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of The Green Revolution in Malwa
Region of Punjab**

by

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THE CANCER TRAIN: INSIDE THE HIDDEN TRAGEDY OF THE GREEN REVOLUTION IN MALWA REGION OF PUNJAB

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ABSTRACT

The Green Revolution (GR) is usually imagined as an event in the early history of independent India which helped the nation achieve the objective of self-sufficiency in food production. However, this is a functionalist imagination of the GR, which fails to capture the micropolitics and ideological significance of this event. The impact of the GR becomes especially stark when one looks at the massive cancer epidemic that has impacted people in Punjab symbolized by the 54703 Abohar Jodhpur Passenger Train, infamous as the “Cancer Train”. One of the most dominant causes of cancer is the increased use of pesticides and fertilizers, and a number of people have blamed the GR for the exclusion and violence that local technologies, environment and human health have faced because of it. How did the Green revolution lead to the Cancer Train? The paper uses Timothy Mitchell’s framework for observing the state-society distinction as a result of the everyday mundane practices of the state. Using this, it is possible to analyse the multiple processes which create the Green Revolution at the basic, mundane and everyday level. What kind of practices and governmentalities operate to push people into going to another state in order to seek treatment for cancer? However, there is resistance to this violent form of agriculture. What is kind of resistance and how is it manifesting itself? The exploration of alternatives becomes more and more essential each day as the violence of modern farming gets more and more serious and pernicious on the people of Malwa region in Punjab.

Keywords: Green revolution, Cancer train, Punjab, Malwa region, alternative farming, Human health.

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Introduction

“By 5 am, after travelling for 326 km, they will reach their destination across the state border: Acharya Tulsi Regional Cancer Treatment and Research Centre (RCC) in Bikaner, Rajasthan. They come all over from Punjab’s Malwa region, which comprises nine of the state’s 20 districts and 60 per cent of the population. It’s an arduous but unavoidable journey - Acharya Tulsi is the closest government cancer hospital that is affordable. “I’ve spent Rs 1 lakh in a private hospital in Bathinda. Couldn’t afford it anymore and went to Bikaner,” says Balwinder Singh who has cancer in the oesophagus. Bathinda is at the heart of Malwa. The poor of the most prosperous state go to another state to save themselves.”¹ This report states a collective category referred as “they”, which has only recently emerged as a significant group in the collective conscience of the society in Punjab. The cancer patient, labeled as *Mareez* in the villages and communities of Punjab, has become a symbol of the violence inflicted by the Green Revolution on the people of Punjab. Cancer is just one of the many new ailments which have emerged in the epidemiological map of Punjab as a tough challenge. A full blown health crisis, resulting in chronic ailments ranging from cancer to reproductive disorders, has created a deep impact on the people, especially the poor and the marginalized.

The Green Revolution is imagined as an event in the history of post- independence India which was introduced to bring about food self- sufficiency and successfully achieved its objective. However, such a functionalist definition of the Green Revolution ignores the fundamental dynamism of an event like the Green Revolution whose end could never be tautologically connected just to its intended function. The paper is a modest attempt to explore the social, political and economic consequences of cancer in the Malwa region of Punjab, and to study the factors and discourses which create the conditions for an epidemic which has acquired a menacing and destructive form in the past decades.

Origins of the Green Revolution

When William Gaud delivered his address at a meeting of the Society for International Development in DC in 1968, describing the phenomenal results of the American Philanthropic funding for fertilisers, high yielding variety of seeds, irrigation etc., few would have foreseen how popular his nomenclature would come to be in the contemporary world. He said, “These, and other developments in the field of agriculture, contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets, nor is it a White Revolution like that of the Shah of Iran. I call it the Green Revolution.”² India had depended on exports of wheat by the United States of America (USA) to India for almost a decade, and it had turned out to be a comfortable ride for India because of the extremely low prices US Agricultural Trade and of wheat sold under the Development Assistance Act /Public Law-480(PL- 480), an Act in the Constitution of the USA which allowed it to export surplus food produce as aid to the Global South.³ What led from this rosy situation to a situation where in the initiation of the Green Revolution seemed the only available alternative? Firstly, economy and nature did not get along too well. The Indian climate was variable between 1965–67, with drought and unseasonable rain.⁴ The general price index rose by another 38 per cent in 1967. Foodgrains took the lead with a price increase of 44 per cent.⁵ Secondly, geopolitics of the Cold War era played an active role too. In response to the India’s political wavering around US foreign policy in South East Asia, US President Lyndon Johnson announced a ‘short tether’ policy around food aid, making its monthly renewal contingent on recipient support for broader US policy goals.⁶ This was supported intellectually by the likes of the

Paddock Brothers, who included India in the list of “hopeless” countries (along with Egypt and Haiti), which, according to the triage concept, needed to be deprived of food aid in order to save the rest of the world which seemed more hopeful.⁷ The challenge, as Shiv Vishvanathan argues, “... was to convince the developed world that India had outgrown the banality of the Paddocks.”⁸

In such a scenario, India, under the Agriculture Minister C. Subramaniam, initiated the process of transforming agriculture to make the young nation self-sufficient in foodgrains. The aim was not just to transform agricultural practice but to change the very nature of the discourse which surrounded agriculture. The main instrument that would be able to bring about this change had been identified- science. It was now time to bring the strategy into motion. Subramaniam observed, “Every country which has improved its agriculture has done so only through the introduction of science and technology into farming. India cannot be an exception.”⁹

The new package of the Green Revolution was based on the research of a team sponsored by the Rockefeller Foundation, consisting of Norman Borlaug among others, in Mexico during the 1940s. The team started with the development of High yielding varieties of wheat and maize.¹⁰ One of the factors which propelled the manic efforts to spread the Green Revolution throughout the Third World was the fear of communism. Hunger was seen as a catalyst which would induce people towards communism. Green Revolution was conceptualized as a strategy to counter the spread of communism. This strategy was founded on a basic founding assumption- that hunger was a problem of aggregate food shortage and not the entitlements that a person enjoyed. The US Foreign Policy, the Rockefeller and Ford Foundations resonated the view which associated the Green revolution as a counter to communism, made clear by the famous Post- War Development Catchphrase- ‘Where hunger goes, Communism follows’.¹¹ The Green Revolution was brought into India under the name ‘New Agricultural Strategy’ (NAS). As a policy, the NAS was designed with the sole purpose of making India self-sufficient in foodgrain production. It was thus directed at certain regions which were well-equipped with the necessary infrastructure (Punjab, Haryana and Western Uttar Pradesh), along with further concentration on particular farmers who were large landowners and already well-off, and finally on particular crops (wheat and rice). The Land Alienation Act of 1900 limited the right to own land among the members of a select list of agricultural castes, notably the Jats. The failure of post independence land reforms maintained the skewed caste-based distribution of land and helped the dominant castes, especially Jats, maintain control over land. The Green Revolution aggravated these inequalities because it was based on the recognition of these differences and the hierarchy embedded in them. The Green Revolution has to be understood more as a broader ideology of rural transformation whereas programmes such as High Yielding Variety Programme, Integrated Rural Development Programme and the like were specific, institutionalized measures for translating the Green Revolution ideology into practice.¹²

As Ashutosh Varshney describes very eloquently, the agricultural policy in the 1960s was taken over by the group of politicians and scholars who favoured the “technocratic strategy” and believed in the dictum which said that, provided the correct incentives and technology, agriculturists would make the correct decisions and the agricultural sector would benefit, over those who believed in the “Institutional Strategy” of Land Reforms and Structural Change, and the Green Revolution was the final nail in the coffin of the Institutionalist thought.¹³ This technocratic policy institutionalized a culture wherein a tacit

encouragement was provided to the act of recklessly spraying pesticides, only in order to attain the goal of high food production. This was the core end of the Governmentality of the Green Revolution: High Production. As the paper would show later, this Governmentality was dispersed throughout the population and has been the prime factor behind the health crisis which has resulted in the cancer train.

It has been argued that science in postcolonial societies has become a “reason of state” (raison d’etat) and an instrument for the State to extend its hegemony over the population.¹⁴ The Green Revolution was an integral part of process of instrumentalisation of science by the state, wherein science became a tool of extending the hegemony of the state in these societies.¹⁵ A number of public institutions- such as the National Seed Corporation, State Farms Corporation, State level agencies and Food Corporation of India- were created, which supported this new mode of governance and discourse in agriculture, providing support to the state’s agenda.

Malwa and the Green Revolution

The Malwa Region is the southernmost among the regions of Punjab, consisting of 14 out of the 23 regions of Punjab. In the Malwa region, soil is sandy in texture and the climate ranges from arid to semi- arid. Since the Green Revolution, cotton has been the staple crop of the Malwa region. Cotton being a dryland crop has always been grown in the dry and arid Malwa region. However, cotton is also known to consume the highest amount of pesticides amongst all the crops. Correlation and association based population studies posit a very high correlation between cotton farming and the occurrence of cancer.¹⁶ It has been reported that during the average cropping season in the cotton growing areas of India including Malwa, “a farmer is exposed (to chemicals for) three to four hours at a time through leaking spray equipment, dripping plants and wind drift.”¹⁷ People in cotton- growing villages have been ascertained to have a far greater chance of getting cancer than those growing any other crop.¹⁸ The Green Revolution, though, was of great developmental advantage to Malwa and Punjab. The per hectare yield of wheat rose from 1104 Kg per hectare to 2238 Kg per hectare, from 1965- 66 to 1970- 71; a period of just 5 years.¹⁹ Today, despite occupying only 1.54% of the land area of India, Punjab produces 22 per cent of wheat, 12 per cent of rice and 13 per cent of cotton.²⁰ However the paper suspects the dominant viewpoint that the Green Revolution was the only way India could have solved its food shortages. As the paper further points out, there were and still are many alternative sources of knowledge which were ignored and underestimated by the bureaucratic elite of the post independence period, who believed blindly in the superiority of modern science and technology in providing a suitable agrarian episteme for India.

Cancer has claimed 34,430 people in the whole of Punjab between 2008- 2012 and more than 84,000 people have complained of having symptoms related to cancer.²¹ Thousands of others have been affected by the other issues emerging from the use of pesticides and fertilisers in the agriculture of Punjab. Pesticides are known to destroy folic acid, especially during pregnancy leading to neural tube defects, stunted growth and mental disorders in infants. There is an increase in the reporting of reduced sperm counts, spontaneous abortions and premature deliveries are a ‘reproductive-crisis’ in some belts in the state.²² The environment has been the biggest victim of the Green Revolution of the indiscriminate abuse of nature to serve human needs. Groundwater levels are falling while the forest and tree cover have long been decimated. The paper argues that the health crisis is a

part of the larger crisis emanating from the Green Revolution, other symptoms of which are the high indebtedness and the rise in farmer suicides.

The Cancer Train

Praveen Donthi in his report on the Cancer Train says that on an average 70 patients in a day travel in this train to Bikaner in order to get treated at the RCC. The private hospitals fare better in terms of the treatment provided but they are very expensive and out of reach for even the middle and lower middle class of patients. Even though a number of new hospitals and wards have been opened in Punjab to deal with the huge increase in the number of cancer patients, Punjab still sends a number of people in despair to Bikaner aboard Train No. 54703.

