POTENTIAL IMPACT OF SUPPLY-SIDE ACTIONS

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Introduction

Since about 1950, more than 70,000 scientific studies have proven that smoking causes disease, disability and death (US Department of Health and Human Services 1994). About one in every two long-term smokers die from the habit. Tobacco use is a major cause of cardiovascular disease, while 90% of all lung cancers, and 75% of all cases of chronic bronchitis and emphysema are due to tobacco. The World Health Organization (WHO) estimates that tobacco products currently kill 4.2 million people each year. By the year 2030 this annual toll will rise to nearly 10 million deaths, about 70% of which will occur in developing countries. In other words, if current trends continue, tobacco will cause 150 million deaths in the first quarter of the twenty-first century, and 300 million in the second quarter. In developed countries, about half of these deaths will occur in people in their most economically productive years. Exposure to cigarette smoke causes a higher risk of lung cancer and several other health problems in children such as sudden infant death syndrome, low birth weight and respiratory disease.

On the other hand, tobacco is grown in more than 100 countries, including about 80 developing countries such as India. In recent decades, the growth in world tobacco production has primarily come from low and middle income countries. In many developing countries, there has been considerable emphasis on agricultural research to increase the efficiency of tobacco farming. The aims have included raising farmers' income and exports, reducing reliance on imported tobacco, and earning and conserving foreign exchange. An additional factor is the growth in demand for tobacco products in developing countries, as incomes and purchasing power have grown. In some countries, farmers have been encouraged to plant tobacco to supply new processing plants built to expand local cigarette production. Many developing countries are attempting to increase cigarette exports or substitute domestic products for imported cigarettes.

In certain low and middle income countries, tobacco growing is important for several reasons, chiefly because of its labour intensity and ability to generate

dependable cash flow for poor small farmers. Tobacco is among the more labour-intensive crops. Seasonal labour is required for transplanting young plants from seed beds or greenhouses to fields, and for removing the tops when plants begin to flower and suckers that grow from the stalk (to maximize growth and improve the quality of leaves). Flue-cured tobacco is harvested by removing a few leaves at a time, a labour-intensive process. Machines are available for flue-cured harvesting and have been adopted in some areas, but there is no mechanization for burley tobacco. Curing is also often done on the farm to ensure the correct moisture, nicotine and sugar content, which affect the quality and taste of tobacco. Mechanization has been difficult to achieve in tobacco farming due to the complexity of these tasks. Additionally, much tobacco is grown on hilly or mountainous land that is unsuitable for mechanized equipment (Chapman and Wong 1990). Many of the developing countries that grow tobacco have highly agrarian economies with large proportions of the total labour force involved in agriculture. In contrast to farming, manufacturing of tobacco products is a mechanized production process and generates few jobs.

For tobacco growers in India, it is a comparatively remunerative crop. It grows in soils of poor fertility and can withstand variations in weather conditions better compared with other crops. Problems of pests and disease are much less severe in tobacco than similar problems in alternative crops such as cotton, chillies and groundnut. Further, flue-cured Virginia (FCV) tobacco has a well-organized marketing system through the Tobacco Board of India (TBI). Tobacco has a short growing season, and enables farmers to grow other crops such as green gram, black gram and certain varieties of rice outside the tobacco growing season. Furthermore, the attraction of tobacco as a cash crop in countries such as India is that tobacco leaf can be grown on either large or small farms, the sale of tobacco leaf potentially generates important public revenue as well as cash flow for farmers and rural communities, and the prices received by tobacco growers are relatively stable over time. (There are some who would argue that the prices paid for leaf are extraordinarily low when compared to the returns from the sale of tobacco

products which are generated by governments at the retail end of the production chain. This represents an interesting social equity issue.)

However, the fact is that prolonged consumption of tobacco has health hazards established beyond any doubt. The reality is that the production and consumption of tobacco is as much a health issue as is an economic issue. The developed nations have responded to scientific research and introduced public health policies accordingly. As a result of this, the level of tobacco consumption in the developed world has been steadily declining. Yet the governments of low income nations have failed to act upon these scientific warnings. Meanwhile, prevalence of smoking in developing countries has been rising considerably. Aggressive investment and marketing by the tobacco industry, alongwith passive or inappropriate national public policy responses have been the main factors contributing to the phenomenon.

The tobacco epidemic may be curbed from either the supply or the demand side. The supply side pertains mainly to crop substitution, trade restrictions, controlling smuggling and even banning of the product. Demand reduction measures include increased taxes and prices, stricter and more prominent health warnings, bans on promotion of tobacco products, curbs on smoking in public places and educating the community on tobacco-related risks. Given tobacco's unprecedented capacity to damage health, a few public health advocates have called for it to be prohibited, arguing that the problem of tobacco is not in its consumption, but its production. Advocates of tobacco prohibition point to the marked reduction in alcohol-related diseases when alcohol supply was restricted earlier in the twentieth century. For example, when alcohol supplies were restricted in Paris, France, during World War II, alcohol consumption fell by 80% per capita. Deaths from liver disease in men were halved within 1 year and fell by four-fifths after 5 years. After the war ended and alcohol became freely available, mortality from liver disease returned to pre-war levels (Jha and Chaloupka 1999).

