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# Tobacco Farming and Illness Induced Poverty in Pakistan

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## ABSTRACT

*Tobacco has been projected for its economic prosperity in Pakistan and many other developing countries while the opportunity cost of domestic labor, health issues and associated health cost related with tobacco farming are often overlooked. Various health conditions associated with tobacco farming result in catastrophic health expenditures which not only increase the chances of poverty head counts but also deepens it further. Taking into account the opportunity cost of domestic labor and health cost associated with tobacco induced illnesses obscure the tobacco prosperity rhetoric. This study examined effect of incremental health cost associated with tobacco farming on poverty head counts and severity. Using survey data from the tobacco producing districts in Khyber Pakhtunkhwa, Pakistan, this study found that tobacco farmers experienced higher proportion of sever health hazards and illnesses like CVD and respiratory issues. The severe nature of ailments caused them higher share of out of pocket expenditures as compared to non-tobacco farmers and general population. Increase in health expenditures not only increased their poverty head counts by four and half percent but also severity of poverty worsened further by 8 percentage points using the Cost of Basic Needs (CBN) approach for measuring poverty. This study concludes that it is not only tobacco consumption associated with various health conditions but also tobacco farming. It is recommended that health cost associated with tobacco farming be considered both in setting up of minimum indicative prices for tobacco and consideration of health cost can be used as a tool against prosperity rhetoric which is used to block tobacco control policy.*

**Keywords**
Tobacco, Health cost, Illness, Poverty, policy
**JEL Classification**
H51, I30

## 1. Introduction

Tobacco industry has been promoting tobacco as a panacea for the economic distress of developing countries (Campaign for Tobacco Free Kids, 2001). Country after country in developing world has been succumbing to this projection and viewed tobacco as panacea for alleviating poverty, unemployment and balance of payment problem (Tomson, et. al., 2009; & Barraclough & Morrow, 2010). This tendency has led to cultivation of tobacco on 10.5 million acre of land in almost 124 countries globally, mostly in the Lower Middle Income Countries (LMICs) like China, the leading producer followed by Brazil and India (FAOSTAT, 2013). Tobacco employs thousands of farmers and agricultural workers on country basis while total employment reaches to over 33 million labor in growing and initial processing of tobacco while including other tobacco related activities the employment magnitude rises to over 100 million. (ILO, 2014). Many of Asian countries are hard target of the tobacco industry to increase their profits due to favorable climatic conditions and cheap labor (Van Minh, et. al., 2009).

Tobacco occupies an important position in terms of profitability, revenue and employment in Pakistan also. Tobacco was introduced in the Indian sub-continent by the Portuguese in the 16th century but its regular cultivation did not begin until the first decades of the 17th century (Bhatti, 1992). Production of tobacco in Pakistan was first tried in Sindh, then in north-west plains of Punjab and finally in parts of the then North West Frontier Province (NWFP) now called Khyber Pakhtunkhwa. Tobacco history in Khyber Pakhtunkhwa can be traced back to 1912 when tobacco was cultivated for experimental purposes at the agricultural research station Tarnab in Peshawar (Muhammad, 1975). Due to its economic significance, Pakistan Tobacco Board (PTB) was established in 1968 with the purpose of promoting cultivation, manufacturing of cigarettes, exports of tobacco and tobacco made products, marketing of tobacco products and fixation of tobacco prices along with other related information. To facilitate the growers of tobacco PTB has been carrying out field experiments at their research stations to impart the latest knowledge regarding tobacco technologies for better yields and income. Before 1968 tobacco produced in the country had poor quality and quality tobacco was mostly imported. Establishment of PTB enabled the country to improve tobacco quality and become self-sufficient in tobacco production. The efforts of PTB have also enabled the country to achieve tobacco yield at par with the developed countries (Ali, et al., 2015). The economic significance of tobacco crop in Pakistan economy can be inferred from the workforce of 350,000, it employs, which generates 300 billion rupees of revenue and livelihoods for 1.2 million people annually. There are almost 75,000 tobacco growers producing about 80 to 85 million kilograms of Flue-Cured Virginia (FCV) tobacco each year. The production of FCV is mostly concentrated in the province of Khyber Pakhtunkhwa province in Pakistan. The province has a population of 45000 tobacco farmers cultivating 25,500 hectares of land and producing 75 million kg of tobacco mostly used in cigarettes. Tobacco contributed

nearly 89 billion rupees to national treasury in the form of various taxes in 2013-14 (PTB, 2018).

