

Case study of tobacco cultivation and alternate crops in India

Dr Vinayak M Prasad
Director (Public Health), Ministry of Health & Family Welfare

**Study conducted as a technical document for
The first meeting of the Ad Hoc Study Group on Alternative Crops established
by the Conference of the Parties to the WHO Framework Convention on
Tobacco Control**

February 2007

Disclaimer

This paper is commissioned by and produced for the World Health Organization, Geneva. The views expressed are personal to the author and may not necessarily reflect the views/policies of the Government of India. The findings, interpretations, and conclusions expressed in this report are entirely those of the author and should not be attributed in any manner whatsoever to any of the Parties to the WHO Framework Convention for Tobacco Control, the World Health Organization or the Tobacco Free Initiative.

Index	Page
1. Background: basic statistics on tobacco farming in India	3
2. Key issues in tobacco farming and alternate crops	4
2.1. Comparison of profitability of tobacco versus other crops	4
2.2. Case studies on current and former tobacco farmers from main tobacco-growing regions	5
2.3. Information on loans, including existing availability of loans from banks and conditions and relative ease of obtaining loans for different agricultural purposes	6
2.4. Efforts taken by the government (public sector institutions) in promotion of tobacco crops (production, marketing and export)	7
2.5. Marketing of crops: existing markets, price fluctuation, the role of agricultural extension programmes	7
2.6. Brief sideline on tobacco and the environment, including pesticides used by farmers	8
3. Potential future directions	9
3.1. Potential role of the formal banking system, rural banks, etc. in giving loans to farmers	9
3.2. Potential role of ICAR, Agricultural Universities, and agricultural extension programmes in setting up a new Board for Alternate Crops, along the lines of the Tobacco/Tea/Coffee Boards	9
3.3. Possibility of using Agricultural Universities and NGOs in tobacco-growing areas as part of agricultural extension to promote alternate crops	10
4. Conclusion	11
References	13
Annex 1: Types of tobacco and their geographical distribution/area under cultivation in India	14
Annex 2: Economics of production—tobacco versus alternate crops	15

Case study of tobacco cultivation and alternate crops in India

1. Background: basic statistics on tobacco farming in India (prevalence, land use, government net loss from tobacco, health consequences for the farmer of growing tobacco)

The Portuguese perhaps introduced tobacco into India in the 16th or in the 17th century. Progress in tobacco cultivation in India began in 1787 with the establishment of the Calcutta Botanical Gardens and continued with research initiated with the establishment of the Imperial Agricultural Research Institute—presently the Indian Council of Agricultural Research (ICAR)—in 1903. In order to regulate production, facilitate promotion of overseas marketing and to control recurring instances of imbalances in supply and demand, which lead to market problems, the Government of India established the Tobacco Board, in place of Tobacco Export Promotion Council, under the Tobacco Board Act of 1975. The Board came into existence on 1 January 1976. In view of tobacco's commercial value, the Government of India also established several tobacco research stations and institutions in the country during the period 1938–1980.

Tobacco is presently an important cash crop grown on 0.4 million hectares in the country and accounts for approximately 0.27% of the net cultivated area. The annual production is around 700 million kg and the country ranks third in the world in production after China and Brazil. The majority of the states in the Indian Union grow some type of tobacco, significantly influencing the economy and prosperity of the farming community. Andhra Pradesh, Karnataka, Gujarat, Maharashtra, Bihar and Tamil Nadu are the major tobacco-producing states.¹ A detailed note on the types of tobacco and their geographical distribution/area under cultivation is attached at Annex 1.

Tobacco offers significant employment opportunities, both in on-farm and off-farm situations, and provides a livelihood to millions of people in India. The Central Tobacco Research Institute (CTRI) has estimated that about 6 million farmers and 20 million farm labourers are engaged in tobacco farming, spread over 15 states. Bidi rolling provides employment to 4.4 million people, in addition to 2.2 million tribal workers involved in tendu collection (leaf used to roll bidi). Nearly 4 million people are engaged in the wholesale/retail sale of tobacco. The main beneficiaries are small and marginal farmers, rural women and tribal youth. According to the Ministry of Commerce and Industry, tobacco contributes around US\$ 293 million per annum towards foreign exchange, accounting for 4% of the total agricultural exports from India. The tax on manufactured tobacco products comes to US\$ 1.778 billion per annum from Central Excise. This is more than 10% of total Central Excise revenue collected by the Central Government.²

Tobacco is therefore important as a crop, as an exportable commodity and as a source of revenue and foreign exchange earnings for the government.