The RCC is probably the largest cancer hospital in the Marwar region and even Rajasthan, being funded majorly by the Rajasthan Government, while partly being supported by a private charity trust called *Acharya Tulsi Shanti Pratishtan* (Acharya Tulsi Charitable Trust). For all official purposes, the hospital is a public entity under the Government of Rajasthan. Under the Chief Minister Free Medicines and Diagnostics Scheme of the Government of Rajasthan, diagnosis and medicines for cancer and other chronic ailments are provided free at this hospital.²³ In addition, patients and people accompanying them have a *Dharmashala* accommodation available for Rs. 35 per person per night, along with a food plate for Rs. 5 per person. Both these facilities are provided by the charitable trust. Patients from Punjab find solace in Bikaner after their insufferable experiences at the public hospitals of Punjab, which are costly, inefficient and deprived of in-patient wards. The number of patients going to Bikaner has not changed in any way even after the spree of cancer hospitals and wards opened in Punjab along the last two years. As Jarnail Singh, a husband of a cancer patient travelling in the train said, “*Train me to log badh gaye hain, kuch kam nahi hua hai*” (The number of people in the cancer train has increased and not decreased). The paper would use primary field data collected through a triangulated methodology including interviews, observations and Focused Group Discussions to understand why the cancer train emerged and what keeps it running.

Is there any Resistance?

Civil society and activism in Punjab have not been active enough in bringing about a grassroots level change in agriculture and rural life. Neera Chandhoke and Praveen Priyadarshi point out that the conflict in the 1980s and the factional rivalries among the farmer groups have been largely responsible in creating an environment of apathy where the agrarian crisis has been ignored by everybody, including the civil society and the state. However, the emergence of a dynamic civil society with an agenda on environmental and health issues related to modern chemical agriculture is a heartening trend. Civil Society activism against the Green Revolution has become a reality with the emergence of the Kheti Virasat Mission which is rapidly gaining popularity, and would only gain more ground in the future as the health and environmental impact of the Green Revolution agriculture becomes more and more stark.

Research Problem and Outline of the paper

The research problem tackled by the paper is, “How has the cancer train emerged as an outcome of the Green Revolution?” Section I of the paper has introduced the paper, giving the historical background to the problem and also through the story giving a brief description of the relevant literature. Section II of the paper would give a brief description of the theoretical framework used to analyse the field data and also, provide a further brief description of the methodology used for data collection. Section III of the paper would present the analysis of the data, while providing descriptions from the field data collected. Section IV would conclude the paper by presenting the findings and conclusions of the paper.

Theoretical Framework And Methodology

Theoretical Framework

Cancer patients in Malwa have been reduced to mere numbers, meant to be counted in hospital beds and in Door- to- Door surveys. The impersonalisation and aggregation inherent in quantitative studies leads to cancer becoming a banal issue, the suffering of which is not deserving of any special attention. If the narratives of the people are given importance, it would become possible to understand and empathies with the seriousness of the problem in Punjab. Purely scientific and quantitative studies about the problem would not be adequate in understanding the dehumanization associated with the disease. Cancer is the result of a governmentality which converts an individual into a homo sacer, reducing individual to bare life in a way that the individual can be done away with for the *raison d'état*.²⁴ The telos of such governmentality is the state and all power is diffused through the society in a way that the state becomes normalized, for which science and development emerge as the major modes through which such governmentality comes into being.

To understand the impact of Green Revolution as carcinogenic, it is important to observe the practices of the farmers and the people in order to understand how Green Revolution impacts the society and leads to cancer, thus creating the contested space of cancer express. The state is seen according to a framework proposed by Timothy Mitchell, which looks at the state as “an effect of mundane processes of spatial organization, temporal arrangement, functional specification, supervision and surveillance, and representation that create the appearance of a world fundamentally divided into state and society or state and economy.”²⁵ To observe the real existence of the state, we thus have to observe the practices of the state through techniques of Governmentality dispersed throughout the society. Similar to the observation of the state the paper would observe the Green Revolution, an inextricably statist paradigm.

At the very base of this approach is the concept of Governmentality, which observes power not as a unidirectional flow from one actor or institution to another, but rather looks at power as dispersed through the society in its deceptive and most pernicious manifestations. Michel Foucault says, “One governs things. But what does this mean? I do not think this is a matter of opposing things to men, but rather of showing that what government has to do with is not territory but rather a sort of complex composed of men and things. The things with which in this sense government is to be concerned are in fact men, but men in their relations, their links, their imbrications with those other things which are wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, etc.; men in

their relation to that other kind of things, customs, habits, ways of acting and thinking, etc.; lastly, men in their relation to that other kind of things, accidents and misfortunes such as famine, epidemics, death, etc.”²⁶ The Foucauldian methodology, contrary to popular perceptions, does not ignore the existence of universals. Rather, The Foucauldian methodology looking at ideas like the Government ignores the existence of universals. As Foucault himself says, “Instead of deducing concrete phenomena from universals, or instead of starting with universals as an obligatory grid of intelligibility for certain concrete practices, I would like to start with these concrete practices and, as it were, pass these universals through the grid of these practices.”²⁷ An approach which looks at everyday practices could help us understand the impact of governmentality practices while ignoring universals; in short help us understand the daily life events which enable power to flow through society. State appears as a well-structured entity because of these mechanisms and arrangements which constitute the way the population is governed in relation to things. The state seems to recognize that a host of mundane rituals and procedures are required to animate and naturalize metaphors if states are to succeed in being imagined as both higher than, and encompassing of, society.²⁸ The paper intends to examine the appearance of the state and this porous boundary between the state and the society, which ‘govenmentalises the Green Revolution’ and cancer in Punjab.

Methodology

The paper relies on an organised data collection exercise and fieldwork. Secondary data in this paper gives a background, theoretical framework and evidential support to the primary data analysis of the research. Given the nature of the problem being studied, a qualitative methodology has been followed to bring out the nuances and details of the tragedy of cancer and the green revolution in Punjab. The tragedy of the green revolution expressed in the cancer epidemic and the cancer train has been studied by narrating the everyday mundane experiences, interactions and actions of the cancer patients as well as other people, giving a detailed account of the tragedy of cancer and green revolution in the Malwa region of Punjab. By considering the views noted from the field, an opportunity arises to conduct a narrative analysis to ascertain the dominant discourse on the Green Revolution, cancer and state in Punjab, along with the alternative discourses around these issues. The data collection was done through a methodological triangulation, which is the use of different methods in order to bring the various nuances of a qualitative study and confirm the analysis of the hypothesis. Norman Denzin says that Methodological Triangulation, “... involves using more than one method to gather data, such as interviews, observations, questionnaires, focus groups and documents.”²⁹ The paper used interviews, observation and focus group discussions for collecting extensive data and field notes, often all these methods together. In addition to two round trips on the cancer train from Bathinda to Bikaner and back, a detailed study of the village of Balbhera in the Patiala District was also carried out. A study of the practices of farmers, government officials and the narratives of people in this village provided a rich array of data from which one could look at the problem of cancer and the Green Revolution. Fieldwork was conducted in four major hospitals- Rajindra Hospital Patiala, Guru Gobind Singh Hospital, Faridkot, Max Hospital, Bathinda, and last but most importantly, RCC, Bikaner. However, the cancer train was the main location of data collection, which was studied in detail in order to capture the narratives of the patients travelling in the train and to unearth this tragic consequence of the Green Revolution.

Cancer patients and their relatives were the main category of people interviewed. 49 cancer patients were interviewed, with or without their families, as a part of the data collection exercise. "Interviewing is a basic mode of inquiry. Recounting narratives of experience has been the major way throughout recorded history that humans have made sense of their experience."³⁰ These interviews were semi- structured in nature, with a structured methodology being avoided. Using a structured interview methodology creates the risk of a priori biases of the interviewer creeping into the questions as well as into the structure of the questionnaire, impacting aspects like the sequencing of questions. . It is well recognized that "semi-structured interviews also allow informants the freedom to express their views in their own terms."³¹ Within the Cancer Train and the village of Balbhera, observation was used extensively to observe behavior, conversations and practices which characterize the general mood within the Cancer Train. "... even the gradual development of understanding is based on the accumulation of observations of daily routines, specific events, and conversation, to which the observer has carefully attended and captured in field notes. At its very basic, observation is just that, the researcher explicitly and self- consciously attending to the events and people in the context they are studying."³² Focus Group Discussions were also conducted in the cancer train with patients to know their views and to analyse their discussions around the topics of green revolution, politics, and cancer in Punjab. Using this triangulated methodology of data collection, the analysis has been enriched with various nuances and diverse representations.

From Pind (Village) To Bikaner: Analysis of The Birth And Existence of The Cancer Train

How does a regular train become a train meant for the cancer patients? How does the cancer disease become such an alarming epidemic, and more importantly, how does an administrative apparatus get caught so underprepared for a crisis? The Cancer Train is a unique phenomenon where one can understand the quagmire which Malwa finds itself in- the quagmire of the Green Revolution. Neither would the Green Revolution let the region live nor would it let the region die. The Cancer Train is a phenomenon which traverses different realities of the state and the green revolution within its fold and seems dispersed across the time frame of the past, present and future. The train showcases the inability of the state to provide a real alternative imagination to the people of Punjab, forcing them into the fatal subjugation of chemical shops, machinery dealers, Primary Health Centres, Hospitals and ultimately the Cancer Train. The Cancer Train turns out to be the end of a process which starts with the most mundane activities of everyday life of the people, from their work in the fields to their consumption of food and water, all of which has become carcinogenic. The daily mundane practices of Punjab's people have become carcinogenic and that has cumulatively resulted in the Cancer train phenomenon emerging in Punjab. The observation of the green revolution through these mundane daily activities is at the crux of understanding the cancer epidemic in Malwa.

When we use a method where we observe the state in its daily mundane existence and the regularized practices, we observe two arenas of power where contestations are seen and where the cancer starts becoming more and more dominating over the people- the village and the bureaucracy. The division between these two arenas can be seen in both, a temporal and spatial mode, and both these modes intersect frequently. Temporally, a mareez (patient) moves from the space of the village to a hospital, facing the bureaucracy at both the stages. Cancer Train becomes a destiny for most patients, who are unable to fund healthcare in the

increasingly neoliberal and market based public healthcare in Punjab. Therefore, both these arenas are imbricate in a global political environment of increased marketisation and neoliberalism which assist the hegemony of science and development, becoming perfect bed fellows in this entire scheme. The paper in this analysis would explore, in detail, the factors which help in creating the cancer train as an almost timeless metaphysical phenomenon which embodies within it the sorrow of Punjab and seems to cry out with voices, listening to which one could understand the current crisis which grips Punjab.

