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Crisis Of Agriculture With Special Reference To Punjab, Its Cause And Wayout

1. Agriculture In Punjab

Punjab is one of the smallest states of India, representing 1.5 per- cent of its geographical area and 2.6 percent of its cropped area. Punjab's geology has a far-reaching impact on its economy. The plain of Punjab was formed by the deposition of alluvium. It has deep and fertile soils. From geological and physiographic points, Punjab is divisible in two regions: the hill region and plain region.

The hill region is very small and includes Shivalik Hills of the Eastern side, moves through Hoshiarpur district towards West. More than 90 percent of Punjab's area is a flat plain and is a segment of Indo-Gangetic plain.

A very high proportion of the land is under cultivation, because the Punjab plain is free from physical handicaps and deficiency of rainfall has been made up by irrigation facilities. It is only the districts of Ropar and Hoshirpur that the cultivated area is less than 60 per-cent of the total. It is in these districts that considerable land is covered by Shivalik Hills and the beds of seasonal streams that cannot be brought under cultivation.

The average annual rainfall in Punjab is 580 mm. The amount of rainfall in the state is not only small but is also ill-distributed in time and space. Whereas the total rainfall in the submountainous northeast part exceeds 1,000 mm, it is hardly 250 mm towards the extreme South-Western parts. Punjab is divided into six agro-climatic regions, which represent homogenous units in terms of agricultural potential and problems.

2. Punjab's Agricultural Record

Punjab used to be a model in foodgrains production for the world in general and India in particular in the last two decades of the last century. As a part of the world, while Punjab covers 0.0003 percent of the global geographical area, it used to produce 2.27 percent of wheat, 2.04 percent of rice and 2.05 percent of cotton in the total production of these commodities at the global level. At the national level, while it comprises merely 1.5 percent of the country's geographical area, it used to produce 9 percent of the total national agricultural production, producing 21 percent of wheat, 10 percent of rice and 15 percent of cotton of total produce under these crops in the country. It has been contributing 50 percent of rice and 70 percent of wheat to central pool for the last two decades.

In South Asia, Punjab has heralded the "Green Revolution" in agricultural production. The foodgrains production increased from 7 million tonnes in 1970 to over 21 million tonnes last year. This is one of the highest rates of growth achieved anywhere in the world.

Punjab comprises only about 5.04 million hectares of India, but in terms of agricultural development, it is the most advanced state.

The total production of foodgrains (cereals and pulses) in the year 2001-02 was 24.9 million tonnes. The concepts of national food-security and self-sufficiency rest heavily on Punjab. Agriculture contributes nearly 39 percent of the state's GDP. The yields of wheat and rice seem to have reached a plateau and there is a notable fall in areas under other crops.

Out of Punjab's total area of 5.04 million hectares, 4.21 million hectares is under crops. Thus, over 84 percent of the area is cropped. Intensity of cropping has increased from 117 in 1947-48 to 183 percent today. Some 94 percent of the cultivated area is irrigated against 53 percent in 1950-51. Thus, extensive crop cultivation mainly with paddy-wheat in rotation, widespread irrigation and intensive use of chemical inputs (insecticides, pesticides, fertilisers, etc.) characterises the Punjab agriculture.

During the past 55 years, the foodgrains production in Punjab has increased from 2 million tonnes (mt) to 24 m t—i.e., twelve-fold increase.

The major break-through in agricultural production was achieved in the year 1965-66 when high-yielding Mexican varieties of wheat were, for the first time, introduced in the state. Another big

advance came in mid-1970s when, with the introduction of dwarf varieties of paddy, the production of rice increased manifold.

After an exemplary rise in production, Punjab agriculture today is confronted with some very serious problems. Its productivity of rice, wheat, cotton, sugarcane, maze, etc., is declining. Its environmental factors of production—soil, water, forests, bio-diversity, etc.—are getting overstrained. Its rural economy is becoming more and more inequitable. There is no scope of expansion of the area under cultivation. Most of the cropland has come under plough. The cropping intensity has risen to a very high level. The consumption of the major agricultural inputs is much above the national level—170 kg. In view of the growing population, the fragmentation of land-holdings has made agriculture un-economic for the marginal and small farmers. The increase in the price of inputs and labour wages has pushed the cost of production up. Data available from 1975-76 to 2001-02 shows that the cost of cultivation of wheat is up seven times, cotton eight times and paddy as much as 11 times. The growing cost of farming has led to increased indebtedness among the agricultural community. The total agricultural debt calculated for Punjab stands at Rs 11,700 crores. The annual interest burden of debt has been worked out at Rs 2,300 crore, i.e., about 14 percent of the net value of crop production. The developing unavailability of the Punjab agriculture has resulted in a large number of farmers suicides. All this is obvious to a keen observer of Punjab agricultural scene.

