AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Agricultural Economics Research Review
Vol. 23 January-June 2010 pp 97-103

Geographical Indications for Kodagu Coffee – A Socio-economic Feasibility Analysis[§]

A.N. Chethana[a] , N. Nagaraj[a]*, P.G. Chengappa[b] and C.P. Gracy[b]
[a]Department of Agricultural Economics
[b]Department of Agricultural Marketing Cooperation and Business Management,
University of Agricultural Sciences, GKVK, Bangalore-560 065, Karnataka

Abstract

The feasibility of Geographical Indications (GI) for the Kodagu coffee has been explored, as the coffee is grown under shade and unique conditions in the midst of rich biodiversity; as a result, the productivity of coffee turns out to be relatively low. The results have indicated that productivity of coffee is lower (6 q/acre) when grown under high shade and native tree cover than under low shade condition (8.9 q/acre). Although, the difference in cost of cultivation between the two shade conditions is not significant, the net gain is to the tune of Rs 10.40/kg for the planters growing under low shade and exotic trees cover. The net loss has been estimated to be around Rs 15.50/kg for the planters growing under high shade and native trees cover. The marginal loss in the productivity of coffee due to shade is not directly reimbursable through the shade benefits. Hence, the coffee planters need to be compensated through a price premium for their products produced under rich biodiversity, thus requiring the GI that ensures quality and price.

Introduction

Shade-grown Indian coffee growing regions of western ghats are recognized world over as one of the most diverse forest ecosystems on the planet earth. This repository of biodiversity is a symbol of wilderness harbouring a wide variety of herbs, shrubs and multiple crops. The coffee plantations are mixed with pepper, oranges, vanilla, cardamom and arecanut in abundance. Since India's coffee ecosystems comprises diversified multicrops mingled with native forest species, these coffee farms have a reputation as being ecofriendly in nature. Indian coffee is known to be "The world's best shade-grown 'mild' coffees". India is the only country that grows all of its coffee under shade. Typically mild and not too acidic, these coffees possess an exotic full-bodied taste and a fine aroma. India cultivates all of her coffee under a well-defined two-tier mixed shade canopy, comprising evergreen to semi-deciduous tree types. Nearly 50 different types of shade trees are found in coffee plantations. These shade trees are valuable in preventing soil erosion on a sloping terrain, enriching soil by recycling nutrients, protecting coffee plants from seasonal fluctuations in temperature and providing host to diverse flora and fauna (http://www.indiacoffee.org)

The landscape mosaic of Kodagu is interspersed by the existence of forest fragments embedded in the human-dominated landscape of coffee belt. Those forest remnants improve landscape connectivity, serving as corridors for numerous species. Together with the coffee plantations, they provide a series of environmental services in terms of pollination, carbon sequestration and water recharge. Coffee plants in agro-forestry system have less branch growth and leaf production, more persistent and larger leaves and present earlier flowering with a smaller number of productive nodes and flower buds, leading to smaller berry yield than plants in the monoculture system. The

* Author for correspondence,
E-mail: nagarajnareppa@ yahoo.com

§ This is part of the M.Sc.(Ag) thesis of the first author, submitted to the University of Agricultural Sciences, Bangalore in 2008

yield of 2443 kg/ha of coffee from the monoculture (sun coffee) was higher than 515 kg/ha of coffee from the agro-forestry system (Monica *et al*., 2005). In the district of Kodagu of Karnataka, coffee is being grown under high shade. Thus, it is unique compared to coffee produced elsewhere.

Over the past 30 years, in response to external market-driven dynamics, intensification of coffee cultivation has led to the loss of 30 per cent of the forest cover, essentially in the species-rich wet evergreen belt of the district Kodagu. Hence, massive landscape fragmentation, habitat loss and biodiversity depletion are continuing. Still, Kodagu is acclaimed for her exceptionally rich biodiversity. The Robusta coffee growers, on one hand, have to enhance coffee productivity and on the other, maintain rich biodiversity of the area. It is a challenge to researchers to evolve technology of maintaining native trees and still making coffee production remunerative. Could the reputation of shade-grown Indian coffee is used to valorize origin-based products whose quality stems from this high biodiversity? A possible strategy could be the use of Geographical Indication (GI), given the fact that the specifications for the GI application are amenable to environment-friendly coffee production, coupled with the maintenance of landscape mosaic.