Village

The village has been a prime unit of sociological study in India right from the time when Village Studies became a subject of sociological enquiry in the Departments of Indian Universities under the mentorship of sociologists like MN Srinivas. In this section, the village would be analysed as a site of power where a whole network of governmentalities operate together, not necessarily in synchronisation, to create the impact of the Green Revolution being studied- Cancer Train. If one looks at Foucault's main inspiration for the idea of governmentality, it is taken from sixteenth century French political economist Guillaume de La Perriere. Foucault says, "in Guillaume de La Perriere's book consists of the following statement: 'government is the right disposition of things, arranged so as to lead to a convenient end'..."³³ Thus, Governmentality or the art of governing, he goes to observe, has become the art of governing things and men in relation to governing things such that it leads to an end convenient for the sovereign state, and the greatest number of people.³⁴ The Green Revolution can be observed as a historic idea which created a particular genealogy within agriculture a way that the sovereign state, with science and development as its reasons, became the end of its actions and effects.

A type of Governmentality which captures the green revolution in its everyday existence is what this paper calls, "Progressive Farmer Governmentality". It is a Governmentality rooted in a particular discourse on farming. "Progressive Farmer" is the name given by the Punjab Agricultural University (PAU) to its chosen farmers who have been most loyal to their advice on farming and have followed a scientific approach to farming, as advised by the University researchers. However, they cannot be treated as passive agents of the PAU's knowledge. They are active in using that knowledge for their advantage and to spread their beliefs. They play the role of advisors for their fellow farmers in the village, where they advise other farmers on the "scientific method" of agriculture. Usually, all the landowning farmers are Jat Sikh by caste. During the fieldwork, when asked about how they learnt about farming, most farmers answered that it was through the father and other members of their *biradari* (caste). The Progressive Farmers, who are also Jat Sikh, disperse this scientific knowledge through the generations because all the landowning farmers are mostly from the same *biradari*. This caste based occupational domination of Jat Sikhs is so obvious and banal that, the community calls itself as the *Zamindar* (land owner) caste. This was observed in the village discourse at Balbhera as well as in the other villages which were visited. The scientific and technocratic governmentality in agriculture, derived from the ideological discourse of the green revolution has been directed solely obtaining a high yield to benefit the landowners. The "Progressive Farmer Governmentality" is not a uniform regular phenomenon across all the farmers. Rather, it is an "ideal type" which is proposed and celebrated by the scientific discourse of the Green Revolution and the institutions like Punjab Agricultural University which are the ideological flag bearers of modern scientific agriculture and green revolution in India.

The state, society and the green revolution are seen in the farm practices, in the minutest arrangement of farm equipment and in the seemingly banal practices of agriculture. The society becomes visible in its interaction with the state through the Green Revolution farm practices. The society is seen interacting with the state, every time the farmer uses his subsidized tractor to sow hybrid genetically modified seeds in the field. The society is seen in the reckless uninformed use of Government- approved pesticides and fertilisers. The state-society interactions here give us a good standpoint to observe the most remote and basic manifestation of the Green Revolution- at the level of the farm and the village.

During fieldwork in Balbhera, when the farmers were enquired about their ideas of farming, most said that there was no alternative to the chemical model of agriculture, if wanted good yields. In addition, the yield was the only aim that was foremost in their minds when it came to their interactions with their land. Gurjeet Singh, a farmer from Balbhera, who was interviewed and observed in his daily practices said, “The Land has become addicted to fertilizers and pesticides. The more chemicals we put, the more the land will give.”³⁵ This statement said in its utmost banality, becomes a horrifying indictment of the hegemonic idea of modern agriculture, when it is known that Gurjeet was actually a cancer patient who had just recovered successfully from the deadly disease, weakened considerably by it. That such a statement should come from a cancer survivor is a sign of the tragedy of green revolution in Punjab, especially considering that Gurjeet was well aware of the contribution of this kind of farming to his cancer. When a particular idea becomes so dominant that its existence is considered inevitable, even at the cost of death, it becomes an imperative to fully understand that which enables this kind of resignation to exist. The “Progressive Farmer Governmentality” is based on a particular mode of interaction with the land- an interaction which Gurjeet talked about in completely utilitarian terms without a thought given to anything else, even his own health.

A farmer’s interaction with their land is nothing but their exercise of power. An observation of the power of the farmer over his land can help infer many subliminal characteristics of agriculture. Primary among them is the discourse in which this power is embedded. The more one sprays these chemicals, the better the yield. Gaining a better yield is a “convenient end” towards which the exercise of power is directed. This aim ignores the farm as an ecosystem of coexistence. This reductionist end plainly excludes the soil, the microorganisms, the water table and the trees that are planted on the land. In the process of getting maximum yield, the farmer governs the land,³⁶ raw materials, machines and chemicals in such a way that the objectives of ecological dynamism, survival and flourishing of microorganisms, birds, insects and animals, and the general availability of good quality food- non adulterated food, become mere “idealistic utopias” and do not get a place in the modern agrarian episteme of farmers. The discourse of the farmers agrees with Karl Manheim’s thesis that any discourse which differs from the dominant one, and poses a threat to it, is labeled a utopia.³⁷

In addition to ideological dominance of the green revolution model of agriculture, there are practical rational reasons which inhibit the farmers from following health- friendly practices. These aspects of the governmentality derive from the incompatibility of both the technological apparatus inducted into the village, and the entire agrarian episteme with the climatic conditions of the village. PK Shetty (2004) states on the basis of his fieldwork, “A majority of the respondents do not follow any of the recommended safety measures while handling pesticides, such as wearing gloves, shoes, face mask and other protective clothing.

They found these protective measures uncomfortable in the hot weather and also as a hindrance to their work... In Bathinda, 46 per cent of the respondents said they take their own decisions regarding the type of chemicals to be used in controlling pests and diseases.”³⁸ A number of farmers in Balbhera, including Gurjeet complained of the same discomfort caused by the apparatus which is meant to protect them, and expressed the same self-assurance regarding their own expertise about the scientific properties and effects of these chemicals on the soil.

This paper is not taking an ascetic view against overproduction and overconsumption, or even one against science as a method of reason. Rather what this paper is pointing towards is the “Reductionist Science” as Vandana Shiva calls it, which is involved in this particular governmentality. According to Vandana Shiva, there are three exclusions which come about when one looks at science with a blinkered worldview of aims and targets- “(i) ontological, in that other properties are not taken note of; (ii) epistemological, in that other ways of perceiving and knowing are not recognized; and (iii) sociological, in that the non-expert is deprived of the right both of access to knowledge and of judging the claims of knowledge.”³⁹ By producing protective equipment which is unsuited to the climatic conditions of the farmers, modern science and its products in India betray their western origins and an imperialist disdain for the demands to adjust science and technology to local conditions. This is only one aspect of the epistemological violence of modern science. This particular form of violence would be taken up in greater detail in the last part of the section, when the alternative discourses against the Green Revolution shall be analysed.

The Progressive Farmer Governmentality is embedded in a scientific discourse which is a perpetrator of mass ontological and epistemological violence. By taking high yield as the only aim, the other properties which make up the farm ecosystem are ignored and this becomes the main mode of violence over environment, health and habitat of the people. Shiv Visvanathan says, “For all its innovation, it (green revolution)’s questioning of the relevance of ideology, traditional knowledge, development it took many of the basic categories of discourse for granted. It had the conventional approaches to nature, to science, to productivity sans ecological consciousness.” This “conventional approach to nature, to science, to productivity sans ecological consciousness” which Visvanathan talks about, leads to the ontological exclusion of science, which Vandana Shiva talks about.

Bureaucracy

If modernity has one feature which defines its birth, existence and perpetuation, it is the modern bureaucracy. The bureaucracy of modern nation states has fascinated sociology ever since its inception as a discipline. Max Weber believed that the emergence of bureaucracy was coincidental with the process of increased rationalization in society. While describing the role of bureaucratization in the rise of “money economy” and capitalism, Weber said, “The basis of bureaucratization has always been a certain development of administrative tasks, both quantitative and qualitative.”⁴⁰ These administrative tasks, according to Weber, were required in order to manage an advanced capitalist economy, and were spread out across the public and the private sectors. In the sphere of the state, bureaucracy is constituted by a bureaucratic agency, while in the sphere of the private economy, it is constituted by a bureaucratic enterprise.”⁴¹ Bureaucracy is treated by Weber as an institution which is tasked with the management of a rational capitalist society. However, Weber does not look at the bureaucracy in plainly descriptive value-free terms. It was also

seen by him as “a threat to individual freedoms”, and he feared that the ongoing bureaucratization was leading to a “polar night of icy darkness”, in which increasing rationalization of human life traps individuals in a soulless “iron cage” of bureaucratic, rule-based, rational control.⁴³ While Weber was concerned with the increased soullessness and rational coldness of the bureaucratic culture he saw the bureaucracy as a necessary institution in modern societies. Marx, on the other hand, saw the bureaucracy as incompatible with modern capitalism, but he also said that in their seeming oppositions they still relied on each other to exist. “The Corporation is civil society's attempt to become state; but the bureaucracy is the state which has really made itself into civil society.”⁴³

However, not all bureaucracies exist in modern societies, and their existence goes far beyond the functionalist idea, that of bureaucracy being a catalyst or obstruction for modernity and capitalism. Bureaucracies exist as sites of the exercise of power over the populations. In his ethnography on corruption and bureaucracy in a village in Uttar Pradesh, Akhil Gupta notes that bureaucracy in India is associated with inefficiency and corrupt practices. The bureaucracy through its actions has the power to convert human beings into homo sacer, reduced to their bare lives. His study of the discourse of corruption brings about the modes of governmentalities through which bureaucratic power commits structural violence upon the people. He calls this violence structural because, “...it is impossible to identify a single actor who commits the violence. Instead, the violence is impersonal, built into the structure of power.”⁴⁴ Akhil Gupta associates with bureaucracy, an arbitrariness which is synonymous with the unpredictability of bureaucratic behaviour. The officials could be the most compassionate people, and offer all the help at hand. Alternatively, they might be cruel and demand compensation in monetary terms or kind even from the poor and marginalized. They might delay the services in case of a disagreement or take up the case before the others if it pleases them. According to Akhil Gupta, “Such arbitrariness is not itself arbitrary; rather, it is systematically produced by the very mechanisms that are meant to ameliorate social suffering.”⁴⁵

The bureaucracy in Punjab and Malwa, like the rest of India, is a product of the colonial rule. The British installed a selected cadre of Indians as civil servants who would execute British policies and collect taxes for them. “The Indian Civil Service was a tiny administrative elite, never more than twelve hundred in number and, until the twentieth century, overwhelmingly British in composition. The lower ranks of the administration were peopled by a vast army of subordinate clerks and provincial staff, recruited in India to do the more humdrum tasks. But the hierarchy was headed and guided by the well controlled hand of carefully selected ICS officers.”⁴⁶ The bureaucracy that we see today is notorious for maintaining the same division and distance between the bureaucratic elite and the population. The bureaucratic culture has not just stayed in Government offices. The culture of bureaucratic elitism has dispersed into the entire society, and forms a Governmentality of its own. This “Governmentality of the bureaucracy” creates a glass frame between the population and the bureaucrats embodying power in its spatial design and formation as well. It produces an “arbitrariness” in its functioning which makes any tryst with the bureaucracy a highly uncertain one. In Balbhera, when a few local shopkeepers were asked about the Door-to-Door Survey of Cancer patients which happened in 2013, it turned out that it was not such a distant memory. There was almost unanimous agreement with the version of the event where the survey enumerators arrived at the local Gurudwara and announced through the loudspeaker, asking all the cancer patients to arrive at the Gurudwara in order to get enumerated. The survey was called “Door-to-Door” but for all practical purposes, turned out

to be a “Gurudwara- to- Gurudwara” survey. As weak cancer patients have great difficulties in not getting out of the houses in their condition, there is a very high probability that many of them were excluded from the survey. The bureaucracy governs through the division of spaces. This special exclusion of people denies them basic services and rights, and becomes especially violent when it is related to healthcare and public health.