However, the net gain or loss to the government in terms of disability, disease and death due to tobacco has not been properly and comprehensively quantified. In addition to causing damage to an individual's health, tobacco use results in severe societal costs, such as reduced productivity, health-cost burdens and environmental damage. As per the study carried out by Rath and Chaudhry in 2001–02, for India, the cost of only three major tobacco-related diseases—cancers,

coronary artery disease and chronic obstructive lung disease—was estimated to be Rs 308.33 billion (approximately US\$ 7 billion) per annum.³ This is more than 2% of the gross domestic product (GDP). (Incidentally, public health spending by Central and State Governments is only 1% of the GDP. The present government has given a commitment to raise this to 3% of the GDP in the next 3–4 years.) The health costs far exceed the total combined revenue and capital expenditure (budget estimates) by the Central and State Governments on medical and public health, water supply and sanitation, which according to the Indian Public Finance Statistics (2002–03), amounted to Rs 290.49 billion (approximately US\$ 6.6 billion). It is noteworthy that these are conservative figures, as they do not capture all the indirect health costs. There is, therefore, a strongly felt need for a regular, comprehensive and reliable database in order to establish cost due to tobacco-related diseases.

The production-related health hazards from tobacco are also a matter of serious concern in India. Millions of tobacco farmers, tobacco farm-workers and bidi workers are ignorant about the adverse health consequences they face. In the organized sector, the government has legislated for the rights of the workers (such as the Factories Act and the Mining Act), but there are no such enabling provisions for unorganized tobacco farm-workers. It is well documented that workers engaged in tobacco cultivation suffer from an occupational illness known as “green tobacco sickness” (GTS), largely due to absorption of nicotine through the dermal route. The symptoms of GTS include headache, nausea/vomiting, dizziness, loss of appetite, fatigue and weakness. Severe toxicity may also lead to breathlessness and fluctuation in blood pressure or heart rate. The studies carried out by the National Institute of Occupational Health (NIOH) in CTRI farms in Andhra Pradesh reveal discoloration of the skin for workers coming into contact with tobacco leaves.⁴ Even the storage of tobacco in houses was found to lead to higher incidences of nausea, headache and dizziness. (For example, many women lose the taste for food, and the smell and bitterness of tobacco is passed on to the food that is prepared in the houses where tobacco is stored.) Likewise, the dust generated during the processing of tobacco was found to result in allergies among the workers.

Studies in Andhra Pradesh and Gujarat indicated a higher prevalence of tobacco consumption among the farm-workers engaged in tobacco cultivation. Studies carried out by NIOH, Ahmedabad, similarly indicated that tobacco farm-workers who smoked were also more likely to suffer from GTS.⁵

2. Key issues in tobacco farming and alternate crops

2.1. Comparison of profitability of tobacco versus other crops

CTRI at Rajamundry (Andhra Pradesh), a Government of India Institution, has conducted applied research on scientific cultivation of tobacco in India. CTRI has carried out studies using various combinations of monocropping and intercropping patterns on different soil types. The studies have been carried out at the four regional centres of CTRI (Rajamundry, Anand, Shimoga and Pusa) with support from seven subcentres (Berhampur, Gurusahayganj, Guntur, Dinhat, Nipani, Nandyal and Hunsur). The sample studies indicate that there are alternative crops to tobacco and that they are economically viable. Farmers in black soils of Andhra Pradesh, traditional soils of Gujarat and bidi areas of Karnataka have successfully replaced tobacco with alternative crops. The economic feasibility of these crops is also revealed in some CTRI studies presented on the basis of cost-benefit ratios (net returns). The crop-related details of some of these studies carried out by CTRI appear in Annex 2. It may, however, be kept in mind that these are only sample

studies and do not include other variables such as marketing or the availability of good-quality seeds.

Similar studies on bidi tobacco in Karnataka indicate that sugar cane, in irrigated areas, and soybean and jowar, in unirrigated areas, can be alternatives for tobacco. For farmers growing tobacco on a large scale, the net return per rupee of investment in the cultivation of jowar was in fact higher (1.84) than the return from tobacco (1.48). This indicated that farmers, especially those cultivating non-flue-cured Virginia tobacco, need not depend only on tobacco for economic returns and that there were equally remunerative alternative crops.

