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"Chemical Farming: Challenges before Environment and Social Health"
(Special reference to Phulambri Town)

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Introduction:

Today Indian economy is known as fast growing economy in the world. In this economical development agricultural sector plays an important role. As per world bank 2015 data India had 60.45 percent agricultural land .To fulfil the need of agricultural development in 1966 green revolution in agriculture had taken place in India. Then Indian farmers made changes in their farming methods by using modern technology and chemical fertilizers, pesticides and herbicides. Due to which in a very short period India became the largest producer of many crops. But after some decade's the impacts of chemical farming has been seen on environment in the form of land, air and water pollution. This affects on Social health on large scale and creates many diseases like skin infection, respiratory problems, nutritional deficiencies, cancer and reproductive health issues. Due to this, pollution free environment and healthy life will become a big challenge in future. Present research paper focus on following objectives.

Objectives:

To find out the ratio of chemical farming in Phulambri town.

To study the reasons behind chemical farming.

To study the impacts of chemical farming on environment and social health.

To suggest remedial measures on environmental and social health problems.

Methodology:

For the present research, Exploratory research method is used. This research is based on survey method. For the survey 100 farmers' from Phulambri selected as sample size. Researcher also have conducted interviews of 5 Doctors and 10 Retailers of chemical fertilizer, pesticide and herbicide. For data collection Interview Schedule, Interview and Observation techniques are used.

Review of Literature:

One research focused that in some parts of Africa , Use of chemical fertilizers and pesticides decline in soil productivity , soil compaction, loss of soil organic matter, water holding capacity, and biological activity, and converting irrigated land to desert .1 It means health of the soil is in danger.

Chemical farming practices have been found to contribute to non-point source water pollutants that include salts, fertilizers (nitrates and phosphorus, especially), pesticides, and herbicides. Pesticides from every chemical class have been detected in groundwater and are commonly found in groundwater beneath agricultural areas. Due to which nutrient runoff affect many rivers, lakes, and oceans. Reduced water quality impacts agricultural production, drinking water supplies, and fishery production. Other environmental ills include

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over 400 insects and mite pests and more than 70 fungal pathogens that have become resistant to one or more pesticides. Pesticides have also placed stresses on pollinators and other beneficial insect species.2

In India chemical farming is not only affects on environment & social health but also affect on economical condition of the farmers. This promotes farmer to suicide. According to the Kerala State Organic Farming Policy Report - 2008: "The advent of chemical intensive farming and its prevalence in Kerala for the past 50 years has resulted in the near stagnant levels of productivity…"The farmers are caught in the debt trap owing to the loan taken to meet the high cost of farming, as it demanded more external inputs such as fertilisers, pesticides and water. These led to increasing instances of suicide by farmers."3

FAO confirms that Chemical Agriculture is associated with "Farmers indebtedness for inputs and suicides": reporting that there were 30,000 deaths in Maharashtra, India, from 1997-2005. {"Organic Agriculture's Contribution to Sustainability" (April 2013)} 4

A Division Bench of the Bombay High Court, citing the Tata Institute of Social Sciences Report on the causes of Farmers' Suicides in Maharashtra, found that there was a high incidence of suicides in the cotton growing areas where chemical fertilisers were used. [2006, DY Chandrachud J.) 5 It means there is need to move towards organic farming.

One of India's biggest economic burdens is the huge Central government subsidy on synthetic fertilisers, which has ballooned from Rs.60 crore in 1976-77, to a mammoth Rs.75,000 crore now. While the organic sector gets barely Rs.500 crore. 6

The UN's Report of the Special Rapporteur on the Right to Food (January 2017) states: "Studies have indicated that agro ecology is capable of delivering sufficient yields to feed the entire world population and ensure that they are adequately nourished." [Report of the Special Rapporteur on the Right to Food: Jan 2017] Then why India should is not moving towards organic farming. Moreover, the National Organic Farming Projects (the Paramparagat Krishi Vikas Yojana (PKVY), Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) cover very little ground. The area under organic farming is 23.02 lakh hectares, a mere 1.27 per cent of the total cultivable land in India (181.95 million hectares).7 .Now in India Sikkim and Kerala States are declared as organic farming state. There are inspiring accounts of villages converting to organic farming and transforming rural lives; as well as stories of urban folk taking to organic farming and making a success of it; largely without government aid.

Data Analysis:

Data collected by survey 100 farmers' and conducted interviews of 5 Doctors and 10 Retailers is analysed by following variables.

