



Transformation of Punjab's Malwa Region from Cotton Belt to Cancer Belt

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Abstract

The immoderate exploitation of chemical fertilizers, pesticides, diffusion of heavy metals in groundwater, industrial waste leading to river water pollution turned out to be the major causes of cancer in Malwa region of Punjab. The average cases of cancer per lakh are higher in Punjab than in other parts of India. Among the three regions of Punjab (i.e. Majha, Malwa and Doaba), the prevalence of cancer is highest in Malwa (108.9 per lakh) region, particularly in cotton belt of malwa region, that is the south-western part of Punjab as the use of pesticides is more on cotton crop as compared to the other crops grown in the state. Due to this, the cotton belt of Punjab is stigmatized and is labelled as 'Cancer Belt of Punjab'. The incidents are found more in villages particularly among the agricultural labourers and peasants. The disease has put rural families into the burden of poverty as well as indebtedness. The exorbitant treatment of cancer and the lack of facilities in civil hospitals in Punjab force the patients from Punjab to approach the Acharya Tulsi Das Regional Cancer Centre, Bikaner in Rajasthan state via infamous 'cancer train' for getting aided treatment at economical rates. Although, many initiatives have been taken by the state government such as establishment of RO systems in villages, testing of heavy metals in groundwater, undertaking of health education activities to aware the people regarding the signs, symptoms and prevention of cancer, control on excessive use of chemicals on crops, Mukh Mantri Cancer Rahat Kosh Scheme and cancer registry system but much more is needed to be done to prevent the nuisance. Some measures should be taken to control this disease by improving the facilities in civil hospitals, cleaning of water bodies, restrictions on industrialists as well as MCs on polluting the water, imposing strict restrictions on overusage and banned chemicals, promoting organic farming, strategies towards crop diversification etc.

Keywords: Cancer, Malwa Region, Pesticides, Fertilizers, Water pollution, Industrial waste.

Introduction

Punjab: From Food Bowl to Cancer Bowl: Punjab as an agrarian economy has gained the benefits of agricultural development, but it has to pay the price for this development. Green Revolution undoubtedly transformed Indian Economy from food importing to food exporting economy and Punjab got honour of the bread basket of India. Due to it, there was also an improvement in the financial conditions of the farmers. But, at the same time, it resulted in many ecological problems such as ground water depletion, soil salinity, soaring in soil and water pollution etc. which caused various types of health problems. Worldwide, the ground water quantity and quality has been the first victim of this agricultural revolution; the next are the human health and the existence of species¹. The "Green Revolution", launched by Borlaug's "miracle seeds", is often credited with having transformed India from "a begging bowl to a bread basket", and Punjab is often cited as the Green Revolution's most celebrated success story. However, far from bringing prosperity, two decades of the Green Revolution have left the state riddled with discontent and socio-political violence. Instead of amassing fortune, the state is beset with diseased soils, pest-infested crops, waterlogged deserts and indebted and discontented farmer². The father of India's Green Revolution, Dr M.S. Swaminathan while talking to Economic

Times Kolkata Bureau in 2004 had asserted that our 'Green Revolution' has been abused into 'Greed Revolution' by over-exploitation of ground water and excessive use of pesticides³. The saying 'excess of everything is bad' implies to the excessive use of fertilizers and pesticides which turned out to be the cause of countless serious health hazards in general but cancer in particular among farmers and agricultural labour. It is also estimated that 99 per cent of the fatal poisonings take place in developing countries⁴.

The cancer mortality was analyzed in the 15 villages of the malwa region and the result shows the greater mortality in females than males⁵. The usage of banned and restricted pesticides in malwa region is increasing mental retardation and reproductive disorder⁶. The average cost of cancer treatment is high i.e. Rs.2.75 lakh is big burden on poor victims and the government support is untimely and insufficient¹. The present study has been carried out with the aim of studying district-wise and region-wise prevalence of cancer in Punjab and its various reasons as well as the impacts of this disease in Malwa region of the state. Along with it how the government take initiatives to curb the problem.