ICAR has suggested a judicious mix of alternative crops, as viable alternatives to tobacco crops, depending on variables that include the climatic conditions, soil type and availability of assured water supply. The broad suggestions are as follow:

- *For irrigated areas:* sugar-cane, groundnut, oil palm, cotton, chilli, maize, onion, cucumber, blackgram, greengram, mustard, ragi, castor-groundnut, cotton-groundnut, pigeon pea-groundnut, paddy-mustard, potato, ginger-wheat, tomato, lady's finger, cabbage, cauliflower, garlic, tomato, brinjal (aubergine), pulses and turmeric.
- *For unirrigated areas:* mustard, sorghum, greengram, coriander, Bengalgram, soybean, redgram, safflower, groundnut, maize, bajra and castor.

Another area of study explored was the possible alternate use of the tobacco crop itself. Studies carried out by CTRI indicate the potential use of tobacco plants as a source of, among other things, protein, edible oil, nicotine sulphate, low-calorie sweetener and solanesol. And tobacco derivatives are being used in the pharmaceutical, oil, paint, soap and chemical industries. There are a number of industrial units engaged in extracting nicotine derivatives and nicotine products such as nicotine sulphate (used as an insecticide), nicotine hydrogen tartarate, nicotine bi-tartarate, nicotine salicylate and nicotine hydrochloride (used in tobacco-cessation products).⁶ The issue requires consideration, as there would be regions/soils, which may not be able to take up alternate crops and in which farmers may continue to grow tobacco. Should the global demand for tobacco products for consumption, as, for example, cigarettes or chewing tobacco, be reduced substantially (most unlikely in the short to medium term), the alternate use of tobacco crops could be explored. There is therefore a need for further empirical study on the techno-commercial and health viability of alternate uses of tobacco crops.

2.2. Case studies on current and former tobacco farmers from main tobacco-growing regions

Action intervention studies have been carried out on a highly limited scale in India. CMDR carried out studies for the first time in India, during 1997–2000 in Sidnal village in the bidi-tobacco-growing region of Karnataka, India.⁷ The project was funded by Research for International Tobacco Control (RITC)/International Development Research Centre (IDRC), Canada.

The strategy of intervention consisted of the following steps.

- Intensive meetings were held with the farmers, agricultural scientists, motivators, social activists and bankers to develop a promising intervention strategy for helping the farmers to shift crop production (2000 tobacco-growing households were surveyed).

- CMDR produced two video films. One was a documentary on the health hazards of tobacco consumption, highlighting the ill effects of chewing tobacco and gutkha. The second focused on the cultivators of tobacco. Various anti-tobacco slogans were also written, distributed to school children and the general public in the project area. Scholarships were awarded to meritorious students in local schools whose families had stopped cultivation of tobacco.
- Provisions were made for the distribution of high-quality seeds of alternate crops suitable to the area.
- Provisions were made for financial assistance to farmers to encourage them to take up non-farm activities and shift away from tobacco crops.

The provision of seeds and bank credit was made at the beginning of the agricultural season. A total of 46 farmers bought soybean seeds and 30 farmers bought buffaloes using the financial assistance made available under the intervention programme.

The initial response was quite good for that year, with a 50% reduction in the area where tobacco is grown out of the total holdings of the participating farmers. The repayment of the credit given for dairy activity was also encouraging, indicating that dairy activity is an equally, if not more, lucrative activity for the farmers. In the immediate next year, the reduction of tobacco was only 15%, due to a lack of sustained financial assistance and institutional support.

In another study in Gujarat,⁸ it was observed that farmers who had switched from tobacco to multiple cropping/intercropping with cotton had a higher net return per hectare. Likewise, tobacco farmers in Andhra Pradesh who were forced to grow alternate crops (such as pulses, gingelly, maize and soybean) in 2000 due to drought conditions found that these crops were viable alternatives to tobacco and that the cost of cultivation was also cheaper.⁹

These studies clearly indicate the willingness of tobacco farmers to change their crop preferences. It was, however, emphasized by the farmers that continued assistance is necessary in the initial years of crop alternation.

The experience of intervention in shifting crop production suggests that any major deviation from established practices in agriculture requires a forceful intervention and comprehensive coverage of all related aspects. It was also realized that the intervention should cover a fairly large percentage of the farm households of the village where intervention is introduced to ensure a significant degree of success.

It would be essential to create an enabling platform, at the local level, to convince the farmers about the ill effects of tobacco cultivation and consumption. An approach that helps farmers improve their situation, through the adequate provision of all necessary inputs for post-shift activities, would help make the shift sustained and sustainable in the long run.

2.3. Information on loans, including existing availability of loans from banks and conditions and relative ease of obtaining loans for different agricultural purposes

The agriculture sector continues to be a priority in India. The farmers are able to take loans from different sources, including rural banks, cooperative banks, commercial banks, moneylenders and traders. Financial institutions, including banks, advance crop loans for purchasing inputs such as

seeds, fertilizers and insecticides, and loans to this sector are advanced at a lower rate of interest, to an extent of 2%. There is no extra/special consideration in the availability of loans from banks to tobacco cultivators as compared to any other farmer. However, banks do assess the viability/return on an investment before advancing the loans, and cash crops, such as tobacco, generally get preferential treatment.

