

## **Cultivation of Environment-Unfriendly Crop Tobacco An Inquiry into the Causes and Consequences**

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**Abstract:** *The article aims to find the extent, causes and consequences of tobacco cultivation in Kushtia district. Tobacco is an environment-unfriendly crop. Tobacco cultivation entails a number of detrimental effects on health and environment. Recently, tobacco cultivation has concentrated in Kushtia district. For the last several years, the amount of land used for tobacco cultivation has shown an increasing trend. During the period 1998/99 - 2005/06, the area under tobacco cultivation in the district has increased by 41 percent. A number of factors are responsible for this rising trend of tobacco cultivation. These include demonstration effect, guaranteed market and ready cash, profitability, patronization of tobacco companies and ancestral occupation. The consequences of tobacco cultivation include both positive and negative impacts. The positive impacts are that the extensive tobacco cultivation in the district has created employment for the people and scope for the farmers to earn ready cash. The negative impacts are health related problems, water and air pollution, hampering of children's education, fuel crisis and loss of normal family life. The study reveals that although tobacco is a profitable crop, the majority of the farmers want to give up this environment-unfriendly crop.*

### **Introduction:**

Tobacco as a plant (*Nicotiana tabacum* or less widely used *Nicotiana rustica*) belongs to the Nightshade family indigenous to North and South America. The word 'Shade' descends from the German word 'schade' which means destruction or damage (Akhter 2011). Tobacco is grown in the winter season because the plant prefers sandy, well aerated, well-drained soils and cooler climate.

According to World Health Organization (WHO) tobacco is the second major cause of death and the fourth most common risk factor for diseases in the world. It is currently responsible for five million deaths each year. An estimated 1.3 billion people smoke worldwide and 84% of all smokers live in developing countries and the countries of transitional economy (WHO, 2002). If current smoking patterns continue, it will cause some 10 million deaths each year and 70 percent of such deaths will be from developing countries (Abdullah and Husten, 2004). In Bangladesh

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tobacco related illness accounts for 16 percent of total deaths among people aged 30 years and above (WHO, 2007).

Tobacco production entails a number of detrimental effects. The principal loss resulting from tobacco production is the amount of food and other crops that are sacrificed. The amount of land used for tobacco production worldwide could be used for the production of essential food crops like rice, wheat, potato, maize etc. Tobacco cultivation causes biodiversity losses, land pollution due to pesticides, soil degradation and deforestation well as water pollution. Forests are cleared to provide more land for tobacco production and wood for tobacco curing. The global share of agricultural land used for tobacco growing is less than 1 percent. However, its impact on global deforestation is 2-4 percent making a visible footprint for climate change. Research suggests that tobacco growing may be up to 10 times more aggressive than the sum of all other factors in deforestation. Tobacco depletes soil nutrients at a faster rate than most crops (WHO, 2008). Tobacco curing also produces a huge amount of fume which causes air pollution.

Tobacco cultivation entails a number of occupational risks including green tobacco sickness (GTS), pesticide intoxication, respiratory and dermatological disorders and cancers at certain sites. As a result, tobacco cultivation causes irreversible costs to the farmers which seriously damage their living standards and erode long term prospects. Health risks, working conditions, contractual arrangements, the use of children in tobacco cultivation and the environment practices of the tobacco cultivation have negative impacts on human capital and land, the two crucial aspects in rural livelihood (WHO, 2008).

Despite all these detrimental effects of tobacco, the reality is that a large number of farmers are engaged in tobacco cultivation worldwide. Bangladesh is also not exception to this world culture. According to Sarkar and Haque (2001), tobacco has been introduced in Bangladesh since mid sixties of the last century into the crop fields and more widely after liberation in 1971 by the British American Tobacco Company in Teesta silt in Rangpur area (as cited in Akhter, 2011, p.1).

Mainly three varieties of tobacco -- Jati, Motihari and Virginia -- are grown in different districts of Bangladesh. The production of Virginia variety of tobacco during 2008-9 was 22,277 metric tons, while the other variety, such as Jati was 8,437 metric tons and Motihari was 9,270 metric tons. The latter two varieties are used for producing bidi - the local and cheaper version of cigarette.