The Human Development Report, 2004 for Punjab, an initiative of the state government in association with the United Nations Development Programme and the Planning Commission, provides some startling statistics; while there is sharp decline in the percentage of cultivators between 1961 and 1991 (46 to 31), there has been a significant rise in the percentage of agricultural labourers in the same period (10 to 23). Since the proportion of agricultural labourers compared to the entire body of agricultural workers was only 8 percent in 1951, it is apparent that the reverse trend started only in the post-1960 period soon after the Green Revolution phase.

The steep rise in agricultural labourers, the Report refers to as pauperisation of the small and marginal farmers. Since then, holdings have shrunk three times. Now, as the Report states, anything less than 5 acres is not viable. Various schemes being introduced come a cropper for the small and marginal farmer who is so engrossed in making two ends meet that corrective steps by the government fail to convince him. The upshot of this is that every household in the state is making a bee-line to go abroad by fair or foul means.

Diversification and contract farming have been touted as a panacea for the farmers. But they have failed to click so far mainly because of poor implementation. For example, diversification to high return crops is the need of the hour because while the yield of wheat has grown at a snail's pace, the yield of rice has remained stagnant and that of cotton has declined. As the net value of all crops per acre has remained stagnant, expenditure on farm inputs has grown stupendously. This has resulted not only in indebtedness of the farmer but also in a negative agricultural growth in the state. There are of course other adverse effects, including declining ground water table. Similarly, contract farming requires private sector participation in capital inflow and transfer of technology. Obviously, in the process, unless the interests of the private sector entrants are safeguarded, the scheme would not make much headway. Not just this, unless the farmer finds his own interests secure, he would not venture into the scheme. This obviously requires assured marketing of the crops produced under the scheme.

The underlying theme of the Report is the need to have a strategy, which delivers a high as well as a sustainable growth rate. The steps taken over the years in the field of agriculture have not borne the required results. For example, diversification of agriculture as suggested by Johl Expert Committee requires proper marketing of alternate crops, like fruits, vegetables and fodder cultivation. Ironically, even schemes like the Apni Mandi are tottering. Besides, diversification of crops alone would not make much headway unless there is diversification of economy. It calls for applying corrective measures to provide a role to the farmers' cooperatives which have long been neglected.

The dairy sector needs to be given the boost. Unless the trend to urbanise is reversed, vast agricultural tracts within a 50-miles radius of small and big towns will be eaten up by urban conglomerates in the next decade or so. In a nutshell, what Punjab requires is an agricultural transformation of the kind that takes it beyond the green revolution of 1960s when cropping intensity

increased significantly and so did the net sown area. In a nutshell, agriculture has to be seen as the road to prosperity.

From the foregoing account, it can be seen that Punjab is facing a serious multi-dimensional agricultural crisis.

Firstly, the environmental dimension of the crisis is quite serious due to the decaying of natural resources. Soil is sick; water resources are declining: salinity and water-logging are on the rise; water, both surface and underground, is getting polluted due to industrial effluents, such as nitrate, sulphate and chloride and is becoming unfit for human consumption. The forest cover (mainly concentrated in shivalik hills) is shrinking. It forms only 5 percent of the state's geographical area although it should at least be 20 percent of its land size. Even 10 percent tree cover constitutes an unhealthy environment.

Secondly, the human related aspect of the crisis is no less serious. Human numbers are growing; poverty increasing; unemployment is on the rise; education (especially at the primary level), health-care and infrastructure are in a bad shape; a discouraging atmosphere prevails in rural areas due to lack of education, poverty, unemployment, ignorance, superstition, etc.; the condition of the agricultural worker and the marginal and small farmers is getting worse.