Tobacco Control Policies and the Economy

The tobacco industry in India has been arguing that the Indian economy is dependent on the industry for employment and incomes. The argument usually put forward is that measures that threaten tobacco sales bring serious political risks because of damage to the economy. We review here the studies carried out worldwide that have estimated the impact of tobacco control policies on employment, tax revenue and incomes.

Studies Commissioned by the Industry

Most of the studies sponsored by the industry have suggested that tobacco control policies would have a detrimental impact on the incomes and employment of high-income countries (for USA: Wharton Applied Research Center 1979; Chase Econometrics 1985; Price Waterhouse 1990, 1992; Tobacco Merchants Association 1995; American Economics Group 1996; for Europe: PEIDA 1985; Agro-Economics Services Ltd. and Tabacosmos Ltd. 1987; for Canada, Deloitte & Touche 1995; for Hong Kong: Coopers and Lybrand 1996). Generally, these studies estimate gross employment and do not consider that the decline of one economic activity (tobacco) would be replaced by alternative spending and economic activity that would generate alternative employment.

Coming to the Indian case, among the traditional agricultural export items, tobacco appears to have considerable scope for earning much needed foreign exchange (National Council of Applied Economic Research [NCAER] 1994). The tobacco industry in India is an important contributor to the economies of a number of Indian states, particularly through providing valuable employment opportunities in regional and rural areas. The industry has the potential to continue in this role and, given the right circumstances, to increase its role as a regional employer. The combined impacts of gradually increasing incomes among consumers and the development of emerging export markets could lead to an increase in demand and, in turn, the production of various types of tobacco leaf and the manufacturing of tobacco products by the ‘organized sector’ of the industry. At the same time, the tobacco industry in India makes a significant contribution to government

revenues through the collection of excise and other forms of taxation. These revenues will continue to be important in a national context for sustaining public sector activities in urban, regional and rural locations (Price Waterhouse Coopers 2000).

Independent Studies

Unlike the studies sponsored by the industry, independent studies estimate the net impact on economic activity from eliminating or reducing expenditure on tobacco, and make certain assumptions about how the alternative expenditure will take place in the economy.

The common conclusions of most studies show that job losses occur in the sectors that are immediately associated with tobacco manufacturing and farming, and the sectors involved in retail, wholesale and distribution of tobacco products. In some cases, jobs would also be lost in government if there were a loss in government revenue. However, these losses are outweighed in most studies by increases in employment in all other industries and sectors. The increase in jobs is most marked in the service industries, which are labour-intensive. Jobs lost in retailing tobacco are likely to be replaced by jobs retailing other products that people purchase with the money formerly spent on tobacco.

Some studies (Buck *et al.* 1995; van der Merwe 1998a) have, however, tested alternative expenditure patterns following evidence that cessation of smoking by consumers leads to new spending patterns. For example, some studies assumed that former smokers would use the marginal increase in their income, in the short term, to increase expenditure on luxury items such as recreational goods and services, while expenditure on essential items such as housing would change little (Buck *et al*. 1995). Studies in the United Kingdom and South Africa examining the expenditure of people who had recently quit smoking showed that they made increased use of labour-intensive services such as recreation, education and communications (van der Merwe 1998b). The results also show that tobacco-producing regions or

countries, for example the south-eastern part of the United States, Zimbabwe and Canada, would have suffered job losses (Warner *et al*. 1996; van der Merwe 1998c; Irvine and Sims 1997). However, in the United States (Warner *et al*. 1996), with every non-tobacco producing region enjoying a net gain in jobs, all non-tobacco regions would collectively have gained enough employment to offset the losses.

Even where it is assumed that a portion of the re-allocated resources would go to saving rather than spending, the studies show that there could still be employment gains. If the money consumers once spent on tobacco were saved instead of spent, this would also be expected to generate jobs because of incremental investment demand, assuming people use their savings to acquire financial assets other than cash (Jacobs *et al*. 2002).