Virginia is mostly grown in Kushtia, Rangpur, Jessore and Dhaka while Jati and Motihari are mostly grown in Rangpur and Bandarban. Other varieties such as Burley are also grown in limited quantities. In terms of land area covered by all three kinds of tobacco, Rangpur still remains biggest region with 40345 acres during 2008-09 followed by Kushtia with 22241 acres and Bandarban with 4678 acres of land (BBS, 2010). Besides tobacco is extending to Jessore, Jhenaidah, Nilphamari, Lalmonirhat and even in Manikganj and Tangail. In 1991-92, tobacco was cultivated in 9940 acres of land in Kushtia district but the figure rose to 17000 acres in 2001-02, 20595 acres in 2005-06 and further to 22241 acres in 2008-09 (BBS, 2008 & 2010). The rising trend of tobacco cultivation in the district is posing serious threat to the environment and health.

## **2.0 Review of Literature**

Very few studies have still been conducted on the issue. Nahar and Chowdhury (2002) have shown that farmers are engaged in tobacco cultivation being lured by the high price of tobacco and the cooperation given by the tobacco companies. The farmers considers tobacco as a profitable crop since they get loan and technical facilities from the tobacco companies and receive hard cash at a time from the sale of their produce. But much of their profit is attributed to the household labor of the tobacco farmers. In cost-benefit studies, they often do not consider the imputed value of free household labor.

In another study Naher and Effroymsen (2007) have shown that tobacco farmers suffer from Green Tobacco Sickness (GTS) for handling pesticides and raw tobacco leaves. They have also shown that tobacco farmers are being kept into debt bondage of tobacco companies from which they cannot be freed.

Ratan and Sujana (2002) have shown that tobacco cultivation is a major cause of deforestation in Bangladesh. They have also shown that the farmers cultivate tobacco being trapped by profitability mirage of tobacco but tobacco cultivation is not as profitable as it seems to be.

The previous studies do not provide enough information about the causes and consequences (health, environmental and others) of tobacco cultivation. Further studies are needed to elaborately investigate the causes and consequences of rising tobacco cultivation.

### 3.0 Objectives of the Study

The broad objective of this study is to investigate the causes and consequences of tobacco cultivation in Kushtia district. The specific objectives are:

- i) to investigate the extent of tobacco cultivation in the district.
- ii) to investigate the causes of rising tobacco cultivation in the district.
- iii) to investigate the socio-economic, environmental, health and other impacts of tobacco cultivation.
- iv) to investigate farmers awareness about the environmental and health impacts of tobacco cultivation and
- v) to investigate farmers' attitude toward giving up tobacco cultivation and suggest recommendations to emancipate the farmers from tobacco cultivation.

### 4.0 Methodology

The study is based on both primary and secondary data. The study area was Mirpur thana of Kushtia district where tobacco is cultivated extensively. Three villages namely Nayanpur, Paharpur and Chuniapara of Mirpur thana, were selected for the study. A total of 300 farmers- 100 from each of the mentioned villages- were selected randomly for data collection. The primary data were collected by two ways: through a random household survey and Focus Group Discussions (FDG). For the household survey a well structured questionnaire was administered to the sample of 300 farmers. Six FDGs- two from each village- were conducted with local tobacco farmers to collect the relevant information. The data collection period was 3rd quarter of 2012.

Secondary data were collected from the Bangladesh Bureau of Statistics, World Health Organization, Journal articles, reports and tobacco related websites. Simple statistics were used to analyze the data.

### 5.0 Findings

Table-1 summarizes the distribution of farmers according to farm size and contract growing. We observe that the majority (more than 50%) of the tobacco farmers are small followed by medium (20.33%) and marginal (18.67%). Only 10.33 % are large farmers. As mentioned earlier, tobacco cultivation has concentrated in the area by the patronization of certain tobacco companies has been proved by the fact that 74 % of the sample tobacco farmers have registered with the tobacco companies i.e they are contract growers.

Table-1: Distribution of the sample farmers according to farm size and contract growing

Category	Marginal (<0.5 acre)	Small (0.5-2.5 acre)	Medium (2.5-5 acre)	Large (> 5 acre)	Contract grower	Non- contract grower	Total
No. of farmers	56(18.67)	152(50.67)	61(20.33)	31(10.33)	222(74)	78(26)	300

N.B: The figures in the parentheses indicate percentage to the total.

