

Human Development and Agricultural Poverty among Small
Farmers in Rural Punjab, Pakistan

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List of Abbreviations

GDP	Gross Domestic Product
UNDP	United Nation's Development Program
GNI	Gross National Income
PSLM	Pakistan Social and living Standard Measurement
FAO	Food and Agriculture Organization
NEPAD	The New Partnership for Africa's Development
R&D	Research and Development
USA	United States of America
KM	Kilometer
VIF	Variance Inflation Factor
WHO	World Health Organization
BHUs	Basic Health Units
RHCs	Rural Health Centers
THQ	Tehsil Headquarter
DHQ	District Headquarter
SHI	Social Health Insurance
AP	Agricultural Poverty
WTP	Willingness to Pay
EPI	Expanded Program for Immunisation
LHW	Lady Health Workers
SSP	Sehat Sahulat Program
HEC	Higher Education Commission
PTEVTA	Punjab Technical Education and Vocational Training Authority
PBTE	Punjab Board of Technical Education
PVTC	Punjab Vocational Training Council
L&NFBE	Literacy & Non-Formal Basic Education
NFBE	Non Formal Basic Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
NER	Net Enrollment Rate
PSESP	Punjab School Education Sector Plan
PESP	Punjab Education Sector Plan
MDGs	Millennium Development Goals
NFE	Non Formal Education
TVET	Technical and Vocational Education and Training
TV	Television
ADBP	Agricultural Development Bank of Pakistan
FBC	Federal Bank for Cooperatives
ZTBL	Zarai Taraqati Bank Limited
ORR	Obligator Risk Rating
NRSP	National Rural Support Program

1. Chapter 1. Introduction

Human needs for food and clothing began with the start of life. The immediate resource available was land. That's why, humans started use of land and began cultivation. Due to lesser population and needs at that time, people produced enough to meet their own needs. But later on, with increase in population, human demand for food also increased (Ullah and Shivakoti, 2017). So, the agriculture turned into a profession and the structure of agriculture also changed which lead to commercial farming in place of subsistence farming. This commercialization of agriculture is a stimulator for rural economic growth (Von Braun, 1995). However, commercialization in agriculture is not a new phenomenon and it is not a surprise to the farming community. Since the nineteen fifties, farmers in most of the countries have moved towards commercial agriculture (Mahaliyanaarachchi and Bandara, 2006). The agriculture expanded in two ways, First, the magnitude of product increased. Second, crop diversity began as the cash crops were produced along with staple food.

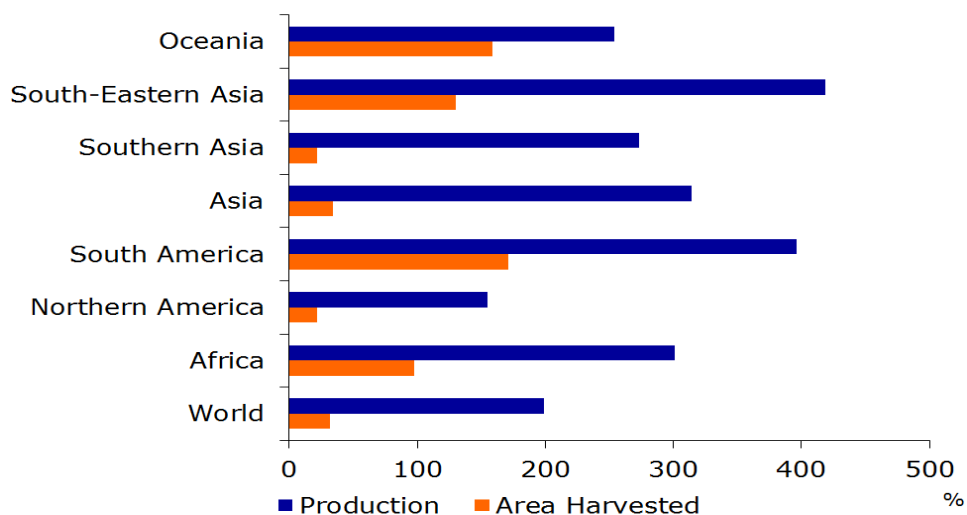
1.1. Trends in Agriculture

The agriculture has ability to keep its pace with growth in population. Especially, the gains in agricultural production in developing countries led this way. According to the estimates of World Bank (2008), the developing countries had faster annual agricultural output growth rate in terms of value than the developed countries during 1980 to 2004. Which was 2.6% annually for developing countries and 0.9 % for developed countries. Which resulted in rise in share of global agriculture Gross Domestic Product (GDP) of developing countries from 56 to 65% during this period, which was much higher than share of non-agriculture GDP (21%). Many effective plans successfully raised agriculture production and decreased hunger in last few decades. Like, The Green Revolution in Asia, pest resistant cassava and better maize in Africa, use of shallow tube wells in Bangladesh, improved mung and hybrid rice in East Asia etc.

The share of agriculture labour is highest in poor countries, sometimes 80 to 90%. Whereas, the contribution of agriculture in GDP is lesser, but still contributes up to half of output value. Both of these shares fall with the rise in GDP per capita. But the timeline of contribution of agriculture in some countries shows an important variation. Sometimes, the participation of labour in agriculture decreases without any increase in GDP per capita. For example, in Brazil and Nigeria, maybe, due to Urbanization. The obstacles of agriculture depress the income, and stimulates migration to informal sector of urban area. In China, in spite of rapid growth, the share of agriculture labour did not fall significantly due to restricted rural urban migration. In contrast to the history of developed countries, where the agriculture sector contributed in total output as much as the share of agriculture labour in early growth stages. The higher share of agriculture labour compared to output shows lower labour productivity in developing countries.

The agriculture production tends to rise all over the world, mostly keeping an order with rise in population. But this progress seems to be uneven. In Asian countries, the per-hectare production of cereals in 2005 was triple than the production in 1960. In Latin America, the Production shows huge gains. The hunger of China fall down. Hunger in India increased in spite of good performance of south Asian agriculture. Whereas, in Africa, only one-third increase in production was observed. Major reason behind this slow increase is the increase in population and the traditional agriculture is not feasible now because of little rest before reusing, which deteriorates the nutrients in soil. Also, the small farmers are unable to purchase fertilizers, improved seeds and mechanization which results in a poverty trap.

Figure 1.1. Absolute growth in area harvested and crop production (1963-2013)



Source: FAOSTAT, Rabobank Analysis

Over the last 50 years, world agriculture production has nearly doubled but the total area harvested has increased by a mere 32%. The implication clearly is that expansion of arable land area has played a less important part in increasing output than crop intensification and yield enhancement. However, these trends are not uniform across the regions. For instance, Asia only marginally increased its share of world area harvested but increased its share of world agriculture output from 34% in 1963 to 47% in 2013. Thus, most of the production growth in land-scarce regions of Asia is due to yield gains and crop intensification. Within Asia, East Asia, where output has tripled with a mere 11% increase in area harvested is at the forefront of this trend. Relative to the world as a whole, Asia's commitment to agricultural research as measured by public agricultural research and development (R&D) intensity—the ratio of public agricultural R&D spending to agricultural GDP—has been low. However, the region's spending on R&D has increased rapidly since the 1990s. This is reflected in Asia and the Pacific's growing share in global public agricultural R&D spending, which has contributed to Asia's agricultural productivity growth. Maintaining this commitment is essential, especially in light of the growing pressure on resources and the population and economic transformations taking place across Asia and the Pacific. (Chew and Soccio, 2016).

According to *Asia-Pacific: Agricultural perspective, Economic Report (2016)* Asia's position in the global food market tilts heavily towards demand due to its huge population and limited agricultural resources. With only one-fifth of the

world's agricultural land, the region hosts more than half of the global population. Asia has achieved significant production improvements over the last 50 years but produces lower yields compared to most other regions, with depleting resources including water, deteriorating soil quality, inadequate logistics and inefficient farming practices and land usage. These issues are beginning to be challenged and addressed through market-oriented approaches and corporate farming to satisfy a growing population featuring rising income levels, urbanisation, demand for higher food quality and environmental concerns (Chew and Soccio, 2016).

1.2. Agriculture as an Industry

Agriculture became an industry with its expansion, where firms (Farms) produce output by using inputs and make decision regarding costs and revenues. Firms try to maximize their profits by controlling costs incurred due to various factor of production and increasing revenues gains from produce. Land, which is the most important factor of production is scarce in nature. The supply of land is scarce, whereas, its demand is increasing day by day. These circumstances need intensive use of land.

Agriculture has capacity to absorb labour and it became a huge source of employment. But due to increase in population and lesser opportunities in other sectors, people have to depend upon agriculture. The pressure on land increased due to increase in population and division of land under laws of inheritance. Thus, men to land ratio is disturbed due to greater inflow of manpower causing Disguised Unemployment.

In Pakistan, agriculture exist in traditional way where agriculture is a way of life rather than a profession. Agriculture has been penetrated in the lives of medium and small peasants who are fond of traditions and taboos. These farmers follow conventional farming instead of modern farming. Majority of farmers are illiterate, and they still don't like to use fertilizers and mechanized farming. The traditional farming is not furnished with the division of labour and specialization. In Pakistan, labour intensive technique is adopted and a single farmer or his family performs all functions from sowing to harvesting.

Simon Kuznets, the Nobel laureate, highlighted the four contributions of agriculture to the economic development. i.e. contribution as input for industry like food and textile industry, source of foreign exchange in form of revenue from agricultural exports, contribution in rising rural income and demand for certain consumer goods and contribution to factor market as Lewis says that extra workers from agriculture sector moves towards industrial sector and the agricultural savings can be reinvested in industrial sector. The contribution of capital is often misinterpreted. It doesn't mean the squeezing of peasantry, actually it means, first investment in agriculture, gains from this investment is saved and reinvested in industry. Today's framework treats industry as basis of development rather than agricultural modernization. Many economists have consensus that, rather than passive or supporting role, the agriculture sector and rural economy must play an active role in economic development, especially in case of developing countries (Kuznet, 1961).

1.3. The Structure of Agriculture System

1.3.1. Three Systems of Agriculture

It is important to understand the agricultural system before moving towards the problems faced by agriculture. World development report (2008) proposed an easy way to categorize world's agriculture, is to observe along with agriculture system of developed world, three situations are common in developing world.

First, the agriculture-based countries, where agriculture is a major source of income and economic growth, especially due to its major contribution to GDP. According to world bank, agriculture contributes average 32% of GDP in such countries having 417 million people. Over two-third of poor population in these countries resides in rural setup.

Second, the transforming countries, about 2.2 billion people live in these countries. Having high share of average about 80 % poor resides in rural areas but the contribution of agriculture to GDP is on average 7% only. Most of these countries are South and east Asian, north African and middle east countries.

Third, the urbanized countries, where half or more poor people lives in cities due to high rates of rural urban migration. And the contribution of agriculture is even more

less. These countries are found in Latin America, Europe and Central Asia. These countries have some 225 million rural population.

