EIC, APEDA, iii) other Institutions like BIS and AGMARK, Federation of Trade etc. The list persons met is included in Annexure II.

The Consultancy period was from July 5, 2005 to August 12, 2005 with a break during July 25 to July 31, when the consultant had to go to Geneva to attend a meeting.

Grateful thanks are due to all the stakeholders, senior Government Officials and others who at a short notice received the consultant and provided valuable information.

Main findings and conclusions

TOR 1: The Institutions that are involved in the control of coffee quality and safety and the legal basis for their actions:

Coffee Board and Coffee Act

The main Institution involved in the Control of Coffee quality and safety in the Coffee production/ marketing chain is the Coffee Board with its head quarters at Bangalore. This is because of the historic reason of the promulgation of the Coffee Act No VII of 1942 to control coffee industry, constituting the Coffee Board under section 4 of the Indian Coffee Market Expansion Ordinance, 1940 and the subsequent amendments of The Coffee Market Expansion acts during 1943 to 1994 with powers to levy fines, inspection of records etc.

The highlights of the Act include compulsory registration of all owners of Coffee estates, coffee to be cured in licensed curing establishments, need for authorization for export of coffee. The Government of India, Ministry of Commerce and Industries had also made the Coffee Control Rules 1955 and had made several amendments. Besides marketing, the other functions of the board were promoting the sales and consumption of coffee in India and elsewhere, promoting agricultural research, development; improvement of quality and other management. The Coffee Board statutorily consists of a chairman and 33 members appointed by the Central Government. These members represent various interests- growers, traders, curers, labour, consumers and the Government. However their affiliations are not specified and are at the discretion of the Government.

The licensing requirements according to the act is administrative in nature requiring the payment of fees, filling of specific form (E), submission statements showing the amount of cured coffee sold by it on behalf of each estate with which it was dealing for the year. A perusal of the specimen form (E) indicates that name and address of the curer is compulsory while the conditions to attaching license is "(if any)". This means that the Board has the powers to specify any condition such as control of moisture needed to improve the quality and if not complied with, can deny , revoke license or even impose fine.

Other Food Control Orders

In India there are a number of laws, control orders, legislative and administrative directives at the Central and State level which relate to Food safety. These include the PFA of the Ministry of Health, Agriculture Produce (Grading & Marketing) Act, ISI Certification and Marks Act of the Ministry of Agriculture, Consumer Protection Act of the Ministry of Consumer Affairs, Export Quality Control and Inspection Act of the Ministry of Commerce and the most

recent (2005) Draft Food Safety and Standards Bill of the Ministry of Food Processing Industries.

The Central Committee of Food Standards of the Ministry of Health and The Prevention of Food Adulteration Act 1954

The PFA Act is operated by the Directorate General of Ministry of Health of the Government of India is a comprehensive Act designed to formulate and monitor standard of quality and purity of foods with emphasis on prevention of adulteration of foods. The Act lays down broad general principles of food control empowering the Government to frame rules, which can be modified to suit frequent changes that may become essential as result of advancement of Science and Technology. This Act is the basic statute intended to protect the consumer against the supply of adulterated foods. The Act makes the provision for prevention of food adulteration, and lays down that no person shall sale, store, sell or distribute any adulterated or misbranded food or food which contravenes the provision of the act or rules. The act also provides that no such food shall be imported to India. Under the PFA Act, the Government of India has promulgated the PFA rules, which lays down in details among other things, specifications for the identity and purity of various foods, tolerances for contaminants, pesticide residues etc. The standards on various articles of food are specified in the rules .The implementation of PFA has been entrusted to the State Governments/Union Territories and Local bodies.

The Directorate of Marketing and Inspection of Ministry of Agriculture and The Agriculture Produce (Grading & Marketing) Act 1937 (AGMARK)

The Agriculture Produce (Grading & Marketing) Act 1937, the oldest certification system in India is an enabling legislation, which empowers the Central Government to authorize usage of “Mark”. The Directorate of Marketing and Inspection is the organization implementing the Agmark quality of control and quality of certification. Grading and Marking under Agmark is voluntary for domestic market. For the export market, Agmark has been made compulsory under the provisions of the Export (Inspection & Quality) Act 1963.

The Bureau of Indian Standards (BIS) and the Bureau of Indian Standards Act, 1986 (63 of 1986)

The Bureau of Indian Standards armed with the Bureau of Indian Standards Act, 1986 (63 of 1986) ensures Quality certification of food items both product and services, on the basis of set standards supported by precise methods of test. The BIS scheme is largely voluntary in nature but certification has been made compulsory for some items meant for mass consumption.

The Export Inspection Council of India and the Export (Quality Control and Inspection) Act 1963

The Export Inspection Council, set up under the Export (Quality Control and Inspection) Act 1963 is an advisory body to Central Government which is empowered under the act to notify commodities which will be subjected to quality control and inspection prior to export; establish standards and quality for such notified commodities; specify types of Quality Control/ or inspection to be applied to such commodities

Ministry of Food Processing Industries and the proposed Food safety and Standards Act/Bill 2005

The Food Safety and Standards Act, 2005 that has been placed before the Parliament during last week of August 2005, but pending approval, proposes to establish the Food Safety and Standards Authority of India. It has General provisions as to articles of food like crop contaminants, naturally occurring toxic substances and Special provisions such as prohibition on placing unsafe food in the market by the food business operators, proper labeling requirements, traceability etc. It also defines food safety management system which is the adoption of good manufacturing practices (GMP), good hygiene practices (GHP) hazard analysis and critical control point (HACCP) by the food business engaged in the manufacture, processing, sale, storage and distribution of food.

Regarding exports it empowers the Central Government to a) notify commodities which shall be subjected to quality control or inspection or both prior to export, b) specify the type and quality control or inspection which will be applied to a notified commodity c) establish, adopt or recognize one or more standard specifications for a notified commodity d) prohibit the export in the international trade of a notified commodity unless it is accompanied by a certificate that the commodity meets the conditions relating to quality control or inspection or it has affixed or applied to it a mark or seal recognized by the Food Authority as indicating that it conforms to the standard specifications applicable to it under clause (c).It specifically states that the food exported from India shall comply with the requirements of this act. Besides it has special provisions to recognize relating to applications for food business from citizens of Convention countries/reciprocity. Regarding imports, it has certain provisions for regulation of import of food and conformations to the standards laid down under the act including subjecting to laboratory analysis and ban/sale/reject/destroy/re export of food not complying with the standards. It also contains certain Special Provisions relating to applications for Registrations of food business from Citizens of Convention Countries.

On the commencement of this act, previous Acts and orders such as the PFA Act stand repealed and sections relating to food of certain orders such as Export (Quality Control and Inspection) Act, 1963, BIS Act, 1986 and the Agriculture Produce (Grading and Marketing) Act 1937 are required to be

deleted/modified. The Institutions that are involved in the implementation of this act is yet to be identified and is expected to be announced shortly.

Developmental agencies: Eg: APEDA

Besides, the above, there are a number of Developmental agencies of the Government of India like the Agricultural and Processed Food Products Export Development Authority APEDA, of the Ministry of Commerce and Industry, Government of India established in 1986 under APEDA Act 1985 No 2 of 1986 (8th January 1986). It is an act to provide for the establishment of an authority for the development and promotion of exports of certain agriculture and processed food products and for matters connected therewith. It has power to prohibit or control imports and exports of scheduled products The Central Government may, by order published in the Official Gazette make provisions for prohibiting, restricting or otherwise controlling the import or export of the scheduled products, either generally or in a specified classes of cases. All scheduled products to which any order under subsection (1) applies shall be deemed to be goods of which the export has been prohibited under section 11 of the customs act and shall have effect accordingly. If any person contravenes any order made under subsection (1), he shall, without prejudice to any confiscation or penalty to which he may be liable under the prohibition of customs act, 1962, as applied by subsection (2), be punishable with imprisonment for a term which may extend for one year, or fine, or with both.

In addition it gets support from the Notifications of Government of India such as the Notification No. 68 (RE)/ 1999-2002 that the export of peanuts to the European Union shall be subjected to issue of Export Certificate by APEDA.

TOR 2: The Institutions that are involved in advising or training in quality and safety management

I. The main Institution that is engaged in advising or training in quality and safety management of Coffee is the Coffee Board and its research wing, the Central Coffee Research Institute, located at Balehonnur, Karnataka. The Quality Control Division at the Headquarters of the Coffee Board in Bangalore is involved in the development and implementation of quality standards for Indian Coffee and also in creating awareness among growers/curers/ traders through training programmes. It has a well-equipped laboratory for coffee quality testing including Ochratoxins and efforts are underway to shift it to the Central Coffee Research Institute (CCRI).