Finally, certain assumptions are made by some of the researchers as to how governments may react to a possible loss in revenue from a fall in consumption in the long run. These usually include alternatives such as reduced government expenditure, and hence employment (Allen 1993), or the collection of consumer taxes on alternative goods and services (Warner *et al.* 1996). If the fall in consumption is brought about not by excise taxes, but by other regulatory actions such as an advertising ban, then consumers would have additional money to spend on goods and services besides cigarettes. Alternatively, if the fall in consumption is brought about by tax increases, then new jobs will also be created, as long as the government spends the additional tax revenues. Even in the unlikely case of governments using the entire extra income for deficit reduction, reduced interest rates would result in increased employment. Taken together, the evidence suggests that the economy, at a macro level, can respond to the decline in cigarette consumption by generating at least as many jobs in other industries as were lost in tobacco growing or manufacturing (Allen 1993).

In the case of India, an Expert Committee was set up by the Ministry of Health by a notification issued on 26 July 1995 to undertake a comprehensive study on the economics of tobacco use inter alia examining the tax revenue

and foreign exchange earnings, employment and consumer expenditure on the one hand, and the cost of tertiary level medical care facilities for the treatment of tobacco-related diseases, losses due to fire hazard, ecological damages due to deforestation and disposal of tobacco-related waste on the other, to make an economic study of the impact of tobacco consumption. The literature on tobacco in India and rest of the world was reviewed, and new research and data collection on health care costs was undertaken. The Preface notes a strong conclusion made by the Expert Committee that 'the costs of medical treatment and other external costs incurred by the patients and society are even in their underestimated form so staggering as to dwarf the putative indirect financial benefits (to persons and entities other than those who spend a part of their income on tobacco products)'.

A review conducted by the Center for Multi-disciplinary Development Research (CMDR), Dharwad provides data on tobacco employment, export earnings and tax revenues. It explains some of the negative aspects of the tobacco industry: tobacco is a labour-intensive crop and has negative consequences for the environment. Tobacco industry workers in India earn low wages, may face gender discrimination and the working conditions can be detrimental to health. The article calls for the government to give support to workers in the tobacco industry to help them in transition to other sectors.

Crop Substitution and Diversification

There has been much discussion of tobacco-farm 'diversification' or 'crop substitution', which entails switching from tobacco to other crops (Aberg and Tedla 1979; Al-Sadat and Zain 1997; Altman *et al*. 1998). Such supply-side efforts, often driven by a desire to move production toward crops with less negative health implications, are not likely to be effective as a means of controlling tobacco use. A basic observation in markets is that if one supplier of a commodity is prevented from operating, another will quickly emerge to take its place, as long as there is a strong incentive to do so.

Large-scale efforts to encourage tobacco farmers to diversify and substitute alternative crops have occurred in only a few countries. In the United States, farmers have expended considerable effort in searching for alternatives to tobacco, motivated in part by the US market's uncertain prospects. A recent survey of US tobacco farmers showed that 70% had attempted supplemental enterprises in the previous 5 years (Altman *et al*. 1996). Efforts, however, have been scattered, and farmers have not been offered financial incentives to switch crops. There have been attempts to grow familiar crops such as broccoli, as well as more exotic enterprises, such as llamas and ginseng. Several alternative crop programme could succeed. Labour-intensive speciality crops and value-added activities are viewed as the most promising alternatives, primarily fruit, vegetables, tree crops and flowers. In the United States, farmers and agricultural specialists are exploring Asian vegetables, greenhouse crops, organic vegetable production, aquaculture and on-farm recreation.

For developing countries too, a number of alternative crops have been identified, which include cassava in Brazil, sugarcane in Kenya, and chillies, soya beans, cotton, and mustard in India. Rose blooms have been identified as a more profitable alternative to tobacco in Zimbabwe, but obstacles to adoption include the large net investment, a lack of cash flow in the initial years, and transportation problems in getting fresh flowers to markets in Western Europe (Maravanyika 1998). Aubergine has been recommended as an alternative or supplemental crop in the Philippines (Campos and Alejandro 1994). Yach (1996) reported that, worldwide, more than 50 alternative crops and land uses for tobacco have been identified, but acknowledged that several obstacles prevented implementation.

In the case of Zimbabwe, the conventional crops, cotton, sugar and coffee, do not seem to be viable substitutes for tobacco. Studies (Maravanyica 1998) have shown that the potential substitutes for tobacco may be found in horticultural crops, fruits, vegetables and cut flowers. The studies also show that the poor financial conditions of the farmers may not permit them to incur the heavy capital costs involved in shifting from tobacco to horticultural

crops. Preserving the horticultural products which are likely to be more perishable than tobacco leaves, transportation of horticultural products to the export points, etc. would involve huge expenditures, which the poor farmers cannot afford. In fact, high margins involved in some of the horticultural crops (e.g. rose blooms) as compared to tobacco might help persuading farmers to diversify.

