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Sustainability of Income through Beekeeping under Rubber Plantations in India: The Case Study of a Rubber Producers' Society*

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Beekeeping under rubber plantations in India is a potential source of maximising the net income and employment of rubber growers. But only less than 3 per cent of the actual potential is being commercially exploited. The oligopolistic structure of rubber honey market dominated by co-operatives and their inherent constraints like low working capital and institutional rigidities are the major factors attributing to low level of popularisation and adoption of beekeeping among rubber growers vis-a-vis *commercial exploitation of rubber honey. Within these limitations, the achievements made in beekeeping by the Elavampadam Rubber Producers' Society (ERPS), a small voluntary association, with growers' participation at local level is worth noting in enhancing the income of rubber growers. Therefore, a consortium of more than 1 200 Rubber Producers' Society existing across the traditional rubber growing regions can be an alternative institutional intervention to achieve the twin objectives of commercial exploitation of rubber honey and hive products and supplementing the income of rubber growers facing market uncertainties in the context of trade liberalisation since 1991-92.*

Keywords: *Natural rubber, beekeeping, migratory beekeepers, oligopoly,* Apis cerana indica, Apis mellifera, *rubber honey, colony bifurcation, honey processing.*

The rationale of maximising net farm income of small farmers, especially in the context of market uncertainty, is well documented. Beekeeping under rubber plantations in India, particularly in Kerala and Tamil Nadu, which constitutes 87 per cent of the total area (mature and immature) under rubber plantations, is a potential source to maximise the net income and employment of 1 million growers depending on natural rubber (NR) with an average holding size of less than 0.5 ha. However, the potential of beekeeping has not received adequate attention even in the context of market uncertainties of NR in the post-economic reforms phase since 1991-92. Beekeeping under rubber plantations in Kerala and Tamil Nadu has been mainly popularised by the co-operatives. Though the intervention of co-operatives in beekeeping under rubber plantations dates back to 1920s, due to inherent limitations of such institutions not only the potential of rubber honey remains under-exploited but the income of growers could not be augmented as well. In this context, an attempt is made to examine the unique achievements made by a small voluntary organisation, the Elavampadam Rubber Producers' Society (ERPS), located in Palakkad district in north Kerala, with growers' participation at local level, in the popularisation

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of beekeeping and enhancement of net income of rubber growers. The paper assumes policy level importance in the backdrop of potential of beekeeping as an income augmenting source and the factors constraining its popularisation through co-operatives among rubber growers.

Accordingly, following are the major objectives of the study undertaken based on primary survey conducted during 2003 among 14 rubber honey processing units and government promotional agencies concerned with beekeeping in Kerala and Tamil Nadu.

i. To examine the potential and extent of commercial exploitation of honey from rubber plantations in India,
ii. To analyse the factors constraining the adoption of beekeeping under rubber plantations within the existing institutional framework of co-operatives,
iii. To examine the performance *vis-à-vis* the influencing factors with respect to ERPS in the popularisation of beekeeping under rubber plantations at local level, and
iv. To suggest alternative policies for scaling up the institutional interventions to exploit the untapped potential of rubber honey so as to maximise the net farm income.

POTENTIAL AND COMMERCIAL EXPLOITATION OF RUBBER HONEY

The mature rubber plantation as the prolific source of honey has been well documented (Jayaratnam, 1970; Suryanarayana, 1980, 1996; KVIC, 1996; Wakhle & Pal, 1998). The two species, *Apis cerana indica.F* and *Apis mellifera.F* are the major sources of honey from rubber plantations. However, though the latter is more economical in terms of yield the former has become more popular on account of its comparable income and lesser natural as well as economic risks compared to the former (Jose *et al.*, 1999, 2002; Nehru *et al.*, 2000). This could be the major reason that more than 70 per cent of total honey procured from rubber plantations is constituted by *Indica cerana* (Veeraputhran *et al.*, 2001).