The Primary Health Centre (PHC) of the village existed at the other end, quite far away from the part of the village where lower castes and the poor lived. The Accredited Social Health Activist (ASHA) of the Balbhera village, Gurinder Kaur, was not exactly unfriendly towards the people and did her job quite dutifully. However, in one of my interactions with the people in the main part of the village which was home to the lower castes and poor, it turned out that the list of cancer patients given to me by the ASHA excluded 3-4 patients who were alive. Not coincidentally, all were non- Jat Sikh and poor. The exclusion of patients from the list resulted in important services like palliative care and health checkups being availed to the people. The arbitrariness and inefficiency of the bureaucracy in its functioning, despite its organized structure, opens up an area where the concept of a rationally efficient bureaucracy needs to be critiqued in the social context of Punjab, especially in the health sector.

This bureaucracy becomes much worse in its impact and consequences over the people when one enquires into the functioning of the public hospitals. Hanuman Singh, a daily wage labourer from Ludhiana had come to Guru Gobind Singh Hospital and Medical College, for his wife’s cancer treatment. The couple was sent back twice. The first time they went, she was made to go through one stage of the check up and then asked to come back for the second, the next week. The next week on the appointed day, the doctor who carried out the examination in the previous week was not present. The other doctors refused to take up the treatment from that stage despite the other doctor having given a detailed note in their patient notebook. They had to return and come back next week when the doctor was present.⁴⁷ The arbitrariness of the bureaucratic culture even among the doctors shows the culture of bureaucracy in the most basic and micro level processes and interactions of daily life, even influencing those professionals who are technically outside the domain of bureaucracy. All of this exclusion is not because of the lack of execution of tasks according to rules and procedures, in fact it is because of this very execution of the rules by the word and not figuring in an ounce of empathy in the whole action. The impact of this “iron cage” leads to what Weber calls a situation akin to “polar night of icy darkness.”⁴⁸ Akhil Gupta says that the suffering and structural violence is “systematically produced by the very mechanisms that are meant to ameliorate social suffering.”⁴⁹

The procedures are inscribed in a manner which is unintelligible to most people, even if it is written in Punjabi, their own language. The complexity of jargon and grammar used in the official writing is a major reason for exclusion of people. The toughness and rigidity of the procedures further add to the already existing contempt which people have for bureaucratic work, the contempt stemming from the immense difficulty faced in understanding, executing and maneuvering through these procedures. However, as much as the state has failed in ameliorating the suffering of the cancer patients and tackling the cancer epidemic, it has done something in terms of welfare for the cancer patients. *Mukhyamantri Cancer Rahat Kosh* (Chief Minister Cancer Relief Fund) is a scheme initiated at the behest of the Punjab Government which provides free diagnosis, treatment and medicines for cancer up to a threshold of Rs. 1.5 Lakh. There are however two major problems with this. The cost of

treatment mostly even exceeds the Rs. 1.5 lakh that the Government provides to the people under the Mukhyamantri Cancer Rahat Kosh Yojana. In a study by Inderjit Singh et al. the average cost of diagnosis, admission, treatment and follow up came out to be Rs. 2.75 lakh.⁵⁰ The difference of an average of Rs. 1.25 lakh between what is given and what is required, is unaffordable for most cancer patients, especially the poor and the marginalized, a category overrepresented by Dalits and OBCs from across faiths. This kind of a half-hearted financial support are only poor substitutes for a strong fully-funded public treatment of cancer and it ensures that people continue to flock to Bikaner where the costs of cancer are far lower even without any special fund, mainly because of the Rajasthan Government scheme for Universal Healthcare including diagnosis and medicines of all diseases including cancer.⁵¹

However a more dominant reason for the ineffectiveness of the scheme in keeping Punjabi cancer patients in Punjab is the utter difficulty in getting enrolled and obtaining a card under the scheme. The procedure of obtaining a Badal Card⁵² is terribly complicated. Inderjit Singh et al. explain this by stating, “The process for taking state assistance, termed as tedious and time consuming, is as follows: (a) submission of application with residence proof, cancer test report and estimates of treatment cost from the hospital; (b) approval from the Govt. Medical College and Hospital Level Committee (Amritsar, Faridkot, GMCH Chandigarh, PGIMER Chandigarh); and (c) a final sanction from the government, Chief Minister of Punjab.”⁵³ This immense complexity and toughness of procedure is debilitating for a poor working class person. There are a few problems associated with the knowledge of Government schemes not being dispersed at the grassroots. Some of the patients interviewed in the cancer train had never even heard of this scheme or the Badal Card. However, most had just been utterly exhausted by the procedure of having to obtain a card for the cancer patient in their family.

The immense bureaucratic leviathan is majorly responsible for the Green Revolution inflicted cancer could take up the form of an epidemic. The inefficiency and complexity pervades the health sector but is also strong in the other departments. The failure of the state to ensure compliance by farmers towards the guidelines for pesticide and chemical use can be attributed to the mammoth task involved in making a policy effective with such an inhibiting bureaucracy. Sucha Singh Gill encapsulates this problem well, “There are three easily identifiable reasons for the past deterioration in these (health) services. First, a section of employees lacks commitment to their profession and avoids work or remains absent. Secondly, there are no visible incentives for efficient workers and disincentives/punishment for inefficiency. The administration lacks efficiency orientation and main thrust of administrators is towards wielding power and the misuse of their position for private benefits. Thirdly due to bureaucratic delays and red-tapism, funds which are available for improvements and upgradation do not reach the institutions well in time and large amounts leak out illegally contributing to the enrichment of those holding key positions”.⁵⁴

The green revolution culture of farming and the bureaucracy have been analysed as exercisers of power through their governmentalities, creating the cancer epidemic as a consequence. The increasing privatization of healthcare has only worsened the crisis and made it difficult to manage for the state. The privatization push in healthcare, concomitant with the decline of publicly funded healthcare is not unique to Punjab and is more or less a consistent trend being seen around the liberal capitalist democracies in the world. Neoliberalism is the dominant ideology of our times and even though Punjab’s health system and cancer epidemic is not solely because of this one ideology, it has played a pretty major

role in aggravating the crisis further and contributing to the further immiserisation of the poor and the marginalized.

Neoliberalism and Health in Punjab

Neoliberalism is an ideology significant since the 1990s. So deep and pervasive is the power of this ideology that every government has, in some measure at least, been forced to adhere to the tenets of this framework. “Neoliberalism sees competition as the defining characteristic of human relations. It redefines citizens as consumers, whose democratic choices are best exercised by buying and selling, a process that rewards merit and punishes inefficiency. It maintains that “the market” delivers benefits that could never be achieved by planning.”⁵⁵ Neoliberalism followed from the academic environment in the 1980s, which had grown in favour of market based delivery of services and contraction of the state. This derived from the works of Public Choice Theorists who saw the state as a nexus of exchange and inefficiency while proclaiming that the essential state was the minimalist state, “restricted largely, if not entirely, to protecting individual rights, persons and property, and enforcing voluntarily negotiated private contracts.”⁵⁶ The theories of economists like Milton Friedman and Friedrich Hayek were associated with this paradigm of neoliberalism and neoutilitarianism. This doctrine found support in various countries, albeit not from a majority of the people. Neoliberalism came to India formally in 1991 through the ‘economic reforms’ or what came to be associated with the abbreviation ‘LPG’ or ‘Liberalisation Privatisation Globalisation’. This set of terms summed up what the reforms meant to India.⁵⁷

The stress on privatisation in Punjab’s healthcare also came up in 1990s as the state began to give up on even the most basic measures for social justice and human development. The shift towards market based privatized healthcare is symbolized by two major policy measures taken in the 1990s. Firstly, there was an across the board increase in fees and the medical expenses of patients in public hospitals through a Gazette Notification of February 18, 1994.⁵⁸ However, the government did not implement it on the intended date, March 1 1994. Again the same notification was issued on September 26, 1995 but its implementation proved disastrous for the ailing patients, who went into a panic, kept away and hospitals wore a deserted look. The Government, despite there being no organized protest, withdrew the notification finally on October 18, 1995. This was followed by a slow and sustained increase in fees over the next few years which raised little alarm, but at the same time was a policy not even remotely as sweeping as the one intended initially.⁵⁹ The second policy brought about was the setting up of the Punjab Health Systems Corporation, which was supposed to privatize and commercialize healthcare in Punjab.⁶⁰ This was also revoked after sustained opposition from unions and civil society interest groups. However, eventually this body was set up with a Rs. 420 crore World Bank loan, though in a much more diluted form covering only secondary healthcare in rural and urban areas of Punjab, with the rest being handled by the Directorate of Health.⁶¹ In today’s scenario, this privatisation has been consolidated far beyond these two policies, with Punjab’s healthcare system being highly market- based, privately managed and very expensive, characterized by a high number of private clinics and a very high ratio of private to public expenditure. After 1991, the number of rural health dispensaries in Punjab has actually decreased marginally and there has been no expansion in health infrastructure of urban and rural areas.⁶²

This decline in public supported healthcare system has been a bane for the common people of Punjab, especially the poor and the marginalized. The withdrawal of support to

healthcare has been concomitant with the rise of proletarianisation and pauperization of the labour force in agriculture and other sectors as well. Punjab is a society dominated by a class of agrarian capitalists. This class of agrarian capitalists emerged as a direct consequence of the green revolution, where the average size of land holdings increased right till the 1980s. A comparison of agricultural censuses of Punjab for the years 1971 and 1981 show that the number of small landholdings below 2 hectares (ha) fell, owing mainly to the cessation of some 0.8 million petty tenancies; land concentration increased and average land holding size went up. At the same time, Punjab registered a steep rise in proportion of labourers in the agricultural workforce (from 32 to 38 per cent).⁶³ However, with an increase in mechanization in farming, labour began shifting out of agriculture into non- agricultural occupations. This got intensified especially after the 1990s, when according to Ranjit Singh Ghuman, the “push effect” from agriculture increased while the “pull effect” from other sectors stayed negligible.⁶⁴ This led to an increase in proletarianisation and pauperization of labour as no significant change in wages came about in non- agricultural sector. Casual labour also increased in proportion amongst agricultural labour and this labour was now employed on a fluctuating and temporary basis. The decade of 1980s witnessed a rise in share of hired labour in wheat and cotton, and this continued after the 1990s. The startling feature of this was that casual hired labour constituted 68 to 84 per cent of hired labour across the three major crops: paddy, cotton and wheat.⁶⁵ In such an economic environment when industrialization has not been fast enough and proletarianisation of labour force has become alarmingly rampant, a withdrawal of state funded healthcare has made the situation worrisome for most people in Punjab. Healthcare costs have increased substantially for the people, majorly affecting the poor and the marginalized. Estimates from the 59th round of NSSO say that nearly 41.6% of the total credit acquired was for healthcare purposes, making cost of healthcare a leading cause of indebtedness.⁶⁶

