

Contract Farming and Its Impact on Rural Society, Health and Environment: The Case of Tobacco Farming in Bangladesh

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Abstract: Contract farming has long been practiced in both developed and developing countries with the aim of increasing agricultural productivity and ensuring the smooth functioning of the agricultural value chain. While the economic impact of this arrangement is better understood, its bearing on society and the environment has received scant attention in recent literature. This gap in understanding leads to a new contract farming research agenda: how to promote contract farming that minimises social and environmental impacts while maximising economic outcomes. To achieve this end, we need to better understand the socio-environmental impacts of contract farming arrangements. This research contributes to this understanding, focusing on tobacco farming in Bangladesh. Tobacco cultivation is mainly practiced through a contract farming arrangement, which is now the second largest agricultural practice in Bangladesh. Data for this research were collected using multiple qualitative tools from several stakeholders in the Kushtia district, including contract growers, key informants, and local government officials. The findings indicate that while this contract arrangement enables farmers to earn higher incomes, it simultaneously generates adverse socio-environmental consequences. The findings will help policymakers adopt measures aimed at minimising social and environmental impacts while maximising economic outcomes.

Keywords: Contract farming, Social impact, Environmental impact, Tobacco, Bangladesh.

1. Introduction

Contract farming has long been practiced in both developed and developing countries with the aim of increasing agricultural productivity and ensuring the smooth functioning of the agricultural value chain (Burch, Rickson, & Thiel, 1990; Dubbert, Abdulai, & Mohammed, 2023). In this institutional arrangement, both buyers and producers agree to produce and market farm products based on a set of predefined conditions. Studies confirm several economic impacts of this arrangement for both producers and buyers. Farmers benefit as they get easier access to credit and technology, and they can overcome market barriers due to the reduction of economic risks (Dubbert et al., 2023; Shiringo, Chundu, & Sithole, 2022). Contract farming also benefits buyers by guaranteeing a smooth supply of quality products. This mechanism has generally contributed to increased production, jobs, income, and food security (Pangapanga-Phiri, Mungatana, & Mhondoro, 2024).

While the economic impact of this arrangement is better understood, its bearing on society and the environment has received scant attention in recent literature (Ibanez & Blackman,

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2016; Lecours, Almeida, Abdallah, & Novotny, 2012). This is a critical issue especially in the context of increasing global concern for food security. Farmers are marginalised by contract farming, and it can lead to a greater expansion of cropland coverage with excessive use of chemicals targeted to producing high-value crops (mostly monoculture). A nascent but growing number of studies show that this unsustainable farming practice can adversely affect soil and water resources and lead to biodiversity loss (Dubbert et al., 2023; Hussain et al., 2020). This anecdote leads to a new contract farming research agenda: how to promote contract farming that minimises social and environmental impacts while maximising economic outcomes.

The current study addresses this puzzle in this research focusing on tobacco farming in Bangladesh, which ranks 12th among the tobacco producing countries in the world (Hussain et al., 2020). Tobacco farming is the second largest agricultural practice in Bangladesh, which covered about 127,000 acres of land in 2014-15 largely concentrated in Rangpur, Kustia, Lalmonirhat, Bandarban, and Manikgonj districts (Ali et al., 2023; Hussain et al., 2020). Tobacco cultivation is mainly practiced through contract farming arrangement. Companies such as British American Tobacco, Akij Tobacco, Abul Khair Tobacco, Dhaka Tobacco, and Nasir Tobacco supply inputs (e.g., chemical fertilisers, loans) and provide buy-back guarantees to contract growers and the farmers produce an agreed amount of tobacco leaves within a predefined timeframe (Akhter, Rafiqul, & Mujahidul, 2011). While tobacco cultivation under contract farming is on the rise in Bangladesh, a limited number of studies assess its social and environmental effects (Hussain et al., 2020; Lecours et al., 2012; WHO, 2017). This gap has been addressed in this research. This study aims to understand the social and environmental effects of tobacco cultivation under contract farming in Bangladesh. The specific research questions include:

1. Is there any role of contract farming arrangements in promoting tobacco cultivation in Bangladesh?
2. What are the social and environmental effects of tobacco contract farming in rural Bangladesh?

Section two describes the state of tobacco cultivation in Bangladesh. I present materials and methods in the third section. The fourth section presents the findings of this research and the final section draws conclusions, policy implications and future research directions.