Thirdly, an important feature of this crisis is that agriculture is no longer a remunerative profession in the state. The agricultural productivity is falling, while the cost of inputs is constantly rising; the overall and the pre-capita agricultural growth rates are far less than the national averages; there is a declining trend in cotton, sugarcane and maize, while wheat and rice are stagnating; per-acre real income (base 1981-82) from paddy-wheat rotation cropping has gone down; Punjab rice has lost its earlier attraction in the country, due mainly to lack of quality norms of the procured paddy; Punjab farmer remains entangled in the paddy-wheat rotation because he sees no wayout; indebtedness is fastly growing, leading to suicides.

Fourthly, the agrarian extent of the crisis is also visible. The rental value of land has, due to fall in agricultural profitability, gone down. The increasing size of the family is getting the land holdings divided.

Lastly, the overall economic reflection of the crisis is very alarming. The general development of the state has slowed down; there is decline in average annual growth rate; the state economy is imbalanced, with agriculture dominating its GDP, without adding anything to its kitty; no big central project worth-citing exists in Punjab in comparison to other states; centre's assistance to Punjab is the lowest in the country; no major private investment has come to Punjab from any part of India; much of the industrial backwardness may be attributed to lack of finance, sickness in SSI units is also spreading due to exorbitant bank interest rates; sugar industry (with 20 working mills) is in a mess.

3. Reasons Underlying Punjab Agricultural Crisis

The fundamental cause underlying the above crisis lies in the prevalent chemical-based agricultural technology. The basic agricultural inputs of this technology, i.e., fertilisers, pesticides and insecticides, are highly chemicalised which, on the one hand, destroy all the organic nutrients contained in the soil and kill the whole lot of the crop-friendly pests, thus resulting in the degradation of soil and finally turning it into a barren land, and, on the other, deplete the water resources through their high water consumption. In the 40 years (1964-2004) of its operation in Punjab, this chemicalised agricultural technology has harmed all the main agricultural components, i.e., environmental resources, human health, crop-productivity, financial growth, agrarian structure, etc. Similar types of negative effects have appeared practically in all those countries, using the chemical oriented agricultural technology. This highly negative performance by the chemical based agricultural technology has brought it to a dead end in the very beginning of the 21ist century. However, the whole lot of the top controllers of the existing world corporate capitalist order has, instead of admitting the entirely negative concept and role of their much-touted chemicalised agricultural policy, zealously undertaken to cover up the reality by propagating that all the existing agricultural lapses of the chemicalised agricultural technology will be set right by the newly-discovered technique of genetic-modification (GM) or transgenic changes (whose real position has been dealt with in the next chapter).

It is worth-noting that the entire architecture of the chemicalised agriculture was conceived and produced by the MNCs who continue to hold its monopoly from its very start to this day. The corporate capitalist-led governments all over the world have since adopted this agricultural technology as the very foundation of their respective national agricultural sectors and policies.

From the very beginning of the chemicalised technology, the corporate capitalist government and business leaders have been calling and publicising it as the emergence of the 20th century "green revolution". They continued to characterise it as the liberator of humanity from hunger and a corner-stone of food security for all times to come. But all these high-sounding claims have proved a flop. Nearly 40 years after the practice of this miraculous agricultural technology, the world is confronted with more deadly problems in the domain of agriculture.

A supplementary reason relating to the Punjab agricultural crisis has been its agricultural custom of paddy-wheat rotation cropping pattern. But now this supplementary reason has become the main plank of all the protagonists of the chemicalised agriculture who are making this argument as the root of Punjab agricultural crisis. The irrelevance of this reasoning can be seen from the fact of the similar types of negative results in all the diversified farming areas in Asia, Africa, Latin America and Europe.

Had diversification of agriculture been a medium to develop agriculture, the impact of chemicalised agriculture would have been entirely different from Punjab agricultural experience in the diversified farming countries and regions.

However, a major responsibility for Punjab's paddy-wheat rotation cropping pattern also rests with the central and the state governments. The centre's responsibility consists in the fact that, having been a miserable failure to increase the national growth rate of agricultural production, it sought the shortcut of meeting its food buffer stock needs by placing excessive burden on Punjab and Haryana agriculture through various price and market inducements. Although it, was from the early 1980's, becoming clear that a grave agricultural crisis had been erupting in Punjab and that it had, according to government's own agricultural experts, been an effect of the paddy-wheat rotation cropping system, the centre covered up this emerging serious threat from the public in Punjab and continued to exploit Punjab agriculture for its partisan exigencies. Even today, it remains on the same track and does not persuade the Punjabi people to replace the paddy-wheat rotation cropping method by a more profitable and appropriate way of crop- diversification. The state government is responsible in the manner that it did neither inform the Punjabis about the seriousness of the danger nor prepared any action plan to combat this challenge and nor asked the centre to undertake timely and appropriate measures to save Punjab agriculture and its farmers from this catastrophe.