Governments of tobacco producing countries see tobacco as source of tax revenues, employment creation and earning income for deprived segment of their population while overlooking health of labor and productivity loss due to premature mortality (WHO, 2004; & Alderete, et. al., 2020).

Though, tobacco related revenue and employment holds ground however, its consumption has established relation with poor health conditions and is considered as a leading risk factor of six of the eight preventable causes of morbidity and pre-mature mortality (Barraclough & Morrow, 2010). Moreover, perils of tobacco are not limited to the smokers only, but creates economic distress for the 8 million tobacco associated death victims' families and 1436 billion USD cost to the global economy in form of health seeking cost and loss in productivity (Anh, et al., 2016 & Goodchild, et al., 2018). Along with consumption related health catastrophe, tobacco cultivation also exposes farmers and workers to poor working conditions including exposure to chemicals, dermal absorption of nicotine, high temperature in tobacco barns, and tobacco dust during the process of tobacco curing (Ballard et. al., 1995 &Arcury et. al., 2003). Moreover, tobacco workers are prone to dermal and respiratory absorption of poisonous substances causing health damages like poisoning, skin & eye irritations, respiratory, kidney problems, and neuropsychiatric issues due to pesticide application for plant protection purposes (Cox, 1992; Cox, 1995, Lonsway et. al., 1997; Salvi et. al., 2003 & Ngajilo, et. al., 2018). These health issues not only raise their upfront treatment cost, but also deteriorate long term health outcomes of farming communities. In addition, seeking treatments for various health conditions causes a drain on the financial resources of those who could hardly manage above the poverty line. In addition to human and economic costs, tobacco diverts useful resources from food and other essential needs along with inverse relation between income and tobacco consumption, which exacerbates poverty situation in poor countries (WHO, 2011; Parera et al., 2017). Many studies have maintained that tobacco is associated with vicious circle of poverty through different channels like poor health, loss in productivity, environmental hazards, diversion of resources from essentials of food security and child labor (WHO, 2004; Kaying, et. al., 2005, Adeioetomo, et. al., 2005, & WHO, 2008).

The current study is aimed to quantify difference in health cost of tobacco and non-tobacco farmers and associated impact on deepening of poverty in both groups. This study hypothesized that tobacco farmers are at higher risk of developing poor health conditions and incur higher expenditures on seeking treatments. Using survey data from major tobacco producing districts of Khyber Pakhtunkhwa, Pakistan results of this study indicate that health costs produce more adverse effects on tobacco farmers compared to non-tobacco farmers. Tobacco farming poverty head counts and poverty depth registered higher magnitudes due to host of health issues. Rest of the work follows theoretical framework in section 2, data and methodology in section 3 while results and

discussion are presented in section 4 and 5 respectively. Section 6 concludes the paper with conclusion and recommendations.

## 2. Theoretical Framework

Catastrophic illness though affects relatively small proportion of population, yet it accounts for a substantial share of out of pocket expenditures of poor households. Expenditure for medical care becomes catastrophic when it endangers the standard of living of a family as family is a basic spending unit and consumption of each member is interdependent. Health expenditures divert resources from other basic chores of life necessary for a better standard of living. Working conditions have strong implication for health and the effects of poor working conditions on health are accumulative. Poor health and poverty have a two-way relationship. Poverty increases the risk of illness and illness in turn increases the chances to fall below the poverty line by forgoing the earnings and out of pocket expenditures (Majra & Gur, 2009).These health expenditures cause drain on farmers' resources and decline their ability of acquiring other goods and services of urgent needs.