Cancer at World Level: As per the data published by WHO, Cancer has doubled its grip over the world in the last 20 years

and struck deep roots in India, from 800,000 lives in 2001 to 3.3 million in 2014. It is also reported that 70 per cent of the cancer deaths are taking place in developing countries where India ranked fifth⁷. As per WHO report 2003, the global cancer rate may increase to 15 million by 2020. In developed countries, about 50 per cent of cancer patients pass away due to this fatal disease, while in developing countries, 80 per cent of cancer victims already have late-stage incurable tumours when they are diagnosed⁸.

Cancer in Punjab: Punjab, once known for its prosperous agriculture and hard-working peasantry, has now infamously got the label of cancer capital of India. Punjab with 90 cancer patients for every 1 lakh populace crosses the national average of 80 per lakh^{9,10}. Malwa region in Punjab is the biggest victim of this disease. Amongst the various districts of Malwa region, cotton belt or south-western Punjab is worst affected by it. In this region, the disease of cancer has become such an alarming issue of concern that the historically known cotton belt has bagged the synonym cancer belt for it. According to Dr. Pritpal Singh (Baba Farid Centre for Special Children, Faridkot), “We can say that Punjab is dying now. There is no doubt. Punjab is the food basket of India. Now we can say it is the disease basket”¹¹.

In 2014-15, the area under American cotton is 413 thousand hectares in Punjab; out of that 95 per cent area is covered by the state’s cotton belt and its production share is 94 per cent. The area under desi cotton has been decreased from 116 thousand hectare in 2000-01 to 7 thousand hectare in 2014-15. Bathinda district have 37 per cent share in the state’s cotton production even the area under this crop is also highest in this district (Table-1). At second place, Ferozpur district is contributing in the cotton production.

The region-wise spread of cancer is shown by Table-2. The Malwa region of Punjab has recorded a jump of 108.9 cancer-afflicted for every 1 lakh whereas in Majha and Doaba region prevalence was found to be 64.7 per lakh and 88.1 respectively. Cancer deaths per lakh were also found to be highest in Malwa region (29.18 per lakh) as compared to Majha (20.24 per lakh) and Doaba region (27.28 per lakh). Similarly, the persons complaining symptoms of cancer were also found to be highest in count in Malwa region (396.7 per lakh) as compared to Majha (361.0 per lakh) and Doaba region (292.4 per lakh). Hence, the spread of cancer in case of prevalence, deaths and symptoms, Malwa was found to be worst affected.

Table-1
Area and Production of cotton in cotton belt of Punjab

| District | | Ferozpur | | Faridkot | | Muktsar | | Bathinda | | Mansa | |
|----------|----|----------|-----|----------|----|---------|-----|----------|-----|-------|-----|
| Year | | A | P | A | P | A | P | A | P | A | P |
| 2000-01 | AC | 98.0 | 291 | 8.4 | 22 | 71.8 | 192 | 114.7 | 258 | 56.7 | 141 |
| | DC | 15.7 | 49 | 5.7 | 13 | 14.7 | 40 | 32.3 | 74 | 21.8 | 51 |
| 2004-05 | AC | 123 | 509 | 17 | 57 | 99 | 414 | 129 | 552 | 74 | 324 |
| | DC | 10 | 39 | 4 | 11 | 6 | 23 | 12 | 41 | 8 | 26 |
| 2009-10 | AC | 123 | 408 | 17 | 69 | 95 | 388 | 147 | 649 | 87 | 323 |
| | DC | 3 | 9 | 1 | 2 | 1 | 3 | 3 | 10 | 2 | 4 |
| 2014-15 | AC | 97 | 249 | 10 | 37 | 65 | 215 | 137 | 494 | 84 | 251 |
| | DC | 2 | 5 | - | - | 1 | 2 | 2 | 4 | - | - |

Source: GoP, 2015¹², Note- Area in thousand hectares; production in thousand bales, AC- American cotton; DC- Desi cotton.