The incidence of these countries in the groups is not fix. Many countries switched from agricultural based countries to transforming countries and from transforming countries to urbanized countries, Like China and Brazil. The agricultural productivity also varies from country to country. Even for very small number of farmer per hectare, the United Kingdom has yield 3 times higher than India, 6 times higher than that of Nigeria and 12 times higher than Sudan. Even the countries have disparities from land to land within the countries. Like, India has areas which fall in all these classification, from Punjab to Bihar. And Mexico has areas with much poverty and higher agriculture dependence in the south. Even within regions, poor and rich, small and large exists together. It is not necessary that the large is more efficient.

1.3.2. Agriculture System in Third World Countries

In third world countries like Pakistan, various past circumstances led to concentration of large areas of land in few hands of powerful landowners. This is also true in Latin America and most parts of the Asian subcontinent. In Africa, both past circumstances and availability of more unused land resulted in different pattern of agricultural activity. Although day-to-day survival struggle infuses the lives and attitudes of poor peasants in both Asia and Latin America. More particularly, the world agriculture system can be classified into two different systems.

- The system of agriculture in developed countries, having very efficient agriculture system where a few people provide food for the whole country, even for world community.
- The system of agriculture in under developed countries with inefficient system which is furnished with low productivity where farmers barely sustain farm population.

There is a big gap between above two systems. The agriculture sector in developed countries had its growth in 18th century after First World War, when a small number of farmers were able to produce the food for many people. All this development is

attributed to biological and technological advancements in agriculture sector. Contrary to this, under developed countries had a different experience. The agriculture sector of the under developed countries had following problems due to which living standards of the farmers was deteriorating.

- There was a scarcity of fertile land
- Because of increasing population, there was a big pressure on lands
- There was a lesser use of agriculture machinery and tools on farms
- The farming patterns and technology were traditional and outdated
- Due to diminishing returns, there was lesser marginal productivity
- The factor of risk and uncertainty because of traditional subsistence farming
- The lands were having problems of water logging and salinity
- The farmer did not get reasonable price for their product

The common feature of these third world countries is family farming. The members of the family is the work force in agriculture. Therefore, the agriculture is a way of life for these families instead of profession and they are not ready to change their life style. Despite different cultures in Latin American and south Asian, the agrarian structures they have is similar. For example, the main objective of farmers in these areas is self-survival. The farmer cultivates a relatively smaller piece of land, which is owned by himself, rented from a big landlord or money lender, in order to meet minimal needs of themselves and their families. In such countries the farmers get sub-standard wages by farming as tenants. Such farmers can hardly desire for profits or market conditions. These farmers are born in debt, grow in debt, depending upon climatic conditions, the common destiny of the farmers and die in debt. The tillers usually depends upon animal and human power, in spite of tools and machinery. The use of excrement rather than fertilizers is common. They use traditional seeds and crops rather than new experimental cultivations and modern seeds. These countries usually do not have insurance laws, unemployment funds or social security. They mostly sell their services for the sake of food.

In third world countries, agrarian systems are not only a part of production system but also a base for entire economic, political and social organization of rural settings. The agriculture system in operation in latin America is the agrarian dualism which is known as Latifundio-Minifundio. Latifundio is the big piece of land which can provide employment to 12 or more person. On the other hand, Minifundio means small pieces of land which can provide employment to 2 person only. 1.3 percent of landlord owns 71.6 percent of lands which means a few big landlords owns are occupying bigger portion of land. The lands occupied by these big landlords remains mostly unused. These big landlords do not effectively contributes to the national income. They are usually possessing the lands in order to show power and prestige (Shahid, 2008).

In Asia, this is common that too many people are holding with too little lands. In traditional system the agriculture was limited to the village or self-sufficient tribes. Where the land owners distributed land among poor farmers to cultivate. Those poor farmers served the tribal chiefs against food and protection. After the British, French and Dutch invasions in Asia the colonial rule was introduced which led to grow the big land lords and the tenants. After independence and increase in population, the pressure on the lands was increased. In absence of the industrial sector, the dependence upon the lands increased. And the agriculture sector was the main sector to absorb labor force. And with the passage of time lands went on dividing and sub dividing. Most of the farmers remained poor and they were unable to adopt technology, modern seed. As a result, agriculture remained inferior in quality and insufficient in quantity. Hence, the small farmer was stuck in agricultural poverty.

Having weak financial position these poor farmers have nothing to invest in health and education which effected the level of human capital over time. The children of the small farmer remain uneducated and faced malnutrition. This new generation grown up underdeveloped in terms of human development. These poor agriculturists ought to borrow cash from moneylenders who charged higher rates of interest. While big land owners and feudals were in a position to urge agriculture credits on the premise of political impacts. But with the time, when the urban life spread, the innovations and advancements took put and the demand for food

expanded within the destitute countries of Asia. As a result, the subsistence cultivation begun turning to mixed Farming, where the farmers not as it were produced for them, but moreover for the trade. The agricultural innovation got to be prevailing, and the small farmers required for funds. Therefore the small farmers could not get easy credit. Once again, agriculture remained compromised in terms of quality or quantity, leading to agricultural poverty.

1.4. Traditional Agricultural Farming

In traditional farming, the farmers follows the same farming practices as their forefathers, these farmers either reluctant of adopting modern techniques of farming or they are unable to adopt them because of financial reasons or so. Resultantly, they get lower outputs and incomes. In this way, the agriculture sector remains backward and poor. Following are the important properties of traditional agriculture sector:

1.4.1. Intermixing of Farming and Family Decisions

The traditional farming is usually concerned with small farmers. And it is commonly observed that in such farms the decisions of farm and family are mixed up. This is because of the reason that the major share of labor and capital, comes from the family. Also, the major portion of the output produced in such farms is consumed by themselves, it is very that the farm produce is brought into market. When the consumption and production decisions are mixed, the farmers get reduced incomes. Also, the factor of conventions are there. In such case, if any crop is fails, the whole family suffers. Due to such fear, the farmers use the same seeds which were used by their forefathers. So, the farmers show a careful response about new varieties of seeds and fertilizers as they are not prepared to take risks.

1.4.2. Labor and Land Use

Mostly the farms are small sized having area less than 2 hectares. While, the labor employed on this small area are greater in number. Which means that the ratio between labour to land is usually higher in case of traditional farms. Along with increase in population, and less industrialization, people have no other choices except to join agriculture. Thus there is heavy pressure of labor on lands in case of

traditional agriculture. As a result, these farms are facing either disguised or under-employment.

The wages of these agricultural labor are not determined on the basis of marginal productivity, but by the average product. Therefore, the family laborers work on these farms, but the local agricultural labors are also demanded at the time of sowing and harvesting. Again, the family laborers also sell their services on the big farms as part-time workers. Because of lower wages, the owners of the big farms always have the inducement to employ the cheaper labor. But, because of lower wages and incomes the owners of small farms as well as laborers have preferences for higher leisure. In other words, they do not have to face higher opportunity cost of leisure. They hardly think to change their lot, as they remain contented over their fate and destiny.

1.4.3. Seasonality

In traditional farming, labor demand changes with changes in agriculture cycle. At sowing and harvesting time, there is a demand of labor in farming sectors. And after sowing and harvesting, there is excess labor in traditional farming. In traditional farming, there is greater role of seasons. In post-harvest period when the farmers have larger quantity of output, they usually increase the consumption of that output. Whereas, in pre-sowing times, there is a shortage of food. The farms of such farmers do not have stores, also they have no savings to purchase food at that time. Therefore, in traditional farming system, consumption usually depends upon agriculture cycles.

1.4.4. Productivity and Efficiency

In traditional farming, many inputs are not purchased from the market, but the agricultural crops are produced with previous seeds, free water and family labor. Eventually, the yield per hectare, output per labor and productivity of the labor remains low. The traditional farms do not tend to change the type of crops, the means of labor and fertility of land. Finally, the productivity of the labor remains low. Lower productivity leads to agricultural poverty which lowers the wages and capital payments which again cause agricultural poverty. As a whole, these farmers have lesser share in the total output.

1.4.5. Rationality and Risk

In traditional farming, the farmers remain afraid of risks since they are risk averse. They usually feel that, following new technique or new seed, following any different way of sowing and harvesting, might cause big losses. They do not give weightage to the thinking that new technologies may have the effect of increased production and incomes. In fact, all such phenomenon results in reduced outputs causing compromised quality or quantity of output and hence, lower incomes leading to poverty.

1.5. The Pathway From Subsistence to Advanced Farming

The transition from subsistence farming to advanced farming can be identified in three stages

1.5.1. Subsistence Farming

The subsistence farming is usually based on Risk Aversion, Survival and Uncertainty. Subsistence farming is the most classical type of peasant farming in which most of the agricultural output is produced for domestic consumption of the farmer. The noticeable features of the subsistence farming are as follows

- The agricultural production mostly consists of staple-food crops such as wheat, rice, sorghum, barley and corn etc.
- The traditional techniques and tools are employed, which leads to reduced productivity and output.
- Labor and land are the only production factors, whereas, the capital investment is very low. And law of diminishing returns holds on the labor.
- The farmers are worried of climatic inadequacy, appropriation of lands and outstanding loans.
- The labor are fully employed while sowing and harvesting, whereas they remains unemployed during rest of the year.

- The farmers cultivate only the land which they can manage without additional hired labor.
- The environment is mostly harsh and static.
- Technological limitations also inhibits production.
- Rigid social institutions and reduced communication between farmers and institutions are also a hurdle in productivity.
- Fragmented markets often inhibit the higher level of production.
- The small farmers are bounded by uncertainties. They only strive to survive.
- The rigid behavior, illiteracy and poverty of the farmers exist.
- Subsistence farming is highly uncertain. They avoid the use of new technology, seeds and machinery, because they do not want to risk their lives.
- The farmers are not aimed at profits maximization. They just desire to save their family from starvation. In addition to above discussed risk and uncertainty, following reasons are given regarding subsistence farming in the poor countries.
- The measures taken regarding economic development benefits only big land lords.
- The Money-lenders try to capture the profits earned by the small farmers.
- The government procurement prices do not benefit poor farmers.
- The supply of necessary inputs like credit, better seeds, pesticides and water were never granted to poor farmers.

It may be concluded that the small farmers are not always resistant to change, but the prevailing circumstances also hinder their transition. The traditional environment also serve as an obstacle in the way of small farmer.

1.5.2. Mixed Farming

It is not quite easy to transform traditional agriculture system which has been practice since centuries to a commercialized farming in one shock. Subsequently mixed farming is the first step to begin with step to commercialized farming from subsistence farming. In such arrange of farming improvement, cash crops like coffee, cotton, fruits, tea, vegetables and natural products are produced. In addition to these, the livestock and dairy are also produced. Those labor which remained unemployed amid the major part of the year go on getting utilized. In this way, the demand for labor goes on to extend on the farms, especially at the time of harvesting and sowing. This leads to extend the real compensation of farm labor.

In such circumstance the farm machinery is utilized to substitute labor. In arrange to boost the staple crops the proper fertilizers pesticides are also utilized. Alongside, the greater production of the food items, the stretch is also laid upon to cultivate more of cash crops. In this way, the farming segment goes on to attain surplus. With this surplus the agriculturist can elevate the living standard of his family. When crop diversity begins the agriculturists some way or another are arranged to accept risk. But all this depends upon the capacities and competence of the farmers as well as on the social, commercial and institutional set-up where the farmer dwells. In case the farmer is in a position to induce the complementary inputs and he is persuaded of that the farming enhancement will advantage him and his family he will welcome the modern changes. The agrarian history of Pakistan, India, Philippine, Columbia, Mexico and Nigeria affirms that in the event that the farmers are beyond any doubt of the benefits they are arranged to move from subsistence farming towards mixed farming.