Agrarian indebtedness has been one of the most important factors to be associated with the agrarian distress and the alarming increase in farmer suicides in the rural areas of India. Punjab has been one of the states worst affected by agrarian distress and farmer suicides. During the fieldwork, the absolutely bleak situation of the economy, environment and society in Punjab became evident. Most of the village water bodies have been polluted beyond measure. The villages have seen a spree of new RO Water dealers who sell RO Water to people who cannot pay for clean drinking water. The income inequality is growing fast while the economy isn't. To make things worse, state funding for education, research, health, and for every other field is being withdrawn and private hospitals, schools and universities are the new norm. The cancer patients flock to Rajasthan because this trend towards privatisation and cutback in state funding has only recently begun there.⁶⁷ A number of patients aboard the cancer train contrasted the bureaucratic culture of Rajasthan's hospitals and the attitude of the doctors in Rajasthan to the blithely insensitive and indifferent attitude of the doctors in Punjab. The state has a strong democratic culture of ground level activism and resistance which has probably been responsible for the State Government taking a number of pro- people measures in all fields. Punjab, on the other hand, has seen neither stable democracy nor an existing and functioning civil society, which has made resistance against neoliberal reforms far more muted than in neighboring Rajasthan. However, this is merely conjecturing and this difference between Punjab and Rajasthan in terms of their bureaucracies and welfare regimes needs to be studied more.

In this environment a cancer epidemic, created by the green revolution agrarian practices and bureaucratic ineffectiveness and arbitrariness, could not have come at a worse

time when the state is almost completely dependent on capital and that too, mostly international capital, for its agricultural policies. The state has been largely stripped of its ability to act in any meaningful way to chart a path away from the green revolution model of agriculture. One of the main culprits for this weakening of the state are the Economic Reforms, Structural Adjustment Programmes and goals such as Fiscal Responsibility and Budgetary Management which in the present policy and government ideology are considered sacred. State support is required to encourage research in alternative agricultural practices and their implementation. This does not mean that the neoliberal order is the main reason for the crisis and the paper does not enter this fallacious reasoning. The roots and substance of the problem lies in the governmentalities at the deepest level of the village and the bureaucracy and in the technocratic discourse based on a reductionist idea of science. However, the ability to move out of these ideological formulations becomes far more difficult when the state is robbed off its autonomy to act and is substituted not by grassroots non-state actors but by capital. The modality by which neoliberalism inhibits meaningful public action aggravates the problem of green revolution induced health crisis.

In today's times, the only way one can move away from a scientific technocratic green revolution model of agriculture is with the help of community level interventions which would create the necessary environment to change the culture of farming from the culture of progressive, modern and yield based farming to a new kind of farming which is sustainable, natural and, human and environment friendly in its existence. Fortunately, the state of Punjab has seen a movement aiming at such a cultural change by changing the mindset through which farming is carried out. The Kheti Virasat Mission (KVM) is a civil society organization which has done tremendous work in the field of organization of communities and people in order to encourage natural 'chemical free' farming. It has been a ray of sunshine in an otherwise dark and dreary environment of degradation and decay.

Is this a movement of change?

The paper, in its introduction, mentioned the movement which is emerging in Punjab - The Natural Farming Movement. It can be called a movement, as it is progressing with an objective of creating a paradigm shift in the way farming is carried out. It is being spearheaded by one organization, Kheti Virasat Mission (KVM) founded and headed by Umendra Dutt, a former journalist. However unfortunately, this movement has not reached a number large enough to create any tangible impact in Punjab or Malwa, atleast presently. However, this does not take the credit away from the KVM which is bringing about a change in mindset and the discourse. With each day, progressively more and more people are being made aware of the disastrous impact of modern chemical farming upon the people's health and the environment. As this knowledge disperses through the society, the cause which KVM is driven towards becomes more and more realistic and remains less of a "utopia."

Civil Society in Punjab could not organically develop into a significant force like it has become in many of the other states, including neighbouring Rajasthan. The absence of civil society and activism in Punjab has elicited a lot of research interest among the people. Many factors have been put forth to explain this void in the realm of civil society. Any discourse of the civil society in Punjab has to be related to agriculture, which is the main source of livelihood for people and the ultimate power base for politics in the state. The long period of militancy and the stagnation of political discourse around the issues of militancy, peace and security put the issues of the agrarian crisis on the backburner during the 1990s.⁶⁸

Even the established civil society organisations like the Bharatiya Kisan Union were riddled with faction politics and infighting.⁶⁹ However, in the new millennium with the ebbing down of militancy and its rhetoric in politics, these issues began coming back into the political mainstream. Reports on cancer and agrarian crisis dominated journalistic space about Punjab in the middle of the first decade of the millennium. The emergence of the KVM as a civil society organisation was a phenomenon of this very new millennium, when the public sphere in Punjab returned to normalcy and issues of the agrarian crisis came to the centre stage.

KVM has successfully created an environment in which a conversation on the Green Revolution and modern farming can be carried out. By no means is it dominating the conversation on agrarian issues, but the clear formulation of the problems related to modern farming which the KVM has brought forth in its engagement is truly representative of a new imagination of agriculture. The KVM intervenes regularly and intensively with farmers in the villages of Malwa with the help of its already existing group of natural farmers and a number of activists, who have been inspired by the vision and imagination of an alternative paradigm of agriculture. The organization has been instrumental in providing the latest information to the farmers about natural and environment- friendly techniques which do not seek to alter nature but to use it in order to achieve the same end: High Yield. An aspect working in favour of the organization and its activities is the high demand of organic food grains in the market, which results in the natural farmers getting a good price for their produce.

There is a school of thought in the intelligentsia and the government who look at the efforts of KVM with a tinge of suspicion. Inder Pal Singh and DK Grover, through their study state that the yields through organic farming are less but the price for organic goods fetched in the market makes it profitable.⁷⁰ They also state that the spread of organic farming to a major section of Punjab's farmers could be a threat to food security.⁷¹ However, during the fieldwork when this was posed as a question to a number of natural farmers, they protested against the reductionist reasoning involved in such statements. They raised a number of points against these claims, stating that these claims could only be made by somebody who did not understand farming and the nuances of it. These counterinterviews can be concisely put forth in two points- Firstly, there is no one way of doing natural farming and different methods work on different land types. It is only through experimentation that this ideal method of natural farming can be deduced for each kind of land. However once the experimentation yields a firm method, the yield increases to a large extent. Secondly, a lot in organic farming depends on the fertility of the soil. The fertility of the soil has been disastrously affected because of the reckless use of chemicals in agriculture for decades. The land, once diverted from these practices towards natural farming, needs a number of years to regain its fertility through a natural regeneration process. There have been numerous examples of farmers who have used completely natural methods of farming and have grown record yields in their farms. Sumant Kumar from Deveshpura in Bihar set a world record in rice production by producing 22.4 tonnes of rice on a 1 hectare farm, when he used the "Systematic Rice Intensification" technique to grow his paddy without the use of an ounce of chemicals.⁷² Subhash Palekar from Belora Village in Yavatmal, Maharashtra has started a technique of farming called 'Zero Budget Natural Farming' which combines Jeevamrit, Beejamrit (a fertilizer applied to seeds before sowing them) and mulching. He also uses various natural ingredients to create natural pesticides, which cause minimum damage to nature and microorganisms.⁷³ These landmark innovations have inspired the imaginations of natural farmers in Punjab, who have taken a number of lessons from these successful natural farmers from across India. The KVM assists the natural farmers in this process of knowledge

creation and distribution by becoming an arbitrator of knowledge to the farmers, except that everything is free and open source.

The knowledge creation at the grassroots and its popularization aims to tackle what Vandana Shiva would call epistemological exclusion, an exclusion of alternative systems or methods of doing science.⁷⁴ The nature friendly methods of natural farming are extremely scientific and sound. The tyranny of the dominant method of reductionist science is embodied in its blinkered view of cause and effect and is a form of reductionist empiricism. The natural farmers not only seek to rescue farming from the scientific method of green revolution farming, but also seek to rescue science from its blinkered reductionist version which creates the monstrous crises like the cancer epidemic in Punjab.

Probably it is the victory of KVM that it has engaged in a dialectical process of knowledge creation with the farmers, tapping the local knowledge systems which they could then use to help farmers who need more knowledge about natural farming. The natural farmers form a closely knit interacting community which constantly engages in a dialogue with each other. Most of them would never have read the book 'The One Straw Revolution' by Masanobu Fukuoka. However, almost all of them have heard of the main arguments and techniques of natural farming described in the book. The technique of mulching was popularized by this book, in which the straws of wheat are used to cover the ground which then acts both, as a fertilizer and as a cover to conserve water against evaporation to the sun.⁷⁵ Mulching is a buzzword among the natural farmers and all of them know about it. This community like feeling among natural farmers seems to be formed by the passion for natural farming and the shared vision for an alternative society in Malwa. The system of democratic knowledge creation and growth, which the KVM has put in place is truly remarkable and one which is indeed its biggest strength as an organization.

The KVM engages with various knowledge systems facilitating a dialogue between these systems to create a space for alternative sciences, based on the same basic doctrines as modern science but with a far more democratic and nuanced understanding of nature and human beings. Their activities seek "cognitive justice"- recognition of alternative paradigms or alternative sciences by facilitating and enabling dialogue between, often incommensurable, knowledges.⁷⁶

The paper believes that the Natural Farming Movement poses a true alternative to the present model of agriculture. The roots of the agrarian distress, health crisis and the indebtedness lie primarily in the green revolution model of agriculture. The governmentalities which have given power to the technocratic discourse of the Green Revolution are at the root of the present agrarian crisis. Only the Natural Farming Movement spearheaded by the activities of KVM and a number of natural farmers in Punjab poses a real alternative to this fatal green revolution model of farming. However, this resistance is still marginal and has unfortunately it is still only developing as a movement. Here, it becomes paramount for the organic intellectuals of Punjab and the academics in the universities of Punjab to engage with the farmers of Punjab to help them and convince them regarding these alternatives. Public interaction and communicative reasoning with the farmers is the only way that the natural farming movement can counter the propaganda by stakeholders in modern chemical farming and promote itself as a viable alternative in the eyes of the peasantry of Punjab.