The income from beekeeping under rubber plantations depends on yield, which in turn is influenced by season and colony density. For obtaining optimum yield the average colony density considered is 15-20 hives per hectare of mature rubber plantations (Haridasan *et al.*, 1987). While the reported average productivity of honey and bee wax from all sources is 8.6 kg and 200 g respectively per hive (KVIC, 1996), the average yield of honey and wax from rubber plantations is estimated to be 12 kg and 200 g respectively per hive from *Apis cerana indica* and 39 kg and 800 g respectively per hive from *Apis mellifera* (Chandy *et al.*, 1998). At this yield level, beekeeping is a potential income augmenting source for small and marginal farmers (Mathew, 2002; Joseph, 2002) as it constitutes 27 per cent of the total family income and as a percentage of income from rubber alone it is as high as 42 per cent (Jameskutty, 2000). The potential of beekeeping is more evident that the existing mature rubber plantations in the states of Kerala and Tamil Nadu, which together constitute 94 per cent of the mature rubber plantations in India, can generate an annual net income of US$163 per hectare (www.mandasofpune5.homestead.com) and 0.15 million man days of employment besides an incremental value of output of more than US$52.20 million per annum without acquiring additional land at a macro level (Veeraputhran *et al.*, 2001).

However, though the mature rubber

plantations in these two states account for an average honey potential of 54 000 mt per annum during the period 1995-96 to 2002-03 (based on the estimates of Chady *et al.*, 1998 with the assumption that the whole honey is produced by *A. cerana indica*) only less than 3 per cent of the actual potential could be commercially exploited during this period. The other important high valued hive products are bee wax, bee venom, pollen, proplis, royal jelly *etc.* Except for bees wax on a limited scale, no other products are commercially exploited. Though the factors reported to have contributed to this low level of popularisation *vis-à-vis* the adoption are varied, the major factors constraining the popularisation and adoption are the persistence of consistently declining farm gate price at unremunerative levels and lack of awareness about the prospects of beekeeping among rubber growers, especially in Kerala, evolving from the existing institutional mechanisms with rigid structural characteristics of the rubber honey market.

STRUCTURAL CHARACTERISTICS OF HONEY MARKET

The existing institutional set up for promoting beekeeping under rubber plantations is dominated by the co-operative sector affiliated to and recognised by the Khadi and Village Industries Commission (KVIC) of Government of India and Kerala Khadi and Village Industries Board (KKVIB) of Government of Kerala supplemented with the non-governmental organisations (NGOs) like Young Men's Christian Association (YMCA), Malanad Development Society (MDS) and private collection centres. There were 200 co-operative societies in 1993-94 affiliated to and recognised by the KVIC and KKVIB and 47 private collection centres located in different regions used to procure honey produced from rubber plantations (Chandy *et al.*, 1998). But, now only 30 co-operatives recognised by the KKVIB (19 Nos) and KVIC (9 Nos), two procuring and processing centres (one each) owned by the KKVIB and KVIVC, one co-operative society, the Marthandam Beekeepers' Society (MBS), affiliated to the KVIC, two NGOs and 37 private collection centres are engaged in honey procurement operations. When more than 66 per cent of the honey is being procured by the recognised and affiliated societies and procuring and processing centres of KKVIB and KVIC and MBS, around 18 per cent is procured by the NGOs and the rest 16 per cent by the private collection centres. Normally, the honey procuring co-operatives and majority of private collection centres, after procuring the honey, sell it to the procuring and processing centres of KKVIB and KVIC and MBS, which, along with the NGOs and six private processors, are alone engaged in honey processing.

The MBS, being the leading co-operative society procuring and processing honey in large quantity, announces the procurement and selling prices of raw as well as processed honey prior to the commencement of the honey season. The same prices are virtually being followed by all other processors without price competition and collusion exhibiting the structural characteristics of oligopolistic nature of honey market. Given these structural characteristics of the market, honey is marketed in raw form (semi processed condition in bulk form) to Ayurvedic and Unani medicine manufacturers and in processed form through private retail shops on commission basis. Since the number of processing units is less, the volume of sale of processed honey depends on the percentage of commission given to the retail shop owners *i.e.* higher the rate of commission higher will be the market. However, the role of intermediaries could not

be observed in the marketing of rubber honey.