2. Current Scenario of Tobacco Cultivation in Bangladesh

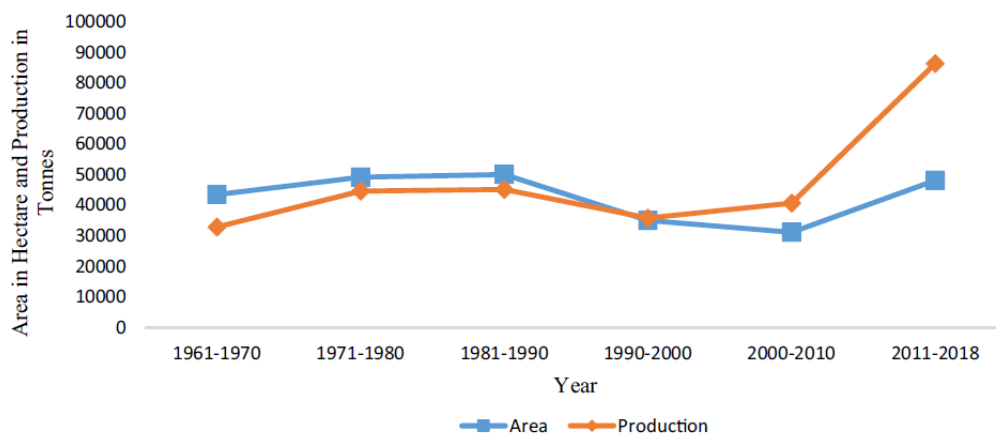
Tobacco cultivation originated in the Peruvian and Ecuadorian Andes between 5000 and 3000 BC, and later, this cash crop was brought to Europe in the 15th and 16th centuries (Roy, Naz, & Mostafa, 2024). During the colonial period, the Europeans introduced this cultivation system in other countries, including Bangladesh. Tobacco cultivation was initially introduced in Bangladesh in 1751 and spread more widely after independence in 1971. British American Tobacco (BAT) company played a key role in spreading this large-scale cash-crop cultivation across the country (Roy, Naz, & Mostafa, 2024). Initially, this cultivation was practiced in the Teesta belt of the Rangpur area. Later, this practice was expanded to Kushtia in 1980s and then to the Chittagong Hill Tracts region (Roy et al., 2024). Geophysical location, soil fertility, and availability of fuel wood in these areas

played a crucial role in such expansion. For instance, the Gangetic floodplain feature of Kushtia region made it an attractive hub for tobacco cultivation (Roy et al., 2024). Therefore, the expansion of tobacco cultivation in Bangladesh is not a “farmer-led phenomenon”, rather it is promoted by multinational and national tobacco companies (Akhter, Buckles, and Tito, 2014:140).

Tobacco cultivation is the second largest agricultural practice in Bangladesh after paddy. It is now cultivated in more than twelve districts, including Rangpur, Kushtia, Lalmonirhat, Jessore, Manikgonj, Tangail, Chittagong, Bandarban, Nilphamari, and Jhenaidah. Farmers mainly produce three varieties of tobacco, namely Jati, Motihari, and Virginia. Virginia is the most popular among these varieties, and it is produced primarily in Kushtia, Rangpur and Dhaka regions (Roy et al., 2024). Although the Bangladesh Agricultural Research Institute (BARI) abandoned research and development activities on tobacco in 1995, tobacco cultivation and development activities are primarily promoted by big business enterprises such as BAT through contract growers. In the beginning, the Government of Bangladesh also played an important role in promoting this cultivation practice. Direct participation of past governments in tobacco cultivation (e.g., through crop diversification programme), promotion of foreign direct investment, and export incentives encouraged farmers and businesses to increase their production and land coverage (Akhter et al., 2014; Ali et al., 2023; Roy et al., 2024).

Figure 1 shows an upward trend in tobacco production and land coverage for tobacco cultivation in Bangladesh. According to the Department of Agricultural Extension, tobacco production has increased from 2.04 tonnes per hectare in 2018-19 to 2.46 tonnes per hectare in 2022-23 (Pandey, 2024). This growth has been possible due to the introduction of high-yield varieties and the application of excessive fertilisers and pesticides with support from tobacco companies (Pandey, 2024). According to a recent study, Bangladesh ranks 12th in the total amount of tobacco produced and 14th in total areas under tobacco cultivation worldwide (Ahmed, 2019).