One important barrier for farmers contemplating a switch of crop may be a lack of credit with which to purchase new seeds or other inputs. In many countries, tobacco growers obtain production loans from processors or marketing boards that are repaid when the tobacco crop is sold. Strong logistical support offered by the tobacco industry with technical advice and packages, which include seeds, fertilizers and pesticides, come with the production loans. In some cases, the loans are sufficiently large so that small farmers may be unable to repay them (Kweyuh 1998). Another problem is an apparent lack of markets for alternatives to tobacco. Other crops often suffer from post-harvest delivery, whereas tobacco's storability can reduce year-to-year fluctuations in prices.

The evidence available suggests that diversification plans are more likely to succeed if their impact on all relevant markets has been carefully considered. Some speciality crops are able to provide competitive returns for a few farms, but widespread adoption would drive prices down, thus eliminating any profitability advantage. For example, in the United States, there are relatively few vegetable growers in tobacco-growing areas. A large increase in production resulting from tobacco farmers entering the vegetable market would have a large downward impact on vegetable prices, with negative effects on current vegetable growers as well as diversifying tobacco farmers. Careful market analysis must also be conducted before recommending substitutes for tobacco (Ernst and Young 1991). The analysis must consider the size of the potential market (domestically and overseas), elasticity of demand (sensitivity of price changes to quantity), inter-regional and international competition, and the relative advantage of the tobacco-growing

region (in terms of production costs, soils and access to markets) compared with competing regions.

Diversification should be viewed as a broad process, with crop substitution being only one component of the whole. Analyses suggest that diversification programmes have a greater chance of success if they are designed in terms of broad economic development in tobacco-growing areas to provide non-farm employment opportunities, sources of tax revenue and foreign exchange. A non-farm job may be the best alternative to tobacco growing in many places (Jha and Chaloupka 1999). Rural economic development, including value-added enterprises, should be encouraged to provide additional job opportunities. This may require investment in transportation and other infrastructure, education and job training, and access to credit for small businesses (Altman *et al*. 1998).

Farmers are likely to need compensation and assistance to make the transition to other crops, retirement or non-farm employment. Informational databases that include soil characteristics, topography, rainfall patterns, field size configurations, machinery complements and any requirement for managerial expertise would help farmers evaluate the prospects for the successful adoption of alternatives. Geographical information systems could also be used to identify suitable areas for various alternatives (Bonoan 1994).

Since tobacco provides much higher returns than alternative crops, farmers would require some financial inducement to switch crops. However, such inducements would be costly and are unlikely to be effective in reducing demand. A few governments have offered, or have proposed offering, inducements to farmers to leave tobacco farming, but none have clearly succeeded in significantly cutting tobacco production. Canada's Tobacco Diversification Plan provided incentives to stop growing tobacco and develop alternatives to assist the orderly downsizing of the Canadian tobacco industry in the 1980s (Pan American Health Organization ([PAHO] 1992). Significant numbers of farmers ceased production through this programme, but many participants acknowledged that they would have quit tobacco farming without

it. Australia eliminated production subsidies, domestic content rules for cigarette manufactures and lowered tariffs, while at the same time offering a buy-out of tobacco quotas (Australian Financial Review 1998). As a result of the Australian deregulation and buy-out, many growers left the tobacco sector, but they tended to be less efficient producers of low-grade leaf; those remaining tended to expand the scale of their operations to increase efficiency. In the United States, officials drafting comprehensive tobacco legislation in 1997 and 1998 discussed a buy-out quota of US $ 8 per pound of tobacco payments to tenant farmers, as well as job training, education and rural development grants.

If a buy-out or other scheme were successful in reducing production in a particular country or region, there will be little effect on the world supply of tobacco as it is well known that world production is already shifting to low income countries. Developed countries have restricted their production (albeit for the welfare of the producers rather than tobacco-control objectives) over the past several decades. At the same time, developing countries have rapidly expanded production to fill the void and meet world demand, so that world production has continued to grow. It is likely that new buy-out policies would merely create huge profits for other tobacco suppliers, and a rapid increase in ‘replacement’ production.

The Indian Case

Several studies have discussed the feasibility of tobacco cultivators switching over to alternative crops. When examined on a cost benefit basis, tobacco may not always ultimately produce the best economic returns, as shown in Table 1. Tobacco farming is labour-intensive with high labour costs that reduce the net returns to land. Therefore, with higher cultivation and labour costs in tobacco farming, alternative crops can sometimes yield greater cost-benefit ratios, despite earning a lower gross income. Table 1 shows returns from tobacco and non-tobacco crops from one study in India.