## 3. Data and Methodology

This study is based on cross sectional data collected from three major tobacco producing districts of Swabi, Mardan and Charsadda in Khyber Pakhtunkhwa, province of Pakistan. Taking into account the financial and time constraints, we selected a sample of 330 farming households. We used 318 farmers' data for analysis as 12 farmers reported incomplete data. Among 318 farmers 201 were tobacco growers whereas, rest of 117 did not grow tobacco crop and termed as non-tobacco group. We used stratified multistage sampling technique for the selection of sample from the respective districts. In the first stage we selected Khyber Pakhtunkhwa province on the basis of higher share of tobacco production. In the subsequent stage we selected three districts including Swabi, Mardan, and Charsadda purposively on the basis of their share in total production. In third stage we selected one tehsil each in the Charsadda and Mardani.e Tangi and Takhtbhai respectively, while two tehsils Chota Lahore and Razzar in the Swabi district on the basis of their share in total production. Among the districts sample was distributed proportionately on the basis of tobacco share in total production in each district. The districts of Charsadda and Mardan share 15 and 25 percent in total tobacco production (Nasrullah, et. al., 2019). The sub samples collected from the Swabi, Mardan and Charsadda districts had 190, 90, and 50 farmers, respectively. Data were solicited by using a well-structured and pre-tested questionnaire and conducting face to face personal interview with the farmers at their farms/ residences. After collection of data from field we transferred the data into excel sheet and used STATA 12 for analysis of the data. We carried out descriptive as well as econometric analysis to test our hypothesis.

### 3.1Occupational hazards

We termed occupational hazard as condition experienced by farmers while performing farming chores and required medical intervention to get relief. We classified the hazards into four groups as sun stroke, chemical exposure, cut/injury and allergy/skin rashes. We added the number of times farmers experienced these conditions and calculated the average score for all these conditions in both groups of farmers using t-test analysis.

$$haz_{ij} = \frac{\sum fhaz_{ij}}{\sum hh_j} \quad \ldots\ldots\ldots\ldots (1)$$

where

$haz_{ij}\ stands\ for\ average\ score\ of\ hazard_i\ in\ group_j farmers$
$\sum fhaz_{ij}\ Stands\ for\ summation\ of\ haz_i in\ group_j farmers$
$\sum hh_j\ stands\ for\ total\ number\ of\ households\ in\ group_j$

### 3.2 Health conditions of households

We measured the health condition of households by the inverse of disease prevalence. We examined the households for diseases like high blood pressure, diabetes, heart diseases, chest & respiratory issues and cancer. We aggregated the number of cases for these diseases and compared the mean scores of all individual cases in both group of farmers.

$$Disease_{ij} = \frac{\sum fDisease_{ij}}{\sum hh_j} \quad \ldots\ldots\ldots (2)$$

Where

$Disease_{ij}\ stands\ for\ average\ score\ of\ Disease_i in\ group_j,$
$i\ for\ high\ blood\ pressure, diabets, Heart\ issues, Chest\ and\ respiratory\ issues\ and\ cancer$
$j\ stands\ for\ farmers\ group\ i.e\ tobacco\ farmers\ and\ non-tobacco\ farmers$
$\sum fDisease_{ij}\ Stands\ for\ summation\ of\ cases\ of\ Diseases_i in\ group_j$
$\sum hh_j\ Stands\ for\ total\ number\ of\ households\ in\ group_j$

### 3.3 Health cost

We estimated health cost of farmers by aggregating their expenditure on seeking medical interventions. We aggregated the expenditure incurred on transportation used to medical facility, doctor fee and expenditure on medicine and other medical equipment's and procedures on the annual basis. We classified health costs into three categories i.e. expenditure on treatment of occupational hazards experienced during farming chores, minor and frequently occurring issues like flu, fever, cuts, allergy and major long term health issues including blood pressure, diabetes, cardiovascular diseases, chest & respiratory issues and cancers of various types. Estimation of health cost is given below

$$hazC_j = \sum Chaz_{ij} \ldots\ldots\ldots (4)$$
$$SRDiseasesC_j = \sum CSRDisease_{ij} \ldots\ldots (5)$$
$$LRDiseaseC_j = \sum CLRDisease_{ij} \ldots\ldots (6)$$
$$THC_j = hazC_j + SRDiseasesC_j + LRDiseaseC_j \ldots\ldots\ldots (7)$$

Where

$hazC_j$ *stands for total hazards cost incurred on treatment of all hazards of households*
$SRDiseasesC_j$ *Stands for total cost incurred on treatment of minor health issues of household*
$LRDiseaseC_j$ *stands for expenditures incurred on treatment of major health issues of household*
$THC_j$ *stands for total health cost of household*

We also compared the means of household's health costs incurred on the above-mentioned conditions of both the farming groups using t-test analysis.