Figure 1: Tobacco production and land coverage trend from 1961 to 2018



Source: Rana, Kamruzzaman, Sharna, and Rana (2021:2)

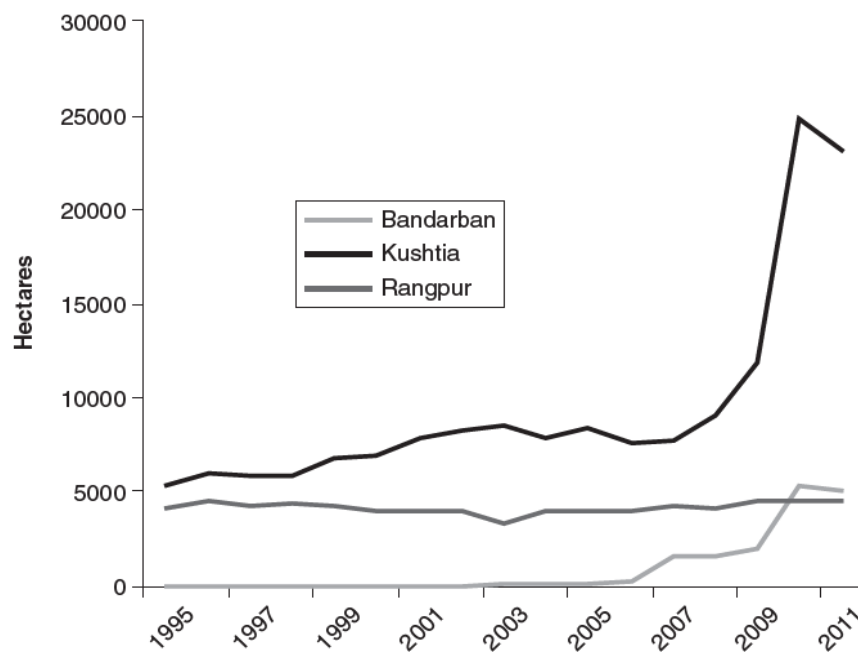
Tobacco farming in Bangladesh mainly takes place under contractual arrangements. For instance, around 87% of total tobacco growers are contract farmers in Meherpur district (Rahman, Ahmed, Ali, Abedin, & Islam, 2020). Contracted farmers produce tobacco for tobacco companies they are registered with (Pandey, 2024). Tobacco companies provide farmers with free seeds, fertilisers, pesticides, interest-free loans, and technical support. Companies offer this support through their field agents. However, tobacco companies realise those costs from the final value of their harvests. The main tobacco companies are: British American Tobacco Company, Japan Tobacco International, Abul Kahir Tobacco Company, and Nasir Tobacco Industries Limited (Pandey, 2024).

3. Materials and Methods

3.1 Study Area

The study was conducted in the Mirpur sub-district under Kushtia district (Figure 2). It is one of the western districts under the Khulna division, having an area of 1608.80 square kilometres and six sub-districts. Kushtia is Bangladesh's second largest tobacco-producing district and has the highest tobacco-producing rate after Lalmonirhat and Nilphamari (BBS., 2023; Lecours et al., 2012). This district produced 35,663 metric tons of Virginia tobacco from 31,974 acres of land in 2021-22, which is about 30% of the total land used for tobacco cultivation in Bangladesh (BBS., 2023; Roy et al., 2024). Figure 3 shows that land coverage for Virginia tobacco cultivation has grown significantly in Kushtia district compared to other important tobacco-producing regions: Rangpur and Bandarban. This is the principal reason for selecting this area as a study location.