The Regional Coffee Evaluation and Upgradation Centre of the Coffee Board at Chikmagalur is a newly established state of the art facility for training and extension activities.

The Central Coffee Research Institute (CCRI), functioning under the aegis of Coffee Board was established in 1925 and has well equipped laboratories and modern facilities for research and manpower training. It has regional stations located at different states of India such as Chettalli (Kadagu, Karnataka,) Chundale (Kerala), Thandigudi (Tamilnadu), R.V. Nagar (Andhra Pradesh) and Diphu (Assam).

II Laboratories accredited for analyzing by the Coffee Board for certifying coffee quality: According to an official publication of the Coffee Board, the Coffee Board Laboratory in Bangalore and the Regional Coffee Evaluation & Upgradation Centre in Hassan (since shifted to Chikmagalur) are the laboratories certifying coffee for quality. In addition the following three laboratories are the “Accredited Lab”:

1. Coffee Lab Pvt. Ltd. Bangalore. It carries out visual examination, moisture content, and organoleptic evaluation like cup quality.
2. M/S Adam & Company, Bangalore. An International Coffee Broker, does quality evaluation through physical parameters such as visual examination, moisture, grading, cup quality.
3. Tata Coffee Limited, Kushalnagar Works, Kodagu caters to the Plantations of the Tata Group of Estates, also tests for Physical quality and taste.

III Private Analytical Testing Laboratories:

1. Delhi Test House, Delhi
2. Reliable Analytical Laboratory, Thane
3. Geo-Chem Laboratories Pvt Ltd, Mumbai
4. Insecticide Residue Testing Laboratory, Pune
5. SGS India Ltd, Chennai
6. Vimta Laboratory, Hyderabad
7. Sipra Laboratories, Hyderabad
8. Shriram Institute for Industrial Research, Bangalore

Most of these Laboratories are NABL Accredited and recognized by the APEDA, Developmental agency of the Government of India. While some like Shriram Institute for Industrial Research, Bangalore are already testing the samples routinely for Ochratoxins at the request of exporters, curing works and large growers, most other laboratories have just procured the standards and are standardizing the method of analysis of Ochratoxins in Coffee. The Charges for testing for Ochratoxins A is varying from Rs 2000 to Rs 2500/- (about US \$ 50).

IV National Research Laboratories/ Universities:

1. The National Institute of Nutrition, Hyderabad;
The Institute pioneered mycotoxin research in India way back in the 1960's. It carried out a research project for Coffee Board on Ochratoxins in Coffee during

1997-2001. It also has an Education and Extension Unit and conducts even adhoc tailor made training programmes.

2. The Central Food Technological Research Institute, Mysore
Engaged in research on Mycotoxins since the early 1960's. It has been playing a major role in the development of human resources for industry in the developing world. It has analytical capabilities besides for other environmental contaminants Ochratoxin, testing and evaluation facilities and provide services to food industry. It also has a Nodal Codex Laboratory. The Southern Appellate Laboratory of the Ministry of Health to viz., the Central Food Laboratory to analyze mandatory PFA Act samples is also located in it. It also carries out various National and International training activities.

V University Departments engaged in Research related to Coffee Quality:

1. Department of Applied Botany, Mangalore University, Mangalore
The department had carried out research projects on the mycological and biological aspects of Monsoon Coffee. The department had developed technology of controlled monsooning of coffee. The research work indicated that 2.5 Krad irradiation can reduce the fungal load.

2. Department of Processing Technology, Kerala Agriculture University, Thrissur.
The department had in the past in collaboration with Aspinwall & company had studied the Biochemical and Physiological Changes in Malabar Monsoon Coffee.

VI Policy/Management Institutions:

1. Indian Institute of Plantation Management, Cunningham Road, Bangalore
Conducts training programmes and carries out research on WTO, IPR impact, audit and certifying systems of Indian Coffee, Techno Human Dimensions of Quality in Indian Coffee.

2. Institute of Plantation and Horticulture Management, Martha Halli, Bangalore

Conducts training Programmes in the Plantation in Sector

3. Centre for International Trade in Agriculture, Delhi
Mainly involved in Policy studies in the Agriculture sector specially those related to Quality- WTO/SPS/TBT/Codex issues.

VII Institutions providing adhoc training/ HACCP etc.:

1. Skal International India, Bangalore

2. American Quality Assessors (India) Pvt. Ltd/ Food Certnl., Hyderabad
Besides carrying out various audits and certificate assessment, they carry out short term training programmes on Food safety issues like HACCP.

TOR 3: Review of the activities of the Institutions in the area of Coffee quality/Safety

Coffee Board

The Coffee growers who were not getting proper prices of Coffee during the years 1939-42 persuaded the then British ruled Indian Government to establish the Coffee Board. Until 1992/93 coffee marketing was wholly administered and regulated by the Board. The Board initiated a process of liberalization during that year and by 1995-96 all restrictions have been abolished. Both large and small growers are free to market their produce in any way they choose. The Board focuses on roles benefiting the industry concentrating in areas of research and development, quality control, market information and its dissemination, promotion, extension and free market development.

Coffee from growers is purchased at approximately 40 local buying centers. Many major and smaller buyers are represented at each center. Most small growers prefer to sell coffee in the form of dry cherry and parchment. Large growers and estates sell coffee in green and graded form either directly to exporters or by private auction. Domestic distribution of coffee takes place through wholesale and retail roasters. Less than 10% of coffee is sold through the auctions. Weekly auctions are held by the Indian Coffee Trade Association (ICTA, consisting of 275 growers, 175 buyers, 25 curers and 4 auctioneers) located at the Coffee Board head quarters, which facilitates the growers to sell their graded coffees. However, as most growers prefer to sell their unprocessed crop directly to exporters or roasters, the scope for auctioning green coffee at the moment remains comparatively limited.

The Coffee Board, prior to 1993, subjected coffee to strict quality control. Both physical and organoleptic qualities were maintained. After physical grading to determine the bean size, further evaluation checks were made by expert staff. Coffee was classified as Fair Average quality (FSQ), superior (FSQ plus) or inferior (FAQ minus). All quality distinctions were used to scale coffee in a notional scale-the price differential scale. Arabica Plantation A grade was the basis for comparison with 100 points. The points are awarded based on quality, size, physical appearance and cup taste. According to the Coffee Board its voluntary quality specifications are still strictly followed by the private trade, which carried out its own checks for quality.

As per the ICO Quality Improvement Programme (resolution 420), the exporting members have to implement with effect from 1st October 2002, minimum standards for exportable coffee. It specifies that exporting members should not export coffee that:

- For arabica, has in excess of 86 defects per 300 grams sample and for robusta has in excess of 150 defects per 300 gram.

- For both arabica and robusta, has moisture content below 8% or in excess of 12.5% measured using the ISO 6673 method.
- Where lower moisture percentage are currently achieved, members should endeavor to ensure that these are maintained or decreased further
- Exceptions for the 12.5% maximum moisture content should be permitted for small quantities of specialty coffees that are traditionally have high moisture content such as Indian Monsooned Malabar.

The Indian Coffee Board had endorsed the ICO Quality Plan as part of 7 steps to quality coffees. It has during 2004 brought out a Guide to Indian Coffee Quality aimed at making quality specifications of Indian Coffee Grades even more transparent, for the benefit of international as well as domestic coffee trade. The first step is “Adhere consistently to strict green bean quality standards, so as to ensure that no inferior grade coffees enter world markets”. Moisture standards established for different types of coffees vary from 9.0 to 11% (13.0 to 14.5% for monsoon coffee). Grading and garbling (sorting) of Indian Coffee is based on size of the coffee beans and percentage imperfections. In the Indian system of grading and garbling, the tolerance level for each and every grade is specified and expressed in percentage by weight. Quality specifications for Indian coffee entail that all the grades be totally free from foreign and extraneous matters, free from mould damage etc. The quality specifications include Sieve standards, Garbling status, Tolerance (permissible % of other grades in the said main grade) for Washed Arabica Plantations PB, A, B, C, Blacks, Bits, bulk, Unwashed Arabica- Cherry PB, AB, C, Black Browns, Bits, Bulk and similar standards of Washed Robusta Parchment and Unwashed Robusta Cherry. In these categories separate standards have been prescribed for Commercial grades and Premium grades. The quality committee of the Coffee Board has grades like commercial grades, premium grades, specialty coffees and miscellaneous grades. Besides, quality assessment meant mostly the cup quality - visual, organoleptic. However, as of now there are no specifications for Environmental contaminants like mycotoxins. Thus the Coffee Board till recently, was mainly concerned with only coffee quality and not safety.