Table 1.
Economic returns of alternative crops to flue-cured Virginia (FCV) tobacco in India, 1989

Crop	Yield (kg/hectare)	Cost of cultivation (Rs/hectare)	Gross income (Rs/hectare)	Cost-benefit ratio
Safflower	1800	3661	14400	1:4.0
Mustard	1500	3196	12000	1:3.3
FCV tobacco	1417	8464	17620	1:2.0

Source: Chari and Kameswara Rao 1992

Jaisani (1989) found that in parts of Gujurat and Karnataka where tobacco is grown extensively, the soil and weather conditions also supported the cultivation of cotton, chillies and grain crops. He reviewed the net returns of tobacco in comparison with other crops grown in the state of Gujarat and found the net returns for castor and cotton considerably higher than those for tobacco. Another study concluded that p*lantago (isabgul*), an indigenous crop which grows well in mild temperatures and is used as a natural laxative, is a viable alternative to tobacco and has a good export potential (Kaur 2002).

The Agricultural Research Centre in Nipani, Karnataka investigated eight alternative cropping systems between 1992 and 1994, and found that mono-crops of chilly and cotton produced higher returns than tobacco. In the case of combination crops (soya bean, *rabi*, *sorghum* and groundnut), the returns were higher than tobacco mono-crops. This was further supported by Nagarajan *et al*. (2001) who found that mono-crops were not as profitable as tobacco across a variety of agro-climatic zones. In addition, the CMDR, Karnataka found that mixed cropping yields higher profits than if tobacco was cultivated exclusively. *Jowar* sown between June and September and tobacco sown in the *rabi* season yields larger returns per acre than other mixed crops. The conclusion emanating from this is that in the interim, farmers can be persuaded to sow tobacco with other crops (e.g. *jowar*) to maintain profits, and gradually phase out tobacco cultivation.

In the state of Gujarat, the net return on cotton was Rs 9,560 hectare compared to Rs 3,367 hectare for tobacco (Kaur 2002). Moreover, single or mono-crop replacement of tobacco is not profitable, and there is support for crop sequences and inter-cropping (Nagarajan *et al.* 2001). For example, in Gujarat, *bajra* can be grown as an alternate to tobacco in the summer

months. In 2000, in the state of Andhra Pradesh, tobacco cultivators were forced to consider alternate crops in the wake of severe drought. Here pulses, gingelly, maize and soya bean were considered alternative *kharif* crops. These crops were significantly cheaper to cultivate (Sharma 2000).

From the regression analyses of a micro-level study of tobacco farming carried out in 50 villages (Panchamukhi 2000), it was found that the area under tobacco cultivation and production are more sensitive to fertilizer subsidy rather than irrigation. These results indicate that the farmers tend to bring land under tobacco cultivation if they expect to receive subsidy of different types. The most interesting point here is that provision of irrigation does not induce farmers to shift from tobacco to other crops requiring more irrigation. Panchamukhi suggested that if farmers receive proper education and if they are suitably sensitized to the adverse effects of tobacco, they may reduce tobacco production. Interaction with farmers in the selected villages also showed that they may be initially encouraged to grow tobacco with sugarcane where irrigation is available and tobacco with soybean where irrigation is not available. If full shifting is recommended, then the combination of sugarcane with soybean in irrigated area and soybean with groundnut in unirrigated area may be accepted as alternatives to tobacco cultivation.

Field experiments (*Singh et al. 1998*) were conducted in inter-cropping systems at the Central Tobacco Research Institute (CTRI), Research Station, Pusa, Bihar from 1990 to 1997. Table 2 presents the indicators of the economics of different inter-cropping systems as reported from the CTRI experiment.

It is evident from Table 2 that tobacco plus garlic inter-cropping system recorded the maximum total yield. The cost-benefit ratio or return per unit of investment was estimated at 1:3.2. Such inter-cropping systems may be the first step of gradually moving away from tobacco. From among the non-tobacco mixed cropping systems, maize plus potato was estimated to fetch the highest net return. Considering the aversion to the calculated risk

associated with alternative cropping systems, garlic and potato were considered suitable because both of them remain underground, escaping the risk of loss due to hailstorms, pests, etc. which normally affect tobacco, completely neutralizing the investments made by tobacco farmers.

Table 2.
Economics of different inter-cropping systems

Treatment	Cost of cultivation (Rs/hectare)	Gross return (Rs/hectare)	Net return (Rs/hectare)	Cost benefit ratio
Tobacco alone	23,221	80,637	57,416	1:2.5
Tobacco + garlic	26,471	1,10,322	83,851	1:3.2
Tobacco + rajmah	24,024	92,724	68,700	1:2.9
Tobacco + maize	25,136	86,528	61,393	1:2.4
Tobacco + cauliflower	25,720	87,873	62,154	1:2.4
Tobacco + potato	28,494	96,468	67,974	1:2.4
Tobacco + blackumin	23,799	78,448	54,649	1:2.3
Tobacco + fenugreek	23,861	86,713	62,852	1:2.6
Tobacco + coriander	23,825	82,923	59,097	1:2.5
Tobacco + maize + potato	13,912	49,769	35,854	1:2.6

Source: Singh *et al*. 1998.