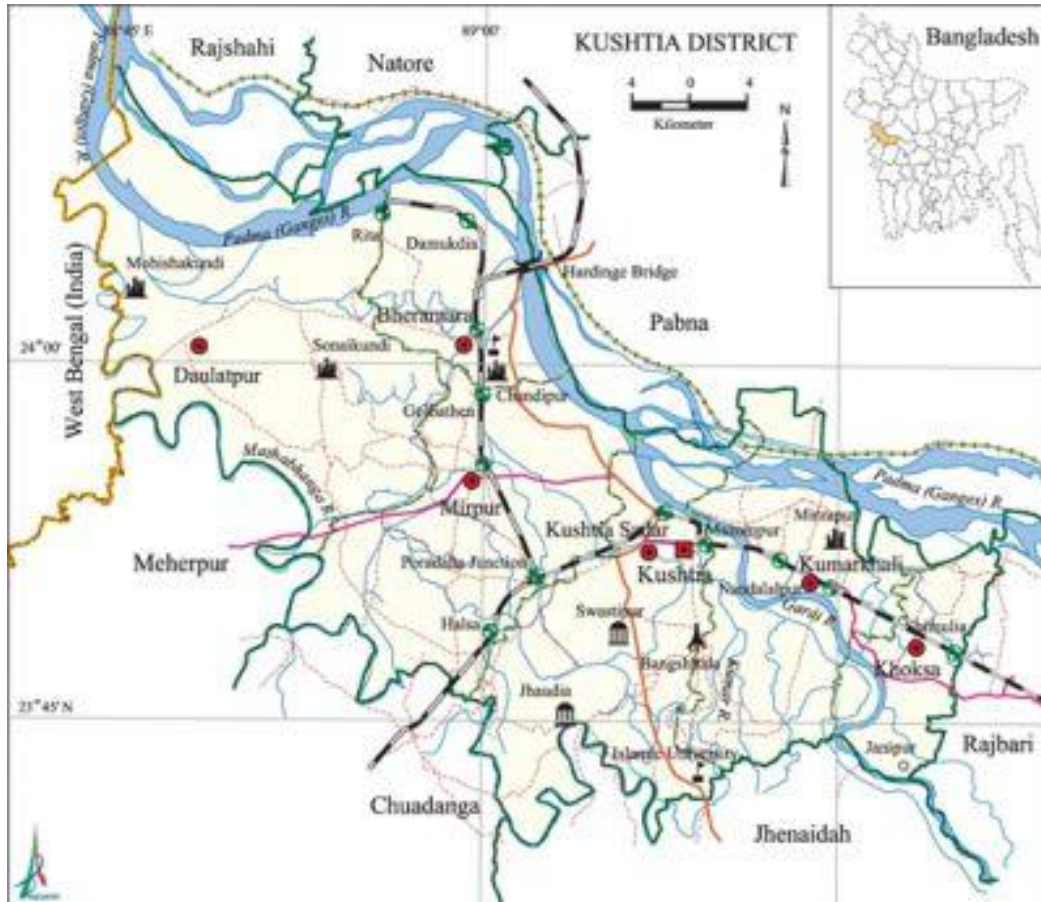
Figure 3: Land coverage of Virginia tobacco in Rangpur, Kushtia, and Bandarban



Source: Akhter et al. (2014:144)

Mirpur is one of the intensive tobacco-growing sub-districts in this district. The majority of people living within this area depend on agriculture (66.54 %), and tobacco cultivation is the primary source of agricultural income. Those who do not own land are also engaged in such activity. They lease lands from large landowners and come into contractual agreements with tobacco companies. About 50 farmers grow tobacco on leased land in this area (Akhter et al., 2014).

Figure 2: Map of the study location



Source: Banglapedia (2024)

4.2 Data collection and analysis

Data for this study were collected using multiple qualitative data collection tools, including focus group discussions, in-depth interviews, and key informant interviews. First, a list of tobacco farmers was collected from the sub-district level agricultural office. Focus group discussions and in-depth interviews were employed to collect data from contract growers. I have also collected data from local government officials and other key informants. The participants for this study were selected purposively, and the sample size is shown in Table 1. A topic guide was used during the interviews and FGDs to understand factors influencing

farmers to grow tobacco and the social and environmental effects of tobacco cultivation under contract farming.

The data were analysed thematically following the protocol advanced by Braun and Clarke (2006). First, I transcribed the data verbatim and then translated it from Bangla to English. I read and reread the data to identify key themes relevant to the objectives of this study, and the findings of this study were presented according to the themes. I have extensively used secondary literature to substantiate my findings.

Table 1: Sample size

Data collection methods	Number
FGDs	2 (6 to 8 farmers in each group)
In-depth interviews	8
KIIs	6 (local government officials, company agents, civil society members)

4. Findings of the Study

4.1 Factors that Influence Tobacco Cultivation

We observed several factors influencing farmers to adopt and continue tobacco cultivation under contract farming arrangements. These factors are discussed below.