The extension services are through 45 extension units providing technical support, field visits, dissemination of technical information through gatherings and organized meetings. The Coffee Board extension department has a number of demonstration farms.

Despite the existence of the Coffee Act and rules, which provides for functioning of the Coffee Board, there are no enabling provisions in the act and rules to enforce them. The specifications already prescribed have to be followed on a voluntary basis by the industry. Repeated efforts by the Board in the past to plug the loopholes have not been successful. The new comprehensive coffee act

which has been drafted, examined, discussed and modified is still to be placed before the Parliament and currently not in the public domain.

During the year 2004, the Coffee Board undertook the exercise of formulating new grades as well as fine-tuning of the existing grades and making quality specifications of Indian Coffee grades transparent. The seven steps to quality Coffee enunciated by the Board include:

1. Endorsement of ICO Quality Plan (details provided earlier).
2. Cuppers Training Programme: A nine month Post graduate diploma in Coffee quality Management has been initiated a few years ago to train students acquire scientific knowledge about coffee cultivation, market related aspects of the industry and technical skills for coffee quality evaluation. The curriculum includes Coffee marketing and trade, principles of coffee quality, specialty coffees including quality specifications, Quality assurance system such as grade specifications, national and international standards, SPS issues, HACCP approach, on and off farm processing e etc. The course admits foreign students too and the fee for the entire course is US\$ 1750 for foreign nationals.
3. Kaapi Shastra: A training programme on Coffee roasting and brewing for capacity building in domestic coffee retailing and raising awareness of the latest technologies in coffee roasting, blending and packaging.
4. Flavour of India –The Fine Cup award: An annual cupping competition designed to select India's finest coffee for the world market which motivates and inculcate quality consciousness among coffee growers, processors and exporters.
5. Creation of Special Quality Task Force: A Quality task force comprising industry experts to develop, implement and evaluate strategic initiatives to guarantee consistency in quality.
6. Quality Guideline manuals: Publications of manuals like Model quality manual for Coffee Estates, Guidelines for processing of washed Robustas (2004) ;Karma and Quality- A guide to Indian Coffee Quality (2004) etc. These guides meant for growers, processors and exporters contain information on good crop husbandry and post harvest processes, elucidation of GAP, GMP for coffee growing and processing.
7. Participation in FAO Coffee Quality Programme: Develop GAP, GMP and HACCP based mould prevention strategies and understand Ochratoxin-A (OTA) formation in the production/processing chain.

The Coffee Board has sent to the stakeholders in July 2005, for comments a revised proposal on “ Voluntary regulatory Scheme on Quality of Green Coffee

for Exports from India”. The proposal is based on the guidelines of ECF Bureau on OTA Risk Management- Guidelines for buying Green coffee and the process to check green coffee with the help of a decision tree.

The salient features of the revised proposal are:

1. A voluntary scheme for exports
2. The exporters need to submit a report on cup quality (as per original proposal assessment of moisture, visual appearance, smell, cup quality & defect norms) along with application for export permits.
3. If needed the exporters may submit a report on Ochratoxin A Analysis
4. If any exporter is not participating in this voluntary system and if any of their consignment is rejected due to OTA contamination by the importing country, the exporters should submit full particulars of such consignments along with details of their subsequent disposal.

It is pertinent to point at this stage that the past experience of the Board is that even leading exporters have refused to provide details of the rejected consignments and their subsequent disposal and the success of any voluntary scheme will only be partially successful. .

Regional Coffee Quality Evaluation and Training Centre, Chikamagalur

Coffee Board has set up recently a Regional Coffee Quality Evaluation and Training Centre at Chikamagalur. At this center the green/raw coffee samples are tested for different physical and cup quality parameters and necessary advisory is given for the up gradation of coffee quality. It also conducts the following one-day training programmes at a nominal fee of Rs 250/- (US\$ 6 only) for the benefit of growers, curers, roasters, and exporters.

1. Training programme on Kaapi Shastra (Roasting, blending, grinding, packaging, brewing etc.) for the personnel working in roasted and ground coffee sector and in hotels.
2. Training programme on the preservation of coffee quality at the curing works for the personnel working in the curing works
3. Training programme on the production of quality coffee at the estate level for the personnel working at the estates.
4. Training programme on Production and Promotion of speciality coffees for the Coffee growers, managers etc.

The newly established center with an excellent infrastructure has a state of the art thematic museum on Indian Coffee and presents an audiovisual show Coffee Yatra, a journey through the world of Indian Coffee.

Central Coffee Research Institute, Balehonnur and its Regional Stations

The Institute carries out work in the areas of Plant Improvement and Biotechnology, Crop Management, Crop Protection, Post Harvest Technology, Training and Transfer of Technology. In the area of PHT it has standardized the

post harvest practices such as drying, pulping. Soaking. The Institute had participated in the FAO/ICO/CFC Global Project “Enhancement of Coffee Quality through Prevention of Mould Formation”. The highlights of the findings are as follows:

1. The *Aspergillus ochraceous* group of fungi are found more in the soil and air samples of arabica estates than in robusta estates. The presence of these moulds in the final product varied from estate to estate, region to region and year to year. However mycological examination of Coffee in the curing works indicated that Ochraceous group of fungi were absent in samples in both arabica and robusta, at different stages of curing such as before and after hulling, grading.
2. Drying in different types of floor i.e. concrete, tiled, polythene and cow dung smeared surface indicated that concrete surface is the most efficient in bringing down the moisture level early.
3. The results of delay processing trials indicated that 4 days of delay in wet processing resulted in higher incidence of Ochraceous infection.
5. Temperature and moisture changes in bean during drying process influence the incidence of Ochraceous group.
6. No relationship was observed between occurrence of Ochraceous group of fungi in coffee beans and cup quality.
7. The ochratoxin levels found in various farm surveys, experimental and trade samples (N=152 during 2002-3 and N=203 during 2003-4) ranged from 0.1 to 28.0 micrograms per kg. Analytical Laboratory results on samples sent by the trade (n=109) indicated the level of contamination to range from 0.1 to less than 10.0 micrograms per Kg.
8. An International Coffee transportation trial to find out the place/point where the mould Ochraceous group contamination may occur (Mangalore to Barcelona) is underway.

As part of the Global project the following training programmes were organized:

1. Training of trainers course on Food safety based on Principles of Food Hygiene & HACCP for officers of Coffee Board and section of industry
2. National Workshop of Coffee Quality for growers, processors, traders and exporters.
3. Awareness campaign on GHP. Thirty-one camps were organized in different Coffee growing regions and over 2500 beneficiaries consisting of extension officials, growers, processors, traders and exporters.
4. Training and dissemination of OTA prevention were organized in the States of Karnataka, Kerala and Tamilnadu. Seventy-five extension officials were trained in aspects of Prevention of OTA producing moulds in the Coffee Chain.

The quality evaluation and upgradation Programme includes visual and organoleptic evaluation of Indian coffee, Inspection and certification of curing works, Promotion and Development of Specialty Coffee, Coffee quality evaluation and advisory for the upgradation of Coffee quality and conduction quality

awareness/ Training programmes and a PG Diploma in Coffee Quality and Evaluation.

Other Institutions and Organizations

Besides the Coffee Board, the industry has many private organizations that provide support for the industry. The United Planters Association of South India (UPASI) based in Nilgiris is the oldest producer organization, which is an association of large plantations. Small and medium size producers have formed their own associations like Karnataka Growers Association. There are 53 association of growers spread over 5 states in India, 7 Trade associations, 78 licensed coffee curing works and 50 exporters of coffee.

Food control authorities under PFA Act

The PFA Act (second amendment) 2003 has defined Coffee, green raw or unroasted; roasted, ground coffee, coffee (green, raw or unroasted), soluble coffee powder. It has prescribed analytical standards for moisture, total ash, acid insoluble ash, water-soluble ash, and alkalinity of soluble ash, aqueous extracts and caffeine. For soluble coffee in addition it has prescribed solubility in boiling water and solubility in cold water. Though a Central Government Act, the PFA act is implemented by the State Governments and the local Health Authorities.

A maximum limit of ochratoxins in coffee has not been fixed under the PFA rules. However a recent subcommittee meeting of Central Committee on Food Standard has recommended a proposal for fixing maximum limit of 20 microgram per kg of Ochratoxin in Wheat, barley and rye. These have to be later on approved by the main committee and the Central Committee on Food Standards before its publication in the official gazette. For Ochratoxins in coffee this basic step has also not been initiated. The Ministry of Health expects a detailed note from the Coffee Board indicating the background of the problem from the health perspective, the international trade perspective including the EU legislation, as well as data generated within the country. This process once initiated would take 2-3 years before getting incorporated in the food laws of the country.