Extent of Tobacco Cultivation in Kushtia District: Table-2 shows the extent of tobacco cultivation in Kushtia district and Bangladesh for the period 1998/99-2005/06. We see that there is an increasing trend of tobacco cultivation in the district. In 1998-99, area of land under tobacco cultivation was 14550 acres while in 2005-06, the figure rose to 20595 acres. Production of tobacco also increased significantly from 6720 metric tons in 1998-99 to 17505 metric tons in 2005-06. On the other hand, the area of land under tobacco cultivation in the whole country remained within 73535 to 79910 thousand acres (BBS, 2008). Table-3 shows the share of Kushtia district in total tobacco production and total area of land under tobacco cultivation during 1998/99-2005/06. Table-4 shows the percentage increase in the tobacco production and the area under tobacco cultivation both in Bangladesh and Kushtia district during the period 1998/99-2005/06.

We observe that the share of Kushtia district in country's total area of land under tobacco cultivation was 18.59 % in 1998/99 which rose to 26.27 % in 2005/06. The share of Kushtia district in the country's total tobacco production also increased drastically from 23.33 % in 1998/99 to 40.98% in 2005/06. During the period 1998/99-2005/06, the area under tobacco cultivation increased by 41.54 % in Kushtia district and only by 0.18 % in whole Bangladesh. Similarly, the increase in tobacco production for the same period was 160.49 % in Kushtia district and 48.32 % in Bangladesh. Therefore, the percentage increase of both tobacco production and the area under tobacco cultivation is higher in Kushtia district than in Bangladesh. These statistics indicate that farmers of this district prefer tobacco cultivation for some reasons.

Table-2: Extent of Tobacco Production in Kushtia District and Bangladesh.

Region	Year	1998/ 99	1999/ 00	2000/ 01	2001/ 02	2002/ 03	2003/ 04	2004/ 05	2005/ 06
Kushtia	Area(acres)	14550	16650	17000	19315	20425	21180	19290	20595
	Production (m.ton)	6720	7990	10270	11625	10375	12960	13985	17505
Bangladesh	Area(acres)	78240	79910	73870	75600	76110	75175	73535	78385
	Production (m.ton)	28795	35480	36755	38080	36840	38690	37955	42710

Source: Bangladesh Bureau of Statistics (BBS), 2008.

Table-3: Share of Kushtia district in country's total tobacco production and total area under tobacco cultivation, 1998/99-2005/06

Year	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006
Share in Area	18.59	20.83	23.01	25.54	26.83	28.17	26.23	26.27
Share in Production	23.33	22.51	27.94	30.52	28.16	33.49	36.84	40.98

Source: Calculated from Table-2.

Table-4: Percentage increase in tobacco production and area under tobacco cultivation in Kushtia district and Bangladesh, 1998/99-2005/06

Region	Percentage increase in area under tobacco Cultivation	Percentage increase in tobacco production
Kushtia	41.54	160.49
Bangladesh	0.18	48.32

Source: Calculated from Table- 2.

Reasons for Tobacco Cultivation: An inquiry was conducted to know why farmers of this district are extensively engaged in tobacco cultivation. The various reasons cited by the farmers are summarized in table-5 and figure-1. We observe that the majority farmers (36%) were engaged in tobacco cultivation seeing other farmers cultivating it. They were inspired by demonstration effect. The second highest number of farmers (30%) was engaged in tobacco cultivation because it has a guaranteed market and they can earn ready cash. In case of other competing crops, the farmers suffer from the uncertainty of not getting the proper price due to the lack of guaranteed market. However, in case of tobacco, the tobacco companies directly purchase the product from the registered farmers with a reasonable price. The non-registered farmers also can sell their product more or less at a handsome price.

The third highest number (29%) of farmers cited profitability as the reason for cultivating this crop. There is a mirage in the locality that tobacco is a profitable crop and many farmers are caught in this trap. Ancestral occupation was also an important reason for tobacco cultivation and 10.33 percent farmers cited this reason. 8.66% farmers told that they were inspired by the loan facilities of the tobacco companies. As mentioned earlier, out of 300 farmers the majority (208) were small and marginal. The poor framers have no easy access to institutional credit. By contrast, Tobacco Company's loan is easy to get and the companies provide the farmers with other facilities including the technical help to grow better tobacco. 7.33 % farmers informed that they had little option for cultivating other crops and only 5.0% farmers cited other reasons for cultivating tobacco.