Support from tobacco companies: Under contract farming arrangements, farmers receive several supports from tobacco companies including seeds, pesticides, fertilisers, loans as well as technical assistance. These supports are not available for other crop production including paddy. These support services influence farmers to start or to continue tobacco cultivation. In one FGD, one farmer said and echoed by others, *“We are poor. We do not have enough money to bear the expenses for seeds, fertilisers and pesticides. So, we are forced to borrow money from different sources. However, the return that we get from paddy cultivation is not even enough to meet our loans. That is why we enter into contract farming arrangements and cultivate tobacco, abandoning paddy cultivation”*. We observed similar observations from in-depth interviews and KIIs.

Buy-back guarantee at fair prices: The findings also demonstrate that farmers can sell their harvests directly to tobacco companies at market prices under contract farming arrangements. Farmers remain assured that they will be able to sell their tobacco leaf directly to companies (Talukder, Haq, Ali, & Drope, 2020). Tobacco companies prefer direct engagement with producers to reduce production costs (Lecours et al., 2012). This opportunity incentivises farmers to grow tobacco under this arrangement (Mahmud et al., undated). In an in-depth interview, a farmer argued, *“Why should we go for paddy or other crop cultivation? There are many intermediaries, and we are forced to sell our harvests to them. So, we do not get fair prices. Under this contract farming arrangement, we can sell our products straight to the company and they give us very good prices.”* Many key informants also made similar observations for growing tobacco farmers under contract

farming arrangements. Rahman et al. (2020) in their study in Meherpur district observed that farmers were 15.9 times more likely to grow tobacco under contract farming when they could sell their products directly to company agents.

Possibility of earning higher income: Discussions with the farmers and key informants indicate that farmers can earn higher profitability from tobacco cultivation than other crops. Higher earning opportunities encourage farmers to continue tobacco cultivation. This result is consistent to other existing studies. Talukder et al. (2020, p. 5) maintain that “tobacco farming can provide opportunities to generate cash, which households need for certain goods and services, and there is a perception that this cash can be generated in a relatively short time frame from farming tobacco compared to farming other crops.” Salam, Zaman, Hossen, and Nur (2020) observed that 80.56 % of farmers were happy with the prices they received from the tobacco companies.

4.2 Social Consequences of Tobacco Cultivation

Our findings show several social consequences of tobacco farming under contractual arrangements. These are discussed below.

Replacement of native food crops: Expansion of tobacco cultivation in new areas and existing locations indicates this cash crop’s popularity among farmers. However, this has severe consequences for reducing the production of native food crops such as paddy, sugarcane, maize, and other vegetables. This causes social disruption by affecting local food security. Replacement of native food crops with tobacco cultivation causes loss of local crop varieties “due to low cultivation and weak seed preservation system” (Motaleb & Irfanullah, 2011: 481).

Loss of autonomy: In contract farming arrangements, companies only promote producing crops with high economic value, like tobacco. Farmers enjoy less autonomy in selecting what crops they want to grow in this scheme. Sometimes, farmers are forced to adopt tobacco cultivation, abandoning their traditional food crop production. Many key informants highlighted that a number of the small-scale farmers were forced to continue tobacco growing by the representatives of tobacco companies even though they were willing to go back to traditional paddy cultivation. The representatives made them understand that they would have fallen into trouble if they had breached the contract. As there were no support services from the local government office, the farmers were helpless and obliged to the directions provided by the company representatives. Akhter et al. (2014: 139) rightly observed that “[d]ebt to the tobacco companies, and the seductive appeal of facilities they offer, bind tobacco farmers to an industrial monocrop”.

Asymmetric relationship between tobacco firms and farmers: Farmers remain committed to growing and selling tobacco leaves to the tobacco company in contract farming arrangements. They are also supposed to follow the technical guidance provided by the company. In doing so, small-scale farmers most often receive loans and other inputs (e.g., pesticides and fertilisers) from the company. So, contract farming arrangements establish a binding relationship between the two parties and sometimes this turns into an asymmetric and exploitative relationship. As subsistence farmers possess less bargaining power due to their inferior position in this contractual arrangement, tobacco firms usually dominate

farmers on issues like what species to be produced in what amount and, above all, the quality and prices of the leaves (Lecours et al., 2012). This asymmetric relationship sometimes locks farmers into a cycle of poverty. For instance, 57% of farmers in Zimbabwe were found indebted to tobacco firms due to unequal relationships (Chingosho, Dare, & van Walbeek, 2021). Another study in Zimbabwe observes that contract farming arrangements perpetuate inequality in the community by favouring well-connected and wealthier farmers compared to poorer and small-scale farmers, who often possess fewer social connections (Moyo, 2022).