In this regard, this study aims at estimating the profitability of coffee production systems that support biodiversity and also explore the feasibility of geographical indications for the Kodagu coffee. The specific objectives of the study were:

- To assess the cost–benefit analysis of managing the shade for exploring the feasibility of GI, and
- To evaluate consumers (processors, roasters and wholesalers) preference for coffee quality attributes.

Materials and Methods

In the first step of data collection, 12 villages, located along the Cauvery basin, were selected through cluster sampling, since the transect from west to east of the district, exhibits perceptible differences with respect to coffee yields, intercrops and also differences in shade tree species maintained by the planters in their estates. In the second stage, the survey numbers of the study villages were collected from the concerned revenue offices. In the third stage, three survey numbers were selected randomly and planters corresponding to those survey numbers were chosen as sample respondents. The primary data from 35 planters were collected during February to March, 2008, pertaining to the agricultural year 2007-2008, using pre-tested schedule. Simple tabular analysis was applied to compare shade intensity, productivity and income from coffee and the gains and loss of coffee production at high and low shades were worked out to estimate the price premium for high shade-grown coffee. The classification of shades into high and low is based on the densiometer readings, which were taken systematically in the randomly selected coffee estates by the team of ecologists. A densiometer is an instrument used for taking measurements of canopy cover. To explore the strengths, weaknesses, opportunities and threats in applying GI protection for the Kodagu coffee, SWOT analysis was carried out.

The consumers' preference for coffee was studied by surveying 20 wholesalers and roasters participating in weekly coffee auction in the Coffee Board. Nine orthogonal plan cards generated by conjoint procedure were given to each of them for the preference rating. The respondent's choice of coffee (through the cards) was noted down to find out the most preferred characteristics.

In the present study, the additive conjoint model was used instead of other forms like the interactive and the multiplicative models. The additive part-worth model is the simplest and by far the most frequently

Table 1. Quality attributes considered for raw coffee beans for conjoint analysis

Attributes	Arabica	Robusta
Origin	Kodagu	Kodagu
	Chikmagalur	Chikmagalur
	Hassan	Hassan
Price	Low	Low
	Medium	Medium
	High	High
Amount of damages	High	High
	Medium	Medium
	Nil	Nil
Elevation	High	High
	Medium	Medium

Table 2. Socio-demographic characteristics of sample respondents

Particulars	Small (≤10 acres) n=19	Medium (10-25 acres) n=9	Large (>25 acres) n=7	Total n=35
Family size (Av. No.)	3.6	4.0	4.3	3.8
Family labour available for farm activity (Av. No.)	1.7	1.8	1.0	1.6
Number of persons working outside the farm in a family (Av. No.)	1.4	1.8	2.6	1.7
Permanent workers (Av. No.)	0.8	2.7	8.4	2.8
Families with coffee as a major source of income (Av. No.)	19 (100)	9 (100)	5 (71.5)	33 (94.2)

Note: Figures within the parentheses indicate percentages to their total

used model. Further, in this model, the omission of the attribute does not have a major impact on part-worth estimates.

The additive model assumes that the overall evaluations are formed by the sum of separate part worths or utilities of the attribute levels. The model has been formulated as:

$$Y = \sum_{i=1}^{n} \sum_{j=1}^{m} V_{ij} X_{ij}$$

where,

Y = Consumer's overall evaluation of the product alternative, and

V_{ij} = Part-worth associated with j (1,2,3, ……,m) of attributes i (i=1,2,……,n).

Results and Discussion

The socio-demographic characteristics of sample households revealed that there was no marked difference with respect to family size across different size groups. Family-labour availability for farm activity was negligible in the case of large (> 25 acres category) compared to medium (11-25 acres) and small (≤10 acres) plantation categories. The number of persons working outside the farm in a family was highest in the large category, followed by medium and small categories. The number of permanent workers was highest (8) in large coffee estates, followed by medium (3) and was least in the case of small (1) planters. The household livelihood dependence coefficient on coffee production as the main occupation revealed that both medium and small planters depended solely on coffee, while, only 71.5 per cent of the large planters depended on coffee production as their main occupation (Table 2).