AGMARK:

Although as on February 2005 over 150 food products grade standards have been prescribed under the act, coffee has not been included. However recently standards for specialty products like Kangra Tea has been prepared by the Agmark. The Directorate of Marketing and Inspection has well equipped laboratories for analysis and are currently carrying out analysis of private samples for environmental contaminants like pesticide residues and heavy metals in Fruits and vegetables.

Bureau of Indian Standards (BIS)

As on date 48 food items like selected food additives have been covered under the Mandatory Certification scheme. In addition to product certification BIS also operates Quality System certification against ISO 9000 accredited by Raad Voor Accreditatie (RVA) Netherlands and Hazard Analysis and Critical Control Point (HACCP) Scheme against IS 15000 to ensure consistent high quality and safety, compliance with regulations, international acceptance and global competitiveness.

So far the BIS have fixed no standards for Coffee. The BIS has a Stimulant Food Sectional subcommittee (FAD-6-BIS) Chaired by the Chairman of the Coffee Board. It is currently considering a voluntary scheme for regulating exports of Coffee with specification for Ochratoxin limits. For this purpose, the data generated by the Coffee Board on the subject is being reviewed. The last meeting of the sectional committee has discussed the issue of appropriate method for detection of Ochratoxin and had requested the CFTRI, Mysore to provide the same. The BIS is willing to consider providing its mark for coffee powder including soluble coffee traded domestically provided it receives such request from Coffee Board.

The EIC provides in process quality control, food safety system management certification, preshipment inspection and certification, Voluntary food certification scheme and countrywide food scheme. . It also provides 3rd party inspection, training and technical assistance, Laboratory services, and special programmes like recognition of export certification system for Basmati rice by European Union. Its mandate does not cover coffee. It is willing to extend any assistance to Coffee if approached by the Coffee Board. It has well equipped analytical laboratories in Port towns, which could be used for analysis of Ochratoxins in Coffee.

APEDA

The APEDA establishes adequate controls to eliminate possibilities of presence of residue levels of toxins and contaminants in excess of prescribed levels. Recently it has issued a trade notice No QMC/GEN/055/2005 dated July 05, 2005 to ensure control of aflatoxins residues in peanuts and peanut products meant for export to the EU prescribing a detailed procedure for recognition of groundnut processing unit, procedure for issue of certificate of Exports. The designated laboratories have to draw and test the samples of groundnuts for aflatoxins as per the EU commission directives, test them as per the method of analysis prescribed by AOAC/Codex/EU ensuring that the method meets the requirements of the Commission Directive and issue certificate. In case the samples exceed the MRLS the nominated laboratories shall immediately bring the matter to the notice of the exporter/processor APEDA and the designated Trade Association (IOPEA). Based on the analysis report, the APEDA issues

Export Certificate. The loading of exportable peanut or peanut products shall be done under the supervision of the concerned laboratory and give the loading certificate to the shipper. It also specifies that all nominated laboratories shall be accredited to the National Accreditation Board for testing and calibration Laboratories (NABL) as per ISO/IEC 17025. The nominated laboratories are under obligation to provide access to their records. A mechanism of coordination between the laboratories analyzing for aflatoxins in groundnuts, the designated trade association, APEDA and the exporter exists so that shipments to EU is not effected and corrective steps are taken. Organizing training/awareness for the farmers/traders/exporters and improvement of hygiene standards, updating itself in respect of the amendments pertaining to the MRLs prescribed by the EU and keeping informed the industry, laboratories and the APEDA lies with the trade association. In the event of breach of the regulation for controlling aflatoxin in groundnuts, APEDA may initiate action as per the provisions of section (19) 3 Chapter –V of the APEDA Act, 1985.

The Coffee is not one the mandate commodities for APEDA since the commodity is handled by the Coffee Board.

Accredited and recognized analytical Laboratories:

The Accreditation is obtained from the National Accreditation Board Department of Science and Technology, Ministry of S & T, Government of India who have specified NABL-criteria for Laboratory Accreditation. The Laboratories generally follow the ISO/IEC Guide 25, ISO 17025, and get recognition from Government of India Development organizations such as APEDA/BIS/EIC.

National Institute of Nutrition, Hyderabad

A project undertaken by the National Institute, Hyderabad for the Coffee Board during 1997-2000 revealed that among the 158 samples of green coffee, selected at random, tested though 60% of the samples contained ochratoxins, 53% had levels less than 5 microgram/kg. About 6% of samples contained more than 10 micrograms/kg and one visibly mouldy coffee sample contained as high as 176 microgram/kg. Defective grades like Black Brown Bits and those stored for more than one year had more than 5 micrograms/kg. In 13 out of 14 samples of gleanings up to 103 micrograms /kg of ochratoxins were found. In 9 out 36 samples of ground, instant and coffee tablets 0.3 to 12.4 micrograms/kg of ochratoxins were found. The extent of ochratoxin contamination was found to be higher in cherry or dry processed samples than obtained by wet method i.e. parchment samples. Among the defective /low-grade beans analyzed Ochratoxins were observed to be high in gleanings or windfall cherries. Roasting resulted in 92% reduction in Ochratoxin levels. The results of Ochratoxin analysis of coffee brews prepared by three traditional methods showed that only 0.7%-10.9% of Ochratoxin from the roast coffee was extracted into the brew and the rest remained in the residue. A preliminary study on HACCP indicated that the critical control Points during production and processing include picking of under

ripe/overripe/defective cherries/gleanings, cherry processing (layering and heaping during drying) drying (protection from rewetting, proper layering, drying yard hygiene) and storage (condition of storehouse). In the preparation of parchment coffee the critical processes identified include pulping, demucilaging, washing and drying

Central Food Technological Research Institute, Mysore

The CFTRI had recently completed a project on Ochratoxins for the Ministry of Food Processing Industries. The level of ochratoxins in barley/wheat analyzed were below 5 micrograms /kg. The Institute conducts various long term and short-term training programmes and is interested in organizing short-term tailor made courses. The cost of the training programmes would be approximately Rs 5000/ per person/day. The Institute has excellent database on Codex issues, and other matters concerning Food.

TOR 4: On the basis of interviews with key stakeholders and Review of Survey data collected under the project or by National coffee authority, assess effectiveness of the existing controls.

The various stakeholders ranging from growers (small, less than 1 acre, medium and large growers), traders (small and big), processors (curing and those processing specialty coffee like Malabar Monsoon), exporters (small and Big), retailers, Manufacturers of soluble coffee, analytical laboratories, research Institutions, food control authorities at the Central, State level, Government Developmental agencies, Nodal agencies, voluntary consumer organizations, Growers associations, federation of Growers association, trade associations, Federation of trade and industry officials, consumers were met, discussions held the following assessment of the effectiveness of the existing controls is made.

There is a general consensus especially among growers, curing works and exporters that the quality of coffee has declined since the since the pool system has been abolished by the Coffee Board 90's. This is at best-summarized In the Book "Kapinadina Jeevana Kathegalu" by K.V Ravichandra Shetty Vice President, Karnataka Coffee Growers Federation, published in 2003 (in vernacular language Kannada) where in views of the growers are documented. The popular feeling is that there is "liberalization of not only trade but also quality". Although the specifications suggest that Coffee with moisture 10.0% to 11.0% with a tolerance of + 0.5% can be permitted, even moisture up to 14.0% are brought to the curing works. While the traditional method of knowing whether "correct moisture" is followed or not is by the "Forlit" method wherein a 40-liter wooden measure called locally "KALASA" is filled with coffee- 18kg, the modern method is by using moisture meters. Most (almost all) of the grass root level growers/curers/workers at plantations, curing, processing works are not aware of the problem of ochratoxins, have not heard of concepts of HACCP. However, they are all aware of the problem of high moisture since it will fetch lower price.

Often middlemen exploit the growers at the farm gate level; deduct more money based on “deduction charts” on the pretext of higher moisture content. There is no control on such transactions.

A recent report indicates that Illycaffe (Italian Coffee importing Company) testing procedures in India has shown that Indian coffee producers have begun to focus on quality to get higher price realization. This year winning coffee trader of the Indian Coffee quality prize for Espresso secured an absolute score of 3 on a scale of 3 of the quality standards. Companies like Illycaffe identify plantation owners, with whom the company sets up direct partnerships, providing training and technical know-how to raise quality over a period of time by introducing the growers to better agronomic practices. Similar joint ventures with curers and exporters like Allansons in setting up manual garbling systems to remove defective beans manually, not only provides employment opportunity but also increases quality.