Conclusion

During the fieldwork a number of people spoken to, including doctors, officials and academicians, refused to acknowledge the culpability of the Green Revolution in being a major event leading to the present crisis. Even Umendra Dutt had a similar experience of facing denial in the middle of the first decade of 21st century when he had just founded KVM and when the organization was just starting to get popular. Fortunately, today there is at least a degree of acceptance regarding the impact of the green revolution on health. The violence of the green revolution was an idea that was once mocked upon. Anybody aware of the issues faced by Punjab especially Malwa, including the health crisis, environmental crisis and the agrarian crisis, would surely not label the Green Revolution as an unqualified success. Even if one accepts the dominant statist narrative, that the Green Revolution was the only way to attain food security at that time, nothing explains why the same set of technologies and knowledge systems should be applied today as well. Such a defence of the Green Revolution technology and ideology falls flat especially in the present times when there have been various instances of farmers practicing natural farming and achieving a yield equal to or even higher than the one achieved through chemical farming.⁷⁷ In our times, it would be unfair to say that the Green Revolution ideology of a blind religiosity regarding technocratic scientific application of technology and chemicals in farming is still as strong as it once was. There is major awareness regarding its drawbacks and substantive resistance is posed by other more environment- friendly technologies which have been popularized under the paradigm of natural farming, which even if are not the dominant paradigm in agriculture, are still gaining immense popularity by the day. This paper, through primary research, looks at the set of government mentalities which create the crisis of the cancer train, emanating from the same green revolution which apparently helped avoid massive famines.

The Green Revolution operates at the most basic level as a discourse, a mindset which legitimizes all activity on the farm directed at a single goal: High Yield. The discourse operates majorly through a set of government mentalities. In this paper, the “Governmentality of the progressive farmer” has been explored. Most farmers in Punjab strive to be progressive as the discourse of the green revolution supports that. The reductionist science, which removes spheres like health, environment and culture out of the field of view of agriculture, creates massive exclusions. The paper states that the ontological exclusion created by this technocratic form of agriculture is the primary form of violence which creates the basis for the cancer crisis. It came out quite strongly in the fieldwork that irrespective of the impact on the health, environment and even indebtedness, the farmers seem to see no other alternative to this violent form of green revolution agriculture. The epistemological basis of the green revolution is not one based in Punjab, and to some extent, the accompanying impact of these technologies on the people derives from this unsuitability as well.

The health crisis which has its roots in the village sees a catalyst in the bureaucratic inefficiency and arbitrariness which is experienced by people and especially impacts the cancer patients in the hospitals and among the village bureaucracy. The arbitrariness in this bureaucratic Governmentality is created by the same procedures which are meant to improve the lives of the people. The uncertainty about their lives leads a lot of people to find alternatives outside Punjab and the cancer train emerges in this context, as a bearer of cancer patients who are victims of the green revolution based agriculture in Punjab. A number of cancer patients find the attitude and bureaucratic systems of Rajasthan far better than Punjab. Further research is required to understand why this might be the case.

Marketisation and privatisation in healthcare is a phenomenon which has accompanied these governs mentalities making the state unable to meaningfully bring about any structural change in the agriculture and farm sector. The substitute for the state has not been a stronger community intervention but increased capital penetration which has aggravated the problems associated with modern scientific farming in Punjab, like the health and the environmental crisis. The indebtedness has increased on accounts of loans taken for healthcare, which means cancer care in a lot of cases. The contribution of this type of indebtedness to the larger agrarian crisis is significant especially at a time when the trend towards proletarianisation and pauperization of the workforce have become significant. This financial burden is another reason why many patients, especially the poor and the marginalized, prefer to travel to Bikaner, taking advantage of the Rajasthan Government's Universal Healthcare Scheme which provides free diagnosis and medicines to cancer patients. There is more research required into ascertaining the politics which made the Universal Healthcare Scheme possible in Rajasthan, especially in a political environment when high public spending on human development is not a common phenomenon. The cancer crisis could not have taken a tragic upswing at a worse time, when the ability for public action has been reduced. The only alternative for social change has been reduced to community based interventions.

KVM and its activities are significant in terms of the paradigm shift that they envision in agriculture. By organizing like- minded farmers into a community of natural farmers, it creates necessary conditions and environment for a dialogue on farming which is essential for a discursive shift in agriculture. The epistemological exclusion engendered by modern farming is tackled by natural farming. The KVM engages in a dialectical process of knowledge creation where it collects knowledge about the various innovative experiments which the farmers take on and then help the community of natural farmers by dispersing the information. The ability of such a model to bring about real epistemological inclusion and cognitive justice is strengthened by the active engagement of scientists, activists and social workers along with the farmers. The Natural Farming Movement is probably the only paradigm which challenges the dominance of the green revolution ideology and poses a real workable alternative to the prevailing system. If the health crisis and the cancer train need to be made history in Punjab, a thrust to natural farming through public and community effort is an unsubstitutable necessity.

Notes:

1. Praveen Donthi, "Cancer Express", *Hindustan Times*, January 17, 2010, Accessed 2 February 2015 <http://www.hindustantimes.com/india/cancer-express/story-G0i4G2mnoQnLDRry0kiV6L.html>
2. William Gaud, "The Green Revolution: Accomplishments and Apprehensions." Speech (Society for International Development, Washington DC. 1968. accessed 2 Feb. 2015) <http://www.agbioworld.org/biotechinfo/topics/borlaug/borlaug-green.html>
3. Raj Patel, "The Long Green Revolution," *The Journal of Peasant Studies* 40, no. 1 (2013): 1-63, DOI: 10.1080/03066150.2012.719224 , 11
4. Read Patel (2011) and Frankel (1969)
5. Francine Frankel, "India's New Strategy of Agricultural Development: Political Costs of Agrarian Modernization", *The Journal of Asian Studies* 28, No. 4 (1969): 693- 710, <http://www.jstor.org/stable/2942406>, 693
6. Inder Malhotra, "Swallowing the humiliation", *Indian Express*, July 12, 2010, Accessed 1 February 2016 <http://archive.indianexpress.com/news/swallowing-the-humiliation/645168/>
7. C. Subramaniam, *The New Strategy in Indian Agriculture: The First Decade and after*, (New Delhi: Vikas Pub, 1979), 108
8. Shiv Vishvanathan, "From the Green Revolution to the Evergreen Revolution: Studies in Discourse Analysis" (Paper Presented at the IDS Seminar on Agriculture Biotechnology and the Developing World, Centre for Study of Developing Societies, New Delhi, India, 1-2 October 2003), 3 idem, 5
9. Raj Patel, "The Long Green Revolution," *The Journal of Peasant Studies* 40, no. 1 (2013): 1-63, DOI: 10.1080/03066150.2012.719224
10. ibid
11. DN Dhanagare, "Green Revolution and Social Inequalities in Rural India," *Economic and Political Weekly* 22, no. 19/21 (1987): AN137-AN139+AN141-AN144, Accessed August 10, 2015 <http://www.jstor.org/stable/4377016> , AN137
12. Ashutosh Varshney, *Democracy, Development, and the Countryside: Urban-rural Struggles in India*, (Cambridge: Cambridge University Press, 1995), 37
13. Ashis Nandy, "Introduction: Science as a Reason of the State," *In Science, Hegemony and Violence: A Requiem for Modernity*, ed. Ashis Nandy (Tokyo, Japan: United Nations University, 1988) Accessed October 2, 2015, <http://www.arvindguptatoys.com/arvindgupta/hegemony-nandy.pdf>
14. See Alvares (1992), Escobar (1995)
15. See HB Mathur et al. (2005); Thakur et al. (2008); Punjab (2013)
16. Francesca Mancini et al, "Acute Pesticide Poisoning among Female and Male Cotton Growers in India," *International Journal of Occupational and Environmental Health* 11, no. 3 (2005): 221-32. DOI: 10.1179/oeh.2005.11.3.221
17. Bajinder Pal Singh, "Cancer Deaths in Agricultural Heartland: A Study in Malwa Region of Indian Punjab." (M.S. diss, International Institute of Geo- Information Science and Earth Observation, 2008), Accessed 20 February 2015 https://www.itc.nl/library/papers_2008/msc/gem/bajinderpdf.pdf
18. Punjab, *Statistical Abstract of Punjab* (Chandigarh: Dept of Finance, Govt. of Punjab, 2005)
19. Punjab, *Statistical Abstract of Punjab* (Chandigarh: Dept of Finance, Govt. of Punjab, 2006)
20. Punjab, Punjab State Health Systems Resource Centre. *State- Wide Door to Door Campaign: Cancer Awareness and Symptom based Early Detection*, (Chandigarh: Punjab Dept of Health and Family Welfare, 2013), 51
21. Dr. Reshma Nayak, "Are the farmers in Punjab paying a price for the Green revolution?," *The Health Site*, Jan 30, 2013, Accessed 10 February 2016, <http://www.thehealthsite.com/diseases-conditions/are-the-farmers-in-punjab-paying-a-price-for-the-green-revolution/>
22. "Rajasthan", National Health Portal, Accessed January 3, 2016 http://www.nhp.gov.in/rajasthan_pg
23. See Agamben (2004)
24. Timothy Mitchell, "Society, Economy and the State Effect," In *State/culture: State-formation after the Cultural Turn*, ed. George Steinmetz, 76- 97, (Ithaca, NY: Cornell University Press, 1999)
25. Michel Foucault, "Governmentality", In *The Foucault Effect: Studies in Governmentality*, ed. G. Burchell, C. Gordon, and P. Miller, 87- 104, (Hemel Hempstead and Chicago: Harvester Wheatsheaf and University of Chicago Press, 1991), 92
26. Michel Foucault, and Michel Senellart, *The Birth of Biopolitics: Lectures at the Collège De France, 1978-79*. (Basingstoke: Palgrave Macmillan, 2008), 3
27. James Fergusson and Akhil Gupta, Spatializing States: Toward an Ethnography of Neoliberal Governmentality, In *Anthropologies of Modernity: Foucault, Governmentality and Life Politics*, ed. Jonathan Xavier Inda, (Malden, Oxford and Victoria: Blackwell, 2005), 109
28. Norman K. Denzin, *Sociological Methods: A Source Book* (New Jersey: Aldine Transaction, 2006)