Table-5: Distribution of the farmers according to the reasons for tobacco cultivation.

Reasons	No. of Farmers <sup>1</sup>	Percentage
Demonstration effect	108	36
Guaranteed market/Ready Cash	90	30
Profitable crop	87	29
Ancestral occupation	31	10.33
Company loan	26	8.66
Little option for other crops	22	7.33
Others	15	5.0

<sup>1</sup> the sum of the farmers may not be equal to total number of farmers due to multiple responses.

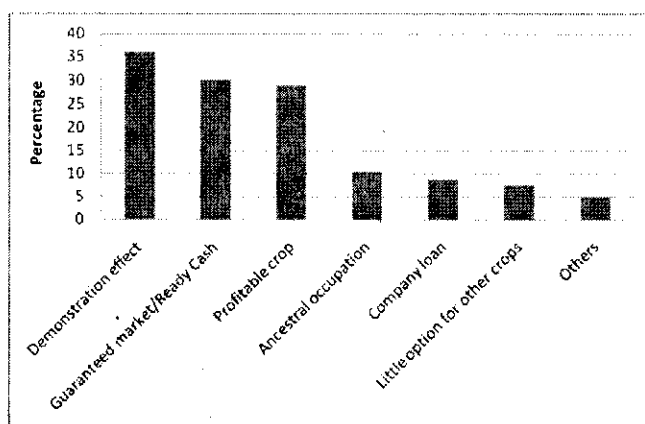


Figure 1: Distribution of farmers according to reasons for tobacco cultivation.

## **5.1 Consequences of Tobacco Cultivation**

### **5.1.1 Positive Impacts**

**Earnings of Hard Cash:** The farmers of the study area informed that tobacco is a profitable crop and it has a guaranteed market. They get hard cash at a time from the sale of their produce. In case of other crops they frequently suffer from the uncertainty about getting the real price due to market fluctuations. The tobacco companies purchase tobacco at a reasonable price which relieves them from incurring loss. Moreover, they do not have to face the problems associated with marketing their produce. They can sell the entire produce to the tobacco companies at a time and receive a handsome amount of hard cash.

**Employment Creation:** Poverty and unemployment are two common features of rural economy. The rural people have limited opportunities to be engaged in productive activities. Therefore, disguised unemployment, seasonal unemployment and under-employment are very common to the rural people. Extensive tobacco cultivation in the region has created enormous employment opportunities for the poor people especially for the women and children. Many people have bent their livelihood with tobacco. From the plantation to the curing, a large number of men and women are engaged as laborer. A large number of women and children work in the cigarette and bidi factor. They would otherwise have been unemployed or underemployed. In addition, many people are engaged in tobacco trading as middlemen. In a word, tobacco cultivation in this district has created a scope for the poor and marginal people including women and children to gain employment for several months.

### **5.1.2 Negative impacts**

**Impact on Environment:** Tobacco cultivation damages environment in a number of ways. Tobacco is a major cause of deforestation because forests are cleared to provide more land for tobacco production and wood for tobacco curing. Deforestation caused by tobacco contributes to soil erosion, flood, and green house effect and global warming.

In the study area, the extensive tobacco cultivation has destroyed the homestead forests. The old tobacco farmers of the area informed that previously there were many old trees in the region. After tobacco cultivation has concentrated in the region, homestead forests were cleared mainly to provide wood for tobacco curing. Deforestation has taken place to such extent that now farmers use straw and hay for tobacco curing. The farmers also informed that tobacco cultivation requires intensive use of



pesticides which, being washed away by rain water has contaminated water of neighboring ponds and canals. They can not use water of ponds and canals for bathing, washing cloths and other necessary purposes.

**Impact on Health:** The health hazards of tobacco cultivation in the study area beggar description. Every stage of tobacco production imposes a heavy toll on the health of the persons engaged in its production. Tobacco farmers and their family members including children and women and the laborers are exposed to chemical fertilizers and pesticides during plantation and growing, nicotine from green leafs during harvest and fume from kilns during curing. As a result, several diseases are very common to the tobacco farmers and their family members. All the farm families experienced one or more tobacco related diseases which is summarized in table-6 and figure-2.