There are other agriculture-related subsidies available to farmers, including tobacco farmers, such as subsidized rates for electricity provided by most state governments. The income from farm produce is also exempt from income-tax assessment.

A CMDR study of households that had taken crop loans, for tobacco cultivation and other crops, indicates that more farmers take crop loans for growing tobacco than for other crops. The study also indicated the possibility of many tobacco farmers with small holdings being in a debt trap of moneylenders and commission agents. This, perhaps, led them into a vicious cycle of tobacco cultivation with increased use of fertilizers and other inputs to get the maximum productivity (ready cash) out of the tobacco produced. Any measure proposed to encourage crop shifting by tobacco-cultivating farmers must therefore examine the possible financial barriers to such a shift, particularly for the farmers with small farm holdings.

2.4. Efforts taken by the government (public sector institutions) in promotion of tobacco crops (production, marketing and exports)

In India, government/institutional support is provided to a number of cash crops, such as rubber, coffee, tea and tobacco. Institutional data sources and tobacco-related studies reveal that subsidies and promotional activities for tobacco are limited to flue-cured Virginia (FCV) tobacco. The direct subsidies in terms of cash discounts are negligible for non-FCV tobacco. FCV tobacco enjoys government support in terms of facilities, regulated production, marketing, technical research, dissemination of information, sales and export promotion. Intervention by the Tobacco Board (TB), tobacco research institutes and the tobacco industry is felt in cultivation, agricultural practices, curing, grading and marketing of tobacco. The TB is the major promoter of FCV tobacco in the country, in addition to promoting sales overseas, and it is the office through which the government promotes FCV tobacco cultivation. The promotional activities for bidi and chewing tobacco are limited to research on new, improved and low-nicotine varieties, farm demonstrations, pesticides management and supply of quality seeds to growers.

The coffee, tea and rubber plantation industries have similar boards that promote the cultivation of the respective crops and market the produce in India and in other countries. All these agriculture/crop promotion boards are under the Ministry of Commerce, as these crops have been traditional sources of foreign exchange for the country.

2.5. Marketing of crops: existing markets, price fluctuation, the role of agricultural extension programmes

The Directorate of Tobacco Development, Indian Society of Tobacco Sciences and Tobacco Institute of India provide information on a variety of topics, including tobacco production, marketing, demand and prices.

In the case of FCV tobacco, the produce is sold and marketed on auction platforms. There are 21 FCV auction platforms in Andhra Pradesh and eight in Karnataka. The Government of India and the TB announce, each year, the Minimum Support Prices (MSPs) to protect the interests of FCV

growers. Since the TB also arranges loans to farmers through banks, as the produce is marketed through the TB, the recovery of loans is affected through sale proceeds. In the case of other tobaccos (non-FCV tobacco), no such arrangement is in practice. Only in the case of FCV tobacco does the TB act as a regulatory authority/facilitator, regarding production and marketing including export promotion

With regard to non-FCV tobacco, no public sector institution extends promotional activity. In Karnataka, farmers generally sell the non-FCV tobacco produce to commission agents and middlemen (many of whom are traders). In most other states, non-FCV tobacco is sold directly to processors/manufacturers or local merchants.

2.6. Brief sideline on tobacco and the environment, including pesticides used by farmers

The tobacco crop contributes to soil erosion and deforestation in the country. In a study carried out by ICAR as far back in 1962, it was established that tobacco, when grown singly, was the most erosive crop, causing a loss of 45 kg of top-soil per acre per year. In comparison, cotton crops lost 7.5 kg of top-soil, grapes lost 11 kg and groundnut lost 12.5 kg. As a result of severe soil erosion in tobacco-growing regions, the water retention in soil also becomes poor. And there is also evidence to suggest that tobacco growing depletes soil nutrients at a much faster rate than many other crops, thus rapidly decreasing the fertility of the soil. Since it depletes the nutrients at a heavy rate, tobacco requires a much larger input of chemical fertilizers, especially potassium.¹⁰ However, CTRI contends that among the various crops, pesticide usage is at a minimum in the case of tobacco and residue levels are well below the guidance residue levels evolved by the Cooperation Centre for Scientific Research Relative to Tobacco (CORESTA), an international organization. Another area of concern is the continued use of banned pesticides/insecticides such as organochlorine and organophosphates by tobacco farmers due to their cheap price and easy availability.