On the similar lines, the CMDR examined this issue with the help of the household level data in one of the tobacco-growing regions of the southern part of India through an ongoing action research project sponsored by the International Development Research Centre (IDRC), Canada called the Economics of Shifting from Tobacco Cultivation.

On the basis of the household survey of 2000 households in the region interesting results have emerged. Out of the total, 1,652 households were engaged in tobacco cultivation; 162 households were mixed croppers; and 144 were mixed croppers with tobacco. Table 3 presents the salient indicators of the economics of mixed cultivation in the region as revealed from the field study.

Table 3
Salient indicators of mixed cultivation

Combination of crops	Per acre production (Rs)	Cost of cultivation (Rs)	Per acre cost of cultivation (Rs)	Net return Per acre (Rs)
Tobacco (K)+ *jowar* (K)	12,430.0	15,11,602	6107.8	6322.2
Tobacco (K)+ *jowar* (R)	7606.4	605,932	3775.3	3831.1
Jowar (K)+tobacco (R)	13,302.5	40,782	4078.2	9224.3
Tobacco (K)+groundnut (K)	8695.8	99,000	7746.5	949.3
Tobacco (K)+groundnut (R)	15,470	16,270	8135	7335
Tobacco (K)+sugarcane (K)	6300	27,750	2775	1.3
Tobacco (K)+chilly (K)	6588.6	30,656	17465.7	-10877.14
Tobacco (S)+ *jowar* (S)	3169.5	21,490	5372.5	-2203
Groundnut (K)+tobacco (K)+paddy (K)	2112.5	8610	4305	-2192.5
Groundnut (K)+ *jowar* (R)	4200.	9825	2807.1	1392.9
Groundnut (K)+ *jowar* (K)	3106.	11,570	2728.8	377.6
Groundnut (K)+cotton (K)	1.4	10,800	9	5320
Pulses (K)+wheat (K)	1.8	9413	9.9	-8741.6
Soybean (K)+groundnut (K)	1992.6	12,850	1906	86
Paddy (K)+ *jowar* (K)	996.	3305.50	1652.5	-656.5
Groundnut (K)+chilly (K)	2821.4	5991	4792.8	-1971.4
Soybean (K)+chilly (K)	3089.7	1145	2290	799.7
Jowar (K)+chilly (K)	1901.2	1315	2630	-728.8
Groundnut (K)+pulses (K)	690	3190	1595	-905
Groundnut (K)+soybean (K)+pulses	8.4	13,800	0	-3469.6

Source: CMDR Field Survey: K: khariff season – Monsoon, June to September; R: rabi season October to January.

It can be seen from Table 3 that mixed cropping is much more profitable than exclusively tobacco cropping. The j*owar* (*khariff*) and tobacco (*rabi*) combination fetches larger net returns per acre than other mixed cropping practices. It is also apparent that the per acre cost of cultivation in the case of mixed cropping of tobacco and *jowar* is very low. It is worth noting that the net return per acre is positive and fairly high when tobacco is cultivated along with *jowar* and groundnut (*rabi*). From this, one can observe that in case farmers have to gradually shift from tobacco, then they must be persuaded to initially take to mixed cropping with tobacco and then move to other crops or other economic activities in place of tobacco cultivation. This is necessary because tobacco is a major source of livelihood for farmers in the tobacco belts of India and asking them to shift from tobacco without any alternative proposals would not be advisable and feasible. A number of suicides by farmers were reported in recent years from different parts of the country in view of crop failures. Hence, a package of mixed cropping, shift to other crops with a suitable crop insurance facilities, adequate farm inputs for the alternative crops, adequate marketing, facilities etc., would be necessary to ensure the success of the policy of gradual shift from tobacco.

Despite the significant support for crop substitution and the compelling reasons to reduce tobacco cultivation, the experience of cultivators illustrates that there are no easy solutions. In a study conducted by Chari and Kameswara Rao (1992), the following results were seen with regard to a number of alternate crops. In the states of Andhra Pradesh and Gujarat, cotton and chillies were less profitable than tobacco. In addition, cotton is vulnerable to pests, and has a lower yield. Although some crops (e.g. chickpea, mustard, coriander and safflower) can be successfully cultivated in the black soils of Andhra Pradesh as a substitute to FCV tobacco, they are less attractive on account of market price fluctuations. In contrast, cultivators are more confident of the economic returns from tobacco.

