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Operationalizing evidence into action for providing viable crop diversification options to tobacco farmers in India - a compelling case for change

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Abstract

India is the second largest consumer of tobacco globally. India also stands third in the production of tobacco. Use of tobacco poses a significant threat not only to health but also to social and economic fabric of families and communities. Besides, negative environmental impacts of tobacco cultivation at the local level lead to deforestation and soil degradation. Both supply side and demand side interventions are important to achieve effective tobacco control in India. International commitment in the form of ratification of the World Health Organization Framework Convention on Tobacco Control by the Indian Government shall galvanize the agricultural fraternity to seriously ponder on the economically viable and sustainable crop diversification options for tobacco growers. A lot of effort has gone into creating evidence on economically viable alternate crops to tobacco over a period of time. Various projects and programmes for alternative livelihoods to tobacco growing have been initiated around the world. However, the initiatives on provisioning viable alternative crop options for tobacco growers in India are generally limited to sporadic experiments carried out in research settings. A detailed plan of action at the field level needs to be drawn based on the recommendations of available research. In the prevailing Indian scenario, shift by the tobacco farmers to alternative crops in near future seems unrealistic. However, concerted efforts on part of the agricultural fraternity in India coupled with timely corollary initiatives from other stakeholder departments may transform today's heresy into tomorrow's new paradigm. This review aims to study the existing evidence base on alternate crops to tobacco so as to call on the policy makers in the country to take initiatives to operationalize this evidence into action for effective tobacco control in the country.

Key Words :tobacco; alternative crops; alternative livelihoods; tobacco farmers; tobacco growers; tobacco cultivation; crop diversification

Introduction

Nearly 35% of adult Indians (15 years and above) use tobacco in one form or the other. The overall tobacco use in the country among males is 48% and that among females is 20%. Nearly two in five, 38% of adults in rural areas and one in four, 25% of adults in urban areas, use tobacco in some form.¹ In fact, India is the second largest consumer of tobacco globally, next to China.² In contrast to most other countries, India's tobacco consumption pattern reflects heavy use of non-cigarette tobacco products, primarily in the form of smokeless tobacco products - chewing tobacco and *paan* preparations - and Bidis. In fact, Bidis account for as much as 85% of the total smoked tobacco.³ To further aggravate the scenario, quitting is still uncommon in India, and less than 2% of adults identify themselves as ex-smokers.⁴

More than 6 million people die annually from tobacco use and exposure to tobacco smoke, which is one death every six seconds, estimates the World Health Organization (WHO). More than one million of these deaths take place in India, where smokeless tobacco use is the highest in the world.⁵ Moreover, the use of tobacco poses a significant threat not only to health but also to social and economic fabric of families, communities and nations. Besides, a growing number of studies have documented the adverse health consequences of tobacco cultivation for farmers. A health problem exclusively related to tobacco growing, Green Tobacco Sickness, is a consequence of nicotine dermal absorption due to skin exposure to tobacco leaves. Risk for this illness is created by certain working conditions, mostly handling wet tobacco or consuming alcohol while working with tobacco leaves.⁶ Studies in Andhra Pradesh and Gujarat indicated a higher prevalence of tobacco consumption among the farm-workers engaged in tobacco cultivation.⁷ Literature also documents many negative environmental impacts of tobacco cultivation at the local level, often linking them with associated social and health problems. The common agricultural practices related to tobacco farming, especially in the low-income and middle-income countries such as India, lead to deforestation and soil degradation. Deforestation in turn lead to ecological disruptions that cause a loss of ecosystem services, including land resources, biodiversity and food sources.⁸

India stands third in production of tobacco, following China and Brazil at the first and second positions respectively.⁹ Moreover, Indian tobacco has an edge over the leading tobacco producing countries in terms of availability of different styles produced with relatively low production costs.¹⁰ Presently, tobacco is being cultivated in an area of about 4.93 lakh hectares, 0.24% of the total arable land in the country, covering many varieties of tobacco viz. cigarette tobacco, bidi tobacco, chewing tobacco, hookah tobacco, cheroot tobacco, cigar wrapper tobacco, cigar filler tobacco, oriental tobacco, dark fire cured tobacco etc., with an annual production of 800 Million Kgs [M.Kgs]. Out of this, around 265 M. Kgs is the Flue-cured Virginia [FCV] tobacco which is produced in an area of 2.17 Lakh hectares, mainly in the states of Andhra Pradesh and Karnataka. Bidi tobacco is cultivated in an area of about 1.02 Lakh hectares, mostly in the states of Gujarat and Karnataka with an annual production of nearly 204 M.Kgs. Ironically, tobacco farming provides employment directly and indirectly to 36 million persons and contributed as much as Rs.19,891.50 crore as excise duty and Rs.4,979.00 crore in terms of foreign exchange to the national exchequer during the financial year 2012-13.¹¹