The surveys conducted by the National Institute of Nutrition, continued later by the Coffee Board and the data on analysis of trade samples by analytical laboratories have all pointed the same picture i.e. the presence of Ochratoxins in small amounts in low grades of Coffee. Official Control measures to minimize the Ochratoxins are non-existent though continuous efforts have been made to improve the quality in general. It is only in recent years that legislation on Ochratoxin contamination in coffee is being introduced in the importing countries, EU legislations on the subject are made, Ochratoxins limits are being introduced in the contracts and a demand is made for producing certificate for analysis for ochratoxins by the buyers. Consequently, awareness of the problem is spreading now and training programmes are being held.

TOR 5: Assess the human and other resources that are used in the control and management of coffee quality and safety; and estimate the cost of the existing controls of Coffee quality and safety to the Government as well as to stakeholders in the coffee sector.

The resources that are used in the control and management of coffee safety and quality are basically the laboratory infrastructure with equipments and the human resources of trained manpower for analysis, inspection, certification and documentation besides training personnel. It is pertinent to point here that prior to liberalization of coffee trade, the coffee Board through its inspectors used to strictly monitor the coffee production, curing, sales etc and thus has the infrastructure including manpower (e.g. Junior Liaison Officers) to implement any measures relating to quality improvement. Infrastructure exclusively for estimation of ochratoxin in coffee is restricted to a few laboratories such as those of the Coffee Board, and selected private testing laboratories such as Shriram Institute of Industrial Research at Bangalore and Delhi, Vimta and Sipra Laboratories in Hyderabad, SGS Laboratory in Chennai, Geochem Laboratories in Mumbai who are already analyzing Ochratoxin in Coffee. The charges per

analysis vary from Rs 2000/- to Rs 2500/- (Approximately US\$ 50). Many of these laboratories are accredited to the NABL and recognized by the APEDA and EIC for analyzing samples of consignments meant for export

In India there are a number of well-equipped laboratories engaged in multipurpose analysis. These include the i) Food control laboratories under the aegis of the Ministry of Health, both Central and State numbering 75 carrying out the mandatory PFA Act function, ii) Laboratories performing analysis to cater to the needs of other control orders under the aegis of Directorate of Marketing and Inspection, Export Inspection Council, Bureau of Indian Standards numbering over 60 iii) Laboratories of leading Research Institutions such as CFTRI, Mysore, NIN, Hyderabad, ITRC, Lucknow, BARC Mumbai, selected University (both traditional and Agriculture)Departments. Many of these laboratories are equipped with instruments like HPLC needed for the analysis of Ochratoxins and have carried out in the past Ochratoxin analysis. Other laboratories are analyzing Aflatoxins in groundnut and its products, chilies and maize and the facility could be easily be utilized for ochratoxins.

The precise cost estimates of existing controls of Coffee quality and safety are not available The main cost of control of coffee quality for the Coffee Board is the maintenance of the Coffee Quality Laboratory in its premises in Bangalore as part of Central Coffee Research Institute. The other costs are the cost of various training/ awareness programmes/ publication of book lets which are met by the regular budget of the Board/Institute. A rough estimate is that the cost of controlling coffee quality at present does not exceed Indian Rs 45,00,000 or US \$ 100,000.

TOR 6: Identify areas where there are overlapping responsibilities for the control of coffee/quality control and explain in concrete terms how this affects the efficiency and effectiveness of control

Hitherto, there is no overlapping responsibilities for the control of coffee /quality control between the specialized agency, viz., the Coffee Board, the Developmental agencies such as ECI and APEDA and the general food control agencies such as the PFA Act/ BIS and the Agmark. Coffee used to be treated as the exclusive domain of Coffee Board since it was one of the earliest commodity Boards to be established in India way back in 1942. Other agencies such as BIS provide only additional support and the Coffee Board Chairman is the chairperson for the Stimulant Food Sectional Committee of the BIS. The EIC and APEDA, as far as coffee is concerned does not include it as one of their commodities. The PFA authorities too act only in consultation with Coffee Board. The PFA act second amendment Rules 2003 regarding analytical standards for roasted coffee and ground coffee as well as chicory which is permitted to be added to coffee under PFA rules as well as the definitions of various coffee (green/raw/unroasted /roasted/ground /soluble coffee powder etc was carried out

in consultation with the Coffee Board. Even the suggestion for inclusion of limits for Ochratoxin in PFA rules need to emanate from the Coffee Board. With regard to implementation of the, Coffee Board grade specifications are voluntary, while, PFA regulations are mandatory. It is implemented by the respective State Food Health/Local Food Health Authorities who have a number of Inspectors who collect the mandatory samples and get them analyzed by the respective State Food Control laboratories. The Appellate laboratories are also controlled by the PFA implementing authorities and the Coffee Board does not come in the picture in the implementation part. Since the Coffee Act/rules in the present form do not have enabling provisions and hence the implementation function is at best left to the major Food control authority in India viz., the State Food Control machinery.

It is pertinent to mention here that the proposed Food Safety Standard Bill 2005, when implemented will remove the existing drawbacks and bring about a single statute relating to food and to lay down science based standards for articles of food and regulate manufacture, import, export, storage, distribution, sale, to ensure availability of safe and wholesome food for human consumption and to establish in that behalf Food Safety and Standards Authority of India.

TOR 7: Identify areas along the Coffee production/marketing chain where there is not clear legal designation of responsibility for control; also identify areas where responsible authorities do not affect control even if legal power exists.

According to the Coffee Board model quality manual for Coffee estates, as per the century old tradition, quality of coffee is mainly attributed to the size, appearance, colour of the bean as well as flavour, aroma, and acidity of the cup. The level of ochratoxin is of concern only during the last couple of years. In other words, attention was focused only on “Quality” and not “safety”. The quality of the final produce at estate level primarily depends on the variety, climatic factors and agronomic practices including plant protection measures, as well as care taken during estate level processing. The post harvest steps like harvesting, sorting, grading, pulping, fermentation, washing, soaking, drying and storing play a very important role in preserving the intrinsic quality of coffee. Total quality management in coffee involves strict vigil from selection of a site, correct variety to various stages of processing at estate and curing works. In the entire chain, as of now there is no clear legal designation of responsibility for control. There are only voluntary guidelines of do’s and don’ts, definition, description, cause /effect, defect qualitative grading system, guidelines during on and off farm processing like harvesting, fruit sorting, grading of fruits, pulping, fermentation, demucilisation, washing, post wash soaking, drying and storage and transportation. Legal designation of responsibility for control is absent. Other food control regulations are applicable only to foods that are sold in the market or that are exported.

Along the coffee production chain such as harvesting / drying at the farm level, purchasing of cherries by the agents/curing works, by convention moisture percentage is used as criteria for quality. Although voluntary guidelines of quality of the Coffee Board specifies up to 11.0% with a tolerance of 0.5%, there is no legal designation of responsibility for any agency for ensuring the compliance of specifications. It is up to the buyer and seller to do what they want. Since there is a free market sale approach is followed, even if, legal designation of responsibility is vested with the Coffee Board or any agency, it would be unrealistic to expect that it would be implemented.

The problem of Ochratoxin in soluble coffee is mainly due to the addition of Black brown Bit (BBB) grade of coffee, which earlier on analysis was found a high-risk commodity for ochratoxins. The percentage of addition of BBB grade is decided by even the “reputed” manufacturers of soluble coffee on considerations of cost, aroma and colour. The manufacturers justify such addition since there is no legislation on ochratoxin limit in soluble coffee.

However, the new Food safety and Standards bill 2005 which is in the pipeline in its definition of food business includes activities related to any stage of production, processing and distribution of food including import/export and sale of food. It also refers to Food hygiene means all the conditions and measures necessary for the manufacture, processing, sale, storage and distribution of food designed to ensure safe and wholesome food for human consumption as well as Food safety Management System” means the adoption of GMP, GHP, HACCP and such other practices as may be notified by the Food Authority, by the food business engaged in the manufacture, processing, sale storage and distribution of food. The bill is expected to plug the existing loopholes and provide clear legal designation of responsibility to the proposed Food Safety and Standards Authority. Even then, the implementation by Coffee Board or any other agency would be difficult since a large number of small stakeholders are involved. It is pertinent to point here that even in Developed countries like UK as per the published reports, the experience of implementation of GMP, GHP, and HACCP etc in small business development establishments indicates that the compliance level is not more than 10%.

TOR 8: Make recommendations for improving coffee quality/safety management and control along the coffee chain covering: legal and policy framework; the institutional framework; mechanism for ensuring adequate coordination among concerned agencies; interaction with private sector; design and implementation of programmes relating to assurance of acceptable coffee quality and safety; technical capacity to support these programmes; evaluation of the efficacy of programmes; involvement in relevant international organizations.