Educational Levels of Sample Respondents

The Kodagu planters have been found to be highly literate (97%), extremely industrious and have better communication networking. The survey revealed that more than 35 per cent of the sample planters had higher education (graduates). Being highly educated, they can be easily motivated to establish an institutional framework required to operate the mechanism of Geographical Indications for the Kodagu coffee, since the growers need to be monetarily compensated for conserving biodiversity by way of producing shade-grown Robusta coffee under the unique conditions of supporting biodiversity, maintaining ecological stability and observing sustainability.

Impact of Shade Intensity on Productivity and Income from Coffee

The densiometer readings were used to categorize coffee plantations into high shade (> 70) and low shade (< 70) intensive cultivation practices. It was interesting to note that even though the number of shade trees per acre was almost the same under both the shade conditions, there was a significant difference in the amount of shade prevalent in the coffee plantations. The percentage of native trees was significantly higher in the case of high shade conditions and that of exotic trees (mainly representing silver oak) was significantly higher in the case of low shade conditions. It implies that wherever there is high shade, the proportion of native trees is higher, which can be attributed to the unique canopy characteristics. The exotic tree species representing mainly silver oak, provide filtered shade, hence the extent of shade prevalent is low in this case.

Table 3. Education levels of sample respondents in the Kodagu district

Levels	Small planters	Medium planters	Large planters	All planters
Primary	1(5.3)	0	0	1(2.86)
Higher primary	5(26.3)	0	0	5(14.3)
Up to high school	3(15.8)	3(33.3)	1(14.3)	7(20.0)
Up to PUC	4(21.1)	2(22.2)	2(28.6)	8(22.9)
Graduation	6(31.6)	4(44.4)	4(57.1)	14(40.0)
Total	19(100)	9(100)	7(100)	35(100)

Note: Figures within the parentheses indicate percentages to column total

The productivity of coffee has been found less under high shade and native tree cover (≈ 6 q/acre) than under low shade conditions (≈ 8.9 q/acre), without any significant difference in the input amount (Table 4). Similar trend was observed for intercrops also, since exotic trees form good support for pepper because of clear bole. Hence, it was the shade intensity that influenced the yield rather than tree density (number of trees per acre). Hence, the planters are advised to regulate only the shade and not to cut the trees. The t-statistics for the net income from coffee and intercrops depict the shade density on farm profitability. However, these planters need to be compensated for preserving bio-diversity through conservation of native trees. One of the modes of payment for the environmental services suggested is through a premium price for the Kodagu coffee with Geographical Indication. Normally, the GI trickles economic prosperity to producers.

Gains and Loss of Coffee Production under High and Low Shades

The details of gains and losses of coffee production under high and low shade conditions are presented in Table 5. The difference in productivity between high and low shades conditions was 2.9 q/acre . Of course, there was a difference in the amount invested for growing coffee under both the shade conditions. Actually, planters under high shade had invested lower amount compared to planters under low shade condition. Taking this also into account, the net gain was found to be around Rs 10.40/kg for the planters growing under low shade and exotic tree cover. The net loss was estimated to be around Rs 15.50/kg for the planters growing under high shade and native trees cover. Hence, these planters should be compensated for the valuable ecosystem services provided by their mode of coffee plantations. The marginal loss in the productivity of

Table 4. A comparison of shade intensity, productivity and income from coffee

Particulars	High (> 70) intensity	Low (< 70) intensity	t-statistics
Area under coffee (acres)	6.5	21.1	2.7
Trees/acre	77	72	-0.5
Native trees (per cent)	93.5	79.8	-2.1
Exotic trees (per cent)	6.5	20.2	2.1
Ratio of exotics to natives	0.1	0.7	2.4
Coffee yield (q/acre)	6	8.9	2.2
Net income from coffee (Rs)	13950	23175	2.3
Total cost of cultivation of coffee (Rs)	13673	17739	1.3
Income from intercrops (Rs)	4759	7483	1.3
Net Income from coffee + intercrops (Rs)	18709	30658	2.9
Total cost /acre on coffee including intercrops (Rs/acre)	15696	19762	1.2