All other reasons, like lack of skill and efficiency in resources and input use; poor infrastructural facilities (like power, transport, storage, etc.); inadequate credit services; high interest rates by money lenders; inadequate crop insurance service; negligible agricultural share in India's aggregate export; lack of farmer needed research; unavailability of information about modern farming techniques and market prices to the farmers; shortcomings in the agricultural marketing system; lack of education, poverty, unemployment, outmoded customs and traditions in the rural areas; etc; are expressions of a mismanaged agricultural policy.

4. Two Alternative Ways To Come Out Of Punjab Agricultural Crisis

(A). GM or Transgenic Farming

One is the newly discovered agricultural model of genetically modified (GM) or transgenic farming. World food and agriculture organisation (FAO) has upheld this path as a great breakthrough in the field of agriculture, providing an answer to world's agriculture problems. Trade markets, capital institutions, UN and all national governments have backed it.

It is interesting to recall to mind a similar type of appreciation by FAO and other agriculture experts at the time of the appearance of chemical-oriented agricultural technology about 40 years ago. It was then lauded as the green revolution of the 20th century.

Now, it is quite obvious that this chemical-based technology and its products have caused a great harm to almost all environmental components (land, water, bio-diversity, climate, forests, etc.) and

human health, while only benefiting a few MNCs who continue to hold the monopoly of this technology and go on getting billions of dollars as subsidy each year on their products (chemicalised fertilisers, pesticides, insecticides) from almost all governments in the world. The fact of the degradation of the environmental resources has now been accepted by all renowned agricultural experts (including FAO) all over the world.

A highly reasonable worth-mentioning fact is that no agricultural agency or expert raised his little finger to demand a trial of the chemicalised agricultural technology even at the laboratory level. Everyone quietly accepted it as the harbinger of a new agricultural era. But, now 40 years after its performance, every one of them is in search of a new formula to pull agriculture out of the prevailing multi-sided crisis.

Again, the new formula of GM or transgenic technology has been provided by the same MNCs on the basis of research carried out by their employed agricultural experts. But this time, the situation is quite different from the earlier one. While the FAO and some other experts have started to welcome the above device an answer to the problems of the world agriculture, half of the world scientific community and all the environmentalist and humanist groups have raised their voice against the GM technology by characterising it as harmful for the environmental and human cause. The world corporate lobby and its hangers on desire that the new GM agricultural technology, like the chemical-based one, be silently accepted by the world community.

Nature-Human Centric Viewpoint holds that a world debate by the agriculture experts, environmental and human right groups, farmers and other interested peoples be conducted in the different regions and areas of each country on the following points:

a) Should agriculture be market-driven or environment-human oriented?

b) Where does lie the cause of world hunger and under-nourishment existing in various areas and reasons of the world? Does the cause of 1/5th hunger of people of the world lies in the inadequate food production or in an unjust social order.

c) How should one define a just and proper agricultural policy?

(B). Environment-Human Oriented
(or Organic) Agriculture

The above approach holds that organic farming represents a mode of production that takes proper care to safeguard and develop all environmental resources, on the one hand, and upholds and serves the human interests on the other. The main features of the organic farming may be stated as follows.

Definition

Simply defined, organic farming denotes a system of agricultural production that prohibits the use of all synthetic inputs, makes soil building and crop rotations mandatory and uses the techniques of inter-cropping, mulching and integration of crops and livestock. It promotes and enhances agro-ecosystem, health, including bio-diversity, biological cycles and soil biological activity. Properly managed, organic farming reduces or eliminates water pollution and helps conserve water and soil on the farm. A few developed countries, e.g., Germany, France, compel or subsidise farmers to use organic techniques as a solution to water pollution problems.