Given this market, the negligible rate of adoption of beekeeping *vis-a-vis* the declining number of procuring and processing units are the phenomena, as mentioned above, evolving on account of the price (farm gate) paid by the processors, which has been remaining declining at unremunerative level over the years (*Table 1*). It is indicated in *Table 1* that the farm gate price offered by co-operatives and private collection centres has been declining for the last nine years whereas the price realised through direct selling for domestic purposes has also been declining but remaining substantially at higher level compared to the former.

Lower farm gate price is the reflection of lower selling prices being realised by the processors (*Table 2*). From *Table 2* it is seen that the selling prices of raw honey in bulk form as well as the retail price of processed honey

TABLE 1
FARM GATE PRICES OF RUBBER HONEY (US$/KG)

Year	*Price paid by*		*Price realised from direct sale by beekeepers*
	*Co-operatives**	*Private collection centres*	
1995-96	1.20	1.49	2.09
1996-97	1.18	1.30	1.97
1997-98	1.21	1.13	1.88
1998-99	1.02	1.00	1.43
1999-00	0.97	0.97	1.38
2000-01	0.92	0.92	1.42
2001-02	0.88	0.88	1.36
2002-03	0.87	0.87	1.76
2003-04	0.91	0.91	2.17

Source: Survey data. * Includes 2 NGOs

TABLE 2
TRENDS IN THE PRICES OF RAW HONEY AND RETAIL PRICE OF PROCESSED HONEY (US$/KG)

Year	*Raw honey price*	*Retail price*
1995-96	2.11	2.83
1996-97	1.99	2.28
1997-98	1.59	2.50
1998-99	1.57	2.21
1999-00	1.50	2.31
2000-01	1.27	2.36
2001-02	1.22	2.26
2002-03	1.20	2.23
2003-04	1.30	2.44

Source: Survey data

have been remaining stagnant at declining rate over the period.

The sales prices are maintained at lower level by the co-operatives mainly with a view to sustaining the larger share of honey market by avoiding the commission based competition of private processors. Normally, when the co-operatives offer the commission to retailers in the range of 12-15 per cent the private processors give it in the range of 25-30 per cent and very often it varies depending upon the market conditions. Therefore, considering the rate of commission the private retail shop owners always prefer to buy and sell the honey offered by private processors. But as the co-operatives are always constrained by inherent constraints of low working capital, storage facilities and institutional rigidities they are not able to offer the commission as is being given by the private processors. Hence, in order to avoid the risk and competition the co-operatives sell 60 per cent of the total honey procured in raw form and the rest in processed form at reduced prices. The honey supplied at negligible investment costs by the migratory beekeepers of Kanyakumari district in Tamil Nadu, who constitute more than 62 per cent of the total rubber honey procurement, could be the plausible factor that the honey prices are always held at lower levels by the co-operatives (Veeraputhran *et al.*, 2001). Historically, Kanyakumari district is popular for beekeeping. The beekeepers in this district procure honey from the rubber plantations in Kerala, which accounts for 83 per cent of the total area under rubber plantations in India, by migrating the bee colonies during the honey season and paying rent in kind form (2-3 kg of honey) to owners of rubber plantations.

The dominance of migratory beekeeping is the direct outcome of the lack of awareness about the prospects of beekeeping among the native planters in Kerala. The location specific operations of existing institutions are other major factors contributing to the lack of awareness *vis-a-vis* lower level of adoption of beekeeping in Kerala. For instance, while the MBS and YMCA and three private processors are the major honey procuring institutions in Nagercoil region of Kanyakumari district in Tamil Nadu, the MDS and the other procuring and processing centre are in operation in isolated locations in different parts of Kerala. Thus, it is evident that the declining farm gate price at unremunerative level and lack of awareness about the prospects of beekeeping are the major factors leading to lower level of adoption among the rubber growers. In this context, the limitations of co-operative institutions in exploiting the potential of rubber honey need to be contrasted with the distinctive achievements made in beekeeping by the Elavampadam Rubber Producers' Society (ERPS) in Kerala, through ensuring collective action among rubber growers at local level.