The Majority of farm families suffer from cough, fatigue, headache, insomnia, breathing problem, chest pain, loss of appetite, leg pain and vomiting. Since all the farm families are attacked with one or more diseases they have to undergo treatment that curtails their income from tobacco.

Table-6: Distribution of farm families according to tobacco related diseases.

Problems reported	No. of families <sup>2</sup>	Percentage of families
Cough	260	86.66
Fatigue	225	75.00
Headache	225	75.00
Insomnia	217	72.33
Difficulties of breathing	165	55.00
Chest pain	150	50.00
Vomiting	144	48.00
Loss of appetite	122	46.66
Leg pain	112	37.33
Jaundice	90	30.00
Anemia	83	27.66
Ulcer	72	24.00

<sup>2</sup> Multiple responses considered.

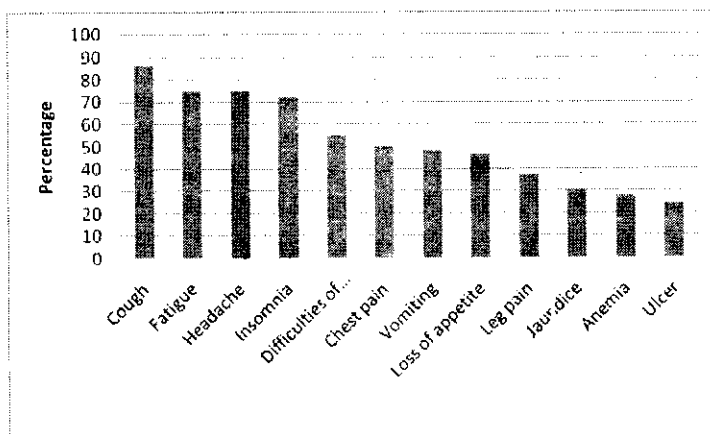


Figure 2: Distribution of farm families according to tobacco related diseases.

Impact on Children's Education: Since tobacco cultivation requires intensive labor use, the children of the majority farm families have to be involved in tobacco related works. The majority of the farmers informed that they involve their children in tobacco related work during tobacco season. Especially, after harvesting; the children have to render labor for tobacco up to next 60 days. Consequently, they have to drop from school and their study at home is also hampered. Table-7 shows that children of 90.66. % families were involved in tobacco related works. Children of more than 50% families dropped from school to help their parents in tobacco related works and in 68 % families children's study at home was hampered. This education costs can not be evaluated in terms of money but it can be realized what a great damage tobacco is causing to these children every year.

Table-7: Distribution of farm families according to children's involvement in tobacco related works and its impact on their education.

Category	No. of families <sup>3</sup>	Percentage
Children involve in tobacco related works	272	90.66
Children drop from school to help their families	153	51.00
Children's study at home is hampered	204	68.00

<sup>3</sup> Multiple responses considered

**Impact on Cow Rearing, Poultry and Milk Production:** Previously woods were used for tobacco curing. But tobacco cultivation in the district for many years has damaged homestead forest. Now tobacco is cured using huge amount of straw and hey which is the feed for cow. Due to extensive tobacco cultivation the price of cow feed (straw and hey) has increased enormously leading to the sharp fall in the number of cows in the region. Consequently, the meat and milk production have also decreased sharply causing a threat to the nutritional status of the people especially of the babies. The farmers of the study area informed that the total number of cows in the region had reduced to about fifty percent. Since women remain occupied with tobacco, domestic poultry production has also reduced to a great extent.

**Impact on Domestic Fuel:** Tobacco cultivation has also caused fuel crisis in the area by absorbing huge amount of fire wood and straw which was previously used for cooking. The rural people previously used cow dung as cooking fuel after drying them in sun. Since cow rearing in the region has reduced, cow dung has also become scarce. The scarcity of cow dung has intensified fuel crisis. Consequently, the farm families use tobacco waste as cooking fuel which is hazardous for health and women mainly pay the price in this case.

Cow dung was also a source of income for the rural poorer households. They used to collect the cow dung from the open field and after processing sold it to the other households. Therefore, scarcity of cow dung has caused loss of income for the poorer people.

**Other Impacts:** During tobacco season the farmers and their wives have to remain so busy with tobacco that they have little time to take care of their children properly. Moreover, in the farm families the husband and wife get little time for each other. Consequently, they have lost their normal family life. The majority of the farmers informed that tobacco had destroyed their family happiness.