Table-2
Region-wise spread of cancer in Punjab

| Region | Cancer prevalence (per lakh) | Cancer deaths (per lakh) | Cancer symptoms (per lakh) |
|--------|------------------------------|--------------------------|----------------------------|
| Malwa | 108.9 | 29.18 | 396.7 |
| Majha | 64.7 | 20.24 | 361.0 |
| Doaba | 88.1 | 27.28 | 292.4 |

Source: GoP, 2013¹³

District-wise spread of cancer is shown in Table-3. Among all the districts in Punjab state, the prevalence of cancer was found to be highest in Muktsar district (136.3 per lakh) followed by Mansa (134.8 per lakh), Faridkot (134.6 per lakh) and Bathinda (125.8 per lakh) while it was found to be least in Tarn Taran district (40.9 per lakh). Cancer deaths per lakh were also found to be highest in Muktsar district (41.48 per lakh) followed by Faridkot (38.14 per lakh), Moga (35.26 per lakh) and were found to be least in Tarn Taran district (16.28 per lakh). Similarly, the persons complaining symptoms of cancer per lakh population were found to be highest in Moga district (565.1 per lakh) followed by Faridkot (505.9 per lakh) and Sangrur (487.9 per lakh) and were found to be least in Ludhiana (153.0 per lakh). So the facts show that the spread of cancer is highest in Malwa region.

Table-3
District-wise spread of cancer in Punjab

| District | Cancer Prevalence (per lakh population) | Annual cancer deaths (per lakh population) | Persons complaining of symptoms (per lakh population) |
|-----------------|---|--|---|
| Muktsar | 136.3 | 41.48 | 466.0 |
| Mansa | 134.8 | 31.04 | 338.7 |
| Faridkot | 134.6 | 38.14 | 505.9 |
| Bathinda | 125.8 | 31.82 | 272.2 |
| Ferozpur | 113.9 | 26.26 | 387.8 |
| Fatehgarh Sahib | 106.3 | 33.4 | 251.6 |
| Kapurthala | 99.1 | 27.9 | 347.3 |
| Barnala | 98.7 | 26.2 | 183.2 |
| Mohali | 94.5 | 20.78 | 156.3 |
| Sangrur | 93.4 | 28.78 | 487.9 |
| Ropar | 90.0 | 30.48 | 246.2 |
| Moga | 88.4 | 35.26 | 565.1 |
| Jalandhar | 87.3 | 31.94 | 402.0 |
| Hoshiarpur | 86.9 | 24.92 | 159.6 |
| Patiala | 86.8 | 17.18 | 397.8 |
| Ludhiana | 83.4 | 19.56 | 153.0 |
| Amritsar | 81.2 | 23.92 | 368.3 |
| Nawanshahar | 79.4 | 17.5 | 194.4 |
| Gurdaspur | 59.9 | 18.5 | 301.4 |
| Tarn Taran | 40.9 | 16.28 | 464.9 |
| Punjab | 91.1 | 25.44 | 322.9 |

Source: GoP, 2013¹³

Reasons for the spread of cancer in Malwa Region

Immoderate use of Pesticides and Fertilizers: Pesticides can cause both acute and chronic effects. Chronic effects known to be caused by pesticide exposure include cancer, as well as reproductive disorders and hormonal disruption⁴. With the arrival of green revolution, Punjab state has befallen among the highest users of fertilizers and pesticides in India. Punjab has just 2.5 per cent area of total agriculture land in India and it consumes near 18 per cent pesticides of the nation¹⁴. During last five decades, India has increased the consumption of pesticides from 154 MT in 1953-54 to 80,000 MT in 1994-95. Malwa's cotton belt has less than 0.5 per cent geographical area of the country but almost 10 per cent pesticides of country are used here¹⁴.

The report of European Centre for Constitutional and Human Rights conducted a study regarding pesticides use in Punjab during 2015 and found that despite the establishment of International code of conduct 1985 by UNO and FAO on pesticides management to manage the global risk with pesticides use and the current version of this code of conduct was also officially supported by the WHO. However the companies in Punjab such as Bayer and Syngenta and their subsidiary companies are manufacturing, distributing and selling products by violating the code of conduct. Of particular concern are the severe adverse health effects witnessed in the 'cotton belt' of Punjab where 75 per cent of pesticides used in the entire state are consumed⁴. In India, there are large discrepancies in the state-wise consumption of fertilizers and Punjab state is ranked first with respect to it's per hectare use. Punjab state alone consumes about 9 per cent of total fertilizers in India and use is the highest on per unit area basis at 190.1 kg/ha of GCA against 88.2 kg/ha in all India¹⁵.