Benefits of Crop Substitution and Diversification

It is sometimes argued that tobacco and tobacco products are major sources of indirect tax revenue for the government and agricultural diversification away from tobacco may possibly reduce this revenue. According to Panchamukhi (2000), the net effects would still be favourable to the government because the government expenditures on health and medical care, necessitated by tobacco health hazards, would be considerably reduced. Agricultural diversification away from tobacco is alleged to cause loss of employment opportunities within the farm sector since tobacco cultivation is supposed to require a large number of workers throughout. While it is true that tobacco cultivation is labour intensive, it should also be conceded that shifting from tobacco may not cause too much of dislocation in the employment situation of the country in the ultimate analysis. In India, only about 5.6% of the total 107.14 million cultivators are engaged in tobacco farming. Since a large number of farmers who have already shifted from tobacco cultivation, do not seem to have been unfavourably affected by the transition, the adverse employment effect of shifting from tobacco is unnecessarily exaggerated. Favourable effects in terms of avoidance of ill health, promotion of schooling of children, etc. would obviously outweigh the alleged adverse employment effects of shifting.

Concluding Observations

In identifying alternative crops, an in-depth market analysis is required. This should include considerations of the size of the potential market, both domestic and international, elasticity of demand and supply, inter-regional and international competition, and the relative advantages of the tobacco-growing region (i.e. production, costs, soils, and access to markets) compared with competing regions (Jacobs 2001). An attempt to persuade tobacco cultivators to switch to alternate crops will only succeed if the alternatives are equally or more profitable. The provision of credit to farmers to invest in seeds, fertilizers, pesticides, and other supplies and equipment, and crop insurance should also be factored into the analysis. Currently, the rates of procurements from farmers are low and are set by the trading agents, who are also responsible for advancing credit to the farmers. Education and awareness programme aimed specifically at farmers are required. These programme should include the options for alternate programme; the costs of tobacco cultivation and the health hazards associated with tobacco should be included. Tobacco is a labour-intensive crop which often requires the time and effort of an entire household, including children. Alternative crops which do not require children foregoing school should be given priority. The government should provide assistance during transition, especially for poorer farmers, which include rural training, broader off-farm employment opportunities and assistance with crop diversification (Jacobs 2001). Further, tobacco diversification needs to be considered within a broader developmental framework and the feasibility of non-farming jobs should also be considered, which might entail infrastructural investment. An investigation of the environmental impact of tobacco curing is required in terms of air pollution and forest depletion.

International Trade and Tobacco Control

Tobacco promotion and trade has become a major global public health threat. While tobacco consumption fell in many high income countries in the 1980s and 1990s, it rose in developing countries. That is largely due to the inroads made by transnational tobacco companies (TTCs) into the markets of low-and

middle income nations since the mid 1990s (Jha and Chaloupka 2000). TTCs have been strong proponents of tariff reduction and open markets to enable them to compete with domestically manufactured tobacco products in the high growth markets of Latin America, Eastern Europe and Asia. Eliminating or reducing tariffs and other barriers to imported tobacco products enables foreign companies to compete more fairly with locally producing companies. The increase in competition associated with opening the market to foreign producers may also lead to more intensive promotion and marketing of tobacco products.

Empirical evidence confirms that trade openness leads to increased tobacco consumption (Taylor and Bettcher 2000). Aggressive marketing efforts undertaken by TTCs in the wake of bilateral agreements negotiated between the USA and several Asian countries in the 1980s stimulated the demand for tobacco in an initial period. The evidence also indicates that the effect of TTC marketing on increasing tobacco consumption is greater in the poorer and more vulnerable countries (World Bank 1999; Taylor and Bettcher 2000).

Trade Barriers as Tobacco Control Policies

Higher tariffs on tobacco may, among other factors (such as taxes), contribute to a rise in consumer price, which leads to lower levels of consumption and lower prevalence of smoking among youth (World Bank 1999). Raising tariffs, however, runs counter to the general goal of trade liberalization, which is to reduce or eliminate tariffs and non-tariff barriers to international trade. Commitments to reduce tariffs on tobacco products are now part of existing multilateral, regional and bilateral trade agreements. But one of the key objectives of the World Trade Organization (WTO) agreements - reducing tariffs and eliminating non-tariff barriers to trade - does not prevent governments from applying non-discriminatory internal taxes and certain other measures which they may consider appropriate to safeguard public health.

Tobacco Control Measures versus Tobacco Companies

The health and tobacco trade debate dates back to the late 1980s. At that time, the US government began a series of actions to get Thailand and some other Asian countries to open their markets to US tobacco products. In each case, tobacco manufacture and sales were controlled by state monopolies. The US government succeeded in negotiating bilateral agreements that removed excise taxes and distribution practices that discriminated against US tobacco products - except in Thailand (WTO, 2002).

Thailand argued that its import restrictions were part of a comprehensive policy to control tobacco use. In response, the US filed a complaint with the General Agreement on Trade and Tariffs (GATT), the predecessor to the WTO, against Thailand. In brief, as a result of this case, Thailand had to lift its import ban and reduce the excise duty on tobacco because these could not be justified on health grounds so long as the sale of domestic cigarettes was allowed. But Thailand was allowed to continue with its advertising ban since this applied to all products without discrimination. In line with the GATT ruling, the Thai government lifted the import ban in 1990 and legal exports of cigarettes commenced to Thailand in 1991. Thailand was, of course, still free to charge duty on imports. It was also free to set its excise duty at any level so long as it did not discriminate between local and imported products.