The utilization of advance seeds, fertilizers, and Modern water system not only improve the generation of staple crops but it'll moreover lead to free the extra land for the production of cash crops. The product overflow can also be utilized to create venture within the farms. Crop diversity will moreover lead to play down the affect of the staple crop failure, and give a security of wage which was not accessible prior. In this way, the move from subsistence cultivating to diversified cropping depends upon reasonable access to credit, fertilizers, water and information.

1.5.3. Commercial Farming

In a free economy, the commercial farming is the final stage in agriculture development. This type of farming is prevalent in advanced countries. It starts along with the growth in other sectors like industry and services sectors of the economy. The agricultural, mechanical, social and living standards changes leads to commercial farming. In this type of farming, the main objective of the farmer is profit maximization instead of subsistence. The farmers are aware of the costs of production and the revenues after harvesting. The farmers try to maximize the difference between the investment in crops and the revenues by utilizing innovations like, seed, modern fertilizers, advanced machinery, cropping and watering techniques.

The following are the common features of specialized farming or commercialized farming:

- More of the cash crops, vegetables and fruits are produced in such farming.
- The capital-intensive and labor-saving technology is used. The use of modern technology, fertilizers and mechanization one hand better off the farmer, on the other hand it promotes the industries providing these inputs.
- The big farmers use economies of scale to enhance their profits. The production on large scale benefits the farmers at one side, and the produce is available for other domestic and foreign consumer also.
- The specialized commercial farms act as industry or a business. Also commercial farming promotes other industries by providing raw material, which also creates employment for the people in industry. Hence commercial agriculture sector also promotes industrial sector.

1.6. Importance of Agriculture Sector in Pakistan

The importance of Agriculture sector in Pakistan can be observed in the following ways.

1.6.1. Contribution to Gross Domestic Product (GDP)

Agriculture sector plays a dominant role in Pakistan economy by making a greater contribution to GDP of Pakistan. The share of Agriculture in GDP is still huge among all other sectors which is 19.31 % in 2019-20. (GOP, 2019)

1.6.2. Source of Employment

Agriculture sector is a big source of employment in a country like Pakistan, having limited industry. Agriculture sector absorbs 42.3 % of labour force (GOP, 2017). Since, agriculture is a primitive and traditional profession, so unskilled people are easily adjusted in agriculture sector to earn livelihood for their families. Majority of population in Pakistan lives in rural areas and they depends directly or indirectly on agriculture for their living.

The development economist like Lewis and Ranis are of the view that agriculture sector of the developing countries is mostly oversaturated. Which means that, people employed in agriculture sector are more than the required labour. They may have zero or negative marginal productivity. If they are removed from agriculture sector, the total agriculture production will remain unaffected. Such withdrawn labour can be employed to start industrialization. Lewis says that, if parents of the withdrawn work force continue to feed them, the earnings of such labour can be reinvested. (Todaro and Smith, 2012).

1.6.3. Food Availability

According to the 6th Population and Housing Census of Pakistan 2017, the country's population is growing at the rate of 2.4 percent per annum. This rapid increase in population is raising demand for agricultural products (Raviagric.com, 2019). Agriculture sector is responsible for making the availability of food possible in the country. Agriculture sector is providing wheat, rice, vegetables and edible oils etc.

1.6.4. Supply of Raw Material

Pakistan has a limited industry and mostly industries are agro-based, like textile and sugar industries. The agriculture sector again becomes responsible for the provision

of raw material to these industries. As the development of textile industry is entirely attributed to a fairly large cotton production in the country and the sugar industry depends upon availability of sugarcane in the country. So, the agro based industries can be established on locally produced raw material.

1.6.5. Source of Forex

Pakistan having big agriculture sector, can export agriculture products like cotton, sugar, rice, vegetable, fruits and seeds. Accordingly, a large amount of foreign exchange can be earned through export of these agriculture products. Such foreign exchange can be used to import machinery and technology which can accelerate the economic development of Pakistan.

1.7. Importance of Agriculture Sector in Punjab

With respect to population and agriculture production, Punjab is the largest province of Pakistan. Agriculture has a key position in Punjab economy. The sector provides raw material to major industries like Textile, sugar, rice, leather and many processing industries.

1.7.1. Geographical Situation

Punjab has total area of 20.63 million hectares which is 25.9 percent of the total area of country making Punjab second largest province with respect to area. 86 percent of total area of Punjab is utilized and 14 percent is unreported. Another 14 percent area is not cultivable due to being barren or presence of villages, roads, houses, canal, rivers and sand. Rest of 72 percent area is available for cultivation.

According to census of agriculture 2010, total number of farms in Punjab were 5,249,800. Majority of these farms were very small. 42 % of these farms were having an area of less than one hectare. These farms shares 8.9 % only in total farm area. About half of total farms fell under the range of 1 to 10 hectares. Share of area occupied by these farms was 68.9 % in total farm area. Whereas, share of farms with area 10 and above hectares was only 2.4 percent in total farms. And share of these farms in total farm area was 22.2% (GOP, 2012).

Overall, two third of total cropped area was used for the cultivation of three big crops, which are Wheat, Cotton and Rice. 10.6 % area was claimed being used for Fodder. Sugarcane and Maize claimed 4.3 and 4.1 percent share in total cropped area respectively. High valued crops like oil seeds, vegetables and pulses were cultivated on 10 percent of total cropped area (GOP, 2012).

1.7.2. Agriculture Production of Punjab

The agriculture sector in Punjab is diversified and producing many types of crops. According to Economic survey of Pakistan, Punjab contributes more than half of total national agriculture production in various commodity groups. In 2015, Punjab's contribution in total agriculture production was 130 million tons out of total nation agriculture production of 176 million tons. The following types of crops are produced in Punjab (GOP, 2015).

1.7.2.1. Cereal Crops

Punjab province is biggest producer of cereals amongst all provinces of Pakistan. Punjab contributed 73 % share of total national cereals production in 2015 which was 27.32 million tons in quantity. This production included 19.28 million tons of Wheat, 3.56 million tons of Rice and 4.02 million tons of Maize which was 77%, 52% and 81% of the total national production of respective commodity.

1.7.2.2. Cash Crops

Punjab is leading in production of cash crops also. Punjab produced 53.6 million tons of cash crops in 2015, which accounted for 69 % of total national production of cash crops. This production included 10.3 million tons of cotton and 41 million tons of sugarcane which accounted for 73.6% and 65.3% of national production of respective crops.

1.7.2.3. Edible Oilseeds

Punjab is largest producer of edible oilseeds amongst all provinces of Pakistan. In 2015, the share of Punjab in total national edible oilseed production was 51%. Rapeseed and mustard are the main contributors in oilseed production and Punjab claimed 60% share of these contributors.

1.7.2.4. Pulses

Punjab is largest producer of pulses, which contributes a huge share of 82% in total production of pulses in Pakistan. The major contributors in pulses produced in Punjab are Gram, Mung, Mash and Masoor.

1.7.2.5. Horticulture

Punjab is also biggest contributor in horticulture production of Pakistan which includes Vegetables, fruit and condiments. The share of Punjab in total national horticulture production was 68.3 % in 2015. The contribution of fruits and vegetables were 63% and 78% respectively.

Mango and citrus are two major contributors in total fruit production. Punjab accounted for 77% mango and 95% citrus of total mango and citrus production in Pakistan.

1.8. Challenges to Agriculture in Punjab

Agriculture sector in Punjab has not been able to attain optimal level of performance due to many challenges. These challenges have obstructed the growth of agriculture in Punjab.

1.8.1. Rural Socioeconomic Setup

The agrarian life in Punjab moves around the defective socioeconomic setup. In villages, there exists poverty along with illiteracy, conservatism, traditionalism and stubbornness. The agriculture sector is also a prey of uncertainty. It remained depressed because this sector has never been held to change its lot. Big land owners consider their land as symbol of power and status. Whereas, Lands are just considered as a source of living as far as small cultivators are concerned. It means, agriculture sector of Punjab is still having its primitive behavior lacking commercialization. The farmers are still hesitant in adopting new technologies, high yielding varieties of seeds, modern insecticides, fertilizers, sprays, improved water techniques and mechanization in farms. Such state of farmer is attributed to factors like illiteracy and capacity of farmer, stubbornness, poor financial position and lesser attention of government towards agriculture.

The poor farmers are living in an environment which is lacking roads, sanitation, clean drinking water, schools, health facilities, financial institutions and markets. They don't have any source of employment other than profession of their forefathers. The small farmers are hardly mobile, least innovative, they have to engage themselves on farms even if they are not required. The farmers are fond of traditions, spend lavishly on matters related to prestige, fond of litigation and gossiping, have no realization of opportunity cost of time and money. This socioeconomic setup seems to be responsible for lower performance of agriculture in Punjab.

1.8.2. Financial Position

There is a common saying regarding our farmer that, he is born in debt, grows in debt and dies in debt. It means farmers are poor and financially weak. They have to feed their parents and their own big families on their small earnings. Moreover, they are adapted to heavy spending on litigations and matters of prestige. Which further worsens the condition and flow of investment to field remains blocked. Small farmers are unable to purchase fertilizers, high yielding seeds, tube wells, tractors and machinery. The financial institution like Agriculture Development Bank and cooperative banks provide very nominal amounts in terms of agriculture credit. Same is the case with commercial banks, they are always found reluctant in advancing agriculture credit. So, small farmers have to go to commission agents and land lords who charge high rate of interest. Because of restricted flow of credit to farmers, there is low capital formation in agriculture which leads to low productivity. The farmers also fail to start activities like horticulture, poultry farming, dairy farming, cattle farming fisheries. So, the earnings of the farmers remain low, which confirms the existence of vicious circle of poverty in agriculture.

1.8.3. Other Challenges to Agriculture Sector

Global climate change is directly affecting agriculture. Changes in temperature, rainfall, CO₂ levels in atmosphere and climatic extremes directly affects crop production. Apart from natural calamities, agriculture sector, especially small farmers face many other problems stemming from lack of resources, awareness and ineffective crop management. The insufficiency and inefficient use of irrigation

water. Use of high efficiency irrigation system is not common may be due to huge initial cost or unawareness. There is low level of mechanization and small farmers have to rely on traditional farming methods. All these circumstances lead to low productivity.

1.8.4. Inadequate Public Policy

An important reason for the poor performance of agriculture in Punjab has been the ignorance of agriculture sector in the development policies of the government. This ignorance of agriculture together with biasness toward urban and industrial investment can be traced historically. If agricultural sector receive a renewed focus, the important challenge will be to define the role and policy of the government.

If agriculture is expected to perform perfectly competitive, but there remains chances of the market failure and role of government is definite. The role of government is required in research and development, extension services, information and market regulation. Also government has important role in providing infrastructure and institutions. The role of government is also necessary for poverty alleviation, which in case of small farmer, can be fulfilled by bringing small farmer out of agricultural poverty.