1. Legal and Policy framework:

The prime need is to add the concept of safety/quality *in toto* to the existing concept of quality, which is mainly organoleptic quality.

1.1 Steps needed to lay down and implement level of moisture in the coffee through out the food chain right from the farm level, commission agents, curing works, processing units, storage godowns, marketing system, export level including during transshipment, taking advantage of the provisions of the new Food Safety and Standard Bill 2005.

1.2 Steps need to be initiated to specify maximum limit for ochratoxins in roasted, soluble and green coffee under PFA Act. The Coffee Board need to furnish background of the problem from the health perspective, the international trade perspective including the EU legislation, information on local consumption patterns and consumptions trends, as well as data generated within the country on levels of Ochratoxin in Coffee to the Central Committee of Food Standards of the Ministry of Health. These limits have to be discussed by the subcommittee and main committee of the Central Committee on Food Standards and appropriate decisions taken in the best National interests. It is to be made clear here that just because certain countries in Europe have fixed stringent tolerance levels based mainly on their own perspectives without appropriate risk assessment studies, following the European limits would not be realistic in the Indian context.

1.3 Coffee Board can recommend Advisory or guidance level for ochratoxins in Coffee as per the EU limits to be followed by the industry.

1.4 Coffee Board can initiate action to get the limits as indicated above for the PFA Act regulations included in the BIS provisions, specially for soluble coffee traded domestically and in the Agmark for raw/specialty coffees

1.5 As and when the new Food Safety and Standard Bill 2005 is adopted, additional measures of Food hygiene, Food safety audit, Food safety Management system in Food business, traceability, at all stages of production, processing and distribution, accreditation of Laboratories, research Institutions and food safety auditors as defined in the bill could be initiated by the Coffee Board

1.6 Coffee Board needs to disseminate knowledge on GAP, GHP, GMP, GSP, GTP (Good Agriculture, hygiene, manufacturing, storage, transport practices) among stakeholders, by way preparation of booklets and conducting awareness camps, training programmes.

1.7 Coffee Board need to issue Trade notice on Regulation of Export of Coffee to the European Union through Control of Ochratoxins on the models of the notice issued by APEDA during July 2005.

1.8 The Coffee Board needs to regularly monitor export rejections of Coffee by EU/USA and Japan through the websites such as EU Food rapid alert system and investigate causes of rejection, trace origin of product and fix responsibility and accountability (e.g. Grower/processor/ Certifying agency /analytical laboratory/inspecting agency etc.)

1.9 Coffee Board needs to explore the possibility of Mutual Recognition agreements with importing countries that would start the process of removing duplicate testing and certificate requirements and or recognition of Export certification system for coffee by European Union (as done for Basmati rice for EU by EIC) .

2. The Institutional framework

The task of ensuring food safety and quality and responsibilities for implementing food control in general are spread over different ministries at the central, state and local body levels, different departments in the same ministry. Control of Coffee quality and safety is no exception. Appropriate Institutional framework for an integrated system within which each limb can play its allotted role, therefore, is a necessity. Coffee Board should be the nodal and lead agency for coordinating the work. It need to interact with academic and research Institutions, other Government departments, developmental agencies, private sector consisting of Grower, processor, trader, exporters association, certification, Inspection, Analytical laboratories.

3. Mechanism for ensuring adequate coordination among concerned agencies

An *ad hoc* Coffee Quality and Safety taskforce need to be constituted by the Coffee Board with representation from Food control agencies such as Ministry of Health (PFAACT), BIS, AGMARK, Ministry of Food Processing who is piloting the New Bill, Developmental agencies such as APEDA, EIA, private sector stakeholders like growers, processors, traders, exporters and research Institutes like CFTRI and NIN.

3. Interaction with private sector

The Coffee Board has an extensive database on Coffee prepared by the Economic & Market Intelligence Unit. It includes the list of licensed and certified curing works, Coffee exporters, Association of Growers and Trade. It also has a network of extension offices numbering 45 located in the coffee growing areas providing technical support and dissemination of technical information through group gatherings and organizing meetings. Additional responsibilities of Coffee safety and quality could be assigned to it after imparting appropriate in-house training.

The interaction of the importers with the exporters on the models of Italian company Illycaffè tie up with Allana Sons in producing coffee of good quality through manual garbling to remove defective beans should be encouraged.

4. The design and implementation of programme relating to assurances of acceptable coffee quality and safety

After examining the product coffee from i) its production stage, post harvest handling processing, domestic distribution and export/import ii) the problem of quality and safety specially from higher than normal moisture and the Ochratoxin contamination iii) the critical control points for prevention approaches iv) the trade/economic and health implications v) the current food control activities both in India and importing countries, the following programme relating to assurance of acceptable coffee quality and safety is designed for implementation in India.

5.1 The Coffee Board should Monitor regularly

- that farmers harvest correctly
- that traders don't buy wet coffee
- that procurers check quality of incoming lots
- that processors/ exporters have GMP programmes
- that storage facilities are adequate
-

Realistic consideration in actual trade dictates that these options are by and large left to the industry to be followed voluntarily, with the Coffee Board making appropriate recommendations and carry extension work to publicize them. However, using the provisions of the Food Safety/Standards bill, enforcement could be made in certain cases like checking the moisture levels in coffee at various points on a selective basis, ensuring processors and exporters have GMP programmes and have adequate storage facilities etc.

5.2 Programme to control moisture level through out the coffee chain

Step 1: The Central Coffee Research Institute should undertake an evaluation of existing methods of moisture measurements including use of “Forelit”, use of variety of moisture meters, their make, use, efficiency, calibration status etc.

Step 2. The Coffee Board should, based on the evaluation of its CCRI, develop a scheme to purchase and supply adequate number of moisture meters to its liaison units and permits its free usage after appropriate calibration, by the small growers, purchasing agents.

Step 3. Direct all curing works/processors of specialty coffee/exporters /soluble coffee manufacturers to use calibrated standard moisture meters only.

Step 4. Interact with the Bureau of Indian Standards to specify and certify moisture meter units.

Step 5. Evolve a scheme for subsidizing purchase of moisture meters by small stakeholders by providing a subsidy up to Rs. 1000 (about 25 US\$) and link it up with subsequent compliance of moisture standards specified by the Coffee Board.

Step 6. Entrust the job of periodically checking and evaluating the use and calibration of moisture meters to CCRI.

Step 7. Through the Junior Liaison Officers, Coffee Board i)can check on a selective basis at random moisture levels of coffee through the market chain ii)using the provisions of the Food Safety/ Standards Bill, monitor moisture levels, inspect documentation in curing works, processing centers , export godowns etc.

5.3 Awareness programmes for growers, processors, exporters, and traders on the problem of higher than normal moisture/appropriate drying practices, accumulation of Ochratoxin A etc be conducted by the Coffee Board in collaboration with the stakeholders associations.

A major awareness campaign for improving the quality and safety of coffee need to be launched by the Coffee Board in collaboration with the industry. During the work carried out during in-house research, outsourced researches as well as the FAO/IC0/CFC multi country project on Ochratoxins in Coffee critical stages of mould formation in Coffee chain have been found and preventive strategies were developed. Also a code of Good Practices has been evolved. These findings need to be widely disseminated among the growers, processors, curers, traders, exporters and other stakeholders through printing of booklets, posters, pamphlets, placing of hoardings.

As part of this, a two-tier Training programme may be envisaged. First tier: Training of the trainers at CCRI/CFTRI – 3 to 5 days (About 100 trainers in 5 batches of 20). Trainers consisting of extension officials of the Coffee Board, research staff based at Field stations, selected staff of the processing/curing/exporting units, etc needs to be trained.

Second tier: Training of stakeholders- one day at CCRI and 5 Regional Stations, Quality evaluation Centre at Hassan (50 to 250 stakeholder participants at each center in batches of 25). Stakeholders include small and medium growers, staff of curing establishments/export houses, traders, warehouse keepers, transporters of coffee, staff of monsoon coffee processing centres etc.

5.4 Regulation of Coffee Quality and Safety with particular reference to Ochratoxin contamination meant for Export to countries that have specified legislation on Ochratoxin A in Coffee

Currently coffee exporters are getting selected few samples analysed for ochratoxins either by the Indian Coffee Board or with APEAD/EIC approved laboratories ,although the EU Coffee Industry has not made analysis for ochratoxins mandatory. However the exporters are not following any systematic plan for analysis of coffee for ochratoxins. Following the examples of testing groundnut samples meant for export to EU countries for aflatoxins , as per the directives of the APEDA, a similar plan for coffee could be considered.