A study in Karnataka by CMDR found that the frequent and unabated use of chemicals was adversely affecting the health of the farmers, causing respiratory ailments, skin irritation and allergies. There is also evidence to indicate that pesticide residues on tobacco leaf adversely affect those who consume semi-processed tobacco products, due to residual pesticides such as endosulphar and DDT (which are banned, but still being used surreptitiously).

Tobacco is also a cause of deforestation in some regions, as large quantities of fuel wood are needed for curing tobacco. In the case of FCV tobacco, which accounts for about 30% of the country's total tobacco production, wood and coal are generally used for curing. It is estimated that in order to cure 1 kg of tobacco leaf, approximately 2.6 kg of fuel wood is consumed in Andhra Pradesh and 5.4 kg in Karnataka. Some studies have been initiated on energy conservation and the utilization of alternate fuels, such as crop residues and solar energy, in order to reduce environmental hazards. In India, the industry and agricultural extension workers have also made efforts to compensate for fuel wood shortage, by supplying briquettes made of agricultural waste (such as coffee husks and groundnut shells) at a subsidized rate.¹¹

There is a need for much more concerted research on this subject. Tobacco growers must be made aware of the long-term adverse economic consequences of growing tobacco. It is important to demonstrate to the farmers the benefits of crop rotation, intercropping and alternate cropping. Farmers also need to be told of the associated benefits in the use of green manures and bio-pesticides.

3. Potential future directions

3.1. Potential role of the formal banking system, rural banks, etc. in giving loans to farmers

Banks provide agricultural/crop loans to any farmer for growing crops that are economically viable. The banks award loans only after due evaluation of the credit-worthiness of the farmer and the farmer's ability to repay the loan without defaulting. It is, therefore, essential to demonstrate to banks the commercial viability of alternate crops, before they advance loans.

In the recent past (3–4 years), Public Sector Banks have encouraged crop loans and farm credits to groups of farmers, who usually form self-help groups (SHGs). This has worked very successfully in the state of Andhra Pradesh, where 15–20 farmers generally pool their resources and apply for a loan. The banks have favoured this arrangement, as it assures them of greater accountability and a more secure return.

The Public Sector/Rural Banks have also introduced, for various crops, the concept of “rolling credit”, which enables farmers to roll their loans over in subsequent years, even if they have switched to a different crop. There is also the option of staggered payment schedules, depending upon the agro-economic conditions of the cropping season. Tobacco farmers may not be aware of the scheme that enables credit rolling for alternate crops in subsequent years and would need to be duly informed of this possibility.

Kisan (“farmer”, in Hindi) Credit Cards have also been introduced by most Public Sector Banks for the benefit of farmers. These cards are like any other credit card, and the value of the card is usually linked to the size of the land holding of the farmer. Due to the minimum support price, better access to information and agricultural extension services, the tobacco-growing farmers are better placed to access credit. It is felt that the availability of higher credit to tobacco farmers could be gainfully used in facilitating the shift to alternate crops. The farmers' only need to be sensitized enough to the risks and adverse consequences of long-term monocropping of tobacco and to the benefits of shifting to alternate crops or intercropping tobacco with other crops.

It would be essential to encourage the Ministry of Agriculture and the Agricultural Marketing Boards to create an enabling environment for the farmers to switch from tobacco to other equally viable alternate crops. This would be a difficult task for India, and will not be possible until sufficiently large studies are carried out demonstrating the long-term techno-commercial viability of alternate crops.

3.2. Potential role of ICAR, Agricultural Universities and agricultural extension programmes in setting up a new Board for Alternate Crops, along the lines of the Tobacco/Tea/Coffee Boards

There is a need to engage ICAR and the Agricultural Universities in the provision of technical support for the effective transfer of technologies on alternate crops to the farming community. The key interventions that would help increase the productivity of alternate crops should be identified. It is felt that a sustained push would require the setting up of a board for promoting alternate crops, along the lines of the Tobacco Board (for FCV tobacco), Coffee Board or Tea Board. This board would provide technical assistance to farmers to switch from tobacco, and also provide information and assistance regarding high-yield-variety seeds, fertilizers and other inputs. The suggested board may also help the government and agriculture-pricing committees in

working out minimum support prices, setting up auction platforms for the storage and marketing of the alternate crops and other activities.

The support of the formal banking system and the agricultural extension programmes may be difficult to secure in the initial years or until such time as the government's policy undergoes a strategic change regarding tobacco cultivation. Since India is one of the leading producers of tobacco, it is most unlikely that the government's policy would discourage tobacco cultivation by farmers.