THE CASE OF ELAVAMPADAM RUBBER PRODUCERS' SOCIETY (ERPS)

Rubber Producers' Society (RPS) is a voluntary association of rubber growers operating in small compact areas having a radius of 2 to 3 kilometres with the active participation of the Rubber Board with its crucial appendage of technical and financial supports provided to rubber growers. The RPS helps the growers through the acquisition and dissemination of modern cultural practices, improvement of productive efficiency of their holdings, group processing of the crop to attain higher marketable grades *vis-a-vis* their prices.

The Elavampadam Rubber Producers' Society (ERPS), Palakkad in north Kerala is one such society established in 1989. Besides its normal activities, from 1992 onwards it has

been encouraging its member as well as non-member growers to undertake beekeeping under their rubber plantations. Currently, there are 252 members (rubber growers) in the society, of which, 50 per cent have adopted beekeeping in their own rubber holdings. The average holding size of rubber area of these members ranges between 0.8 to 1.2 ha. The ERPS acts as a facilitator among its grower-cum-beekeepers to get the financial as well as technical assistance given by the promotional agencies like the Rubber Board, KVIC, KKVIB and Regional Rural Banks (RRB) and other promotional agencies to meet the initial infrastructural investment required for beekeeping.

Besides, technical support at free of cost and beekeeping equipment at a price lower than the market price are also provided to both the member and non-member beekeepers. From 1998 onwards it has started honey processing by procuring from the members and non-members at a price, as in the case of other co-operatives, determined and declared before the commencement of honey production season. Normally, its procurement price is always higher than that of other co-operatives and private processors (*Table 3*). The marketing strategy of the ERPS is also in sharp contrast to that of others, thus enabling the popularisation of beekeeping and supplementing the net income of member growers. The ERPS sells only 10 per cent of total honey in raw form (semi-processed) to Ayurvedic and other medicine manufacturing units while the major share is marketed in processed form through its own show room (40%), direct sales to different offices and households with the help of its sales representatives (25%), Trading Companies of the Rubber Board (10%) and retail outlets (15%) with a commission of 10-15 per cent. As in the case of others, conventional method of water heating is used for processing.

A detailed profile of the achievements made in beekeeping by the ERPS is given in *Table 3*. The *Table* shows that though in the initial year of 1998-99 it could sell honey worth only US$339.43, during 2002-03 the sales increased to a significant level of US$5486.67. It is also to be noted that when the beekeepers affiliated to the ERPS received a higher farm gate price with an average of US$1.38 per kg during the period 1998-99 to 2002-03, the beekeepers supplying to all other co-operatives and private

TABLE 3
INCOME REALISED BY ERPS FROM BEEKEEPING

Details	*1998-99*	*1999-00*	*2000-01*	*2001-02*	*2002-03*
Honey collected	121	480	1110	1800	3000
Own production	0.00	0.00	350	450	0.00
Total honey output	121	480	1460	2250	3000
Value of honey procured	215.71	720.06	1457.97	2075.91	3409.80
Price/Kg	1.78	1.50	1.31	1.15	1.14
Expenditure	3.57	13.85	109.46	147.20	206.65
Honey sold	119	470	1430	2016	2950
Value of honey sold	339.43	1193.17	3130.47	4015.94	5486.67
Value per kg	2.85	2.54	2.19	1.99	1.86
Profit from sale of honey	120.16	459.27	1563.05	1792.83	1870.22

Source: Thengumpally (2002) Note: Quantity in kg; values in US$

processors received only less than 32.61 per cent of what the ERPS members realised during this period (*Tables 1 & 3*). However, as the consumers are assured the supply of honey by other co-operatives at lower prices, the ERPS is also forced to sell the procured honey at reduced prices. In spite of its higher farm gate prices provided to beekeepers, the ERPS could earn a net profit of US$1870.22 by selling around 3 mt of honey during 2002-03 as against a lower level of US$120.16 from the sale of a meagre volume of 121 kg during 1998-99.