Deteriorating health conditions of farmers and their family members: Tobacco-growing farmers are vulnerable to many respiratory and dermal diseases due to their exposure to tobacco leaves, and chemicals and pesticides. Farmers usually handle chemical fertilisers and pesticides without taking proper protective measures. They also handle wet tobacco leaves without taking proper measures. Many farmers tell us that they are suffering from headaches, anxiety, vomiting, weakness, breathing difficulty, and itching. These health-related risks related to tobacco growing are known as Green Tobacco Sickness (Lecours et al., 2012). Ali and other colleagues in their study (2015) also observed that majority of farmers (62%) were suffering from coughing and asthmatic diseases. Similar observations were made in other studies. In Kenya, Malayasia, and Pakistan, for example, many farmers were found vulnerable due to pesticide exposure and poisoning (Cornwall, Ford, Liyanage, & Daw, 1995; Hussain & Yousafzai, 2022; Ohayo-Mitoko, Kromhout, Simwa, Boleij, & Heederik, 2000). In Vietnam, reported health problems (e.g., weakness, nausea, increased sweating, high heart rate, increased salivation, whole body pain, poor appetite, itchy/rushing) were statistically significant among tobacco-growing farmers compared to those who do not produce tobacco (Van Minh, Giang, Bich, & Huong, 2009). Moreover, family members of the farmers, including their wives and children, are also suffering from these health risks as they participate in tobacco growing and processing activities. Most of them are subsistence farmers, so they depend on family labour, making them susceptible to health risks. They are also required to spend a higher part of their income to meet treatment costs (Hussain et al., 2020). The finding indicates a longer-term detrimental health effect for the farmers and their families, which may soon put them in a vulnerable situation, undermining their wellbeing.

Food insecurity: Most farmers and key informants agree that tobacco cultivation has enhanced their income and ultimately improved their wellbeing outcomes in terms of household food security. Farmers are able to buy adequate food, medicine, and they can afford school expenses for their children. However, they raised a growing concern for the country's overall food security because of the displacement of food crop production. Most land areas in Kushtia were used to cultivate food crops earlier, and this was a food surplus region (Akhter et al., 2008). Now, "tobacco occupies the best lands in the district, having displaced vegetables, pulses, sugar cane and jute crops" (Lecours et al., 2012: 194). Therefore, this practice would undermine the country's overall food security if tobacco production grows at the current rate.

4.3 Environmental Consequences of Tobacco Cultivation

The study identifies several harmful consequences of tobacco cultivation on the surrounding environment. These are discussed below.

Soil pollution: Farmers must apply huge amounts of fertilisers because of diminishing soil fertility due to repeated tobacco cultivation without rotation with other crops. One of the farmers in an FGD told and echoed by others that “We apply an increasing amount of pests and fertilisers in our tobacco fields every year. Otherwise, we do not get good leaf.” Farmers also apply vast amounts of pesticides because tobacco plants are vulnerable to many pests and diseases (Lecours et al., 2012; WHO, 2017). Studies confirm that the application of excessive amounts of pesticides (insecticides, herbicides, aldicarb, chlorpyrifos) and chemical fertilisers affects soil fertility by changing soil parameters. For instance, the excessive use of phosphate and potash fertilisers increases toxic elements in soil and decreases soil fertility (Ali et al., 2015; Kutub & Falgunnee, 2015; Suma, Islam, Jamil, Kabir, & Kumar, 2022). Moreover, “specific agricultural practices of ‘topping’ and ‘desuckering’, designed to attain high levels of nicotine and high leaf yields, also contribute to the depletion of soil nutrients” (Lecours et al., 2012: 192).