It would therefore be advisable to facilitate the establishment of SHGs in the villages. These SHGs could come together and set up cooperative societies on the pattern of AMUL, one of the most vibrant milk cooperative federations in Gujarat. The tobacco farmers who are encouraged to shift to alternate crops could form the SHGs or cooperatives for basic necessities of the village economy and for projects including the establishment of links between producers (such as oil refineries, processing units and sugar-cane factories) and cultivators, the provision of technical support in terms of seeds and fertilizers, and arrangements for storage and transport of agricultural produce.

The AMUL experience in Gujarat has demonstrated the strength of the cooperative movement in ensuring markets, reasonable prices and a support base to the dairy farmers. Likewise, the SHG movement in Andhra Pradesh has successfully demonstrated the benefits of community-based interventions. Both of these movements have evolved without any government funding. The Indian tobacco crop is largely grown in the states of Andhra Pradesh and Gujarat and in neighbouring states, including Karnataka and Maharashtra. The setting up SHGs and cooperatives in these states, for facilitating a shift from tobacco to alternate crops, is therefore a distinctly feasible option.

3.3. Possibility of using Agricultural Universities and NGOs in tobacco-growing areas as part of agricultural extension to promote alternate crops

The research on alternative crops to tobacco or on the economic viability of alternative crops should be done in situ with tobacco farmers and not on an experimental basis in the agricultural fields of research institutes or universities.

Studies on alternative crops need to be taken up (simultaneously) in the major (4–5) tobacco-growing regions for a period of at least two years before any conclusion regarding crop shifting is made.

Since agricultural extension programmes for facilitating shifting depend on many factors, such as economics, suitability of alternate crops to soil conditions, changing the mindset of farmers, the provision of marketing facilities for alternate crops and awareness programmes, there is a need for the involvement of multiple organizations, with one among the group acting as the coordinator.

NGOs are expected to play an important part in the shift to alternate crops, including roles in the dissemination of information, sensitization to and awareness of the hazards of cultivating tobacco and the possibilities of crop shifting, helping the farmers gain access to institutional and technical support and facilitating the creation of SHGs and cooperatives.

There would also be a need to create an effective monitoring and evaluation mechanism at the grass-roots level.

4. Conclusion

Tobacco is grown in 0.4 million hectares in India, accounting for approximately 0.27% of the net cultivated area, and around 80% of tobacco is grown in the states of Andhra Pradesh (44%), Gujarat (24%) and Karnataka (15%). Annual tobacco production is around 700 million kg and the country ranks third in the world in production after China and Brazil. Tobacco is therefore an important cash crop for India. Millions of people are engaged in the production, manufacture and distribution of tobacco and tobacco products. While tobacco's contribution to the Indian economy is well documented, there are very few studies that document the adverse health and economic burdens due to tobacco. Tobacco use results in severe societal costs like reduced productivity, health-cost burdens and environmental damage. Some studies reveal that there is a net loss to the society due to disability, disease and death due to tobacco use. There is a need for a more comprehensive study of the economic and health costs due to tobacco.

The economic impact on GDP due to the alternative use of tobacco-cultivated land and alternative farm-worker vocations must also be worked out. This information would enable the key stakeholders, especially the Central and State Governments to recognize the net loss due to tobacco.

Existing studies indicate that farmers find it difficult to shift from tobacco to alternate crops because the cultivation of tobacco is considered profitable in monetary terms. Tobacco farmers depend significantly on financial institutions and moneylenders to meet the heavy costs of tobacco cultivation, and finance (credit) is easily available to the farmers. Irrigation facilities and assured demand for the produce (on the consumption side, as well as from traders and manufacturers of bidi, cigarettes, gutkha, snuff and other tobacco products) are the main reasons for facilitating tobacco cultivation.

The limited intervention studies indicate that tobacco is not the only crop that can bring good returns. Sugar-cane, onion, maize and other vegetables under irrigated conditions, and groundnut and soybean under rain-fed conditions, could be possible alternatives to tobacco. It was observed that mixed non-tobacco cropping patterns may perhaps be a good substitute strategy for tobacco cultivation. In one tobacco-growing region in India, it was observed that farmers were amenable to the following crop-shifting schemes.¹²

(i) Partial shifting of tobacco

with irrigation = tobacco and sugar-cane;

without irrigation = tobacco and soybean.

(ii) Complete shifting of tobacco

with irrigation = sugar-cane and soybean;

without irrigation = soybean and groundnut.