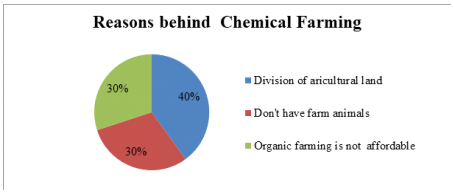
Ratio of chemical farming:

In data collection, when we asked farmers which kind of fertilizers, pesticides and herbicides are used their farms then 90 means (90%) farmers told that they are using only chemical fertilizers, pesticides and herbicides. Remaining 10 means (10%) farmers told that they are using both chemical and organic fertilizers and pesticides. It means in Phulambri town 90% of farmers prefer chemical farming.

Reasons behind chemical farming:

When we studied the reasons behind chemical farming we found following data.

Diagram-1



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Above diagram indicate that 40% farmers moved towards chemical farming because of division of land from one generation to another generation. If one person's grandfather had 10 acer land but now he is having 2.5 acer land. When he wants good production in his small land to full fill his family needs then he was started using chemical fertilizers and pesticides.

30% farmers told that in Phulambri town most of the farmers don't have farm animals like cow, ox, buffalo, goat and ship to make organic fertilizers and pesticides. Remaining 30% farmers say that, organic farming is not affordable because of more coast of organic products as compare to chemical products. Also there is less availability of organic products.

Commonly used Chemical Fertilizers, Pesticides and Herbicides

When we collected the data according to the Commonly used Chemical Fertilizers, Pesticides and Herbicides by Farmers in phulambri,. We got the following information.

Table-1

Commonly used Chemical Fertilizers, Pesticides and Herbicides by Farmers in phulambri.

Sr. No.	Type of Crop	Commonly used Fertilizers	Commonly used Pesticides	Commonly used Herbicides
1	Corn Crop	10.26.26	Ulala (Moderately hazardous)	Astazin (slightly hazardous)
2	Cotton Crop	12.32.16	Confidore (Moderately hazardous)	----
3	Wheat Grain	Urea	Monocrotifoce (Highly hazardous)	Pendimethalin (Moderately hazardous)
4	Vegetables	18.18.10	Crifoce (Moderately hazardous)	Pendimethalin (Moderately hazardous)

Above Table indicates that in Phulambri town Commonly used Chemical Fertilizers, Pesticides and Herbicides by Farmers are hazardous, It means that, it affect the Environment & Social Health. According to some scientists nearly 50 per cent of the pesticides used in the country are highly hazardous. Their residue causes skin and nervous system's toxicity.

Consumption Ratio of chemical fertilizers, pesticides and herbicides

According to the Hukum Deo Narayan Yadav committee report, in India near about 292 districts account for consumption of 85 per cent of all of the country's fertilisers. Besides, there are discrepancies in the use of fertilisers on the basis of chemical ratios. The current consumption ratio of nitrogen, phosphorus and potassium (NPK) is 6.7:2.4:1 against their desirable ratio of 4:2:1.The situation is grimmer in major agricultural states like Punjab and Haryana where NPK use ratios are as high as 31.4:8.0:1 and 27.7: 6.1:1 respectively. 8

The crop-wise usage pattern of fertilisers is highly uneven. They are mostly used in potato, sugarcane, cotton, wheat and paddy. Fertilisers used in some crops is more than double the requirement. When we study the Consumption Ratio of chemical fertilizers, pesticides and herbicides in Phulambri , we got the following information

Table- 2

Average ratio of Chemical Fertilizers, Pesticides and Herbicides used by farmers in one acear

Sr.No.	Type of Crop	Fertilizers	Pesticides	Herbicides
1	Corn Crop	200kg	400gm	1kg 500gm
2	Cotton Crop	250kg	1200gm	-------
3	Wheat Grain	225kg	200gm	600gm
4	Vegetables	150kg	300gm	500gm

Above table shows that, in Phulambri town ratio of Chemical Fertilizers, Pesticides and Herbicides used by farmers is more than the requirement. When we take interview of Retailers of Chemical Fertilizers, Pesticides and Herbicides, then they told that quantity and precaution is mention on each and every bag

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and bottle of Chemical Fertilizers, Pesticides and Herbicides. We also give them all information about how to use Chemical Fertilizers, Pesticides and Herbicides. But most of the farmers do not take care of it. Farmers have one misconception that if they use plenty of Chemical Fertilizers, Pesticides and Herbicides they will get more production and economical benefits.

Impacts of chemical farming on Environment:

Due to Continuous use of chemical fertilizers and pesticides, health of the soil is in danger .40% farmer's upper layer of farm soil have become hard like rock. It is personally observed by researcher by touching the soil. It was seen that in rainy season with flow of rain water many chemical components are transmitted to natural resources of water like river, lake, well and bore well. From last ten years it is observed that water pollution has become a big problem in Phulambri, which affects on water animal, animals and birds on large extent.