Despite agrarian setup, Punjab agriculture setup has always been ignored by the policy makers. The policy makers give preference to commerce and industry in form of reduced taxes, tariffs and duties. On the other hand, agriculture sector remained at the mercy of backward, illiterate farmers. There is no adequate policy for farmer education and training. The public programs of field sprays, provision of subsidized inputs, and provision of credit and extension services remained confined to influential farmers and big landlords. The performance and role of agriculture department is unsatisfactory in respect of advisory and consultancy services. They failed to provide mechanization in agriculture. There is no provision to provide equipment to farmers, especially small farmers at subsidized prices. Such state of affair is big obstacles in progress of agriculture in Punjab.

1.9. Agricultural Poverty

There are various challenges to agriculture sector which makes either the quality or the quantity of agriculture output to suffer. These challenges may range from land, seed, technology and capabilities of the farmer. Hence, making the agriculture poor which is termed as Agricultural poverty. Poverty among people has been vastly discussed in literature. However, the current study, for the first time introduced poverty among agriculture which is termed as “Agricultural poverty”.

Therefore, the agriculture poverty is the poverty of agriculture due to inferior quality or insufficient quantity of the agriculture output”.

1.9.1. Conceptualization of Agricultural Poverty

The term poverty is derived from the word “Poor” which represents inferior quality or standard. And the poverty is referred to as a “state of being inferior in quality or insufficient in quantity”. The term poverty was historically used only in case of human being. Accepting agriculture as a living being, the current study is introducing the term poverty for agriculture also. Which is termed as agricultural poverty in this study.

“The agriculture poverty is the poverty of agriculture due to inferior quality or insufficient quantity of output”

The current definition of the agricultural poverty explains that the agricultural poverty will exist if the agricultural product is poor, either inferior in quality or insufficient in quantity or both of them together. There are two main factors which are determining agricultural poverty according to the definition. The inferiority of the quality and insufficiency of the quantity.

1.9.1.1. Inferiority of Quality of Agriculture

The quality of agriculture is different in different countries/areas which is represented by the quality of agricultural output. There might be different factors affecting the quality of the produce. But resultantly, the quality of output will reflect the overall quality of agriculture. This inferiority of the quality of output discourages the produce in the market. This low quality product is not able to

compete in the market with good quality alternatives. Ultimately, the farmer will get low price for such product.

1.9.1.2. Insufficiency of the Quantity of Agriculture

The quantity of agricultural output is usually measured by the yield per acre of the land. The yield of the agriculture may also differ in different areas. And there might be different factors affecting the quantity of agricultural output. Because of any factor, if the yield of the agricultural product is low, it will be a cause of agricultural poverty. Since, the quantity of output is less, therefore the farmer will get lesser sum by selling the product.

1.10. Rural Poverty

According to FAO (2018) despite real progress, nearly 2 billion people in the developing world grind out a meager and often inadequate existence in agricultural pursuits. Over 3.1 billion people lived in rural areas in developing countries in 2010, a quarter of them in extreme poverty. People living in the countryside make up more than half of the population of such diverse Latin American and Asian nations as Haiti, Guatemala, India, Indonesia, Myanmar, Honduras, Sri Lanka, Pakistan, Bangladesh, the Philippines, Thailand, and China. In sub-Saharan Africa, the ratios are much higher, with rural dwellers constituting 65% of the total population. Of greater importance than sheer numbers is the fact that well over two thirds of the world's poorest people are also located in rural areas and engaged primarily in subsistence agriculture. Their basic concern is survival. Many hundreds of millions of people have been bypassed by whatever economic progress their nations have attained. The United Nations Food and Agriculture Organization estimated that in 2009, for the first time, over 1 billion people did not have enough food to meet their basic nutritional needs. In the daily struggle to subsist, farmer behavior in developing countries often seemed irrational to many observers who until recently had little comprehension of the precarious nature of subsistence living and the importance of avoiding risks. If development is to take place and become self-sustaining, it will have to include the rural areas in general and the agricultural sector in particular. The core problems of widespread poverty, growing inequality, and rapid population growth all originate in the stagnation and often retrogression

of economic life in rural areas, particularly in Africa. Traditionally in economic development, agriculture has been assumed to play a passive and supportive role. Its primary purpose was to provide sufficient low-priced food and manpower to the expanding industrial economy, which was thought to be the dynamic “leading sector” in any overall strategy of economic development.

Poverty, a state of deprivation and destitution, is a primitive predicament. Poverty in Pakistan has historically been higher in rural than urban areas. In terms of the number of poor, about 35 million out of the total of 47 million people estimated to fall below the poverty line, live in rural areas. Poverty rose more sharply in the rural areas while agriculture is the predominant activity in rural society. The concentration of chronic poverty is found in rural areas of the country (Arif and Farooq, 2012). The disparity in incidence of poverty in urban and rural areas, and the higher rate of increase of poverty in the rural areas has prompted debate on growth and productivity trends in the agriculture sector. The major sources of income in rural Pakistan are farming, agricultural wages and salaries and domestic and international remittance. According to Malik (2005), farm crops/products accounted for 49.49% of average household income in rural areas. Despite the rapid speed of urbanization over the past decades, rural small farming remained the primary source of food and income for a majority of population in developing countries.

1.10.1. Separating Agricultural Poverty from Rural Poverty

Poverty has been higher in rural areas as compared to urban areas historically. Rural areas are also most vulnerable because of poor or no access to health, education and other facilities which shows low level of human development. So, poverty and lower level of human development exists side by side in rural areas of Pakistan. (Qureshi and Arif, 2001) estimated the incidence of poverty and examined poverty differentials across rural and urban areas. Their study also confirmed higher incidence of poverty on rural household. A bulk of population residing in rural Punjab is directly or indirectly dependent on agriculture for their livelihood. Most of the rural poverty is attributed to deficient performance of agriculture sector of Punjab. Another argument was given by (Arif and Farooq, 2014), they studied rural poverty dynamics in Pakistan. The study revealed that the Poverty increased sharply

in rural side where agriculture was a dominant activity. Hence, the concentration of chronic poverty is found in rural areas of the country. Agriculture cannot be blamed for rural poverty as a whole. Since, Agriculture is not only activity in rural areas. Instead, it is a dominant activity of rural areas as argued by (Arif and Farooq, 2014). And 43.4% of Pakistan's workforce is employed in Agriculture (GoP, 2007). Whereas, 65.9% of Pakistan's rural population is somehow, directly or indirectly depends upon agriculture sector for their livelihood (GoP, 2006).

Rural poverty refers to poverty among people in rural areas, including factors of rural society, rural economy and politics. Rural economy includes both farm and non-farm industry. Whereas, Agricultural poverty is a specialized concept which refers to the poverty of agriculture only. Hence, "The agriculture poverty is the poverty of agriculture itself due to inferior quality or insufficient quantity of output". Therefore, Agricultural poverty may be a cause of rural poverty. Since, agriculture is the biggest economic activity in rural areas, therefore, agricultural poverty may also be referred to as biggest cause of rural poverty.

Since, a bulk of rural population is dependent upon agriculture for their living. And majority of them are small farmers. These small farmers lacks behind in modern technology and human development as compared to other rural community. Which leads to agricultural poverty amongst them. Hence, these small farmers becomes the direct victim of agricultural poverty. As a result, the small farmers remain poor.

1.10.2. Incidence of Agricultural Poverty

Agriculture remained surrounded by poverty, natural calamities, illiteracy, rigidity, conservatism and orthodoxy. The Green Revolution mostly benefited the big landlords, while a lot of small farmers could not change. Big landlords have advantage over small farmers and mostly big landlords are out of agricultural poverty because of large cultivable lands. Also, they can afford fertilizers and mechanization. Therefore, the small farmer is actual victim of agricultural poverty. In case of small farmer, due to poor health, low level of education and awareness, lower levels of living standard, lesser availability of credit, and existence of conventional farming where most of the produce is kept for domestic needs and some part of it is sold in the market at depressed prices. In the situation when a

transition could not take place in agriculture sector, it remained lagging in respect of finance, productivity, growth, supervision, consultancy and extension services and the poverty became indispensable (Shahid, 2008). The poverty of small farmer decreases the ability of the small farmer to invest in human development and also decrease his ability to invest in next crop. Therefore, next crop is either inferior in quality or insufficient in quantity which is term as “Agricultural Poverty”.

1.10.3. Definition of Small Farms

The concept of small farms can be approached from a variety of angles. Small-scale agriculture is often, albeit not always appropriately, used interchangeably with smallholder, family, subsistence, resource poor, low-income, low-input, or low-technology farming (Heidhues and Brüntrup, 2003). About two-thirds of the developing world’s 3 billion rural people live in about 475 million small farm households, working on land plots smaller than 2 hectares(Nagayets, 2005).The following examples of definitions illustrate the diversity of conceptual approaches to the term:

Lipton defines family farms as “operated units in which most labor and enterprise come from the farm family, which puts much of its working time into the farm” (Lipton, 2005).

The World Bank’s Rural Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank, 2003).

A FAO study defines smallholders as farmers with “limited resource endowments, relative to other farmers in the sector” (Dixon, Taniguchi, and Wattenbach 2003).

Narayanan and Gulati (2002) characterize a smallholder “as a farmer (crop or livestock) practicing a mix of commercial and subsistence production or either, where the family provides the majority of labour and the farm provides the principal source of income”.

The sole consensus on small farms may be the lack of a sole definition. As a result, the issue spans “a widely diversified group from middle class family businesses well-integrated into the market economy to subsistence farmers, who constitute almost 75 percent of the world’s poor” (Huvio, Kola, and Lundström, eds. 2005).

To underscore this point, consider that various agencies in the United States categorize small farms using agricultural sales cutoffs of \$50,000, \$250,000, or even \$500,000 (Economic Research Service, Small Business Administration, and National Commission on Small Farms, respectively [ERS 2005]). According to the \$500,000 threshold, 97 percent of U.S. farms fall into the small farm category.

The most common approach—adopted driven by availability of internationally comparable empirical data—is to define small farms on the basis of the size of landholding. It is important, however, to recognize the limitations of this measure, given that it fails to properly account for the quality of resources, the types of crops grown, or disparities across regions. For example, a small farm in Latin America that produces high-value crops in an irrigated area is hardly comparable with a small farm in South Asia producing a staple crop in a marginal or rainfed area. The size-based definition also precludes analysis or comparison of institutional and market arrangements available to farmers, which play a critical role in determining their income opportunities as well as their access to key social services, such as health and education. Further, the size-based definition does not shed light on a farm's labor arrangements, such as relative shares of family and hired labor, which can also have substantial implications for the farm's efficiency and productivity. With these criticisms in mind, in this research the terms small farms and smallholders are confined to farms of less than 2 hectares of owned land. This definition also assumes that the farm family provides the primary source of labor and that farming constitutes a basic source of income for the family.

1.11. Human Development

Development was considered as only economic development for a long time, and remained related to the structure and level of income. Subsequently, focus shifted towards human development. Human development is a process of enlarging people's choices. In principle, these choices can be infinite and can change over time. But, at all levels of development, the three essential choices are for people to lead a healthy and long life, to acquire knowledge and to have access to the resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

The basis of the term “Human Development”, popularized by the United Nations Development Programme (UNDP) can be seen in various writings of Nobel laureates, Mahbub ul Haq and Amartya Sen. In 1990, the UNDP published first global Human Development Report. Since publication of this report, many efforts were made to refine the measures of human development under the guidance of Mahbub ul Haq (McGillivray, 1991; Srinivasan, 1994; McGillivray and White 1994; Noorbakhsh, 1998, 2002; Streeten, 2000; Neumayer, 2001 and Malhotra, 2006).