The ERPS has also earned profit by way of bifurcating the bee colonies and the details are given in *Table 4*. The *Table* shows that during 1999-00 it purchased 42 colonies and in the next two consecutive years it could bifurcate 240 and 210 colonies and sell 220 and 360 colonies respectively and the respective net profits were US$1355.74 and US$1939.61. This profit is also the income of member growers in addition to the profit earned through the sale of honey to the ERPS.

In this context, the income accrued to a member beekeeper (excluding the profit share from ERPS) having a minimum of four bee colonies is worth noting and the details of his earnings are given in *Table 5*.

From *Table 5* it is clear that the beekeeper had only four colonies during 1998-99, from which he realised a net income of US$61.80. However, by 2002-03 he had 32 colonies through bifurcation, thus he could earn a net profit of US$824.55. The important point is that the whole achievement of the ERPS has been within the inherent limitations applicable to all other processors.

CONCLUSION

Thus, it is to be observed that the existing institutional intervention by the co-operatives is highly constrained in popularising beekeeping under rubber plantations *vis-a-vis* commercially exploiting honey in augmenting the net income of rubber growers. Besides, the high valued hive products remain completely unexplored. Therefore, rubber honey and hive products can be commercially exploited on a wider scale to supplement the income of rubber growers through a consortium consisting of more than 1 200 RPSs operating across regions in Kerala. This consortium, even by using the

TABLE 4
PROFIT REALISED BY ERPS FROM COLONY BIFURCATION

Details	*1999-00*	*2000-01*	*2001-02*
Own colonies*	0.00	0.00	30
Colonies purchased*	42	80	120
Value of colonies purchased	387.72	612.96	880.69
Colonies bifurcated*	0.00	240	210
Colonies sold*	42	220	360
Value of colonies sold	436.19	2167.25	3396.94
Wages to workers	5.77	149.30	419.38
Feeding expenses	0.00	49.26	157.27
Total expenditure	5.77	198.56	576.64
Net profit	42.70	1355.74	1939.61

Source: Thengumpally (2002) Note: * in nos.; values in US$

TABLE 5
INCOME OF A RUBBER GROWER FROM BEEKEEPING

Details	*1998-99*	*1999-00*	*2000-01*	*2001-02*	*2002-03*
No. of colonies per ha	4	8	16	32	32
Honey produced (kg)	28	64	160	320	320
Price of honey / kg	2.38	1.73	1.64	1.36	1.34
Income from honey	66.56	110.78	262.70	436.15	429.84
Colonies bifurcated (No)	4	8	16	48	60
Income realised	38.03	73.85	122.59	402.60	444.31
Expenditure*	42.79	67.21	131.35	251.63	49.60
Gross income	104.59	184.63	385.29	838.75	874.15
Net profit	61.80	117.42	253.94	587.13	824.55

Source: Thengumpally (2002) Note: Values in US$

* Since family labour is used, wages are not included in expenditure

conventional method of processing, can exploit the domestic as well as the growing export market of honey (DGCIS, 2003). The scope of honey market would be larger if the consortium processes higher grades (lesser moisture content) of honey through the adoption of modern processing plant, which can reduce the moisture content in honey at any desired level. However, the establishment of such a consortium has to be perceived within the limitations of the critical socio-economic factors such as the availability of bee forage, land and family labour. Since the larger size of holdings characterised by diversified cropping pattern ensuring availability of bee forage and higher share of family labour participation are more in northern Kerala compared to the monocrop cultivation of NR in other regions (Veeraputhran *et al.*, 2001), the consortium of RPSs in the northern region can make the initiative to popularise beekeeping among the rubber growers so as to achieve the twin objectives of commercial exploitation of honey from rubber plantations and supplementing the income of marginal and sub-marginal farmers. Given this background, the achievements as illustrated by the ERPS substantiates the relevance of co-operatives at local level with growers' participation as alternative institutions for the sustaining income from beekeeping through the economisation (colony bifurcation and hive products) with diversified marketing approaches. Therefore, as a prelude, the establishment of a consortium of RPSs in northern region of Kerala can play a vital role in enhancing the adoption of beekeeping and supplementing the income and employment of rubber growers facing market uncertainties and consequent prices of NR.