### 3.4 Estimation of poverty

To estimate the poverty different measures have been in vogue like arbitrary benchmark, Food Energy Intake (FEI) and Cost of Basic Needs (CBN) in different time periods. Some pioneering works on poverty used arbitrary benchmark approach using a fixed income or expenditure required for household's basic needs fulfillment. However, by mid 1970s the focus of researchers shifted to food energy intake to calculate food calorie intake as measure of poverty. With the passage of time embedding non-food essential needs into caloric intake provided a more comprehensive measure of poverty used by different researchers like Malik (1988) Jaffri and Khattak (1995) Quraishi and Arif (2001) and Bashir & Idrees (2018) in the context of Pakistan. We took cost of basic needs approach and determined the threshold level of income 43,822 rupees per capita, which can cover the cost of basic food and non-food items necessary.

We found the head count poverty in pre health expenditure and post health expenditure for both groups of farmers to see the effect of health cost on poverty ratio. We also estimated deviation from poverty line in pre and post health expenditure scenarios for both groups to show the severity condition in both groups.

We compared the deviations in both groups using t-test analysis.

## 4. Results

### 4.1 Descriptive analysis

Socio-economic descriptive statistics show that households' heads fall in the same age category irrespective of farmer type. However, poor households' heads were older. Regarding family size this study data show that tobacco farmers have larger families in general and in poor farming group in particular. Likewise, households with less numbers

of earning members are more likely to be poor whereas, difference in number of earners for overall and poor farmers is 0.31 and 0.60, respectively. Similarly, tobacco farmers have large farm sizes in both categories, however poor farmers have small farms as compared to overall category. Likewise, poor households are living in congested houses where family size to room ratio is higher reflecting the typical developing countries characteristics (Todaro & Smith, 2014). Moreover, farmers have non-significant difference in per capita income. Contrary to the difference in per capita income, tobacco farmers incur more health expenditures and spend higher share of their income on health issues than non-tobacco farmers. Mean values and their differences for various socio-economic characteristics are given in Table 1.

**Table 1 Socio-economic characteristics of farmers**

| **Variable** | **Farming groups** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Over all | | | | Poor farmers | | | |
| | Tobacco | Non-tobacco | Diff | Sig | Tob | Non-tob | Diff | Sig |
| **Age (years)** | 42.31 | 42.73 | -0.48 | 0.29<0.70 | 46.12 | 47.94 | 1.82* | .64 >.52 |
| **Education (years)** | 8.56 | 7.50 | 1.06* | 2.72>0.007 | 7.88 | 8.07 | 0.19 | .36<.71 |
| **Household size (No.)** | 13.54 | 12.40 | 1.14* | 1.19>0.24 | 14.04 | 13.60 | 0.44 | .28<.78 |
| **Earners (No.)** | 3.19 | 2.88 | 0.31* | 1.59>0.11 | 3.20 | 2.6 | 0.60* | 1.65>.10 |
| **Farm size (jerib)** | 13.75 | 10.02 | 3.73* | 3.40>0.001 | 10.95 | 8.01 | 2.94* | 2.26>.03 |
| **No of rooms** | 4.50 | 4.32 | 1.18* | 0.58>0.56 | 3.83 | 3.48 | 0.35 | .90> .37 |
| **Per capita Income (Rs.)** | 104747 | 100323 | 4421 | .31<.75 | 33978 | 27041 | 6937* | 2.54>.01 |
| **Per capita Health expenditure (Rs.)** | 6383 | 4296 | 2087* | 1.80>.07 | 6985 | 3109 | 3876* | 1.18>.24 |

Source: Field survey, 2018-19

### 4.2 Hazards Exposure

Farming is a hazardous occupation on overall basis, but some crops pose more exposure to various types of hazards. This study' survey data show that tobacco farmers experienced significantly higher exposure to sunstroke as compared to non-tobacco farmers. Similarly, pesticides and cut/injury adverse effects and exposure are more than twice as those of non-tobacco farmers, while allergy difference was found non-significant. Findings of this study illustrate that tobacco farmers are more likely to develop poor health outcomes. Hazards experience and differences are presented in Table 2.