29. Irving Seidman, *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences*, (New York: Teachers College Press, 1998), 8
30. “Semi Structured Interviews”, Qualitative Research Guidelines Project, Last Modified January 15, 2016, <http://www.qualres.org/HomeSemi-3629.html>
31. Kathleen Musante DeWalt and Billie R. DeWalt, *Participant Observation: A Guide for Fieldworkers*, (Lanham, MD: Rowman & Littlefield, 2011), 76
32. Michel Foucault, “Governmentality”, In *The Foucault Effect: Studies in Governmentality*, ed. G. Burchell, C. Gordon, and P. Miller, 87- 104, (Hemel Hempstead and Chicago: Harvester Wheatsheaf and University of Chicago Press, 1991), 92
33. *ibid*
34. Gurjeet Singh, Interviewed by Shantanu Nevrekar, Balbhera, 27 April 2015
35. Here land is being defined in the economic way where land includes land and all the natural ecological things known as “resources”.
36. M.H. Behrooz, "Ideology and Utopia in Mannheim: Towards the Sociology of Self-Knowledge," *Human Architecture: Journal of the Sociology of Self-knowledge* 1, no. 1 (2002): 120-39, Accessed May 21, 2016. <http://www.okcir.com/Articles I 1/HAsp02p120-140.pdf>
37. PK Shetty, “Socio-Ecological Implications of Pesticide Use in India,” *Economic and Political Weekly* 39, No. 49 (2004): 5261-5267 <http://www.jstor.org/stable/4415873>, 5265
38. Vandana Shiva, “Reductionist Science as Epistemological Violence,” In *Science, Hegemony and Violence: A Requiem for Modernity*. edited by Ashis Nandy. (Tokyo, Japan: United Nations University, 1988). Accessed October 2, 2015, <http://www.arvindguptatoys.com/arvindgupta/hegemony-nandy.pdf>, 89
39. Max Weber, “Bureaucracy,” In *Economy and Society: An Outline of Interpretive Sociology*, edited by G. Roth and C. Wittich, Translated by E. Fischoff, H. Gerth, A.M.Henderson, F. Kolegar, C.Wright Mills, T. Parsons, M.Rheinstein, G. Roth, E. Shils, and C.Wittich, 956–1005, (New York: Bedminster Press, 1968)
40. *ibid*
41. Max Weber, *Protestant Ethic and the Spirit of Capitalism*, Translated by T. Parsons, (London and New York: Routledge, 1992), 123
42. Karl Marx, "Notes for a Critique of Hegel's Philosophy of Right, by Karl Marx", marxists.org <https://www.marxists.org/archive/marx/works/1843/critique-hpr/ch03.htm>, Accessed January 20, 2016
43. Akhil Gupta, *Red Tape: Bureaucracy, Structural Violence and Poverty in India* (New Delhi: Orient Blackswan, 2012), 20
44. *Idem*, 24
45. “Indian Civil Services”, thebritishempire.com, Accessed January 22, 2016, url: <http://www.britishempire.co.uk/maproom/india/ics.htm>,
46. Hanuman Singh, Interviewed by Shantanu Nevrekar, Faridkot, 14 May 2015
47. Max Weber, “Bureaucracy,” In *Economy and Society: An Outline of Interpretive Sociology*, edited by G. Roth and C. Wittich, Translated by E. Fischoff, H. Gerth, A.M.Henderson, F. Kolegar, C.Wright Mills, T. Parsons, M.Rheinstein, G. Roth, E. Shils, and C.Wittich, 956–1005, (New York: Bedminster Press, 1968)
48. Akhil Gupta, *Red Tape: Bureaucracy, Structural Violence and Poverty in India* (New Delhi: Orient Blackswan, 2012), 20
49. See Inderjit Singh et al. (2013)
50. “Rajasthan”, National Health Portal, Accessed January 3, 2016 http://www.nhp.gov.in/rajasthan_pg
51. The card obtained under the scheme is called “Badal Card” as the scheme and the card are considered a policy owed completely to the Chief Minister Parkash Singh Badal and his government.
52. Inderjit Singh, Lakhwinder Singh and Parmod Kumar, “Economic and Financial Consequences of Cancer from Patient's Family Perspective: A Case Study of Punjab”, *Discussion Papers in Development Economics and Innovation Studies* 5 (2013), 19 http://www.punjabiversity.ac.in/cdeiswebsite/downloads/discussion_papers/5%20Economic%20and%20Financial%20Inderjeet%20Singh,%20Lakhwinder%20Singh%20and%20Parmod%20Kumar.pdf
53. Sucha Singh Gill, “Punjab: Privatising Health Care,” *Economic and Political Weekly* 31, No. 1 (1996): 18-19 Accessed December 20, 2015 url: <http://www.jstor.org/stable/4403641>
54. George Monibot, “Neoliberalism – the ideology at the root of all our problems”, *The Guardian*, April 15, 2016, Accessed February 20, 2016, url: <http://www.theguardian.com/books/2016/apr/15/neoliberalism-ideology-problem-george-monbiot>

55. James M. Buchanan, Robert D. Tollison and Robert Tullock, *Towards a Theory of the Rent-seeking Society*, (College Station, TX: Texas A&M University Press, 1980), 9
56. Read Nagaraj (1997) and Mukherjee (2007)
57. Sucha Singh Gill, "Punjab: Privatising Health Care", *Economic and Political Weekly*, 31, No. 1 (1996): 18-19 Accessed December 20, 2015 url: <http://www.jstor.org/stable/4403641>
58. ibid
59. ibid
60. Sucha Singh Gill and Ranjit Singh Ghuman, Rural Health: Proactive Role of the State, *Economic and Political Weekly* 35, no. 51 (2000): 4474-4477 url: <http://www.jstor.org/stable/4410079>
61. ibid
62. Utsa Patnaik, "Some Economic and Political Consequences of the Green Revolution in India", In *The Food Question: Profits Versus People*, edited by Henry Bernstein, Maureen Mackintosh, Charlotte Martin (New York: Earthscan Publication Ltd., 2013)
63. Ranjit Singh Ghuman, "Rural Non-Farm Employment Scenario: Reflections from Recent Data in Punjab", *Economic and Political Weekly* 40, no. 41 (2005): 4473- 4480. Accessed December 20, 2015. <http://www.jstor.org/stable/4417268>
64. Sucha Singh Gill and Ranjit Singh Ghuman, "Changing Agrarian Relations in India: Some Reflections from Recent Data," *The Indian Journal of Labour Economics*, Vol. 44, no. 4 (2001): 809-826
65. National Sample Survey Organisation. *Income, Expenditure and Productive Assets of Farmers*, 59th Round, Report No 497 (New Delhi: NSSO, 2005), 59/33/5
66. Sahil Makkar, "CM Raje pushes the reforms pedal, people await results," *Business Standard*, January 2, 2015, Accessed 8 August 2015 http://www.business-standard.com/article/economy-policy/cm-raje-pushes-the-reforms-pedal-people-await-results-115010200023_1.html
67. Surinder Jodhka, "Return of the Region: Identities and Electoral Politics in Punjab," *Economic and Political Weekly* 40, no. 3 (2005): 224- 230. Accessed May 15, 2015. url: <http://www.jstor.org/stable/4416079>
68. Chandhoke, Neera and Praveen Priyadarshi, Electoral Politics in Post-Conflict Societies: Case of Punjab, *Economic and Political Weekly* 41, no. 9 (2006): 811-813+815-819 Accessed May 10, 2015 <http://www.jstor.org/stable/4417908>
69. Inder Pal Singh and DK Grover, "Economic Viability of Organic Farming: An Empirical Experience of Wheat Cultivation in Punjab," *Agricultural Economics Research Review* 24, no.2 (2011): 275- 281 <http://ageconsearch.umn.edu/bitstream/119380/2/10-Inderpal-Singh.pdf>
70. ibid
71. John Vidal, India's rice revolution, *The Guardian*, February 16, 2013, accessed January 20, 2016, <http://www.theguardian.com/global-development/2013/feb/16/india-rice-farmers-revolution>
72. "What is Zero Budget Spiritual Farming," Subhash Palekar, accessed January 20, 2016 <http://www.palekarzerobudgetspiritualfarming.org/>
73. Vandana Shiva, "Reductionist Science as Epistemological Violence," In *Science, Hegemony and Violence: A Requiem for Modernity*. edited by Ashis Nandy. (Tokyo, Japan: United Nations University, 1988). Accessed October 2, 2015, <http://www.arvindguptatoys.com/arvindgupta/hegemony-nandy.pdf>, 89
74. Masanobu Fukoka, *The One Straw Revolution: An Introduction to Natural Farming*, Translated by Chris Pearce, Tsune Kurosawa and Larry Korn Mapusa. (India: Other India Press, 1992)
75. Shiv Visvanathan, "The Search for Cognitive Justice," (Paper presented at the Symposium- Knowledge in Question, a symposium on interrogating knowledge and questioning science #597) http://www.india-seminar.com/2009/597/597_shiv_visvanathan.htm, Accessed May 10, 2016
76. Stories of Sumant Kumar and Subhash Palekar mentioned in the previous chapter, p. 29- 30

References

- Agamben, Giorgio. *Homo Sacer: Sovereign Power and Bare Life*. Stanford, CA: Stanford University Press, 1998.
- Alvares, Claude. *Science, Development and Violence: The Revolt against Modernity*, Delhi: Oxford university Press, 1992.
- Behrooz, M.H. "Ideology and Utopia in Mannheim: Towards the Sociology of Self-Knowledge." *Human Architecture: Journal of the Sociology of Self-knowledge* 1, no. 1 (2002): 120-39. Accessed May 21, 2016. http://www.okcir.com/Articles_I_1/HAsp02p120-140.pdf
- Buchanan, James M., Robert D. Tollison and Robert Tullock. *Towards a Theory of the Rent-seeking Society*. College Station, TX: Texas A&M University Press, 1980
- Chandhoke, Neera and Praveen Priyadarshi. "Electoral Politics in Post-Conflict Societies: Case of Punjab." *Economic and Political Weekly* 41, no. 9 (2006): 811-813+815-819 Accessed May 10, 2015. url: <http://www.jstor.org/stable/4417908>
- Denzin, Norman K. *Sociological Methods: A Source Book*. New Jersey: Aldine Transaction, 2006.
- DeWalt, Kathleen Musante and Billie R. DeWalt. *Participant Observation: A Guide for Fieldworkers*. Lanham, MD: Rowman & Littlefield, 2011.
- Dhanagare, DN. "Green Revolution and Social Inequalities in Rural India." *Economic and Political Weekly* 22, no. 19/21 (1987): AN137-AN139+AN141-AN144. Accessed August 10, 2015 <http://www.jstor.org/stable/4377016>
- Donthi, Praveen. "Cancer Express." *Hindustan Times*. January 17, 2010. Accessed 2 February 2015. url: <http://www.hindustantimes.com/india/cancer-express/story-G0i4G2mnoQnLDRry0kiV6L.html>
- Escobar, Arturo. *Encountering Development: The Making and Unmaking of the Third World*, Princeton: Princeton University Press, 1995
- Fergusson, James and Akhil Gupta. "Spatializing States: Toward an Ethnography of Neoliberal Governmentality." In *Anthropologies of Modernity: Foucault, Governmentality and Life Politics*. edited by Jonathan Xavier Inda, Malden, Oxford and Victoria: Blackwell, 2005
- Foucault, Michel and Michel Senellart. *The Birth of Biopolitics: Lectures at the Collège De France, 1978-79*. Basingstoke: Palgrave Macmillan, 2008
- Foucault, Michel. "Governmentality." In *The Foucault Effect: Studies in Governmentality*. ed. G. Burchell, C. Gordon, and P. Miller. 87- 104. Hemel Hempstead and Chicago: Harvester Wheat sheaf and University, 1991
- Frankel, Francine. "India's New Strategy of Agricultural Development: Political Costs of Agrarian Modernization." *The Journal of Asian Studies* 28, No. 4 (1969): 693- 710. url: <http://www.jstor.org/stable/2942406>
- Frankel, Francine. *India's Green Revolution: Economic Gains and Political Costs*. Princeton: Princeton University Press, 1971.
- Fukoka, Masanobu. *The One Straw Revolution: An Introduction to Natural Farming*. Translated by Chris Pearce, Tsune Kurosawa and Larry Korn Mapusa. India: Other India Press, 1992
- Gaud, William. "The Green Revolution: Accomplishments and Apprehensions." Speech, Society for International Development. Washington DC. 1968 accessed 2 Feb. 2015. url: <http://www.agbioworld.org/biotechinfo/topics/borlaug/borlaug-green.html>
- Ghuman, Ranjit Singh. "Rural Non-Farm Employment Scenario: Reflections from Recent Data in Punjab." *Economic and Political Weekly* 40, no. 41 (2005): 4473- 4480. Accessed December 20, 2015 url: <http://www.jstor.org/stable/4417268>
- Gill, Sucha Singh and Ranjit Singh Ghuman, "Changing Agrarian Relations in India: Some Reflections from Recent Data." *The Indian Journal of Labour Economics*, Vol. 44, no. 4 (2001): 809-826
- Gill, Sucha Singh and Ranjit Singh Ghuman. "Rural Health: Proactive Role for the State." *Economic and Political Weekly* 35, no. 51 (2000): 4474- 4477. Accessed May 21, 2015. url: <http://www.jstor.org/stable/4410079>