The World Health Organization Framework Convention on Tobacco Control - WHO FCTC - is an international treaty to reduce the health damage caused by tobacco by committing signatories to enact laws that control the supply as well as the

demand of tobacco. The FCTC was passed in February 2005.¹² At present, 179 countries, including India, are Parties to the Convention. Provision of support for economically viable alternatives for tobacco workers and growers - article 17 - and protection of the environment and the health of persons involved in tobacco cultivation and manufacture - article 18 - are two salient components of this treaty aimed towards reducing the overall supply of tobacco.¹³ Thus, apart from the social, economic and health related adverse effects of tobacco consumption, the obligation of the country towards the international community should galvanize the agricultural fraternity in India to seriously ponder on the economically viable crop diversification options for tobacco growers and farmers, and to come out with new evidence-based programmes and projects on the same. This review work aims to study all the relevant international and national evidence-base on the issue and to call on the stakeholders to undertake initiatives to operationalize the research evidence into action.

Methodology

A systematic and comprehensive search was conducted to identify all original published literature related to economically viable alternative crop options for tobacco farmers. Studies reporting on the same were obtained through text word searches related to 'alternative crops tobacco', 'viable cropping options tobacco' or 'alternate options tobacco farmers'. Academic databases such as PubMed, Cochrane Library, AGRICOLA, AGRIS and Google Scholar were searched.

A single assessor reviewed the titles and abstracts of all search results and identified studies throwing light on internationally and nationally successfully-implemented alternative cropping models for tobacco farmers. Studies of low quality were excluded - low quality was defined as an admission by the assessor that the study doesn't contribute anything new or substantial towards the outcomes of interest. A second, independent assessor reviewed all studies deemed potentially relevant by the first reviewer and confirmed inclusion. Disagreement between the reviewers was resolved through arbitration.

Global Success Stories

Both supply and demand side interventions are imperative for effective tobacco control.¹⁴ The WHO FCTC and its guidelines provide the foundation for countries to implement and manage tobacco control. To help make this a reality, WHO introduced the MPOWER measures in order to assist country-level implementation of effective interventions contained in the WHO FCTC. However, the WHO MPOWER strategies are limited to demand reduction policies for tobacco control.¹⁵ Besides, as not many countries grow tobacco, the effort to undertake measures for alternate livelihoods to tobacco growing mainly remains the responsibility of tobacco growing countries only. Further, WHO FCTC guidelines for Articles 17 and 18 are still in the process of being drafted, even nearly a decade after FCTC came into existence.¹⁶ Thus, many of the developing economies where tobacco is grown find it a real challenge to promote alternate livelihoods to tobacco growing in the absence of standard guidelines and international cooperation.

Over the past decade, projects and programmes for alternative livelihoods to tobacco growing have been initiated around the world. The geography of these projects shows that most of these are located in areas of extensive tobacco cultivation.¹⁷ In order to introduce diversification successfully from an economic-social viewpoint, literature clearly corroborates that

extensive, country-specific research and innovations at the local level hold the crux.¹⁸ Studies further suggest that broader policy issues have a strong bearing on the degree to which tobacco farmers diversify their crop production.¹⁹

In China, approximately 20 million farmers produce the world's largest share of tobacco. In a study, collaborators from the Yuxi Bureau of Agriculture and the University of California at Los Angeles School of Public Health initiated a tobacco crop substitution project in Yuxi municipality. At three sites, 458 farm families volunteered to participate in a new, for-profit cooperative model. This project successfully identified an approach engaging farmers in cooperatives to substitute crops such as grapes, white mushrooms, cauliflower, broccoli, arrowroot and peas for tobacco, thereby increasing farmers' annual income by 21% to 110% per acre.²⁰ With around 180,000 tobacco-producing households in the country, Brazil is the second largest producer and biggest exporter of tobacco. The National Programme for Diversification in Tobacco Growing Areas launched in 2005 has invested about US\$ 25 million - € 19 million - into 75 successful projects that focus on technical assistance and rural extension along with training and research involving 45,000 agricultural families from 600 municipalities across Brazil.²¹