**Table 2 Hazards scores of tobacco and non-tobacco farmers**

| Hazard type | Average score by farmer type | | Difference | Significance |
|---|---|---|---|---|
| | **Tobacco** | **Non-tobacco** | | |
| **Sun stroke** | 1.29 (0.16) | 0.08 (0.03) | 1.21* (0.21) | 5.84 >0.00 |
| **Pesticides affect** | 0.25 (0.07) | 0.10 (0.04) | 0.15* (0.09) | 1.63 >0.04 |
| **Cuts/injury** | 0.07 (0.03) | 0.03 (0.02) | 0.04* (0.04) | 1.75 >0.45 |
| **Allergy** | 0.37 (0.16) | 0.36 (0.15) | 0.01 (0.24) | 0.05 < 0.96 |

Source: Field survey, 2018-19

### 4.3 Hazards' intensity perception

Farmers reported different poor health conditions and ranked their experience. Average rank scores for the mentioned conditions were significantly high in tobacco farmers. Tobacco farmers reported almost 50 percent more fatigue, heart burn (salivation) and perspiration as compared to non-tobacco farmers, whereas average scores for vomiting and poor appetite was more than twice. However, experiencing of skin rashes was ranked same in both groups of farmers. Average rank scores and their differences are presented in Table 3.

**Table 3Hazards ranking scores**

| Hazard type | Farmer type | | Difference | Significance |
|---|---|---|---|---|
| | **Tobacco** | **Non-tobacco** | | |
| **Fatigue** | 3.58 (0.07) | 2.33 (0.09) | 1.25* (0.11) | 10.91>0.00 |
| **Vomiting** | 2.78 (0.08) | 1.34 (0.11) | 1.44* (0.14) | 10.55>0.00 |
| **Perspiration** | 3.73 (0.07) | 2.34 (0.08) | 1.39* (0.11) | 12.33>0.00 |
| **Heart burn (salivation)** | 2.75 (0.08) | 1.49 (0.11) | 1.26* (0.13) | 9.54>0.00 |
| **Chill** | 2.17 (0.08) | 1.63 (0.14) | 0.54* (0.14) | 3.89>0.00 |
| **Poor appetite** | 2.37 (0.07) | 0.91 (0.09) | 1.46* (0.12) | 12.15 > 0.00 |
| **Skin rashes** | 2.37 (0.08) | 2.34 (0.10) | 0.03 (0.13) | 0.22<0.81 |

Source: Field survey, 2018-19

### 4.4 Health condition of households

Tobacco farmers are more likely to develop sever health conditions in comparison with their non-tobacco counterparts**.** These conditions include high blood pressure, diabetes, cardio-vascular diseases (CVD), illness of chest and respiratory system, and cancers of various types. This study found that high blood pressure has almost same prevalence irrespective of farming group. However, diabetes, CVD, and respiratory

issues have higher prevalence in tobacco farmers. Findings from this study's survey show that almost every third of tobacco farming household has a diabetes and CVD patient, while these conditions prevail in every fifth of non- tobacco farmers. Similarly, respiratory issues also, have higher prevalence in the tobacco producing districts as every second of tobacco and every third of non-tobacco farming households reported the problem. Average cases of these mentioned conditions and differences in means of the groups are presented in Table 4.

**Table 4 Prevalence of various health conditions across the farming groups**

| Illness type | Farmer type | | Difference | Significance |
|---|---|---|---|---|
| | **Tobacco** | **Non-tobacco** | | |
| **High blood pressure** | 0.94 (0.07) | 0.90 (0.10) | 0.04 (0.12) | 0.36<0.76 |
| **Diabetes** | 0.33 (0.04) | 0.21 (0.04) | 0.12 * (0.06) | 1.97>0.05 |
| **CVD** | 0.28 (0.04) | 0.20 (0.05) | 0.08* (0.06) | 1.31>0.19 |
| **Chest & respiratory** | 0.45 (0.06) | 0.35 (0.07) | 0.10* (0.09) | 1.05>0.29 |
| **Cancer** | 0. 03 (0.01) | 0.02 (0.01) | 0.01* (0.02) | 0.66>0.50 |

Source: Field survey, 2018-19

### 4.5 Health expenditure

Health expenditures depend on frequency and nature of ailments. Tobacco farmers face more working hazards and incur more expenditure on treatment in general, but poor tobacco farming households are more prone to hazardous environment and incur more expenditure in particular. Similarly, for all other categories of health care expenditure tobacco farmers spend significantly more money on seeking health. On overall basis, tobacco households spent 30,724 rupees more than non-tobacco farmers. However, the difference between the two groups but poor farmers was higher by 50 percent. Table 5 presents the average values and differences of means for tobacco and non-tobacco overall and poor households.