Note: > 70- values greater than mean+ Standard deviation
< 70- values less than mean+ Standard deviation

Table 5. Gains and loss of coffee production under high and low shades — Alternative pricing for shade-grown coffee

Particulars	High shade (> 70)	Low shade (< 70)
Yield gain (difference in productivity) (q/acre)	-2.9	2.9
Cost saved (Rs/acre)	4065.8	-4065.8
Income gain*(Rs/acre)	-13340.0	13340.0
Net gain (Rs/acre)	-9274.2	9274.2
Net gain (Rs/q)	-1545.7	1042.0
Net gain (Rs/kg)	-15.5	10.4

Note: * Calculated at model price of Rs 4600 per quintal.

coffee due to shade is not directly reimbursable through the shade benefits, the coffee planters need to be compensated through a price premium for their products produced under rich biodiversity, thus requiring the GI that ensures quality and price. It was estimated to be around Rs 15.50/kg of the dried cherry.

Quality Preferences of Wholesalers and Roasters for Coffee

The conjoint analysis was carried out to understand the preferences of wholesalers and roasters for the two major types of coffee, viz. Robusta and Arabica (Table 6). In both robusta and arabica, the wholesalers and roasters had placed highest preference for the elevation at which coffee was grown and the origin, where coffee was grown had the second most important criterion in selecting coffee beans for roasting and trade. They preferred coffee grown at higher elevations because that coffee offers unique cup taste, aroma, and good body. Traders preferred robusta coffee from the Kodagu area and arabica coffee from the Chikmagalur area. The past experience with respect to regional difference in coffee quality was also a significant factor influencing the buying decisions. Robusta from Kodagu and Arabica from Chikmagalur are of good quality because of the difference in geographical location. Thus, quality reputation of these coffees is widely recognized by consumers and therefore the producers ought to make available coffee of consistent quality. The GI protection is expected to be a tool to provide incentive framework for the shade-grown coffee.

Geographical Indications for the Kodagu Coffee: SWOT Analysis

In applying the protection of GI, for the Kodagu coffee, the industry enjoys several strong points and opportunities; in contrast, it also faces some weaknesses and threats. The GI protection necessitates that the product should originate from a particular geographical territory (Rangnekar, 2002). Since the aim is to conserve bio-diversity and to compensate the planters promoting bio-diversity (since proportion of native trees was significantly higher in high shade than low shade conditions) at the cost of their reduction in yield, GI for the Kodagu coffee is crucial. It was observed that a majority of planters (> 45% of the respondents) had permanent labours. These labours had migrated from the nearby rural areas. Thus, the Kodagu coffee industry has generated employment even for unskilled labours.

Strengths

The strong points for protection of GI for the Kodagu coffee are:

- The other two products, viz. the Kodagu orange and the Kodagu green cardamom have already got GI for their uniqueness. Since 'Coffee' is also associated with the same production system as a main crop, GI for the Kodagu coffee is feasible.
- It improves product reputation in the market.
- In Kodagu, the coffee is grown under rich floral diversity. In the recent past planters have resorted to heavy pruning of shade trees for increasing coffee yields and planting more *Gravelia robusta* since it gives filtered shade and also a fastest growing species, which has good timber value. (Muthappa, 2000) But, still many planters are maintaining large number of tree species that provide copious amount of shade at the cost of their reduction in yield. These planters are promoting for maintaining rich tree species and conserving bio-diversity. Because of a large number of trees in the coffee plantations some planters face elephant menace also. They should be compensated by way of GI for the valuable eco-system services offered by their mode of coffee plantations.