A study conducted in Canada gave many viable alternatives - peanuts, ginseng, cucumbers, garlic, asparagus, hems, herbs and spices - for Canadian tobacco growers. However, it emphasized that the future lies in growers trying different options, combinations and new technologies to existing crops along with implementing better marketing techniques to existing operations.²² In the three most concentrated tobacco growing districts of Bangladesh - Kushtia, Cox's Bazar and Bandarban - the prominent Rabi crops' combinations practiced by the *Nayakrishi* farmers are potato + maize + lentil + coriander at Kushtia and potato + french bean + felon at Cox's Bazar and Bandarban.²³ A study in 2010 showed that the total cost per hectare of tobacco production was 119% higher compared to Rabi crops' combinations cultivated by these *Nayakrishi* farmers. More significantly, the *Nayakrishi* farmers obtained greater return i.e. 1.42 *Taka* more per *Taka* investment by cultivating these combinations compared to tobacco production.²⁴ Another study conducted in Kenya showed that two species of bamboo - *Bambusa vulgaris* and *Dendrocalamus giganteus* - can do well in soil and agro-climatic conditions similar to those of tobacco.²⁵ A later research concluded that although households in Kenya engage in tobacco farming to improve their living standards, tobacco farming is ironically responsible for poor and un-sustainable livelihoods in the region. Hence, an urgent need, to provide alternative livelihood strategies to tobacco-growing households in the country, was underscored.²⁶

A study conducted in Zimbabwe showed that the tobacco farmers were mostly unaware of the available alternate options to tobacco and of the impacts of tobacco on health and on the environment, and were amenable to gaining knowledge about the same. The study also suggested that finding a substitute as extensive as tobacco and establishing it are feasible; however, these could take time and need sustained commitment on part of the agricultural scientists and the government at the local level.²⁷ An Indonesian study concluded that wetland rice, hybrid corn, red chili and soybean are viable options for tobacco growers in Jember Regency of Indonesia where as Potatoes are the most potential alternatives for tobacco in Temanggung Regency. To forge a massive shift from tobacco to these alternate crops, a comprehensive approach, including continued innovative research by the agricultural fraternity and provisions of financial support and market support systems for the alternate crops by the government, was recommended.²⁸ Studies in Zambia, Malawi, Vietnam, Thailand and many other

countries also echo similar findings. Consideration of alternative crops demands attention to climatic suitability, market linkages and long-term price trends. Further, countries interested in sustainable solutions should not develop just one or two substitute commodities, but need to focus on helping multiple products emerge alongside tobacco.²⁹

Indian Scenario

The initiatives on provisioning viable alternative crop options for tobacco growers in India are generally limited to experiments carried out in research settings.³⁰ Though enough research has been accomplished on this issue starting from the year 1990 itself^{31,32,33}, projects and programmes for provisioning alternative livelihoods for tobacco growers at the field level are ironically almost absent in Indian perspective. The research conducted over the last five years or so further corroborates that a substantial shift by the tobacco farmers to alternate crops is possible if evidence-based, structured initiatives in the desired direction are planned without any further delay.

Central Tobacco Research Institute [CTRI] avers that a remunerative cropping system rather than a sole crop can be a viable alternative to the tobacco crop. Alternative crop systems like maize, rice, wheat, ragi, cotton, soybean, mustard, castor, groundnut, blackgram, chilli, chickpea, potato, ginger, sugarcane, jute, banana, oil palm, eucalyptus along with dairy, poultry and fishery products have been identified for the benefit of farmers and farm workers in tobacco growing areas in India, as per the cropping pattern followed in the particular region. CTRI remains committed to conduct research on economically viable and sustainable cropping systems alternative to tobacco to facilitate release of more area for cultivation of food crops.³⁴

A field experiment conducted for three years during *kharif* season at the Zonal Agricultural Research Station Karnataka concluded that none of the alternative sole crops were comparable to FCV tobacco in terms of net returns. However, the study was optimistic that the cropping systems - hybrid cotton + chilli + groundnut and hybrid cotton + chilli+ frenchbean - can be economically viable alternatives to FCV tobacco for farmers in Karnataka.³⁵ Another study in Karnataka analyzed the nature and extent of crop diversification in the state by collecting secondary data for a period of 26 years from 1982-83 to 2007-08 and suggested that the creation of basic infrastructural facilities like sustained supply of irrigation water, markets, fertilizer availability, proper roads and transportation is an essential pre-requisite for creating enabling conditions for fostering the process of agricultural development and crop diversification, as most of these parameters greatly influence the nature and extent of crop diversification.³⁶