These studies also reveal that the farmers who agreed to shift experienced fewer problems of labour and could devote more time to leisure after shifting from tobacco. The progress of the intervention was satisfactory and the farmers managed to significantly reduce the area under tobacco cultivation. The farmers who had taken to alternative vocations such as dairy activity had

also done well and the bankers were happy that the repayment status of the loans which had been advanced to the farmers was quite good.

The brief analysis of the cost-benefit ratio of tobacco and alternate crops strongly suggests that the returns are not unattractive for other crops vis-à-vis non-FCV tobacco. The preliminary studies indicate that net returns from groundnut, redgram, soybean and chilli, and the intercropping of various crops, have been favourable. However, there was no economically viable substitute to FCV tobacco.

Much more study is needed on the alternate crops that could be grown by tobacco farmers under different climatic conditions and using different soil types. Apart from the technical feasibility issues, the main concern among the farmers regarding the economic viability of an alternate crop to tobacco needs to be addressed. The studies done until now are only on demonstration plots, under technical supervision and the balanced application of fertilizers/manures, and therefore the results need to be field-tested on a large scale, so as to induce the tobacco-growing farmers to shift to alternate crops.

The tobacco farmers and farm-workers appear unaware of the serious damage caused by tobacco crop to the environment, the soil and their health. Even if they are aware, the absence of any institutional support to shift to another crop appears to have led the tobacco-cultivating farmers to continue growing tobacco. There is therefore a need not only to bring about greater awareness within the farming community, but also to look into the technical and financial barriers that have prevented the farmers from shifting to alternate crops. The issues concerning crop loans; agricultural extension support, including minimum support price; and assured markets need to be addressed in order for the shift to take place. The techno-commercial viability of alternate cropping systems needs to be properly documented.

The shift to alternate crops may be facilitated by making the farmers aware of the financial support available to them through formal banking channels, in the form of crop loans to SHGs, rolling credits and Kisan Credit Cards, among others. The tobacco-growing farmers need to be encouraged to set up SHGs and cooperatives that would provide the needed technical assistance and marketing support for alternate crops. The government would need to consider setting up agricultural extension programmes in the form of a board, along the lines of the Tobacco, Coffee and Tea Boards, to promote alternative crops to tobacco.

It is felt that these measures would create an enabling environment to progressively reduce the area of land under tobacco cultivation in India.

References

- ¹ WHO, Ministry of Health & Family Welfare, Government of India and Centers for Disease Control and Prevention. Report on tobacco control in India. 15 November 2004.
- ² Union budget and economic survey: Budget 2006–2007. Department of Revenue, Ministry of Finance, Government of India, 2006 (<http://indiabudget.nic.in/ub2006-07/ubmain.htm>, accessed 21 May 2007).
- ³ Rath GK, Chaudhry K. Estimation of cost of management of tobacco-related cancers. Report of ICMR Task Force Study (1990-96), New Delhi: Institute of Rotary Cancer Hospital, AIIMS; 1999.
- ⁴ National Institute of Occupational Health (NIOH): Studies on occupational health problems in tobacco workers. Annual Report. Ahmedabad: NIOH; 1977 and Annual Report 1978.
- ⁵ National Institute of Occupational Health (NIOH): Occupational health problems of tobacco harvesters and their prevention. Annual Report. Ahmedabad: NIOH; 2000:7.
- ⁶ *Nicotine and its derivatives from tobacco waste*. New Delhi, Technology Information, Forecasting & Assessment Council, 2000. (<http://www.tifac.org.in/offer/tlbo/rep/st158.htm>).
- ⁷ Centre for Multi-Disciplinary Development Research (CMDR). Economic aspects of tobacco cultivation and consumption: a pilot study. Working paper.
- ⁸ Kaur S. “Tobacco cultivation in India: time to search for alternatives,” in Tobacco and poverty: observations from India and Bangladesh, eds. Efroymson, D, FitzGerald, S. PATH Canada, 2002
- ⁹ Sharma R S. Hobson’s choice for AP tobacco farmers. *Business Line: internet edition*. 24 March 2000.
- ¹⁰ Goodland R J A, Watson C, Ledec G. *Environmental management in tropical agriculture*. Boulder, Colorado, Westview Press, 1984.
- ¹¹ FAO: Issues in the global tobacco economy. Selected case studies: Raw materials, tropical and horticulture product service. Rome: Commodities and Trade Division, Food and Agriculture Organization of the United Nations, 2003.
- ¹² Panchamukhi P R. Agricultural Diversification as a tool of tobacco Control. Presented at the WHO International Conference on Global Tobacco Control Law, New Delhi, 7-9 January 2000.