Although still only a small industry, organic agriculture is becoming of growing importance in the agriculture sectors of many countries, irrespective of their stage of development. In Austria and Switzerland, organic agriculture has come to represent as much as 10 percent of the food system, while USA, France, Japan and Singapore are experiencing growth rates that exceed 20 percent annually.

The demand for organic products has also created new export opportunities for the developing world. Since demand for a variety of foods year-round makes it impossible for any country to satisfy all its organic food needs domestically grown products—many developing countries have started to tap lucrative markets for organically grown products—for example, tropical fruits to the European baby food industry, Zimbabwe herbs to South Africa, African cotton to the European Community, and Chinese tea to the Netherlands and soybeans to Japan.

Initial Phase

Logically, farmers experience some loss in yields after discarding synthetic inputs and converting their operations to organic production. Before restoration of full biological activity (e.g., growth in beneficial insect populations, nitrogen fixation grow legumes), pest suppression and fertility problems are common. Sometimes it may take years to restore the ecosystem to the point where organic production is possible. In these cases, other sustainable approaches that allow judicious use of synthetic chemicals may be more suitable start-up options. One strategy involves converting farms to organic production "in instalments", so that the entire operation is not put at risk. Most studies have found that organic agriculture requires significantly greater labour inputs than conventional farms. Therefore, the diversification of crops typically found on organic farms, with their different planting and harvesting schedules, may distribute labour demand more evenly, which could help stabilise employment. As in all agricultural systems, diversity in production increases income generating opportunities and can, as in the case of fruits, supply essential health protecting minerals and vitamins for the family diet. It also spreads the risks of failure over a wide range of crops.

Nevertheless, organic farmers face huge uncertainties. Lack of information is a major obstacle to organic conversion, according to 73 percent of North American organic farmers. Extension personnel rarely receive adequate training in organic methods and studies have shown that they sometimes discourage farmers from converting. Furthermore, institutional support in developing countries is scare—professional institutions capable of assisting farmers throughout production, post-production and marketing processes are non-existent in many developing countries. In such conditions, it is highly unlikely that tenant farmers would invest the necessary labour, and sustain the difficult conversion period, without some guarantee of access to the land in later years, when the benefits of organic production emerge.

Impressive Premiums

Typically, organic exports are sold at impressive premiums, often at prices 20 percent higher than identical products produced on non-organic farms. The ultimate profitability of organic products varies, however, and few studies have assessed its long-term prospects. Nevertheless, under the right circumstances, market returns from organic agriculture can add to local food security by increasing family incomes. Entering this lucrative market is not easy, however. Farmers and agri-businesses seeking to sell their products in developed countries must usually hire an organic certification agency to annually inspect and confirm that they adhere to the standards established by various trading partners.

Environmental Gains

Most organic farmers are motivated by more than economic objectives—their aim is to optimise land, animal, and plant inter-actions, preserve natural nutrient and energy flow, and enhance biodiversity, all of which contribute to sustainable agriculture.

They have adopted many of the soil and water protection and conservation techniques used to combat erosion, compaction, salination and other forms of degradation. Their use of crop rotation, organic manure and mulches improves soil structure and encourages development of a vigorous population of soil micro organisms. Mixed and relay cropping provide a more continuous soil cover and thus a shorter period when the soil is fully exposed to the erosive power of the rain, wind and sun.

Organic farmers also employ natural pest controls—e.g., biological control, plants with pest control properties—rather than synthetic pesticides which, when misused are known to kill beneficial organisms, cause pest resistance and often pollute water and land. Reduction in the use of toxic synthetic pesticides, which poison an estimated three million people each year, should lead to improved health of farm families. Eliminating the use of synthetic nitrogen fertiliser greatly lowers the risks of nitrogen contamination of water, while crop rotation is a widely used method of fertility maintenance of pest and disease control. Most certification programmes restrict the use of mineral fertilisers, which may instead be necessary to supplement organic manure produced on the farm. However, natural and organic fertilisers from outside the farm, e.g., rock phosphate, potash, guano, seaweed, slaughterhouse by-products, ground limestone, seaweed, woodash may also be used.