The opening of the domestic market to foreign producers initially led to an increase in cigarette consumption, but it also served to strengthen national tobacco control efforts. After the GATT ruling, support grew for national tobacco control measures and in 1992, Thai Parliament passed two important tobacco control acts designed to restrict tobacco sales. The measures included increased sales taxes, smoking bans in public buildings, disclosure of ingredients and requirements for prominent health warnings on cigarette packages. As a result, smoking prevalence declined in the mid - and late 1990s.

Most countries, however, face strong challenges to implementing effective, comprehensive tobacco control measures. There is often fierce political opposition from domestic producers. Meanwhile, foreign producers continue to seek market access. These challenges are further compounded by international tobacco smuggling.

WTO Agreements and Tobacco Policies

Depending on how governments choose to manage the trade in tobacco and tobacco products, a number of WTO rules could come into play. The US-Thai tobacco case illustrated the relevance of the GATT, as it affected taxes, prohibitions and human-health related exceptions to the GATT rules. Other WTO agreements that may be applicable, but which have not yet been involved in tobacco-related controversy among WTO members, include:

1. the Technical Barriers to Trade (TBT) Agreement in relation to product requirements such as packaging and labeling;
2. the Agreement on Agriculture in relation to government support for tobacco production;
3. the General Agreement on Trade in Services (GATS) in relation to restrictions on cigarette advertising; and
4. the Agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS) in relation to trademark protection and the disclosure of product information considered by producers to be confidential.

Framework Convention on Tobacco Control

The challenges to comprehensive tobacco control policies that lie outside national borders led the WHO to propose in 1996 the development of a Framework Convention on Tobacco Control (FCTC). Its purpose is to facilitate multilateral cooperation and action at the global level to address transnational tobacco control strategies, the effectiveness of which in reducing demand for tobacco is substantiated by overwhelming empirical evidence (Taylor and Bettcher 2000).

At the FCTC negotiating sessions, there were discussion on certain trade-related provisions in the text proposed by the Chairman's text. These provisions include those designed to combat illegal trade and smuggling, phase out duty-free sales, and increase and harmonize taxes internationally; and various packaging and labeling issues, such as bans on the use of labels such as 'low tar' or 'mild', which are criticized for giving smokers a false sense of security. Some countries proposed that tobacco products be exempt from reduced tariffs under regional trade agreements. Advertising limits may also have implications *vis-à-vis* trade agreements.

The draft text proposes as a guiding principle that: 'Tobacco-control measures should not constitute a means of arbitrary or unjustifiable discrimination in international trade'. None of the provisions of the FCTC are inherently WTO-inconsistent; and many of the restrictions called for by some of its provisions may well be determined to be 'necessary' for health protection under WTO rules. However, some governments and non-governmental organizations (NGOs) are arguing that health objectives should take precedence over trade agreements. Thus, the relationship between WTO rules and the FCTC will depend on the direction that future negotiations of the FCTC take, and the manner in which its rules are applied by governments.

It is noteworthy that the draft FCTC has been modelled on a number of multilateral agreements, as the relationship between WTO rules and those of other international treaties can offer lessons for the FCTC. A conclusion that can be drawn is that proper coordination between trade and health officials at the national and international levels is crucial to negotiating a WTO-consistent FCTC. In this sense, the initiative by the WHO to create the Inter-Agency Task-Force on Tobacco Control for greater coordination between all relevant organizations at an early stage in the negotiations is useful. The WTO, which has an observer status in the WHO, follows the negotiations of the FCTC and is part of this Task Force. We suggest that a combination of strong global and national regulatory strategies is required to address tobacco consumption. The challenges, such as internet marketing and illicit trade, pose unique transnational threats to public health but remain unregulated by existing frameworks.

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Abbreviations

CMDR:	Centre for Multi-disciplinary Development Research
CTRI:	Centre Tobacco Research Institute
FCTC:	Framework Convention on Tobacco Control
FCV:	flue-cured Virginia
GATS:	General Agreement on Trade in Services
GATT:	General Agreement on Trade and Tariffs
IDRC:	International Development Research Centre
NCAER:	National Council of Applied Economic Research
NGOs:	Non-Governmental Organizations
PAHO:	Pan American Health Organisation
TBT:	Technical Barriers to Trade
TRIPS:	Trade-Related Aspects of Intellectual Property Rights
TTCS:	Transnational Tobacco Companies
WHO:	World Health Organization
WTO:	World Trade Organization