The process of human development is a process of expanding the capabilities of people (Sen, 1984). Human development is also defined as “the process of enlarging the range of people’s choices”. As basics to expand human choices, is the building of human capabilities and also increasing the accessibility of things. Knowledge acquisition, to lead a healthy life and to have access to sufficient resources required for a decent living standard have been highlighted as three important choices for human development.

The main element in the concept of human development is Productivity. Productivity is concerned people must be enabled to increase their productivity and to participate fully in the process of income generation and remunerative employment to achieve higher economic growth, which is a subset of human development models.

In 2019, the Human development index of Pakistan calculated by United Nations Development Program was 0.560 and was ranked at 152nd position among 189 countries. Currently, 64 percent of the nation’s population is younger than 30 and 29 percent of Pakistanis are between 15 and 29 (an age group which we define as the youth). Pakistan now has more young people than it has ever had, and this is forecasted to continue to increase until at least 2050. This is important because the youth have the power to transform a country’s future. They could be the engines of development. Or their disillusionment could lead to social unrest.

1.11.1. Three Dimensions of Human Development

According to United Nations Organization, there are three distinct dimensions of Human Development which are used to calculate human development index by

United Nations Development Program. These three dimensions collectively indicates the level of human development in any country/region. These three dimensions includes

- Long and healthy life (Health)
- Knowledge (Education)
- A decent standard of living (Income)

1.11.1.1. Health

To live a long and healthy life is the first dimension of the human development which is indicated by health and health is most important component of life. A long and healthy life is considered to be a basic human right for all. Health is a name of complete physical and mental wellbeing of a person which can make his life long and healthy. From the beginning of mankind, health remained a center of concern for human being. The transition in time and environment had caused many health problems and men had been able to find solutions. In modern time, due to advancement in medical science, dealing with health problems is not a big issue. But the situation is not same all over the world. Different countries has different health status of its citizens and their health care setups.

On one hand, Japan has life expectancy of 84.5 years and Central African Republic has life expectancy of 52.8 years. Whereas, Pakistan stands at 67.1 years (Human Development Report, 2019). Life expectancy may be quite high for better-off people in developing countries but far lower for the poor. Child mortality rates in developing countries remain more than ten times higher than those found in the rich countries. If child death rates in developing countries fell to those prevailing in the developed countries, the lives of more than 8 million children would be saved each year (Conceição, 2019).

In human capital health plays a key role. The labour productivity as well as the efficiency is positively affected by the good health (Akram and khan, 2007). Pakistan had highest infant mortality rate in 2012. According to the latest World bank data published in 2018 life expectancy in Pakistan is: Male 66.194, female

68.109 and total life expectancy is 67.114 which gives Pakistan a World Life Expectancy ranking of 138 and infant mortality rate was 57.2 deaths per 1000 live births. Whereas, death rate was 6.942 per 1000 population.

Health is a precondition to increase productivity, and also the successful education depends upon adequate health. Therefore, health may be considered as a basic component of human development. The role of health as a basic input gives health the central position in economic and human development.

1.11.1.2. Education

Knowledge and health are basic motives of the human development; they are important in themselves. Knowledge is the second dimension of the human development which is indicated by education. Education is obligatory for a rewarding life; and education is fundamental to the expansion of human capabilities which is the base of the meaning of development. Meanwhile, education has a basic role in the abilities of people and country as a whole to absorb modern technology and to build capacity.

Recent decades have witnessed a historically unprecedented extension of literacy and other basic education to a majority of people in the developing world. The United Nations reports that although there were still a staggering 780 million illiterate people aged 15 or older in the world in 2004, the good news is that 82% of all people are literate today, compared to just 63% as recently as 1970. But almost two-thirds of the world's illiterate people are women. Despite such outstanding achievements, developing countries continue to face great challenges as they seek to continue to improve the education of their people (Todaro and Smith, 2012). Overall, 30 percent of children of age between 5-16 years are out of school in Pakistan (GoP, 2019).

The distribution of education within countries is as important as income distribution. Unfortunately, in Pakistan, about 10 million children are out of school (GoP, 2011). Even if every child attends school, it does not mean that they get a quality education. Quality education is a luxury which is available for those who can pay. Many challenges to the poor education also include less public schools availability and lesser investment in public schools.

1.11.1.3. Living Standard

A decent living standard is the third dimension of the human development. Decent standard of living is indicated by per capita income of the individual. Level of income of the countries itself has become a scale of ranking of the rich to poor countries. According to Human Development Report (2019) the rich country like Qatar has 110489 \$ Gross National Income (GNI) per capita and on the other end Burundi has 660 \$ GNI per capita. And Pakistan stands on GNI of 1590 \$ per capita. From these statistics the difference between living standards of different countries can be observed (World Bank, 2018).

The inequality exists not only among countries, but also within a country different people have different incomes/living standards. Same with in Pakistan, there exists various levels of Elite, middle and poor class. Privileged class including Business person, politicians, Bureaucrats and big landlords enjoys a decent living standards, good health and education opportunities. Whereas, poor class, the labour, hand worker, small farmers and unemployed segment of society can hardly meet the needs of daily bread. Therefore, decent living standard, health and education are out of question for them.

Government can provide subsidized health and education but the standard of this health care and education cannot meet the standards. Whereas, government cannot provide free money to all poor for their daily needs. The poor should have an option to take loans to start their own means of living, for business, agriculture inputs, for education and health. But, unfortunately in Pakistan this credit system is not adequate. This system is not poor friendly. Thus poor remains poor.

1.12. Combining Human Development and Agricultural Poverty

Poverty prevails everywhere and poverty alleviation has been the main concern of human development. Though human development has much more scope than just poverty eradication. Human development parts out which of measurements of poverty are altogether influenced by the human development and which one has stay untouched (Madan, 2012). Human capital plays a positive and significant part and the poorest of the poor don't have the human capital. This group needs unique consideration (Bhutto and Bazmi, 2007). With regards to social vulnerability, the

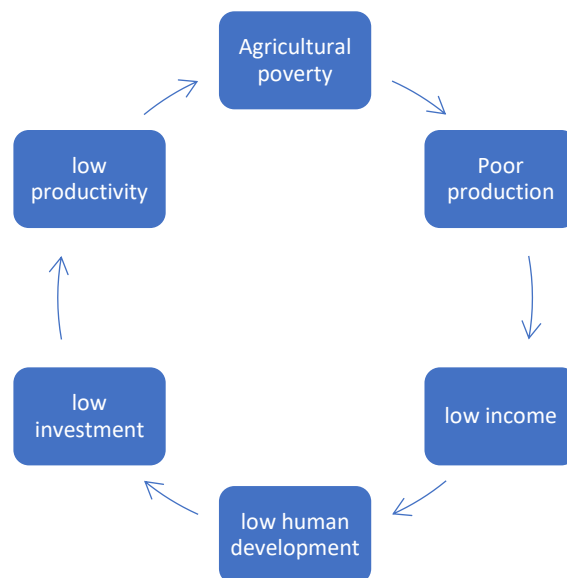
capacity of the poor in Pakistan to access public entitlements like political processes or goods and services which determine human development contrasts strikingly with that of the rich (Aftab et al. 2002).

Human development do not have a role only in defining poverty among people, but it also have a role in determining agricultural poverty. There are certain sub factors which determine the quality and quantity of the agricultural output. Along with other sub factors, the factor of human development among small farmers may also affect the agricultural poverty. There is an impression of a higher frequency of vulnerability of falling and staying in poverty among families which are reliant exclusively on agriculture. Rural ranges which are connected with the urban territories appear to be more prosperous because of access to better education, health and employment opportunities which leads to human development. This human development may increase agricultural productivity or quality, which leads to reduction in agricultural poverty which result in a rise in incomes of poor farm households who primarily depend on agricultural wages and hence, may also bring them out of poverty.

Hanjra et al., (2009) states that poverty traps stems mainly from access to productive assets, poor infrastructure, underdeveloped market and low human capital. The agricultural production along with quality of land, inputs, water and climate, also depends upon level of human development of farmer. A more experienced, healthy, wise and educated farmer can run his farm in a more proper and efficient way. Normally, a farmer is manager and also a laborer. He plans the production procedure, use machinery and watch out the market situation. In this manner, a good farmer should have characteristics of a good businessman, labour, a mechanic and a decent forecaster in regards to climatic conditions and market demand. It is said that any farmer who need a productive agriculture, he should have information about agriculture, farming and technology. The current study argue that skills along with technology is must for proficient agriculture. Presently, farming has turned into a science as contrasted arts. Consequently, it is essential for the farmer that he should be educated with the goal that he could consider the modern technology and innovation and follow up on it.

1.12.1. Vicious Circle of Agricultural Poverty

The vicious circle of agricultural poverty starts from agricultural poverty and results in agricultural poverty. Agricultural poverty at first steps give rise to poor production. The production might be poor in terms of quality or quantity. Resultantly farmer will have lower level of income. When the small farmers having a complicated family system and the social obligations like litigations and marriage and death like ceremonies he will have lesser amount to invest in human development like health, education and living standards. As a result, the health, education and living standards of these poor farmer remains poor. Since, small farmer invests his human capabilities in farming. Therefore with poor health, education, living standards, lack of technology and agriculture credit his investment in next crop will be compromised. Lower investment in next crop leads to lower productivity which will ultimately cause agricultural poverty. Again, the next crop will be either inferior in quality or insufficient in quantity.



1.13. Objective of Study

Agriculture and farmer in Punjab, Pakistan are most neglected segment of society by policy makers and planners. Among farmers, small farmers are most vulnerable. There is no effective agriculture policy, and no policy regarding human development among these small farmers. Since, a lot of work has been done by agricultural scientists globally on improving the productivity of agricultural sector

by improving the use of better seed, fertilizers, mechanization etc. The productivity of land can be increased up to a limit by using these techniques. Secondly, these techniques are not pro poor. The small farmers are either not able to adopt or willing to adopt these techniques. So, the agricultural poverty prevails.

This study is unique in introducing the concept of poverty in agriculture and also in introducing the term of agricultural poverty and vicious circle of agricultural poverty. This study is unique in relating human development among small farmers and their agricultural poverty because there is no prior work available on the relationship between Human Development among small farmers and agricultural poverty.

The objective of this study is to explore the relationship between human development among small farmers and agricultural poverty and give recommendations to break the vicious circle of agricultural poverty through investment in Human Development. For this purpose, the study will deeply analyze the relationship between the dimensions of human development among small farmers in Punjab and agricultural poverty. Important factors will be sort out which effect the agricultural poverty either positively or negatively. The results will be used to make suggestions for the future.