**Table 5 Health expenditures of various types of health condition across the farming groups**

| Treatment nature | Group status | Farmer type | | Difference | Significance |
|---|---|---|---|---|---|
| | | **Tobacco** | **Non-tobacco** | | |
| **Hazards (Rs.)** | overall | 1,915 (367) | 256 (85) | 1,659* (490) | 3.38>0.00 |
| | Poor | 2,518 (1,082) | 248 (105) | 2,270* (1,280) | 1.77>0.07 |
| **Minor diseases (Rs.)** | overall | 32,746 (3,132) | 23,889 (2,257) | 8,857* (4,484) | 1.98>0.05 |
| | Poor | 29,880 (3,102) | 23,083 (4,177) | 6,797* (5,091) | 1.33 >0.18 |
| **Sever diseases (Rs.)** | overall | 36,173 (8,079) | 15,966 (3,866) | 20,207* (11,091) | 1.82 > 0.07 |
| | Poor | 48,520 (26,126) | 12,083 (3,673) | 36,437* (30,497) | 1.18 > 0.24 |

| | | | | | |
|---|---|---|---|---|---|
| **Overall diseases(Rs.)** | overall | 70,834 (9,258) | 40,110 (5,039) | 30,724* (12,839) | 2.39 > 0.02 |
| | Poor | 80,918 (26,900) | 35,414 (5,267) | 45,503* (32,067) | 1.42 >0.16 |

Source: Field survey, 2018-19

### 4.6 Poor health and poverty head counts

The table below shows the effect of health severity on poverty head counts. Though tobacco farmers have low head counts than non-tobacco farmers, but poor health conditions affect them adversely as compared to non-tobacco farmers. Before incurring health expenditures,19.90 percent of the tobacco farmers were unable to have income sufficient to meet their basic needs whereas, the proportion for non-tobacco group was 29.06 percent. However, incurring health expenditures, the proportion of tobacco poor rose by 4.48 percent while that of non-tobacco farmers rose by 0.85 percent. Without incurring health expenditures 23.89 percent of farmers fall below poverty line, while health cost increases incidence of falling below poverty line to 26.42 percent on overall basis. Proportion of headcounts and the impact of health cost on poverty head-counts are presented in Table 6.

**Table 6 Poverty head counts with and without health expenditures**

| Group | Poverty head counts | | |
|---|---|---|---|
| | Pre health expenditure (%) | Post health expenditure (%) | Change (%) |
| **Tobacco farmers** | 40 (19.90) | 49 (24.38) | 4.48 |
| **Non-tobacco farmers** | 34 (29.06) | 35 (29.91) | 0.85 |
| **Total** | 74 (23.89) | 84 (26.42) | 2.53 |

Source: Field survey, 2018-19

### 4.7 Health expenditure share

Farmers face different health issues of short term and long-term nature. They use both public health facilities and private health care providers' services. Tobacco farmers needed more health care services due to associated conditions. They spent on average 8.56 percent of their total income on acquiring health care services, while non-tobacco farmers spent around 7 percent. Both groups have significant difference of 1.51 in health spending which reflect the severity of health outcomes of tobacco farmer. However, health care expenditures affect tobacco and non-tobacco farmers differently and causing higher proportion of tobacco farmers to fall below the poverty line in terms of fulfilling their basic needs. Among the poor farming groups tobacco farmers spent almost 3.90 percent higher on health-related conditions compared to non-tobacco farmers. Shares and their differences for tobacco and non-tobacco farmers are presented in Table 7.

**Table 7 Share of health expenditures in farming groups**

| Scenario | Share of health expenditure | | | |
|---|---|---|---|---|
| | Tobacco farmer (SE) | Non-tobacco (SE) | Difference (SE) | Significance |
| **Overall farming groups** | 8.56 (1.03) | 7.05 (0.08) | 1.51* (1.48) | 1.02>0.31 |
| **Poor farmers groups** | 17.52 (4.74) | 13.62 (2.14) | 3.90* (4.67) | 0.83>0.40 |

Source: Field survey, 2018-19

### 4.8 Illness effect on shrinking of income of poor farmers

As shown above tobacco farmers face more health adversities than non-tobacco farmers. They incurred more expenditures, which left them with less income to meet other basic needs. Illness caused their income to further fall by over 20.56 and 11.50 percent, for tobacco and non-tobacco farmers, respectively. Illness caused a shrink in income by 6,986 rupees on average basis for tobacco farmers while non-tobacco farmers face shrinkage of 3,109 rupee on per capita basis. Overall, farmers experienced shrinkage of 5,371 rupees per capita due to poor health conditions and incurring health expenditure. Average values of pre and post health expenditures and their differences are presented in Table 8.