Another important fact is that companies only buy tobacco leaves, and the rest of the plants remain on the ground. These plant residues do not have any food value to animals such as livestock. Consequently, farmers are required to burn the residues “to reduce tobacco diseases and weeds before onset of another planting season” (Lecours et al., 2012: 193). This causes harm to the soil and biodiversity (Ali et al., 2018).

Water pollution: Tobacco needs eight times more water than other crops (Pandey, 2024). Moreover, excessive use of chemical fertilisers and pesticides also affects nearby and underground water bodies by changing water properties. When chemicals and pesticides mix with water, it can disrupt and damage aquatic life (Pandey, 2024).

Deforestation: Discussions with the farmers and key informants reveal that land for tobacco cultivation is increasing gradually in the study area (see also Figure 2). Farmers have cleared the forests, and the emptied lands are now used for tobacco cultivation. The small-scale farmers usually use traditional techniques of tobacco cultivation, and this method does not help farmers to meet growing demands for tobacco leaves. In order to meet growing market demand and earn additional income, they try to increase production by clearing forest lands. Consequently, the forest area is decreasing in the study area.

This deforestation rate is higher in Kushtia region as the farmers in this area produce Virginia tobacco, which has higher demand and, therefore, higher prices. However, this variety involves flue-curing², “which is performed in kilns by burning wood at constant heat temperatures for several days” (Lecours et al., 2012: 193). This flue-curing requires a high volume of wood fuels, which farmers usually collect from nearby forests, cutting trees from their own land or buying from local markets. Farmers now use jute sticks and rice straws, as the supply of wood from local sources is almost exhausted (Akhter et al., 2014).

² “Curing is more than drying the leaf. It improves chemical and physical changes that are necessary for high-quality cured leaf” (Sumner & Moore, 2009: 3).

Studies confirm that this process requires 100kg to 230kg of wood for curing one kg of tobacco, and about 11.4 million metric tonnes of wood are required annually for such curing (Lecours et al., 2012; WHO, 2017). In the context of Bangladesh, farmers use 201.77 kg of wood to cure 40 kg of leaves (Hussain et al., 2020). This causes deforestation in this region and may have long-term implications for changes in local land cover. Globally, 1.5 billion hectares of forests have been lost due to tobacco cultivation since the 1970s (WHO, 2017). Tobacco farming in Bangladesh causes 30% of annual deforestation (Pandey, 2024).

Threats to biodiversity: As tobacco is cultivated as a mono-crop, it threatens soil health and causes deforestation, as discussed above. All these risks create threats to biodiversity. For instance, “[a]ldicarb is toxic to birds, fish, earthworms and honeybees that causes genetic damages” (Kutub & Falgunee, 2015: 6).

5. Concluding Discussions

Bangladesh’s economy is predominantly agricultural and the spread of tobacco cultivation at its current rate would destabilise food security in the near future as it replaces the production of food crops such as paddy. This study also demonstrates several negative social and environmental consequences of tobacco cultivation that culminate in a net loss to society. Therefore, the Government of Bangladesh should take immediate measures to reduce farmers’ incentives for tobacco production. Though the government has set a vision to be a tobacco-free nation by 2040, current progress toward achieving that vision seems to be far-reaching. The government should immediately implement existing laws and update those to meet the objectives of World Health Organization’s Framework Convention on Tobacco Control. This study points to several important measures the government can adopt to reduce tobacco cultivation and encourage farmers to adopt alternative food crops. For instance, the government should adopt measures that facilitate farmers in receiving agricultural inputs for food crop production at lower prices. Moreover, the government should take stringent actions to control the intermediaries, and farmers should be guaranteed fair prices for their harvests. Most importantly, policies and programmes should be designed in a participatory manner where farmers can share their opinions with other stakeholders to understand their real needs. The government should take necessary actions to promote sustainable alternative livelihoods for those who are involved in tobacco cultivation, complying with the condition of article 17 of the World Health Organization Framework Convention on Tobacco Control. Article 18 of the Convention also stresses taking appropriate measures to protect the environment and health of persons engaged in tobacco farming.

Overall, the findings of this project will inform policymakers about the potential social and environmental effects of tobacco cultivation under contract farming. This information will help policymakers adopt measures to promote contract farming to minimise social and environmental impacts while maximising economic outcomes. This research also calls for more research on the social and environmental effects of tobacco farming under contractual arrangements and the political economy of this practice in Bangladesh.

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