2. Chapter: 2. Literature and Methodology

2.1. A Review of Literature

Different works related to measures of human development and its relationship with the poverty somehow, are the means to analyze the relationship between human development and agricultural poverty among farmers in Punjab. Poverty among people has been point of focus of researchers and scientific community since very long and various social scientists have focused on different dimensions of poverty among people. But instead, the current study attempts to identify the importance of human development in determining poverty of agricultural through a review of existing literature. Since there is no exact literature available in context of agricultural poverty.

Poverty is a state of deprivation, and it is a dilemma in Punjab, Pakistan. People of the Punjab are suffering with poverty since time immemorial. Maharajas, Kings, Sultans, Rajas and the British-who ruled over this land pillaged the poor and made their condition pitiable. On independence, people dreamed that this poverty, which reflects hunger, ignorance, disease and vulnerability, would finish and a new era of prosperity will prevail henceforth. This actually did not happened and the people of Pakistan continued to sink in deep poverty (Saqib, 2001).

(Aftab et al., 2002) states that poor segment of the society is most vulnerable. With regards to social vulnerability, the capacity of the poor in Pakistan to access public entitlements like political processes or goods and services which determine human development contrasts strikingly with that of the rich. Hence, poor segment exhibits lower level of human development. (Madan,2012) further adds that poverty and human development seems to have an inverse relationship in his study of human development and poverty in India. He argues that human development attempts to capture quantitative as well as qualitative aspects of human well-being. Whereas poverty implies denial to the opportunities and choices most basic to human development. His study found a negative relationship between human development and poverty across major states of India and underlines the need of educational and economic opportunities in all sections of society.

Agriculture and poverty somehow are under debate in literature. (Shahid, 2008) also provided the linkage between this rural poverty and agriculture in his book. He argues that conventional farming is a reason for depressed agriculture in Pakistan. And this depressed agriculture cause poverty among farmers. Whereas, (Michler and Josephson, 2017) studied agricultural diversity and poverty in Ethiopia and provided an empirical evidence on agricultural diversity and poverty. Results of their study revealed that the farmers which grow a diverse set of crops are less likely to be poor. In other words, Crop diversity reduces the probability that a non-poor farmer will fall in to poverty and the probability that a poor farmer will remain in poverty. For adopting effective crop diversification farmers need awareness and knowledge which comes through education.

Extending the argument of (Shahid, 2008) the depressed agriculture leads to lower agricultural income. The lower agricultural income fails to increase savings, when the small farmers having a big cluster of joint family and many social obligations For example, marriages, deaths ceremonies, litigations etc. they have nothing to spend on health, education and they cannot even fulfil the input requirement of the next crop. As a result, the next crop will be either inferior in quality or insufficient in quantity which again leads to poverty. Therefore, poverty induced by inferior quality or insufficient quantity of agriculture is termed as “Agricultural Poverty”.

2.1.1. Health and Agricultural Poverty

Health plays a key role and is very important factor in human development. It is also responsible for an economic progress of a country because the healthier people are more efficient than the others. Whereas, Huge differences are observed between the health statuses of the different countries (WHO, 2008).

The effect of poverty on health is obvious from the literature. Like (Mansfield and Novick, 2012) studied poverty and health with a focus on North Carolina. They wrote that people living in poverty have poorer health outcomes than the others do. The national recession of 2008-2009 brought increased joblessness and income inequality to North Carolina leading to adverse health effects. The mechanisms by which poverty affects health include a lack of sufficient resources with which to obtain food and shelter.

Evidence from the world overall supports the link between poverty, hunger and poor health. (Murray,2006) Argues that the poverty and health are inextricably intertwined. Poverty leads to increase dangers to the health. On the other hand, poor health may also lead to poverty by effecting the efficiency. The working conditions of the poor often have more risk for illness and disability. Other factors such as lack of access to clean drinking water disproportionately effects the poor families. This situation mostly exist in rural areas of Pakistan because of very less attention of policy makers towards rural areas. (Akram and Khan, 2007) carried out a study to measure the incidence of government spending on health in Pakistan at provincial, both rural and urban level by using the primary data of the Pakistan Social Standard Living Measures Survey (PSLM), 2004-05, and by employing the three-step Benefit Incidence Approach (BIA) methodology. They explored the inequalities in resource distribution and service provision against the government health expenditures. The rural areas of Pakistan were more disadvantaged in the provision of the health care facilities. Since, (Akram and khan, 2007) said that the labour productivity as well as the efficiency is positively affected by the good health. While the expenditures in health sectors are overall regressive in rural Pakistan as well as at provincial and regional levels. Public health expenditures are pro-rich in Pakistan.

(Howitt,2005) wrote that healthier workers have more life expectancy and they are more productive because of more attentiveness, strength, vigor, creativity and stamina. Even health status effects the returns from investment in education. Healthier workers are more creative, innovative, better understand technologies and can cope stress and stressful events. Which is significant for farm workers who are vulnerable to weather changes, labour and market issues.

As, rural residents are more vulnerable with respect to health facilities, And amongst rural residents the poor farmers are at most health risk. The workers of the agricultural sector have to face many kind of threats and danger related to their occupation, which are responsible for illness, high accident rate and impairments. Farmworkers, Farmers and their families are exposed to various health risks, environmental and safety hazards, and are at risk for illness and fatal and non-fatal injuries (Tonelli et al., 2014).

As, (Antle et al., 1998) studied pesticides, productivity and farmer's health in Ecuador. The focus of the study was potato production and farmers producing potatoes. The study argued that the use of pesticide has positive effect on the potato production but the farmer's health was negatively affected from the usage of pesticides. (Croppenstedt and Muller, 2000) investigated the nutritional status of farmer, farmers health and productivity in Ethiopia. Their study argued that there exists a very strong relationship between the nutritional status and health, and the productivity. Poor nutritional status of the farmer negatively effects farmers health which may effect the productivity and efficiency of the farmer.

The safety and health of farm families impacts the life quality and economic viability. If a farm operator, worker of a family member is not available, because of health issue like illness or accident, it can negatively effect the production, farm management and marketing. The health recovery and ability of farmer to cope with health issue depends upon health care facility (Gillespie and Johnson, 2010; Zheng and Zimmer, 2008).

Investment in health and health care policies are important components of human development. There is little research on how health insurance effects the human development among farmer. (Inwood, 2017) linked health insurance with food and agriculture benchmarking the farmer and to suggest human development policy in USA. His research is based on a sample of 654 farmer surveys and 90 interviews. Nearly half of the sample did not have enough information about health insurance. A meaningful number of farmers reported that they were uninsured due to high rates of insurance. And reported that their personal health effects the farm operations. Whereas, (Currie and Madrian, 1999) states that poor health decreases the capacity of labour to work and have significant effect on wages. And also stated that health insurance has important impacts on labour force participation. But the relationship between health insurance and earning is unclear.

(Fink and Masiye, 2015) evaluated the effects of investment in preventive health technology on productivity through a randomized controlled trial in rural Zambia. In the experiment, access to subsidized bed nets was randomly assigned at the community level; 516 farmers were followed over a one-year farming period. They found large positive effects of preventative health investment on productivity:

among farmers provided with access to free nets, harvest value increased by US\$ 76, corresponding to about 14.7% of the average output value.

It is clear from the literature that health has positive relationship with efficiency and productivity of labour or farmer. But the role of health in determining agricultural poverty in Pakistan and a suitable health policy is yet to be discovered.

2.1.2. Education and Agricultural Poverty

Education is an important and necessary component of human development which make them more productive. Without human development, the goal of poverty eradication and development is not reachable and human development is largely based upon skills and education. Poverty is mostly associated with low education in developing countries (Filmer,2000). (Brown and Park, 2002) argues that Less educated parents may give lesser value to education and are less likely to educate their children. They have less scholastic aptitude which they pass to their children or they are less able to help in learning of children. Absence of community resources in rural areas further discourages the attitude towards educational attainment. (Qureshi and Arif, 2001) claims that the educational attainment of household head is the critical determinant of household poverty in Pakistan. An increase in the educational level of the head of the household significantly reduces the chances of the household being poor. The results of the study found education as an important factor, as increase in schooling effects individual earnings as well as earnings of others with whom he interacts. (Nasir et al., 2016) also support the positive role of education in poverty alleviation. They collected the opinions of Head teachers of the Public sector schools, District Education officers, Managers of Technical Education and Vocational Training Authority and Educationists who are the main stakeholders of education in Pakistan. It was found that poverty can be alleviated by educating the children of the poor families. The literate family heads send their children to schools, Pakistani education system prepares the students for white collar jobs which are not available for all school graduates. It was recommended to introduce technical education and vocational training at the secondary level of education to enable the school graduates to get paid or self employment to break the vicious cycle of poverty. From the above studies it is concluded that education is an important factor which plays positive role in eradication of poverty.

Moving towards agricultural poverty, (Hanjra et al., 2009) investigated the complementarities and linkages between education, agriculture, markets and rural poverty by using household level data from selected villages. Their research revealed that in presence of greater human capital and well developed markets, the investment in agriculture, the irrigation water can reduce the poverty. Besides this, the education of the household head and year of schooling were found to be significant factors in reducing rural poverty. This result is consistent with the argument of (Qureshi and Arif,2001).

(Jamal, 2014) performed a situation analysis of education in rural Pakistan by using a cohort wise analysis technique. And explored the relation between education and rural poverty. He argues that education improves efficiency of the farmer and encourages the development in country side. The results also revealed the significance of education in enhancing individual lives in the rural setting. Lockheed, Jamison and Lau wrote about farmer's education and farm efficiency. The study included an analysis of 37 sets of farm data that allow statistical estimation of the effect of education, with other variables controlled. Six out of those 37 data sets found that education had negative (statistically insignificant) effect, and but remaining 31, were found to have positive and significant effect. The study concluded that farm productivity increased by 7.4% on average as a result of education of farmer (Lockheed et al., 1980) . The effects of education were much more likely to be positive in modernizing agricultural environments rather than in traditional ones, which the study ascertained both by inspection and by regressing (across studies) the measured effect of education on productivity against modernization of the environment and other variables. (Asadullah and Rahman 2009) assessed the debate over the role of education in farm production in Bangladesh using a large dataset on rice producing households from 141 villages. Average and stochastic production frontier functions were estimated to ascertain the effect of education on productivity and efficiency. A full set of proxies for farm education stock variables were incorporated to investigate the 'internal' as well as 'external' returns to education. Their analysis showed that, in addition to raising rice productivity and boosting potential output, household education significantly reduces production inefficiencies. However, the study was unable to find any evidence of the externality benefit of schooling. (Reimers and Klasen, 2013)

Revisited the role of education for agricultural productivity by applying advanced panel econometric techniques. The positive association between education and agricultural productivity is found in their writing.

(Onphanhdala, 2009) found that the education of farmer has strong and positive effect on farm efficiency in Lao. The effect of primary education on farm efficiency was 29 % and gains from lower secondary was 46%. The annual rate of returns to education were specially higher for the farmer with completion of primary education.

(Šūmane et al., 2017) Explored the importance of informal farmer education in sustainable agricultural development in different parts of Europe. They explored several ways through which different kinds of knowledge can be integrated. It can be possible through synthesising of knowledge by different sources, farmer networking-whether facilitated by formal institutions or not, through collaboration among researchers and farmers, also through multi actor network which combines people from various fields. They also highlighted the importance of local specificity of the challenges facing agriculture.