**Table 8Income shrinkage of tobacco and non-tobacco farmers**

| Farming group | Per capita income | | | |
|---|---|---|---|---|
| | Pre expenditure (Rs.) | Post expenditure (Rs.) | Shrinkage (Rs.) (%) | Significance |
| **Tobacco** | 33,978 (1,867) | 26,992 (2,316) | 6,986* (20.56) | 1.85>0.69 |
| **Non-tobacco** | 27,041 (1,888) | 23,931 (1,889) | 3,109* (11.50) | 1.16>0.25 |
| **Overall** | 31,088 (1,388) | 25,717 (1,564) | 5,371* (17.28) | 2.57>0.01 |

Source: Field survey, 2018-19

### 4.9 Poor health and severity of Poverty

Poor health not only affects earning capability but also diverts resources from acquiring goods and services necessary for sustenance of life. Tobacco farming is associated with frequent exposure to severe health conditions which causes rise in health expenditure. The incurring of health expenditures intensifies the severity of poverty with higher proportion in tobacco farmers as compared to non-tobacco farmers. In the pre health expenditure scenario tobacco farmers were short of poverty line by 31 percent,while non-tobacco farmers had nearly 40 percent deviation. However, poor health of tobacco farmers caused a further fall by 8.61 percentage points while non-tobacco farmers experienced further deviation of over 5.68 percentage points. It indicates that tobacco farmers are hit adversely by poor health outcomes as compared to non-tobacco farmers. Overall poor health conditions worsen the situation of poverty for all farmers but tobacco farmers face burden with higher proportions. Details of

deviations from poverty lines in pre and post health expenditure scenario are presented in Table 9.

**Table 9 Health cost and deviations from poverty line**

| Group | Deviation from poverty line | | | |
|---|---|---|---|---|
| | Pre health expenditure (%) | Post health expenditure (%) | Illness effect (%) | Significance |
| **Tobacco** | 31.30 (3.56) | 39.91 (3.89) | 8.61 (5.28) | 1.62>0.10 |
| **Non-tobacco** | 39.70(4.19) | 45.40(4.32) | 5.68 (6.01) | 0.94>0.34 |
| **Total** | 35.16(2.75) | 42.87 (2.90) | 7.71 (3.99) | 1.93 >0.06 |

Source: Field survey, 2018-19

## 5. Discussion

Historically farming has been an important source of livelihood and employment in developing countries (Rao, et al., 2005). At the same time, it also exposes farmers and workers to risks including extreme weather, hazardous chemicals, allergies, cuts and injuries due to agricultural tools and machineries. However, some crops pose higher degree of exposure than others. The difference arises due to variation in use of chemicals, machinery operations, exposure to weather conditions, and physical contact with crop (Cordes & Foster, 1988 & Kidane, et al., 2013). Tobacco has been reported to pose higher risks to farmers' and workers' health due to host of reasons. Tobacco crop involves more plant protection and processing, and exposure to hazards increases with each additional process. More chemicals in the form of pesticides/insecticides, suckericides, and other growth inhibitors are used for plant protection and achieving higher productivity (Damalas, et al., 2006). However, the use of pesticides associated with poor handling techniques is associated with adverse health outcomes for farmers and workers especially in developing countries (Peres et. al., 2006 & Khan et. al.,2010). Similarly, the frequency of physical contact with tobacco crop is high and workers are exposed to extreme environment. Furthermore, the presence of nicotine enhances the chances of Green Tobacco Sickness (GTS) while other crops involve rare physical contact, minor exposure to extreme environmental factors, less use of pesticide and absence of nicotine (Gosh et. al., 1986 & McBride, 1998). Difference in exposure and severity of health conditions causes difference in health expenditures. Tobacco farmers face hazards of severe nature and had to seek proper medication in their farm vicinity whereas, the more severe cases had admission in hospital. They had to bear the cost of various diagnostic tests and medicine while non-tobacco crops' hazards were mostly handled through self-medication and traditional home remedies. Farmers view tobacco hazards more deadly than non-tobacco hazards as per their own and neighborhood past experience and therefore responded differently. Difference in response and expenditures can find support in literature from Indian Gujrat and Veitnam (Parikh et. al., 2005 & Von Minh, et. al., 2009).