Finally, crop rotation encourages a diversity of food crops, fodder and under-utilised plants, which, in addition to improving overall farms production and fertility, may assist in the on-farm conservation of plant genetic resources. Integrating livestock into the system adds income through organic meats, eggs and dairy products, as well as drought animal power. Three crops and on-farming forestry integrated into the system provide shade and windbreaks, while providing food, income, fuel and wood. Integrated agro-aquaculture may also be found within diverse organic agriculture systems

Organic Farming—Thousands Of Years

Traditional Farming

In fact, organic farming is no new invention. It is the traditional agricultural production method that has, during the course of its ten thousand years' practice, developed to its present stage. Forty years before also, it was the predominant agricultural production system of the world. For the time being, it has not much appeal to the corporate business and ruling circles.

5. For According First Position To Agriculture

In Development Model

Taking into account the highly important position of agriculture (concerned with human food and health, on the one hand, and with the proper development of all environmental resources, i. e., land, water, climate, bio-diversity, forests, etc., on the other, it is highly essential that the organic-oriented agriculture be given the first position in the development model in terms of investment, rural credit, crop-insurance on low premiums, exports, relevant technology, bio-seeds and bio inputs, land-reforms, etc.

6. For Value Addition To Agricultural Products

It is necessary to develop agro-processing industries (big, medium and small) for value addition to agricultural produce in and around villages. This is the most crucial matter for adopting the method of diversification of crops in place of paddy-wheat rotation pattern in Punjab agriculture, the restoration and future development of Punjab agriculture and also for building a balanced and viable economy of Punjab.

Punjab, with its food grains surplus, is quite fit for food-processing industries of various types. It is also suited for growing most of the horticultural crops, which, apart from their raw value, can be processed into various varieties of juices. This involves the creation of an adequate infrastructure for the export of processed foodstuff and fruit juices, including the availability of adequate power, setting up of cold storages, starting of processing facilities, like packaging, caning and bottling, freezing and dehydration to attain value-addition for food articles as well as fruits.

Fresh vegetables and fruits can be supplied even in various parts of the country provided there is satisfactory arrangement of transport. They can also be sent to Europe though chartered flights. All this requires the dissemination of timely and proper information among the farmers. They would have to be informed about the prices of various types of fruits and vegetables prevailing in different markets in the country to enable them to choose the right selling point. Likewise, they would have to be supplied with the information about the prices of various outside markets in Europe through fax or phone. Here, the state government is required to play the desired role.

To develop agro-industry on a sound footing, it is necessary to take the following steps:

To give industry status to agro-industry

To provide adequate funds for developing infrastructure by improving transport network and upgrading storage (including cold ones) and handling facilities for foodgrains, fruits and vegetables within a prescribed time to minimise post-harvest losses

7. For Ensuring Equity

To develop agriculture on a Nature-Human Centric basis, the most important task is to develop the rural human resources. Because, it is the people, and they alone, who, by using natural resources and inputs of agricultural production, carry agricultural process forward. Once the people involved in any process are awakened and motivated, any possible task can be realised. To develop the rural human resources, it is necessary to fulfil the following tasks

8. For Changing Agrarian Structure

A major constrain on agricultural equity (and also productivity) in Punjab is the continuously diminishing size of the landholdings. This makes them incapable of producing an income to meet the average needs of an ordinary family—thus turning them non-viable. At present, the total number of such holdings (with an area less than four acres) in the state is about two-third of the total land holdings, that is, two-third of farmers in the state are marginal and small farmers, living on subsistence level. If agricultural workers (mostly living below the poverty line) are added to them, they all make up over 80 percent of the rural population in Punjab.

Given our general perspective, it is necessary to remove this constraint in a way that, on the one hand, makes our landholdings viable units (capable of using all modern means of production), and, on the other, safeguards the interests of the marginal and small farmers. This should, in our view, be achieved by preparing the marginal and small farmers (with units less than four acres) in different regions to restructure themselves into three broad types of agrarian sub-structures.

(a) Private farms—with the productive capacity of 10 acres of irrigated, 2-crop land, varying according to the quality of land in different areas—may be formed by farmers having land adjacent to one another; or even by one small or marginal farmer having his 10 acres unit formed by securing the land on contract or lease basis from the small and marginal farmers. Such farms be given special farm subsidies on inputs used and investments made and low interest loans against mortgage of land as collateral. These units should be knitted into genuine marketing cooperatives to reduce their marketing cost and increase marketing gains.