Coffee plantations in the Kodagu district has generated employment to a large extent, on an average

Table 6. Group results of conjoint analysis of arabica and robusta coffees

Sl No.	Characteristics		Arabica		Robusta	
			Utility	Relative importance	Utility	Relative importance
1	Origin	Hassan	1.56		1.27	
		Coorg	3.13	31.78	3.83	25.70
		Chikmagalur	4.70		2.55	
2	Elevation	Medium	-1.78		-1.95	
		High	1.78	36.55	1.95	39.73
3	Amount of damages	High	-0.66		-0.59	
		Medium	0.18	12.76	0.37	11.91
		Nil	0.48		0.22	
4	Price	High	0.93		1.12	
		Medium	1.86	18.91	2.25	22.67
		Low	2.80		3.38	
	Constant		0.59		0.84	
	Pearson's R		0.97*		0.97*	
	Kendall's tau		0.93*		0.83*	

Note: * Denotes significance at 1 per cent level

2,46,022 persons/day are employed in coffee plantations; thus it promotes rural development (http://www.indiacoffee.org).

Weaknesses

- The GI system is very recent to India (Geographical Indications Protection and Registration Act, 1999 was enacted in September, 2003). Therefore, lack of knowledge on the GI system is the main weakness. Also, many of the small producers live in the remote areas and take time for socialization and product transformation conducted outside the area. In fact, one of the objectives of survey was to generate awareness about GI among the coffee producers.
- Many a time GI alone will not bring about premium price but concerted efforts to popularize the product among consumers are also required.

Opportunities

- While claiming GI protection for Basmati rice, the application was flawed. One of the reasons for this was that the applicant consisted of the association of exporters and millers only and not the producers. Hence, always producers should come forward in claiming for GI protection.
- The opportunities for applying for GI protection system exist, as there are many planters associations in the district, like Kodagu Planters Association, Kodagu District Small Coffee Growers Association, Kodalipet Coffee Growers Association, etc. There is one company in Kodagu called Biodiversity India Company Limited exclusively for the promotion of biodiversity.

Threats

- Conflict with trademark (Hirwade, 2006)
- Low awareness among small producers
- GI may create monopolistic competition in the society leading to threats because it differentiates coffees of different coffee-growing regions and creates competition among a few.

Conclusions

The entire robusta coffee in India is grown under shade, which pulls down coffee yields. The marginal loss in the productivity of coffee due to shade is not

directly reimbursable through the shade benefits. Hence, the coffee planters need to be compensated through price premium for their products produced under rich biodiversity. The best way is to promote Geographical indication for the Kodagu coffee for internalizing the eco-system services. Normally, GIs are designed to defend valuable intellectual property and rights belonging to the community in a specific geographic boundary. Most of the requirements for GI, like environment-friendly practices (bio-diversity promotion) are being naturally met in the area. In addition, the coffee planters are highly educated and innovative; hence, the institutional framework to facilitate the GI is crucial in the area. Since the consumers recognize the quality of Kodagu coffee, this reputation needs to be properly protected through promotion of Geographical Indications. Although coffee from high elevation is the most preferred attribute, traders and roasters have used the region of origin of coffee also as an important attribute to decide on the quality of coffee beans. The concept of GI for the Kodagu coffee can't be taken up by individual planters who are widely spread across the district and as such need concerted efforts of Coffee Board, which is the promotional body for Indian coffee.

References

Chethana, A.N. (2008) *Economic Analysis of Coffee Production System for Exploring the Socio-economic Feasibility of Geographical Indications for Kodagu Coffee*. M.Sc. (Ag) Thesis, University of Agricultural Sciences, Bangalore.

Hirwade, M. (2006) *Geographical Indications: Indian Scenario*, Paper presented at Shivaji Science College, Congress Nagar, Nagpur-12.

Monica Campanha, M., Henrique Ricardo, S. L., Bernardo Gilberto, D.F., Emilia Herminia, P.M., Silvana Garcia,l.R. and Luiz Fernando, F. (2005) Growth and yield of coffee plants in agroforestry and monoculture systems in Minas Gerais, Brazil. *Agroforestry Systems*, **63**: 75-82.

Muthappa, P.P. (2000) *A Resource Economic Study on Tree Diversity in Coffee based Plantations in the Western Ghats Region of Karnataka*. M.Sc. (Ag) Thesis, University of Agricultural Sciences, Bangalore.

Rangnekar, Dwijen (2002) *Geographical Indications: A Review of Proposals at the TRIPS Council*, UNCTAD/ ICTSD Capacity Building Project on Intellectual Property Rights and Sustainable Development.

http://www.indiacoffee.org