## **5.2 Farmers' Awareness about Environmental and Health Hazards of Tobacco**

Since the majority of the farmers of this area are engaged in tobacco cultivation, it is very important to know whether they are aware of the environmental and health impacts of tobacco. With this end in view an investigation was made the result of which is given in table-8. It is interesting to note that the majority of the farmers are aware of the environmental and health hazards of tobacco. Out of 300 farmers, 192

(64%) know that tobacco is hazardous for environment and 160 (about 54%) know that tobacco is hazardous for health.

Table-8: Farmers awareness about environmental and health hazards of tobacco cultivation

Aware	No. of farmers <sup>4</sup>	percentage
Environmental hazards	192	64.00
Health hazards	160	53.33

<sup>4</sup> Multiple responses considered.

### 5.3 Attitude of the Farmers toward Giving up Tobacco Cultivation

An investigation was made to know whether the farmers want to continue tobacco production or quit it. It is a good sign that the majority of the farmers are willing to give up tobacco cultivation. Out of 300 farmers, 194 (about 65%) farmers are willing to give up tobacco cultivation and 106 (above 35 %) farmers are willing to continue its cultivation (see table-9). An inquiry was also made to know why they want or do not want to give up tobacco cultivation. The result is contained in table-10, table-11 and figure-3 and figure -4.

Table-9: Farmers' attitude toward giving up tobacco cultivation.

Total No. of farmers	No. of farmers want to quit tobacco cultivation	No. of farmers do not want to quit tobacco cultivation
300	194 (64.67 %)	106 (35.33%)

Table-10: Reasons for wanting to give up tobacco cultivation

Reasons	No. of farmers <sup>5</sup>	Percentage
Excessive labor use	92	47.42
Hazardous for health	77	39.69
High production cost	35	18.04
Hampers children's education	32	10.66
Comparatively Low Profit	25	12.88
Others	18	09.27

<sup>5</sup>Multiple responses considered

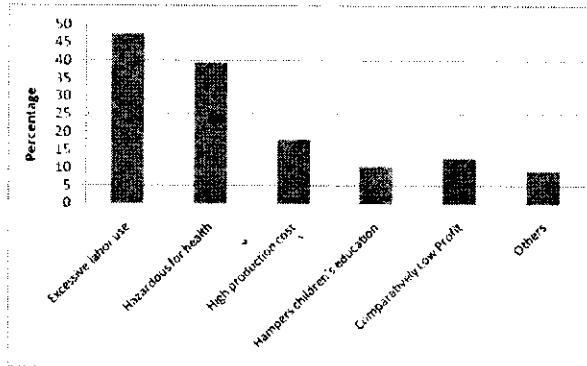


Figure 3: Reasons for wanting to give up tobacco cultivation

We observe that the majority farmers (47.42 %) want to quit tobacco cultivation because it needs intensive labor employment. Tobacco leaves very limited time for them to rest and take meal timely. The next highest number of farmers (39.69%) wants to quit tobacco cultivation because it is hazardous for health. This opinion has conformity with their awareness about health hazards of tobacco cultivation. Above 18 percent farmers want to quit tobacco cultivation because it entails high costs, about 13 percent want to quit because they have realized that tobacco is not as profitable as it seems to be, more than 10 percent farmers want to quit because it hampers children's education, and above 9 percent farmers cited other reasons for wanting to give up tobacco cultivation (see table 10 and figure 3).

Table-11: Reasons for not wanting to give up tobacco cultivation

Table-11 and Figure-4 show that out of 106 farmers, the majority (about

Reasons	No. of farmers <sup>6</sup>	Percentage
Ready Cash	62	58.49
Profitability	54	50.94
Cooperation of Tobacco Company (TC)	30	28.30
Ancestral occupation	22	20.75

<sup>6</sup> Multiple responses considered

58.50 %) do not want to give up tobacco cultivation because it earns ready cash followed by about 51 % who do not want to quit because it is a profitable crop. Tobacco Company's cooperation accounts for 28.30 percent farmers' and ancestral occupation accounts for 20.75 percent farmers' attitude towards not giving up tobacco cultivation.