Objective: To establish a system for controlling Ochratoxins A (OTA) in Coffee meant for export to E U countries, Switzerland and Japan

Goal: To increase the compliance level of OTA in Coffee specified by the importing countries with limits for OTA.

Strategy:

1. Maintain an inventory of growers, curers and processors, exporters of coffee
2. Introduce educational programmes to familiarize industry with adequate safety/control procedures to ensure OTA levels in coffee below limits specified by importing countries
3. Introduce a system of inspection, analysis, and certification for OTA levels
4. Initiate appropriate follow-up/enforcement action for firms out of compliance

Programme description/operation

All Coffee Board registered exporters shall subject their coffee meant for export to Countries which have specified limits for OTA to Decision Tree approach for Assessing Green Coffee as specified by the International Coffee Organization (ICO) notification “OTA Risk Management-Guidelines for Green Coffee Buying” and adopted by the Coffee Board. The Coffee Board Analytical

Laboratory or EIC Laboratory or any National Research Laboratory (e.g. CFTRI, NIN) or any NABL Accredited Ministry of Commerce (EIC/APEDA) Recognized Laboratory carry out analysis of samples for Ochratoxin A, in case of necessity. (The European Coffee cooperation OTA risk Management: Guidelines for Green Coffee Buying does not recommend obtaining OTA analysis certificate or testing of all imported Green Coffee)

In case of necessity of analysis all sampling/ Analysis be carried out as per International norms i.e. as specified by Codex/EU/AOAC.

In such cases the certificate of Export will be issued only if the certificate of analysis indicates that the OTA levels are within the prescribed limits by the importing country.

The laboratories analyzing coffee samples for OTA under the scheme shall submit a monthly statement of samples tested to the Coffee Board.

Since the Coffee Act/rules does not have enabling provisions to insist on mandatory regulation, Ministry of Commerce provision under EIC could be evoked.

The proposed programme is in addition to the Revised proposal on Voluntary Regulatory Scheme on the Quality of Green Coffee for Exports from India evolved by the Coffee Board in July 2005.

5.5 Other measures

-The Coffee Board may initiate penal Provisions such as cancellation of registration of exporters or any other action as deemed fit.

-Trade notice on measures initiated to control Ochratoxins be place on website.

-Incorporate in the Curricula of undergraduate course in Agriculture, programmes of plantation education Institutes issues of Coffee safety/quality.

-Encourage analytical laboratories engaged in Analysis of Ochratoxin A to participate in International proficiency testing programmes on Ochratoxins like FAPAS proficiency testing. (www.fapas.com e mail: fapas@csl.gov.uk). Also organize Analytical Quality Assurance/check sample programme on Ochratoxins A for Indian laboratories engaged in Ochratoxin analysis.

6. Technical capacity to support these programmes:

The Central Coffee Research Institute, Balehonnur and its Regional Coffee Research Stations at Chettalli, Chundale, Thangudi, R.V.Nagar, along with the Quality Division and Analytical Laboratory at Bangalore, Quality Evaluation

Centre, Chikmagalur as well as the Various Liaison Units of the Coffee Board spread across the Coffee Growing Regions have sufficient technical capacity to support the programmes on moisture control as well as prevention and control of Ochratoxins. The BIS has the capacity to implement compulsory certification of moisture meters. For the purpose of training the trainers they can draw assistance from Research Institutions like the Central Food Technological Research Centre at Mysore and the National Institute of Nutrition, Hyderabad. Both these organizations have carried out research on Ochratoxins and have considerable expertise of Quality and safety issues/HACCP/training.

7. Evaluation of the efficacy of the programmes

The programme can be evaluated on a yearly basis by keeping track of the number of inspection performed, number of samples collected and analyzed for moisture percentage, ochratoxins, the number of violations encountered, number of moisture meters supplied/ used by the stake holders,/calibrations done, number of export consignments and quantity detained/ seized/ destroyed, the variety/grade of coffee involved etc. number of training programmes held, number of awareness campaign organized, number of beneficiaries trained , the number of rejections of samples because of poor quality by importers etc.

8. Involvement of relevant international organizations

The programme could involve the International Coffee Organization, the FAO, EU Food safety officials, European Coffee Federation, The European Coffee Cooperation Task Force on OTA which represents the entire European Coffee sector and several scientific bodies (such as AFCASOLE-soluble coffee manufacturing industry of the EU, CECA-European Green Coffee Trade, EUCA-European Coffee Roasting Industry, ECF- Umbrella organization of green coffee trade, soluble manufacturers and roasting industry, EDA- European Decaffeinators Association, ASIC- Association Scientifique Internationale du Café, ISIC- Institute for Scientific Information on Coffee, PEC- Physiological Effects of Coffee Research Group).

The Indian Coffee industry should get involved in the Codex process. For this purpose, the Coffee Board could organize a meeting specially called to sensitize the private sector on the codex process, various codex committees, role of National codex contact point, attending the international codex meetings along with the Indian delegation when coffee related issues are discussed, down loading the agenda items etc.

TOR 9: Outline a plan of action for the follow-up of recommendations: estimate the resources required.

The nodal agency for the follow up of recommendations should be the Coffee Board. The National Coordinator of the Global Coffee project and Head of the Analytical Laboratory at the Headquarters of the Coffee Board may be designated as the Coordinator of the Coffee Quality and Safety Task Force and entrusted with responsibility for follow up of the recommendations. A time schedule for each of the tasks needs to be prepared and adhered to. For example time likely to be taken for incorporating the maximum tolerance limits for Ochratoxins in Coffee under the PFA rules/ BIS/AGMARK is a minimum of two years.

From the Discussions the Consultant had with the Chairman, Coffee Board and Officials of the EIC, APEDA, AGMARK it could be recommended that instead of depending exclusively on one laboratory of the Coffee Board at Bangalore for analysis of Ochratoxin A, the facilities of the EIC Laboratories/Central Food Laboratory (Appellate Laboratory under mandatory PFA Act) based at the CFTRI, Mysore could be utilized. This would reduce the cost of Laboratory establishment/ buying HPLC etc. Instead cost of analysis on a sample basis could be reimbursed for these Government supported Laboratories. The Coffee Board could resume dialogue with these laboratories for extending the facilities for analysis of Ochratoxin A. Assuming that not more than 500 samples would be analyzed the cost of analysis would be around Rs 12 Lakhs (Around US\$ 26,500).

The cost of participating in the International proficiency testing programmes on Ochratoxins would be Rs 11,250 or US \$ 250 per laboratory and assuming there are at least 10 laboratories analyze Ochratoxins A, the cost would be US \$2500 per year and for 5 years it is Rs 5,62,500 or US \$12500.

The cost of training for improving Coffee quality and safety of about 200 stakeholders consisting of Growers /Trade associations (number of growers participating could be up to 500, Coffee curing works/ Exporters (20 training programmes at different centers, @ 1,00,000 per training) would be Rs 20 Lakhs (US \$ 45,000)

The cost of supply of moisture meters for 50 Coffee Board Liaison units and providing subsidy for moisture meters at the rate of Rs 1000 per moisture meter for about 1000 state holders would be around Rs 12 lakhs (US\$ 26,500)

The cost of HPLC needed for Ochratoxin analysis is up to 20 Lakhs (US \$ 50,000). Equipping one food control Laboratory in the Coffee growing states of Karnataka, Kerala, Tamilnadu, Andhra Pradesh, Orissa and north Eastern States alone would cost Rs 10 million (US \$ 2,22,000)

Miscellaneous expenditure like additional equipments, training of analysts, initial chemicals like standards, would be another Rs 80 Lakhs (US \$ 175,000).

The cost of awareness campaign on Coffee quality and safety consisting of training, publicity materials (posters/pamphlets, resource materials / hoardings / audio, video, CD, etc would be around Rs 25 Lakhs (US \$ 55,000)

Miscellaneous expenditure and escalation Rs 50 lakhs (US \$ 111,000)
The total cost would be around Indian Rs 30 million or US \$ 673,000

The present guestimates are based on the assumption that existing laboratories will be strengthened rather than establishment of new laboratories for analysis of Coffee quality/safety.

General recommendations

These are the additional recommendations, general in nature, to those made in the TOR 8 for improving Coffee quality/safety. Although many of these recommendations have to be implemented by various stakeholders in the private sector, the Coffee Board being the nodal agency for coffee in India should act as a catalyst and motivator and persuade the various stakeholders to ensure that the tasks are accomplished.