Table-4
Nutrient-wise per hectare consumption of fertilizers in Punjab vis a vis at India level during 2012-13 (in kgs)

| Nutrient | Punjab | India |
|----------|--------|--------|
| N | 188.47 | 84.54 |
| P2O5 | 58.67 | 33.44 |
| K2O | 3.05 | 10.36 |
| Total | 250.19 | 128.34 |

(Source: GoI, 2014)¹⁶

Phosphatic fertilizers are known to contain uranium ranging from 20 to 300 mg/kg. These fertilizers are used extensively in the State. These chemicals are also used on vegetable crops in heavy amount and hence besides the farmers and agricultural labour, the spread of this disease has been reaching to the consumers also.

Pollution by Industrial Waste: Industrial waste as well as sewage of urban area is another major factor responsible for cancer in Malwa region of Punjab. According to the PPCB report 2010, the Sutlej's water is rated as "A" class (pure) at Nangal headquarters, become "E" class and "D" class respectively at the emergence of Buddha Nullah in Ludhiana and East Bein or Chitti Bein in the Doaba region. Since "D" class water is considered as unfit and harmful for health¹⁷. As the south-west belt of Punjab is canal command area and most of the people in Malwa region use to drink this unfit water running through canals even without treatment. Besides the malwa region of Punjab, this water further flow to some districts of Rajasthan state and many people of this state are reported to be evolving symptoms of cancer. PPCB (Punjab Pollution Control Board) identified and enlisted 28 major sources polluting river Sutlej¹⁸.

Presence of Heavy Metals in Groundwater: In the Malwa region of Punjab, the amount of heavy metals in ground water has crossed the safe limits set by the WHO. The survey of three districts shows that 20 per cent of all sampled wells had nitrate levels above the safety limit set by the World Health Organisation. According to the report of Greenpeace Society India released by Dr. Jai Roop Singh in 2009, the highest level of pollution in drinking water was found in Doda (Gidderbaha), a region which is also defamed for high prevalence of cancer cases. Two water samples from Doda show nitrate levels of 94.3 mg/l and 72.8 mg/l, way above the WHO safety limit of 50 mg/l¹⁹.

As per the report of Central Ground Water Board, the entire south-western belt of the State comprising of Ferozepur, Moga, Barnala, Bathinda and Sangrur Districts have high incidence of Uranium in groundwater and there is also a chance of getting cancer from any radioactive material like uranium. However, the content of Uranium above the safe limits set by WHO (i.e. 15µg/l) and AERB (i.e. 60µg/l) was not found in samples of ground water taken from Muktsar district and sent to BARC for analysis. Fluoride having concentrations more than 1.5 mg/l were reported from Bathinda, Ferozepur, Mansa and Patiala Districts²⁰, which also causes cancer in human health²¹.

Use of Alcohol and Tobacco: Use of tobacco and alcohol is also responsible for lungs cancer. However, it is worth mentioning that in Punjab the prevalence of lung cancer is very rare due to socio-religious facts as Punjab accounts 59.9 per cent of total Sikh population and fundamental doctrine of Sikhism is non-use of tobacco and non-smoking which is prescribed in Sikh Code of Conduct⁵.

Impact of cancer in Malwa region of Punjab

The existence and spread of cancer has adversely affected the people as well as economy of Malwa region of Punjab. Due to expensive treatment of cancer in private hospitals of Punjab as well as lack of proper facilities in civil hospitals, large number

of people from Bathinda goes to Bikaner daily for treatment via train (generally named as Cancer Train or Cancer Express). According to ICMR's national cancer registry programme, out of total 424 cancer patients from Bathinda district 328 were treated at Acharya Tulsi Regional Cancer Centre, Bikaner²². The village Jajjal of Talwandi Sabo block is badly affected by the curse of cancer. The cancer victims in Jajjal are facing multiple crises. Every cancer affected family is facing at least one to three lakhs debt burden.