A new insight as provided by (Knight et al., 2003), as they investigated the role of education in facilitating risk taking and innovation in agriculture using an attitude survey instrument. Education of the household head was found to decrease risk-aversion. Schooling encourages farmers to adopt innovations, whereas risk-aversion reduces the probability of adoption. Thus, the schooling encourages innovation, a potentially risky undertaking, not only directly but also indirectly, through its effect upon attitudes toward risk.

It is concluded from the above studies that education can improve farmer and farm efficiency and hence lead to increase in agricultural productivity which may cause a decrease in agricultural poverty. There is a need of debate over the role of education of farmer in eradicating agricultural poverty especially in Pakistan. Also the role of informal education, training or any awareness campaign for farmers in Pakistan and a suitable policy is yet to be discovered.

2.1.3. Living Standard and Agricultural Poverty

Modernization of agriculture is expanding, however in the vast majority of the territories, the old executes are as yet being utilized for agricultural production. Old techniques of production can't raise the production level as per world levels. As, (Shahid,2008) wrote that conventional farming is a reason of depressed agriculture in Pakistan. Same as (Qureshi and Arif, 2001) and (Arif and Farooq, 2014), (Bhutto and Bazmi, 2007) also states that Poverty is rampant in the rural areas of Pakistan, where people are in a state of deprivation with regard to incomes, clothing, housing, healthcare, education, sanitary facilities and human rights. 65.9 percent of the population living in rural areas is directly or indirectly dependent on agriculture for their livelihood.

Basically, farmer in Pakistan is poor and he has low level of income. And income demonstrates the living standard of people according to United Nation's Human development index. Mostly, Farming is not conducted at commercial level in Pakistan. A substantial proportion of farmer is linked with subsistence level farming; a big of portion of production is consumed at farmer's own large families. Very less portion of produce is available for supply to market. It causes low income of the farmers. A big portion of the farmer's income is spent on occasions like birth, marriage, death and several other rural ceremonies and festivals in Pakistan. Even farmers have to take loans for fulfilment of such occasions. Massive spending on all these ceremonies further worsen the poor living standard. And they usually have nothing to invest on next crop. (Ahmad, 2003) estimated the input elasticities of production for poor and non-poor farms by using stochastic frontier production function. The results of their study showed that the elasticities of production differ for poor and non-poor farms. The production elasticity of land is substantially higher on rich farms as compared to the farms belonging to poor farmers. This implies higher returns on investment on land by the rich farmers. Whereas, (Shaukat, 2011) stated that small farmers are facing several problems in Pakistan and not easy for them to live and stay long with agriculture sector. However, they need agricultural credit for the purchase of agricultural inputs but only the large holders receive the major share of formal credit due to influence. Even though the small farmers have no access to get credit which having a negative effect on rural

development and welfare. Due to high increasing agricultural inputs prices the farmers cannot purchase inputs such as high yield variety, sufficient fertilizer, pesticide and modern implements. Therefore, small farmers borrow credit from other different sources which cannot meet their requirements.

Similarly, (Iqbal et al., 2003) are of the same view that higher production requires higher use of inputs. Higher use of inputs required funds which either comes from savings or through borrowings. Majority of the small farmers and tenants, are not in position to purchase inputs such as fertilizer, improved seed, pesticide and modern implements. Thus, to meet the required investment to bring about the increase in the production, agricultural credit is an important element. (Bhutto and Bazmi, 2007) also suggested to enhance the productivity through the provision of a series of inputs including provision of easy credit to the small farmer.

(Mahmood et al., 2009) states that Credit is the back bone for any business and more so for agriculture which has traditionally been a non-monetary activity for the rural population in Pakistan. Agricultural credit is an integral part of the process of modernization of agriculture and commercialization of the rural economy. The introduction of easy and cheap credit is the quickest way for boosting agricultural production. (Ahmad, 2007) reported that small farmers always facing the financial problems and they are not able to use improved seeds, sufficient fertilizers and modern farm implements, which causes depressed agriculture. However, In Pakistan the lack of agricultural credit is one of the main reasons for low per acre productivity. On the other hand to increase agricultural productivity depends on the availability of credit and delivers agricultural credit facilities to the small farmers in their respective areas in time. (Chandio et al., 2015) studied the role of agriculture credit in maize productivity by using secondary data from period 1991 to 2014. The study concluded that agriculture credit have a positive impact on maize production.

It is obvious from the literature that poor financial conditions of the farmer leads to poor production of agriculture which is termed as agricultural poverty in this study. When income of farmer is low it means that they have nothing to save and hence, have nothing to invest in next crop. As a result, agricultural poverty remains unaffected. There is still a need to check that how living standard of farmer actually

effects agricultural poverty in Pakistan. And whether availability of agriculture credit can play significant role against agricultural poverty.

2.2. Data and Methodology

A very essential and significant thing in conducting any analytical study is to adopt a systematic and appropriate technique. After formulating the study and specific objective, devising an appropriate methodology to conduct and complete the study is very important step. Methodology is essential part of any study as it provides a guide to future research to evaluate any study to verify its results. So the scientific methodology is “a system of explicit rules and procedures upon which research is based and against which claims for knowledge are evaluated” (Nachmias and Nachimas, 1992). Data collection, various related values and trends presents in any type of data (quantitative and qualitative) should carefully be applied and practiced. Presentation of data and dissemination lead to successful completion of the study. Methodology is the “reasoning of the scientific method”. To conduct any analytical study a systematic approach was adopted to ensure the meaningfulness, accuracy and significance of the study. It is universally accepted to devise the right methodology and applying the most suitable analysis from the heart of the study.

The methodology has significant values for empirical analysis of any socio-economic problem in any research study. This is useful for the explanations of different variables in the model. The methodological techniques and tools vary from one study to another. The tools of qualitative and quantitative research are used to analyze data for the implementation of the suitable model. In this study qualitative tools were used to investigate the relationship between dimensions of human development and agricultural poverty among small farmers in Punjab. Primary data was used to analyze the relationship. The significance of research methodology of quantitative and qualitative analysis can be judged from the study design, selection of the respondents, area and data sampling, design of the questionnaire and model selection for empirical analysis.

2.2.1. Study Area

The current study was conducted in Punjab province of Pakistan. Punjab is largest province of Pakistan both in terms of population and agriculture contribution to the

GDP of the country. A large population of Punjab lives in rural areas which is dependent on agriculture for their living. The majority of the farmers are small farmers. Therefore, five districts of Punjab were selected for the data collection. These districts includes the following

- Rawalpindi
- Sargodha
- Faisalabad
- Multan
- Rahim Yar Khan

These five districts represents the true picture of the situation in Punjab.



The Map of Punjab Province

2.2.2. Source of Data Used for Research

Keeping in view the purpose of this specific research, Primary data was required. Primary data is the data which is collected at the hand for the specific study. In this

case individuals provide information when interviewed, administered questionnaires or observed. Therefore primary data was collected for the target population, which is small farmers.

2.2.3. Sample Size

Sampling is a term used in statistics. It is a process of choosing a representative sample from a target population and collecting data from that sample in order to understand something about the whole population. Two hundred and fifty small farmers were selected for the research purpose. These two hundred and fifty small farmers were selected from different areas of the understudy 5 districts. Fifty respondents were selected from each district.

2.2.4. Sampling Technique

For the current study the information was required from small farmers only. Therefore at first stage Purposive sampling was used. Instead of taking data from the conveniently available respondents, it is sometime necessary to get information from the specific target group. Therefore, due to criteria of the research, this purposive sampling was confined to small farmers only, who can provide the desired information. This type of sampling is known as purposive sampling.

Because of the nature of the study and statistical tool being used for analysis it was necessary to further specify two different strata of the target respondents. Therefore, Stratified random sampling was used at this stage in order to ensure the requirements of the data. In stratified random sampling, population is divided into meaningful segments. For the analysis of current research the information from both small farmers facing agricultural poverty and those who are not facing agricultural poverty was required. Therefore, these two different strata was formulated and primary information was collected from both these strata. The advantage of the stratified random sampling is that, it is the most efficient method amongst all probability designs because all groups are truly sampled and a clear comparison is possible.

2.2.5. Method of Data Collection

Since, the target population for the research was small farmers in Punjab. These small farmers are mostly uneducated. Therefore, interview technique was used to collect primary data. For this purpose, a detailed questionnaire was made and primary data was collected with the help of both structured and unstructured questions.

2.2.6. Preparation and Interviewing Schedule

Keeping in view the aim of the present study a well-designed interviewing schedule was prepared to collect the data from the respondents. The questions in the interview were covered the important issues like socio-economic conditions of the respondents. The variables related to the dimensions of human development and agricultural poverty.

The required information was collected with the help of interview. In the interview schedule, both planned and unplanned questions were asked to get the required information. The questionnaire was set in English, however the questions were asked in local language i.e. Punjabi and Urdu. However, the researcher made at most effort not to change the mean of the questions in any way. Before asking the questions researcher made it clear that the purpose of the survey was educational so that the respondents might not have any doubt in their minds and in this way the researcher tried to win the confidence of respondents. However, in the process of collection of data the researcher faces some difficulties.

2.2.7. Pre-Test of Questionnaire

Pre-testing is essentially a trial and error procedure in which the successful trials are repeated and errors are avoided in the final questionnaire. Before proceeding to the field for actual data collection it was considered necessary to test the validity and accuracy of the interviewing schedule and Questionnaire. To achieve this pre-testing of the interviewing schedule was an important step. In the light of pre testing changes were incorporated, after that interviewing schedule was finalized for data collection.

2.2.8. Data Editing and Coding

After data collection, each and every questionnaire was carefully checked so that to ensure that required information should be properly placed in questionnaire. Serial number were assigned to questionnaire and then coding of data was done in Microsoft Excel. For the purpose of coding dummy variable was assigned to all variables included in the model. The entered data was then analyzed by using SPSS software.

2.2.9. Field Experience

Throughout the data collection the field experience was very interesting. Some problems were faced during the data collection. The main problem was to describe the objective of doing research because of the low level of education in society; the respondents were unable to understand the importance of research. A lot of time was used in explaining the purpose of the study. While asking question about health, Some of the respondent considered the researcher as a doctor and tried to get the guidance for healthcare and some of the respondents were considered the researcher as a communicator of government or Bank so they were hesitating to provide information about their socio-economic characteristics. Researcher had to introduce himself individually with every respondent to get the correct information. Sometimes they considered the researcher would might create the problem for them by giving the correct information. As a result, researcher had great difficulty to win the trust of the respondents and hard to take in confidence to get the correct information. Anyhow, the collection of data was very interesting and completed in between 2- 3 months.

2.2.10. Difficulties Faced During the Field Experience

Researcher had faced the following difficulties while accomplishing the research such as:

- ✓ The data was mostly collected from different rural areas of Punjab. Some respondents were not cooperative to provide information, and some of them clearly denied.

- ✓ Some of the respondents were suspicious of the purpose of data collection and were reluctant to give exact information to interviewer.
- ✓ Respondents were afraid of giving correct information about their income until the researcher made him sure that the purpose of data collection is purely the study purpose.
- ✓ Some respondents were unwilling to tell about their socio-economic characteristics.
- ✓ Some respondents were expecting physical and financial help from the researcher.