- There need to be more vigorous participation of private sector consisting of growers, processors, traders and exporters and their associations/cooperatives in the programmes on Coffee quality/safety improvement rather than leaving the entire responsibility to the Coffee Board.
- As part of the GMP, the growers, processors organize a self-control programme and take steps to minimize or eliminate instances of contamination, mix up, errors and ensure that their products are safe. They should provide the consignments, which follow the benchmark requirements of hygiene, process control including storage and allot a "MARK" of quality.
- The Coffee industry representatives should effectively participate in the deliberations of National Codex Committee and International Codex/other meetings of interest to coffee trade and influence decision on standards, Guidelines, recommendations
- Research on Ochratoxins in normal and specialty Coffee like Malabar Monsoon Coffee including surveillance/prevention need to be encouraged both in the CCRI and other research and Academic Institutions
- Greater emphasis need to be given in the analytical laboratories engaged in OTA Analysis for Analytical Quality Assurance, Proficiency testing

(international), Check sample programme (National inter-laboratory testing) and, Accreditation programme so that they meet the global trade demands.

- Information, Education, Communication among growers be speeded up through Quality literacy movement and innovative measures like “Solution exchange” or learning from others-sponsored by the UN (www.solutionexchange-un.net.in or www.un.org.in).

- National standards or even Codex standards for specialty Coffees like Malabar Monsoon Coffee need to be prepared.

- More quality/safety related aspects have to be included in the undergraduate curricula of Agricultural University syllabus.

Terms of reference for the review of coffee quality / safety management and control in India

Background:

The Global project on “Improving coffee quality through prevention of mould formation” focuses mainly on the question of OTA-contamination in green coffee. The project has reviewed practices in coffee production and handling; implemented field trials aiming at providing a better understanding of the factors that lead to OTA contamination; provided training to national trainers on good hygiene practices in the coffee chain; supported national programmes of training and dissemination; conducted surveys of practices and problems along the national coffee marketing chains; and, developed capacity for OTA analysis in producing countries. At the end of the project (Sept. 2005), the project findings will be used in the elaboration of guidelines for good practices along the coffee chain.

The European Union has recently established maximum limits for OTA in roasted and soluble coffee; they will decide before the end of next year whether limits should be set for green coffee. Some countries have already established national limits for OTA in green coffee. Apart from official checking of green coffee, there has been increased inclusion of OTA clauses in commercial coffee buying contracts and increased checking of OTA by buyers. Countries that rely heavily on revenues and employment generated from coffee exports have an interest in ensuring that they are not ‘black listed’ as sources of highly contaminated coffee. As with all mycotoxins, the distribution of OTA in batches of coffee is highly heterogeneous. This creates great practical difficulties in the sampling of coffee for OTA. While programmes of OTA monitoring have a place within any national programme of OTA prevention, it cannot be a routine tool for the control of coffee safety. Ensuring the risky practices are avoided along the coffee chain is a much more effective way of ensuring acceptable quality and safety.

During the project implementation, it has become clear that coffee marketing systems and the regulation of coffee quality and safety varies widely from country to country. Responsible authorities need guidance in establishing practical measures for assuring that good practices, that will reduce opportunity for mould growth and OTA formation, are followed.

Under the technical and operational supervision of the Food Quality and Standards Service of FAO (ESNS) and in close collaboration with the Coffee Board of India, national coordinators of the Global coffee project (GCP/INT/743/CFC), and the FAO office in India, the consultant will undertake the following tasks:

- Considering the entire coffee production/ marketing chain, identify the institutions that are involved in the control of coffee quality and safety and determine the legal basis for their actions
- Considering the entire coffee production/ marketing chain identify the institutions that are involved in advising or training in quality and safety management.
- Review the activities of the institutions identified above and assess the extent to which these activities address important aspects of coffee production and handling along the chain (those aspects of production and handling that affect risk of mould contamination)
- On the basis of interviews with key stakeholders and review of survey data collected under the project or by the national coffee authority, assess the effectiveness of the existing controls.
- Assess the human and other resources that are used in the control and management of coffee quality/ safety; and, estimate the cost of the existing controls of coffee quality and safety to the government as well as to stakeholders in the coffee sector.
- Identify areas where there are overlapping responsibilities for the control of coffee/quality control and explain in concrete terms how this affects the efficiency and effectiveness of control (being sure to investigate overlaps with broader framework of general food control – this may be particularly important in countries where roasting and other downstream processing activities take place to a significant extent at national level)
- Identify areas along the coffee production/ marketing chain where there is not clear legal designation of responsibility for control; also identify areas where responsible authorities do not effect control even if the legal power exists.
- Make recommendations for improving coffee quality/ safety management and control along the coffee chain covering: the legal and policy framework; the institutional framework; mechanisms for ensuring adequate coordination among concerned agencies; interaction with private sector; the design and implementation of programmes relating to assurance of acceptable coffee quality and safety; technical capacity to support these programmes; evaluation of the efficacy of programmes; involvement in relevant international organizations.
- Outline a plan of action for the follow-up of recommendations; and estimate the resources required

Design a poster that highlights the importance of an appropriate regulatory framework for the quality and safety of green coffee in India and its relationship with the broader policy environment governing the coffee sector (the poster will be displayed at a conference attended by people largely involved in coffee marketing and will not have a deep understanding of food control systems).

List of Institute Visited/Persons met

1. Coffee Board, Bangalore:

Sri G.V. Krishna Rao, IAS, Chairman
Sri Ganga Raju, Joint Secretary (L)
Dr S Radhakrishnan, Dy Director (R)
Dr. Y. Raghuramulu, Coffee Scientist, F.A.O. Project, Sri Gopinandan, RA

2. Central Coffee Research Institute, Balehonnur

Dr. Jayarama, Director and other Scientists

3. Regional Coffee Evaluation Centre, Chikmagalur

Dr K. Venkatesh Dy Director (QC)

4. Central Food Technological Research Institute, Mysore

Dr. V Prakash, Director
Dr. K.N. Guru Dutt, Head, AQCL
Dr. Prema Viswanath
Dr K M Appiah, Emeritus Scientist and Coffee Planter

5. National Institute of Nutrition, Hyderabad

Dr. B. Sivakumar, Director
Dr S Vasanthi, Research Officer

6. Mangalore University, Department of Applied Botany, Mangalore

Prof Rasheed Ahmed

7. State Food Laboratory, Guindy

Sri K. Gunashekar I/C Public Analyst

8. Government Food Control Officials, Delhi

Sri Deepak Gupta, IAS, Addl Secretary, Ministry of Health
Smt Rita Teotia, IAS Joint Secretary, Ministry of health
Sri A N P Sinha, IAS, Joint Secretary Ministry of Food Processing Industries
Dr P.K.Bansal, Director, Sri Surendra Singh, Ministry of Food Processing Industries
Dr D Chattopadhyaya ADG(PFA), Mr Sunder Lal DADG PFA, Sri A K Srivastava, AADG, PFA, all of Ministry of health
Dr Madhulika Prakash, head, Food & Agriculture, Bureau of Indian Standards
Dr Suneetha Toteja, Assistant Director, Bureau Of Indian Standards
Dr Vidyutma Tripathi, Assistant Director, Export Inspection Council
Dr K K Sirohi, Dy AMA, Directorate of Marketing & Inspection

9. APEDA

Dr S Dave, Director

Sri Devendra Prasad, Information Officer

10. Confederation of Indian Industry

Sri D S Chadha, Advisor (Technical)

Sri Kamaljit Singh, Consultant

11. Centre for International Trade in Agriculture & Agro-based Industries:

Dr. Vijay Sardana, Executive Director

12. Indian Coffee Trade Association

Sri G Sridhar, Manager

13. Hindustan Lever Ltd, Mysore

Sri Balachandran, General Manager

14. COMARK, Hassan

Sri Srikanth, Manager

15. Karnatak Coffee Growers Federation, Chikamagalur

Sri A. Jaganath, President

16. Estate Owners

Sri Ravichandra Shetty, Ujjaini Estate

U S Janardhana, Hosabettu

Sri Jayaram, Mallikarjun Estate, Aldur

Sri K K Nagesh Annapurneswari Estate, Kelmane

Sri Nagappa, Ujini

17. Aspinwal & Company, Managlore

Sri Thimmayya, DGM, Sri Maheshchandran, QC

18. Saldhana & CO, Mangalore

Mr H R T Saldhana

19. Allansons, Mangalore

Mr Ravindra, Export Documentist

20. Allansons, Bangalore

Mr Prabhakar, Mr Murthy

21. Coffee Lab , Bangalore

Ms Renuka Gangadharan

22. M/S Adam & Company

Sri Surya Kantha Raju, QC Manager

23. CONCERT (Consumer Group) Chennai

Sri G Santhanrajan, Coordinator, Food Safety

24. SGS laboratory, Chennai

Mr V.K. Gupta, Lab Manager

Ms M. Meena, Lab in charge