Water Animal: All respondents in present research told that, day by day number of water animals like frog, snail, crabs, and tortoise are decreasing.

Birds: In Phulambri due to eating of chemical affected worms & insects and drinking polluted water, number of birds like sparrow, Crow, duck, Pigeon, Salunki, Holgi and Titavi is decreasing .

Farmers are using chemical pesticides to destroy insects & worms in their farm but they don't know about its danger effects. After few years new and strong generation of insects & worms will born then farmers will use more strong pesticides. This cycle is becomes harmful for biodiversity. Pesticides are killing helpful insects and produce harmful insects.

Few month ago in Phulambri town army worms attack was seen in most of the farmers farm. Army worm attacks on corn crop was seen on large extent. When this corn crop had been eaten by farm animals like cow, buffalo, goat and ship, a number of animals died in a week.

Social Health:

Good social health is the right of every people in our society. But in Phulambri town use of chemical fertilizer, pesticides and herbicides by farmer causes land, water and air pollution. Which affects on social health. In Phulambri town, for drinking water most of the people purchase bisleri jars. Due to air pollution respiratory problems had been seen very commen in children and old age people.

When we ask the farmers that which kind of precautions they have taken when doing Practise regarding Use of Chemicals in Farming. We got following data.

Table- 3

Practise regarding Use of Chemicals in Farming

Activities	Categories	Percentage
Store of Agro chemical products	Farmers who store fertilizers, pesticides & herbicides at home	82 (82%)
Method of Mixing Chemical	Stick Glove Bare hand	78 (78%) 14 (14%) 08 (08%)
Personal protective equipment while applying chemical	Shoes Gloves Mask Sunglasses All the four equipment Won't use anything	05 (05%) 02(02%) 02 (02%) 01 (01%) Nil 90 (90%)
Cleaning immediately after applying chemicals	Soap & water Water Don't do anything	45 (45%) 40 (40%) 15 (15%)
Disposal of empty sacks & tins	Store materials Thrown away Burnt Give to rag pickers	38 (38%) 32 (32%) 05 (05%) 25 (25%)

Above table shows clear picture of farmers practise regarding use of Chemicals in Farming.

When we took interview of 5 Doctors in Primary Heath Centre in Phulambri. We got the following information.

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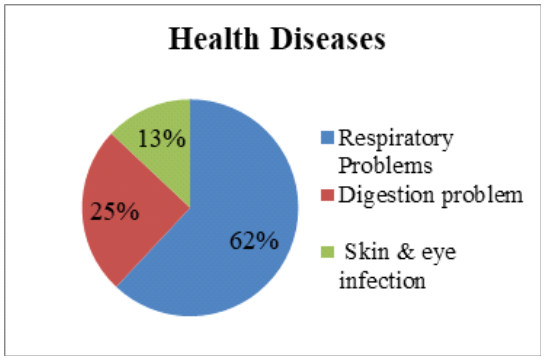
Doctors told that most of the farmers in Phulambri town not use long shoes, hand gloves, mask, sunglasses and cap while spreading chemical pesticides and fertilizers. Which affects on farmers health . Farmers also told that they are suffered by following diseases.

Diagram-2



Above diagram indicates that, Most of the farmers 62 % suffered by respiratory problems. 25% farmers suffered by stomach infection and digestion problem. Remaining 13% farmers suffered by Skin and eye infection.

Doctor's told that, due to polluted water in rainy season, 80% of farmer's family members were suffered by stomach infection and diariya.

Blood pressure, Sugar, Heart disease and Thyroid problems are very common in Phulambri village the number of Cancer patients is also increasing day by day. In personal observation, it is seen that, on each and every vegetables there is a white layer which does not remove after wash. It means directly or indirectly chemical components went in our body. Many peoples in our society said that, they were eating all kind of fruits & vegetables but still doctor said they have vitamin deficiency.

Findings:

This research concludes that, in Phulambri town 90% of farmers prefer chemical farming. Land, water and air pollution becomes a big problem due to continuous and excessive use of chemical fertilizers, pesticides and herbicides. As a consequence of land pollution the upper layer of soil is becoming harder like rock and it decreases the productivity of land.. Water animals like frog, snail, crabs, and tortoise are missing from river and lake. In rainy season, 80% of farmer's family members suffered by stomach infection and diariya.62% of farmers suffered by respiratory problems. Pesticides are killing helpful insects and produce harmful insects. Recently Army worms attacks are seen on large scale in the farms in Phulambri. It is seen that the chemical components remain present in the environment for a long period and they are transmitted directly or indirectly into the corns and vegetables that affects the human health.

If society wants pollution free environment and healthy social life, then farmers must move towards organic farming.