Annex 1

Types of tobacco and their geographical distribution/area under cultivation in India

Flue-cured Virginia (FCV), bidi, hookah and chewing cigar, wrapper, cheroot, burley, oriental, traditional burley (HDBRG), lanka and natu are among the different types of tobacco grown in the country. FCV, burley and natu tobacco are the three main varieties of cigarette tobacco. Around 80% of India's production and area under tobacco cultivation is in the states of Andhra Pradesh (44%), Gujarat (24%) and Karnataka (15%). Bidi tobacco occupies 30–35% of the total area under tobacco cultivation and is mostly grown in Gujarat, Karnataka and Maharashtra. Nearly 85% of the world's bidi tobacco is grown in India. The average yield of bidi tobacco varies between 1000 and 1700 kg/ha in Karnataka and Gujarat, respectively. FCV tobacco used in the manufacture of cigarettes is grown in Andhra Pradesh and Karnataka. Small quantities of this tobacco are also grown in Orissa (Rayagarh) and Maharashtra (Gadchiroli). Traditionally, FCV tobacco was grown on black soils, but with increasing demand for low nicotine/tar content and light body leaf, FCV cultivation has extended to light soils. FCV is grown as a “kharif” crop (cropping season May–August) in Karnataka, whereas it is grown as a “rabi” crop (cropping season October–February) in Andhra Pradesh. The average yield of FCV tobacco is 1710 kg/ha (2000–01). FCV is the most remunerative tobacco crop due to demand from domestic cigarette manufacturers and importers. Fifty percent of the FCV grown is used by the domestic cigarette industry and the rest is exported. Burley tobacco used for cigarette blends is air cured and is grown in Andhra Pradesh. Hookah tobacco used for smoking is grown in Uttar Pradesh, Bihar, West Bengal and Orissa. Chewing tobacco used for gutkha, snuff and pipe tobacco is grown in Tamil Nadu, Uttar Pradesh, Bihar, West Bengal and Orissa. Natu tobacco is sun cured and is grown in Andhra Pradesh. Cigar tobacco is grown in West Bengal and Tamil Nadu. Cheroot tobacco is grown in Tamil Nadu and Andhra Pradesh

The overall trend in tobacco area, production and productivity in India during the last 50 years (1950–2001) is summarized below.

Trends in area, production and productivity (all India) of tobacco

	1950–51	1960–61	1970–71	1980–81	1990–91	2000–01
Area (thousand hectares)	360	400	450	450	410	290*
Production (million kg)	260	310	360	480	560	490
Yield (kg per hectare)	731	766	810	1065	1353	1710

*In 2000–01, the total area under cultivation was reduced, especially in Andhra Pradesh, due to drought and unsold surplus tobacco produce.

Sources: (i) Directorate of Economics and Statistics, Government of India, New Delhi
(ii) www.agricoop.nic.in

There has been an improvement in output and yield over the years, due to research and technological advances. The area under tobacco cultivation, however, has remained stagnant and is now on the decline.

Annex 2
Economics of production—tobacco versus alternate crops

Zone and type of tobacco	Net income from monocrop of tobacco (Rs./ha)	Net income from alternative crops (Rs./ha)	
Northern light soils (NLS) (FCV)	25 668	groundnut maize (cobs) soybean	4 160 13 868 2 500
Northern black soils (NBS) (FCV)	17 732	rabi redgram Bengalgram	9 840 9 195
Central black soils (CBS) (FCV)	19 779	Bengalgram rabi redgram maize (seed crop)	10 000 10 000 8 000
Southern black soils (SBS) (FCV)	20 000	blackgram sunflower mustard Bengalgram redgram	7 500 4 000 5 000 8 000 7 500
Southern light soils (SLS) (FCV)	15 000	blackgram sunflower mustard Bengalgram redgram	6 900 3 500 7 250 6 250 6 600
Karnataka light soils (KLS) (FCV)	18 000	cotton maize	9 000 5 250
Tamil Nadu (chewing)	35 058	chilli	29 614
Bihar (chewing)	52 000	potato garlic	35 000 12 000
West Bengal (chewing)	18 000	amon paddy aus paddy mustard wheat jute maize	8 000 4 000 7 500 6 000 6 500 4 000
Gujarat (bidi)	52 423	mustard groundnut (summer) chillies	17 480 30 320 38 211
Uttar Pradesh (chewing and hookah)	20 000	potato wheat bhendi sunflower	30 000 70 000 10 000 9 000

Source: Central Tobacco Research Institute (ICAR), Ministry of Agriculture, Government of India Rajahmundry (A.P.) - 533105