Tobacco farmers had higher proportions for heart problem, chest & respiratory issues and cancer. Though these diseases have been reported to have high association

with tobacco consumption, but we witnessed no significant difference in tobacco consumption of these farming groups. However, tobacco growers and workers absorb nicotine from green tobacco leaves through their bodies' pores from green tobacco while they face tobacco dust in curing and further processing stages. Moreover, exposure to smoke of tobacco burning stalks used as fuel for energy increases the likelihood of heart and respiratory problems (Mackay & Eriksen, 2005;Schenker et. al., 2005; & Ngajilio, et. al., 2018). Dusty environment in tobacco barns and non-use of protective masks increases risk of chest and respiratory problems (Caze, et al., 2019).The dust particles are accumulated during curing process in the tiny sponge tissues in respiratory system especially when farmers avoid use of protective masks and duration of exposure is high (Osim et. al., 1998; &Arcury&Quandt, 2006). Higher prevalence of chest and respiratory problems confirms the hypothesis that the minute particles are absorbed and causing emphysema even in non-smoker tobacco workers (Ghosh et. al., 1980).

Findings of our study reflect on the link of poor health and poverty. Though tobacco has been projected as panacea for eradication of poverty in developing countries, but the illness associated with tobacco crops has been rarely considered. This study findings show that tobacco farmers are at higher risk of various hazardous situation and various health conditions. They spend a significantly higher share of their income on seeking health. The health cost of tobacco farmers increases likelihood of their net income after paying for health to fall short of the poverty line on one hand and severing the situation of already poor on other. Out of pocket health expenditures increase poverty head count of tobacco farmers by 4.48 percent, while non-tobacco headcount experienced a rise of 0.85 percent. Out of pocket health expenditures have been reported with increased head counts in many countries like India, China, and Bangladesh (Chowdhury, 2015; Pryer, et. al., 2005 &Sun, et. al., 2010). Though large-scale tobacco farmers are able to earn livelihood above poverty level but small and poor farmers not only earn low income from tobacco but are more prone to health issues and spent higher share of their income on health (WHO, 2004). Poor farmers in tobacco group spent almost 18 percent of their income on health-related issues, while on overall tobacco farmers spent 8 percent as compared to 7 percent of non-tobacco farmers. Higher share of health expenditures support claim of the WHO and are in contrast with the no link of tobacco farming and poverty (Pain, et. al., 2012). Out of pocket health expenditure share for tobacco farmers is higher than the national average of 6.51 percent and higher share of out of pocket health expenditures of tobacco farmers as compared to non-tobacco farmers are in conformity with literature (Kaying et al., 2005 &Adioetomo, et. al., 2005).

## 6. Conclusion and recommendations

Tobacco consumption has established relation with detrimental health conditions and illness induced poverty, but even then, has been projected as panacea for poverty alleviation of farming community. However, we found that tobacco farmers are at higher risk of developing poor health conditions as well as incur high proportion of out

of pocket health expenditure. Tobacco farmers have significantly higher proportion of cases for diabetes, CVD and respiratory issues and spent 80,918 rupees per household on seeking treatment for various hazardous situations and diseases of minor and sever nature. On the other hand non-tobacco farmers spent only 35,414 rupees per household on average. Health expenditures increased the head count poverty by 4.48 and 0.85 percent, for tobacco and non-tobacco farming groups, respectively. Furthermore, the increase in severity of poverty was also high in tobacco group.

The study recommends provision of personal protective dressings for tobacco farmers and workers to reduce physical contact with hazardous chemicals and environment. Ensuring effective plant protection chemicals to reduce the frequency of chemical application will not only decrease physical contact with tobacco plant but also adverse pesticide effects. We also recommend that health cost of tobacco farming must be considered, while determining Minimum Indicative Price (MIP) for tobacco leaf, so that small farmers must be compensated for bearing the adverse health issues associated with tobacco farming. Furthermore, alternative livelihood sources should be developed for tobacco farmers to ensure switching from tobacco to non-tobacco sources. Solving marketing issues associated with horticultural crops will encourage speedy switching from health hazardous tobacco farming.

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