- Gill, Sucha Singh. "Punjab: Privatising Health Care." *Economic and Political Weekly* 31, no. 1 (1996): 18- 19 accessed May 21, 2015. url: <http://www.jstor.org/stable/4403641>
- Gupta, Akhil. *Red Tape: Bureaucracy, Structural Violence and Poverty in India*, New Delhi: Orient Blackswan, 2012
- "Indian Civil Services." thebritishempire.com. Accessed January 22, 2016. url: <http://www.britishempire.co.uk/maproom/india/ics.htm>
- Jodhka, Surinder. "Return of the Region: Identities and Electoral Politics in Punjab." *Economic and Political Weekly* 40, no. 3 (2005): 224- 230. Accessed May 15, 2015. url: <http://www.jstor.org/stable/4416079>
- Makkar, Sahil. "CM Raje pushes the reforms pedal, people await results." *Business Standard*, January 2, 2015. Accessed 8 August 2015 http://www.business-standard.com/article/economy-policy/cm-raje-pushes-the-reforms-pedal-people-await-results-115010200023_1.html
- Malhotra, Inder. "Swallowing the humiliation." *Indian Express*. July 12, 2010. Accessed 1 February 2016 <http://archive.indianexpress.com/news/swallowing-the-humiliation/645168/>
- Mancini, Francesca, Ariena H. C. Van Bruggen, Janice L.S. Jiggins, Arun C. Ambatipudi, and Helen Murphy. "Acute Pesticide Poisoning among Female and Male Cotton Growers in India." *International Journal of Occupational and Environmental Health* 11, no. 3 (2005): 221-32. accessed January 2, 2016 DOI: 10.1179/oeh.2005.11.3.221
- Marx, Karl. "Notes for a Critique of Hegel's Philosophy of Right, by Karl Marx." marxists.org <https://www.marxists.org/archive/marx/works/1843/critique-hpr/ch03.htm>, Accessed January 20, 2016
- Mathur, HB, HC Agarwal, Sapna Johnson, Nirmali Saikia. *Analysis Of Pesticide Residues In Blood Samples From Villages Of Punjab*. New Delhi: Centre for Science and Environment. 2005. Accessed March 20, 2015. url: http://www.cseindia.org/userfiles/Punjab_blood_report.pdf
- Mitchell, Timothy. Society, Economy and the State Effect. In *State/culture: State-formation after the Cultural Turn*, ed. George Steinmetz. 76- 97. Ithaca, NY: Cornell University Press, 1999
- Monibot, George. "Neoliberalism – the ideology at the root of all our problems." *The Guardian*, April 15, 2016. Accessed February 20, 2016 <http://www.theguardian.com/books/2016/apr/15/neoliberalism-ideology-problem-george-monbiot>
- Mukherji, Rahul. *India's Economic Transition: The Politics of Reforms*. Oxford: Oxford University Press, 2007.
- Nagaraj, R. "What Has Happened since 1991-Assessment of India s Economic Reforms." *Economic and Political Weekly* 32 no. 44 (1997): 2869- 79. Accessed May 22, 2015. <http://www.epw.in/journal/1997/44-45/special-articles/what-has-happened-1991-assessment-india-s-economic-reforms.html>
- Nandy, Ashis. "Introduction: Science as a Reason of the State." In *Science, Hegemony and Violence: A Requiem for Modernity*. edited by Ashis Nandy. Tokyo, Japan: United Nations University, 1988. Accessed October 2, 2015, <http://www.arvindguptatoys.com/arvindgupta/hegemony-nandy.pdf>
- National Sample Survey Organisation. *Income, Expenditure and Productive Assets of Farmers*, 59th Round. Report No 497. New Delhi: NSSO, 2005
- Nayak, Reshma. "Are the farmers in Punjab paying a price for the Green revolution?" *The Health Site*, Jan 30, 2013. Accessed 10 February 2016, <http://www.thehealthsite.com/diseases-conditions/are-the-farmers-in-punjab-paying-a-price-for-the-green-revolution/>
- Patel, Raj. "The Long Green Revolution." *The Journal of Peasant Studies* 40, no. 1 (2013): 1-63. DOI: 10.1080/03066150.2012.719224
- Patnaik, Utsa. "Some Economic and Political Consequences of the Green Revolution in India." In *The Food Question: Profits Versus People*, edited by Henry Bernstein, Maureen Mackintosh, Charlotte Martin. New York: Earthscan Publication Ltd., 2013
- Perkins, John. *Geopolitics and the Green Revolution: Wheat, Genes, and the Cold War*. New York: Oxford University Press, 1990

- Punjab. Punjab State Health Systems Resource Centre. *State- Wide Door to Door Campaign: Cancer Awareness and Symptom based Early Detection*. Chandigarh: Punjab Dept of Health and Family Welfare, 2013
- Punjab. *Statistical Abstract of Punjab*. Chandigarh: Dept of Finance, Govt. of Punjab, 2005
- Punjab. *Statistical Abstract of Punjab*. Chandigarh: Dept of Finance, Govt. of Punjab, 2006
- “Rajasthan.” National Health Portal. accessed January 3, 2016 http://www.nhp.gov.in/rajasthan_pg
- Seidman, Irving. *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences*. New York: Teachers College Press, 1998
- “Semi Structured Interviews.” Qualitative Research Guidelines Project. Last Modified January 15, 2016, <http://www.qualres.org/HomeSemi-3629.html>
- Shetty, PK. “Socio-Ecological Implications of Pesticide Use in India.” *Economic and Political Weekly* 39, no. 49. (2004): 5261- 5267. Accessed January 30, 2016 <http://www.jstor.org/stable/4415873>
- Shiv Visvanathan. “The Search for Cognitive Justice.” Paper presented at the Symposium- Knowledge in Question, a symposium on interrogating knowledge and questioning science #597. http://www.india-seminar.com/2009/597/597_shiv_visvanathan.htm. Accessed May 10, 2016
- Shiva, Vandana. “Reductionist Science as Epistemological Violence.” In *Science, Hegemony and Violence: A Requiem for Modernity*. edited by Ashis Nandy. Tokyo, Japan: United Nations University, 1988. Accessed October 2, 2015, <http://www.arvindguptatoys.com/arvindgupta/hegemony-nandy.pdf>, 89
- Shiva, Vandana. *The Violence of the Green Revolution: Third World Agriculture, Ecology, and Politics*. London: Zed Books, 1991
- Singh, Bajinder Pal. “Cancer Deaths in Agricultural Heartland: A Study in Malwa Region of Indian Punjab.” M.S. diss, International Institute of Geo- Information Science and Earth Observation. 2008. Accessed 20 February 2015 https://www.itc.nl/library/papers_2008/msc/gem/bajinderpdf.pdf
- Singh, Inder Pal and DK Grover. “Economic Viability of Organic Farming: An Empirical Experience of Wheat Cultivation in Punjab.” *Agricultural Economics Research Review* 24, No. 2 (2011): 275- 281 <http://ageconsearch.umn.edu/bitstream/119380/2/10-Inderpal-Singh.pdf>
- Singh, Inderjit, Lakhwinder Singh and Parmod Kumar. “Economic and Financial Consequences of Cancer from Patient's Family Perspective: A Case Study of Punjab.” *Discussion Papers in Development Economics and Innovation Studies* 5 (2013). Accessed May 8, 2015 http://www.punjabiversity.ac.in/cdeiswebsite/downloads/discussion_papers/5%20Economic%20and%20Financial%20Inderjeet%20Singh,%20Lakhwinder%20Singh%20and%20Parmod%20Kumar.pdf
- Subramaniam, Chidambaram. *The New Strategy in Indian Agriculture: The First Decade and after*. New Delhi: Vikas Pub, 1979
- Thakur, JS, B. T. Rao, Arvind Rajwanshi, H. K. Parwana and Rajesh Kumar. “Epidemiological Study of High Cancer among Rural Agricultural Community of Punjab in Northern India”. *International Journal of Environmental Research and Public Health* 5, no. 5 (2008): 399-407, doi: 10.3390/ijerph5050399
- Varshney, Ashutosh. *Democracy, Development, and the Countryside: Urban-rural Struggles in India*. Cambridge: Cambridge University Press, 1995
- Vidal, John. India's rice revolution. *The Guardian*. February 16, 2013. accessed January 20, 2016, <http://www.theguardian.com/global-development/2013/feb/16/india-rice-farmers-revolution>
- Visvanathan, Shiv. “From the Green Revolution to the Evergreen Revolution: Studies in Discourse Analysis” Paper Presented at the IDS Seminar on Agriculture Biotechnology and the Developing World, Centre for Study of Developing Societies, New Delhi, India, 1-2 October 2003.

- Weber, Max. "Bureaucracy", In *Economy and Society: An Outline of Interpretive Sociology*, edited by G. Roth and C. Wittich, Translated by E. Fischoff, H. Gerth, A.M.Henderson, F. Kolegar, C.Wright Mills,T. Parsons, M. Rheinstein, G. Roth, E. Shils, and C.Wittich. 956- 1005. New York: Bedminster Press, 1968
- Weber, Max. *Protestant Ethic and the Spirit of Capitalism*. Translated by T. Parsons. London and New York: Routededge, 1992
- "What is Zero Budget Spiritual Farming." Subhash Palekar. accessed January 20, 2016 <http://www.palekarzerobudgetspiritualfarming.org/>

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