A study conducted in Jayavaram and R.C.Puram villages in Prakasam district of erstwhile state of Andhra Pradesh analyzed the cost of production and net returns of tobacco cultivation, and revealed that paddy or bengalgram are more profitable crops in comparison to tobacco. More significantly, in both the villages, an inverse relationship was found between the size of land holding and the cost of production of tobacco. The study prodded the government to disseminate the economics of these Rabi crops in order to motivate farmers to drop tobacco cultivation gradually. However, the study also cautioned that adequate measures should be put in place to preserve the labour employment as tobacco is more labour intensive than bengalgram or paddy.³⁷ Another study concluded that kharif maize with minimum tillage of Rabi crops viz. redgram, chickpea and horsegram may be a viable alternative to FCV tobacco cultivation in vertisols of Andhra Pradesh.³⁸ Likewise,

in another study in Gujarat, it was observed that farmers, who had switched from tobacco to multiple-cropping or intercropping with cotton, had a higher net return per hectare.⁷

Conclusion

Authors have tried to analyze the existing evidence base on economically viable and sustainable alternate crops and cropping systems in different agro-climatic zones in India. Authors suggest alternate crops and cropping systems, as detailed in **Table 1**, that have been found to be suitable in the different tobacco growing regions of the country and would be equally remunerative, viable alternatives to the conventional tobacco crop. Authors strongly feel that there is a need to engage the Indian Council of Agricultural Research (ICAR) and various Agricultural Universities in the country in provisioning technical support for the effective transfer of technologies, related to alternate crops, to the farming community with support from the Ministry of Agriculture. The key interventions that would help increase the productivity of alternate crops should be identified. It is felt that a sustained push in this direction would require setting up of a board for promoting alternate crops, along the lines of the Tobacco Board, the Coffee Board or the Tea Board. This board would provide technical assistance to farmers who are willing to switch from tobacco cultivation, and also provide information and assistance regarding high-yield-variety of seeds and fertilizers, and other related inputs. The suggested board may also help the government and agriculture-pricing committees in working out minimum support prices for alternate crops, in facilitating soft loans for the concerned farmers, in setting-up auction platforms for these crops, in marketing of these alternate crops, and in other supportive activities. Awareness programs should be routinely held for the tobacco farmers on impacts of tobacco cultivation and tobacco consumption on human health, and on the available alternate, equally remunerative, crop options. Meanwhile, the research on alternative crops to tobacco or on the economic viability of these alternative crops should continue not only in the agricultural fields of research institutes or universities on an experimental basis, but also in situ in close collaboration with tobacco farmers.

This review attempts to raise awareness about the strategic significance of initiating programmes and projects on alternate cropping options to tobacco cultivation in order to facilitate the success of tobacco control in India. Development of new sustainable cropping alternatives to tobacco cultivation requires evidence-informed investment in specific supply chain processes beginning right at the farm level and extending through to the crop assembly, processing and distribution; and should be driven by close collaboration and optimal synergy among all the stakeholder government departments, with Ministry of Agriculture taking the lead.

In this regard, paucity of initiatives on part of the policy makers to operationalize the extant evidence-base in form of actual projects holistically addressing all the agricultural, social and economic variables influencing viability of different alternative cropping options to the conventional tobacco cultivation seems to be the major limiting factor in the Indian context. In the prevailing scenario, a massive shift by the tobacco farmers to alternate crops in near future seems unrealistic. However, concerted efforts on part of the agricultural fraternity in India coupled with timely corollary initiatives from other stakeholder departments may transform today's heresy into tomorrow's new paradigm.

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Table 1: Crops/ Combination of crops that have been found to be suitable in the different tobacco growing regions of the country and would be equally remunerative, viable alternatives to the tobacco crop

Type of tobacco and Zone	Alternative crops	Alternative cropping systems
Bidi/ Chewing tobacco- Gujarat	Mustard, Groundnut, Chilli, Maize, Cotton and Castor	Cotton – Groundnut or Castor - Groundnut
Chewing and Hookah tobacco – Uttar Pradesh	Potato, Wheat, Okra, Sugarcane and Mustard	Maize - Potato
Chewing tobacco -Bihar	Potato, Garlic, Mustard, Maize and Wheat	Maize - Potato or Potato + Garlic
Chewing tobacco - West Bengal	Rice, Mustard, Potato, Wheat, Jute and Maize	Jute - Rice –Potato or Jute - Rice – Mustard
Chewing tobacco - Tamil Nadu	Sugarcane, Sunflower, Maize, Chilli, Moringa and Sorghum	Onion – Moringa or Chilli –Moringa
Bidi tobacco – Karnataka	Sugarcane, Chilli and Cotton	Groundnut – Sorghum or Soybean – Sugarcane