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INI IALAH IKLAN RACUN PEROSA

KINI, PRODUK ACM BERCIRIKAN

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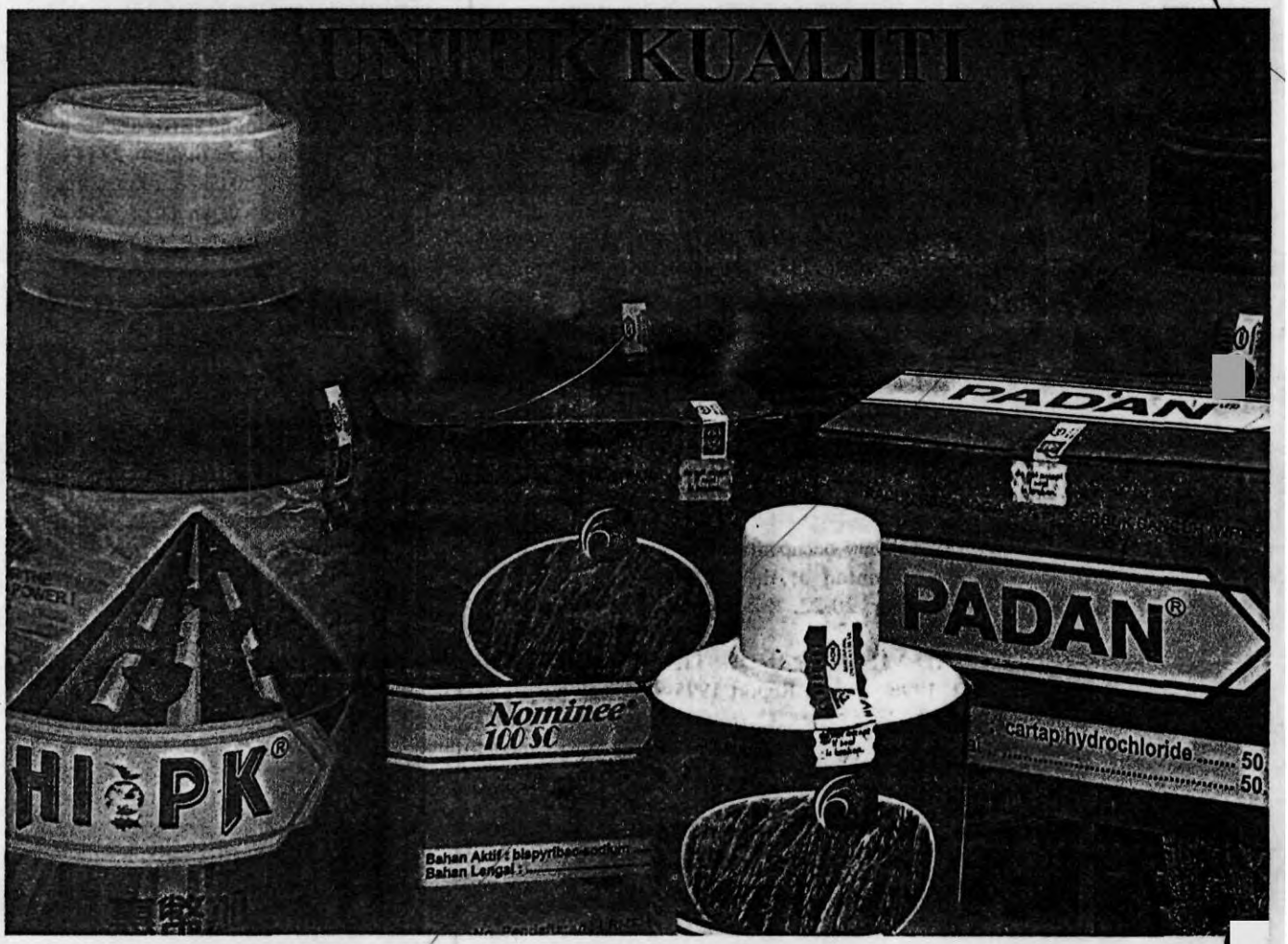

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