(b) Cooperative farms—with the productive capacity of 100 acres of irrigated, 2-crop land, varying according to the quality of land in different areas—may be formed by small and marginal farmers with the adjoining lands. Such farms should engage themselves both in the farming as well as marketing operations. It should be legally laid down that no farmer with a unit larger than 4-acre size would be allowed to become its member for enjoying institutional benefits. Experience shows that rich farmers often become dominant in these bodies and exploit them for their advantages. The labour will mainly be provided by the members on hired basis. Outside labour will be employed only in special cases. Cooperative farming should be based on a new law, which makes it a peoples-based movement and totally stops all sorts of bureaucratic interference.

c) Contract cultivation should be promoted by the central and the state governments. By contract cultivation is meant cultivation of a specific crop by the small and marginal farmers under a contract with an industrialist (who needs a given special quality agricultural commodities for exports) or an agro-industrial unit working in their vicinity (requiring particular agricultural products for processing). This arrangement, on the one hand, ensures the ownership and the control of small and marginal farmers over their lands, and, on the other, enables them to become nearly viable.

However, the contract cultivation can only become viable if the government (central or state) acts as a legal guarantor, ensuring the farmers that their interests would not be allowed to suffer at the hands of the big industrialists.

The contract cultivation suits most to the cooperative farms and the 10-acre irrigated farms, formed by the small and marginal farmers. The contract cultivation can be operational in all crops, including medicinal plants, bio-diversity, agro-forestry and conservation. There are many areas where private and public sector industry can develop it. Already sugarcane and tobacco industries in India are engaged in contract cultivation. China, Thailand and many other countries have developed industry-agriculture linkage in many of their regions.

d) As regards the rich and middle farm-holdings, their owners should be allowed to continue with their farming operations in the usual manner.

e) As regards the agricultural workers, their miserable conditions demand the taking of certain ameliorative measures to improve their lot. These are:

1. Fixation of minimum wages and its strict implementation.
2. Resettlement of those landless who had earlier got lands under land reforms, bhoodan, gramdan, etc., but not settled yet.
3. Vacant lands not earmarked for any public purpose should be allotted to the remaining landless.
4. Social security for drinking water, education and health services.
5. Implementation of a rural house site-cum-house construction scheme.

6. Each agricultural worker to be ensured for Rs 50,000, with equal contribution from the concerned state and the centre.

7. Old age pension scheme for agricultural workers.

The restructuring of the agrarian structure on the above lines will make the agricultural process more productive and equitable.

9. For Democratising Rural Structure

* To improve the quality of education, health services and infrastructure in rural areas.

* To develop the knowledge and skill of the rural masses.

* To better the living conditions of the agricultural workers and the marginal farmers

* To provide subsidised inputs and cheap credit to the small farmers.

* To ensure a stable price policy, fair national market, long-term credit, export facilities, etc., to the middle and rich farmers.

* To authorise the village elected committees to supervise the proper utilisation of funds earmarked and spent on their village development under various schemes, i. e., IRDP, Jawar Rozgar Yojana, Indira Awas Yojana, etc.

* To fully democratise the cooperative movement by amending its bureaucratic law and changing the department's bureaucratic policy.

* To make women co-owners of their respective husbands belongings, including land, and give them 50 percent reservation in all elective bodies.

* To make every Panchayat (i.e., all of its members) accountable to its electors by placing a legal obligation on it to visit each one of its constituencies after every six months (i.e., twice a year) and present its six monthly record before the electors general meeting for the latter's discussion and remarks.

10. Social Need To Change Present Corporate Capitalist System

To accord a proper place to agriculture in human society, it is necessary to change the capital (i.e., money and wealth)-oriented corporate capitalist system and its double dealing style (i.e., saying one thing and doing another) and to replace it by a nature-human directed social system which stands for two top priorities, i.e., environment and man and which follows five basic principles, i.e., environmental promotion, fair equality (i.e., empowerment of the people in place of corporate capital supported political parties and business circles, social security to every deprived and needy person and the rationalisation of irrational income differences in the proportion of 1:5), productivity (or growth-rate), peoples-led democracy and all-sided transparency

11. Sum Up

Summarising all that has been said above, one can say that the chemical-based farming has much harmed Punjab, as also the world agriculture, beyond repair. The GM-oriented technology will further wreck Punjab and the world agricultural structure. The only wayout lies in Nature-Human Centric (or organic) farming.

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