The disease does not make distinction between land owner and land less labourer so the death is knocking the doors after door, ruining the families, social system and economy of the Jajjal²³. Hence, the situation of cancer affected patients in Malwa region of Punjab is very painful. Cancer has ended up the families with poverty and indebtedness.

Initiatives taken by the State Authorities

Prevention of Cancer: Testing of heavy metals in drinking water, installation of Reverse Osmosis Systems (ROs) in various villages of districts, undertaking of Health Education activities for the awareness about the causes, signs and symptoms and prevention of cancer, steps to control excessive use of pesticides/insecticides and ban on manufacture, import and use on dangerous and injurious pesticides.

Diagnosis of Cancer: Installation of Mammography units at Civil Hospital Bathinda, Patiala, Jalandhar and Hoshiarpur, Signing a MoU by Punjab government with the NGO 'Roko Cancer Trust' to spread cancer awareness, Cancer Registry (starting and collection of data of Population Based Cancer Registry (PBCR) at Govt. Medical College, Patiala and Hospital Based Cancer Registry (HBCR) at PGI, Chandigarh)

Free/Cheap Treatment of Cancer: Provision of Financial assistance under State illness Fund through Punjab Niropi cancer patients along with other life threatening diseases belonging to BPL families, Provision of Rs. 20.00 crore to all cancer patients except Govt. employees and those having health insurance cover and an amount of up to Rs. 1.50 lakhs to every cancer patient under Mukh Mantri Punjab Cancer Raahat Kosh Society, free treatment to school children suffering from cancer by Health Department, installation of Brachytherapy Machine at Government Medical College & Hospital, Patiala, Radiotherapy machine & Cobalt Unit at Sri Guru Gobind Singh Medical College Faridkot, Cobalt Source for the treatment of cancer patients at Sri Guru Ram Das Institute of Medical Sciences & Research Centre Amritsar, connection of Regional Cancer Centre to all districts of Punjab via Tele-Medicine facility, Provision of Free travel facility in Punjab Roadways & PRTC Buses to cancer patients for availing treatment¹.

Conclusion

In the end, it may be concluded that cancer is widely spreading disease in Malwa region of Punjab and it has made the lives of

affected families very pathetic. Water pollution by industrial waste and urban sewage, over use of pesticides and fertilizers, presence of heavy metals are the major reasons of cancer in Punjab. Poverty and indebtedness are the major adverse impacts on the cancer affected families. Although many efforts have been taken by the state government to control this disease but much more is needed to be done. In this regard, the Centre Government has also announced the establishment of IIMS in Bathinda in union budget, 2015-16. Some steps can be taken to control its spread are restrictions on the exorbitant use of chemicals such as pesticides and fertilizers on crops. The optimum quantity should be provided by the government on per acre basis and restrictions should be imposed strictly on the use of banned chemicals such as Monochlorophos, Endosulphan, Aldrin, DDT and BHC etc. Strict actions should be taken against the private dealers on the selling of the same. Farmers should use the chemicals if necessarily required. Industrial waste should not be thrown into the water bodies such as in Sutluj, Beas and Buddha Nullah. Timely steps should be taken for the hygienic maintenance of these rivers. Empty containers should not be used for domestic purposes and also these should not be dumped into the water bodies. Organic Farming should be promoted by the government as it is free from the use of chemical fertilizers etc. Crop diversification towards the fewer chemicals consuming crops is must. There should be efficiency in the marketing system of vegetables and fruits, moong etc. Generally, farmers use more chemicals on vegetables which are grown unseasonably for example consumers in Punjab prefer to purchase cauliflower in summer season and in order to get more profit, farmers grow them prior from the right time of growing and hence, use dangerous chemicals on the same. Therefore, cold stores should be established by the government to store the vegetables and lease out these when their demand is on peak and therefore, untimely yielding of crops should be banned. Media being the 'fourth state of democracy' should arrange and broadcast awareness programmes as it appears to be an important tool in shaping thought patterns of society. Media through its programs should warn people not to drink the untreated canal water and also should forewarn its adverse effects on health. More and more facilities should be provided in civil hospitals of Punjab, particularly in malwa region so that it becomes easy for the patients to treat themselves at the local hospitals instead of going to Bikaner.

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