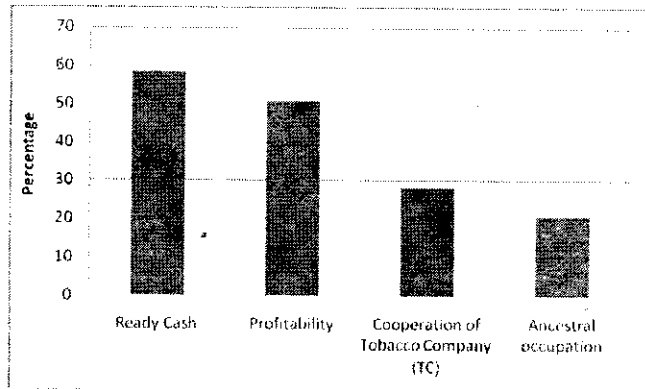


Figure 4: Reasons for not wanting to give up tobacco cultivation

## 6.0 Conclusion and Recommendations

Although tobacco is a profitable crop, its negative impacts far outweigh the positive impacts. Extensive tobacco cultivation in the district has given rise to socio-economic, environmental and health related problems which include deforestation, water and air pollution, diseases, fuel crisis, reduction of cow rearing, meat and milk crisis, hampering of children's education and loss of normal family life.

Bangladesh is an over-populated country. On the other hand, more land is being used for tobacco cultivation every year. If this trend continues, there may be an acute food shortage in the district and it may also affect the food security of the whole country. The rising trend of tobacco cultivation in the district is an alarming message for us. Therefore, cultivation of this environment- unfriendly crop should be reined in as soon as possible. It is hopeful that the majority of the farmers are aware of the environmental and health hazards of tobacco and they want to quit it. Appropriate measures should be undertaken by the government and NGOs to divert the farmers to the cultivation of other beneficial crops. In this context, the following recommendations have been suggested:

- i) The government should, first of all, undertake a strong motivational program for tobacco farmers to divert them to the cultivation of other crops. The government has to make the farmers realize that tobacco is no longer a profitable crop if free household labor and the negative impacts (health costs, environmental cost and other costs) are properly taken into consideration.
- ii) The government has to ensure proper market for other crops by various measures so that the farmers get real price for their

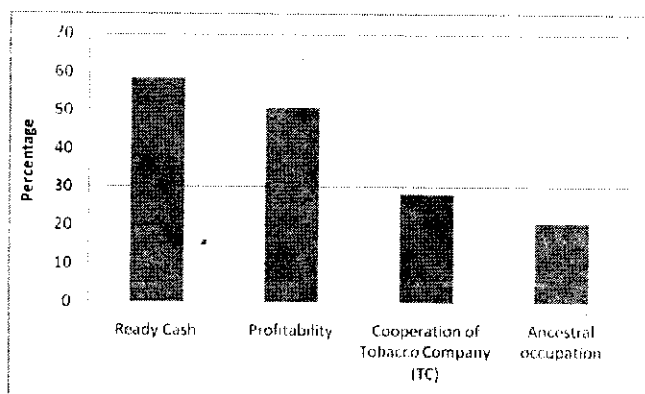


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- ii) The government has to ensure proper market for other crops by various measures so that the farmers get real price for their

produce. The government should ensure minimum price for the output, adopt effective procurement system and other necessary measures as the situation demands.

- iii) In order to divert the framers to the cultivation of other crops, the government has to ensure necessary loan facilities for the poor farmers through the government commercial banks and provide all kinds of technical cooperation through agricultural extension department. The government has to ensure that the farmers have easy access to quality inputs such as seeds, fertilizer and pesticides.
- iv) The demand side measures must also be integrated with the supply side measures to get long lasting result. The government has to reduce the demand for tobacco by imposing higher tax. The government should not hesitate to impose higher tax on this harmful product.
- v) At present, the NGOs are playing significant role in the development of Bangladesh. Several NGOs are engaged in anti-tobacco movement and augmenting sustainable development. Their action has to be broadened and intensified. It would be very difficult for the government alone to extricate the farmers from tobacco trap. The government should lend full cooperation to the NGOs to perform their activities properly.

We expect that the proper and sound application of these recommendations would divert the farmers from tobacco cultivation to the cultivation of alternative crops. But any isolated and piccemeal action will not bring significant result.



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