2.3. The Conceptualization of Variables

The conceptualization of the variables is an important part of the methodology. Because, sometimes the same concepts are used in different meaning by different researchers. The need of conceptualization and defining the general concept with specific and verified component is important. Some concepts used in the study were operationalized as under:

2.3.1. Agricultural Poverty

Since, the current study has defined Agricultural poverty as a phenomenon in which the agricultural product is either inferior in quality or insufficient in quantity. During the interview questions were asked about the quality and quantity of their output. If the quality or quantity happened to fall below average quality and quantity of the product in the area, it was marked as poor agricultural output, therefore fall in category of agricultural poverty. And if the quality and quantity of agricultural product was found above average it was considered out of agricultural poverty. And the dummy variable was used to represent agricultural poverty of that particular small farmer. Dummy variable was assigned as “1” if agricultural poverty was existing, and “0” otherwise.

2.3.2. Health Status of the Family

Question was asked about prevalence of any chronic disease to any family member of the farmer, which represents general health status of the family. The farmer was

provided with two options “Yes” or “No”. Dummy variable were assigned as “1” if the health status of the family was not good and “0” otherwise.

2.3.3. Any Disease to the Farmer Himself

The farmer was asked about existence of any prolonging disease to him. The answer was categorized in two options “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer was facing any disease and “0” otherwise.

2.3.4. Any Physical Disability to Farmer

Question was asked about presence of any physical disability in farm worker. The answer consisted of two options, “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer was facing any disability and “0” otherwise.

2.3.5. Depression

The respondent was asked about existence of any mental illness like depression. The depression was well explained by the researcher before asking the question. The answer comprised of two options “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer was facing any depression/anxiety and “0” otherwise.

2.3.6. Hospital Availability

The question was asked about the availability of hospital in the vicinity. The answer had two options, “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer was having any medical facility in the vicinity and “0” otherwise.

2.3.7. Distance to the Hospital

Another question was asked to the respondent regarding distance of health care facility nearest to their residence. The answer was categorized in the following 4 categories, range increasing from level 1 to 4. All these categories were assigned dummy variable 1 to 4 respectively.

- 0-10 Kilometer (km)
- 10-20 km

- 20-30 km
- More than 30 km

2.3.8. Public or Private Hospital

Question was asked about the type of health care facility the respondent use to utilize. The answer had two categories, “Public” and “Private”. Dummy variable was assigned as “1” if the small farmer was utilizing Public medical facility and “0” if private.

2.3.9. Free or Subsidized Medicine

The question was asked about the availability of free or subsidized in the hospital they used to go. The answer had two categories, “Yes” and “No”. Dummy variable was assigned as “1” if the small farmer was getting free or subsidized medicine and “0” otherwise.

2.3.10. Health Awareness Program

Question was asked from the respondent about any health awareness program provided by any governmental/non-governmental organization they have ever attended. Answer was categorized in to two categories, “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer has ever attended any health awareness program and “0” otherwise.

2.3.11. Hygiene Program

A question was asked from the respondent about any hygiene related program provided by any governmental/non-governmental organization they have ever attended. Answer was categorized in to two categories, “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer has ever attended any hygiene program and “0” otherwise.

2.3.12. Safe drinking water

A question was asked about the availability of safe drinking water to the small farmers in rural Punjab. The respondent was provided with two distinct options

“Yes” or “No”. Dummy variable was assigned as “1” if the small farmer has access to safe drinking water and “0” otherwise.

2.3.13. Food Consumption

The requirements of the balanced and healthy diet was explained to the respondent by the researcher and then, a question was asked whether they feel that the respondent and his family is taking a healthy balanced diet or not. The answer was provided with two options “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer family is taking balanced diet and “0” otherwise.

2.3.14. Literacy of the Small Farmer

A question was asked to the small farmers about their ability to read and write. The answer had two options “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer if he/she can read and write and dummy “0” was assigned otherwise.

2.3.15. Formal Education

The question was asked to the respondent about the schooling, whether he/she has attended any school for formal education. The answer was categorized in two distinct options “Yes” or “No”. Dummy variable was assigned as “1” if the small farmer had any formal schooling and dummy “0” was assigned otherwise.

2.3.16. Technical Education/Training

Another question was asked to the respondent about any training course or technical education they have ever attended. The answer was categorized in two distinct categories “Yes” or “No”. Dummy variable “1” was assigned if the small farmer had any technical education or training and dummy “0” was assigned otherwise.

2.3.17. Education of Female Household

A question was asked by the researcher to the respondent regarding the literacy of female household. The answer was categorized in two categories “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported the female household as literate and dummy “0” was assigned if the female household was illiterate.

2.3.18. Education of Children

The question was asked to the respondent whether any of his/her children are getting education or have already completed their education. The answer was categorized in two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.19. Number of Literate Members in Household

The question was asked to the respondent about the number of learned member in his family. The response was kept open ended. The respondent was free to give total number of literate members in his household.

2.3.20. Availability of School

Question was asked about the availability of school in the vicinity. The provided answers had two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.21. Distance to School

A question was asked by the researcher to the respondent regarding the distance of school from their home. The answers were categorized in following 4 categories. The dummy variables from 1 to 4 were assigned respectively.

- 0-10 km
- 10-20 km
- 20-30 km
- More than 30 km

2.3.22. Extension Service Availability

A question was asked about the availability of extension services in the area. The answer consisted of two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.23. Extension Service Representative Visit

A question was asked about the visit of the extension service representative to the respondent at least once a year. The answer comprised of two categories “Yes” or “No”. A dummy variable “1” was assigned to the response if the small farmer reported that extension service representative have visited him at least one in a year. Dummy “0” was assigned if the extension service representative have not visited the small farmer in at least once a year.

2.3.24. Formal Mass Media

A question was asked to the respondent whether he/she read newspaper or watch television daily. The answer was categorized in two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.25. Social Media

For the study purpose a question was asked to the respondent regarding use of social media platform. The answers were provided as “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.26. Per capita income of the family

Per capita income of the family is calculated by dividing total income of the family by total number of family members. Questions were asked to the small farmer about the total income of the family and total number of family members. This per capita income of the family was compared by the poverty line. Dummy variable “1” was assigned if the per capita income of the family was found above poverty line, and dummy “0” was assigned if the per capita income of the family was below poverty line.

2.3.27. Off Farm Employment

A question was asked from the respondent about off farm employment by himself or any family member. A dummy variable “1” was assigned if at least 1 member of

the household have employment other than agriculture. And dummy “0” was assigned if no one in the family was having off farm employment.

2.3.28. Contribution of the Female

Question was asked by the researcher about the participation of female household members in agricultural activities. The answer was categorized in two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.29. Live stock

A question was asked to the respondent whether they have live stock or not. The answer was categorized in two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.30. Methods of Irrigation

Question was asked to the respondent about the method of watering they use to irrigate their crops. Whether they are using traditional irrigation methods of modern irrigation technologies. Dummy variable “1” was assigned if the respondent reported partial or complete use of modern technology whereas, dummy “0” was assigned if the small farmer was using traditional methods of irrigation.

2.3.31. Type of Grown Crops

A question was asked to the respondent about the types of crops they mostly grow, cash crops or food crops. Dummy variable “1” was assigned if the small farmer was growing cash crops and dummy “0” was assigned if the small farmer was growing food crops only.

2.3.32. Agriculture Mechanization

A question was asked to the respondent about ownership of agricultural machinery. Whether he/she is owning any farm machinery. Dummy variable “1” was assigned if the small farmer owns farm machinery and dummy “0” was assigned if the small farmer do not have any farm machinery.

2.3.33. Own Means of Transportation

A question was asked to the respondent about the own means of transportation. The answer was categorized in two options “Yes” or “No”. Dummy variable “1” was assigned if the small farmer was having own means of transportation and dummy “0” was assigned if the small farmer do not have any private means of transportation.

2.3.34. Access to credit

A question was asked to the respondent whether he/she has access to credit when needed. The answer contained two options “Yes” or “No”. The dummy variable “1” was assigned if the small farmer reported “Yes” and dummy “0” was assigned if small farmer reported “No”.

2.3.35. Source of Credit

A question was asked to the respondent about the source of credit they usually avail in the time of need. The respondent was provided with two options “Formal” and “informal”. The dummy variable “1” was assigned if the small farmer reported “formal” and dummy “0” was assigned if small farmer reported “informal” source of credit.

2.3.36. Use of Agriculture Credit

A question was asked by the researcher about the usage of credit. Whether the small farmer have used the credit for agriculture or non-agricultural purpose. The dummy variable “1” was assigned if the small farmer reported that he/she always use agriculture credit for the right purpose and dummy “0” was assigned otherwise.

2.3.37. Distance to the Bank

A question was asked to the respondent about the distance between their residence and banks. The respondent was provided with options categorized in following 4 categories and dummy variables from 1 to 4 were assigned respectively.

0-10 km

10-20 km

20-30 km

More than 30 km

2.4. The Binary Logistic Regression

Logistic regression is a statistical model which is used to find probability of a specific event or class like, win or lose, sick or healthy, fail or pass or poor or rich. This model is extended to model different classes of event such as in a picture there is day or night. A probability between Zero to One would be assigned to both categories.

The basic logistic regression uses logistic function to analyze a dependent variable which is binary in nature, although some more extensions also exist which are complex in nature. In this regression, the parameters of the logistic regression is estimated.

Mathematically, there are two possible values of the dependent variable in binary logistic regression like rich and poor, which is indicated by a variable having value 0 and 1.

The log-odds in the logistic model, the labeled value is a linear combination of one or more than one independent variable which are also known as predictors. All these independent variable can be binary in nature which may have two classes coded by a dummy variable or a continuous variable. The probability may vary between 0 and 1. Hence, this logistic function converts log odds to probability. The measurement unit of log odds is known as logit.

The dependent variable in binary logistic regression have two categories. Whereas, in multinomial logistic regression the output have more than 2 values. The logistic regression is not a classifier, it simply models the probability of output in terms of inputs.

The logistic regression might be used in different fields including social sciences, economics, agriculture, marketing, engineering and medical fields. Logistic regression can be used for analyzing the probability of risk of a disease in medical

field. In political or social science logistic regression might be used to check the probability of the voter to vote party A or party B. In engineering, logistic model may be used to predict the chances of failure or success in a given process. In marketing it can be used to access consumer behavior. Whereas, in economics this model can be used to predict the probability of choosing labour force or business, poverty or studies of willingness to pay for various products.

This model represent the given below collective probability density function:

$$P = \frac{1}{1 + \exp[-\beta X_i]}$$

p = the probability of occurrence of agricultural poverty

\exp = the exponential value

X_i = the set of explanatory variables and

β = the corresponding set of regression parameters

2.4.1. Rule of Ten

One in ten rule, is a rule of thumb which says that the values given by logistic regression are stable if it is based on minimum of about 10 events for one independent variable. Which means that one variable can be added for every ten events. And the number of events are the size of the smallest of the categories of dependent variable.

2.4.2. Hosmer and Lameshow test (The test of Goodness of Fit)

It is important in the research that the statistical model should be fit according to the requirement. For this purpose Hosmer and Lameshow test was applied. Hosemer and Lameshow test indicates goodness of fit of the model. Goodness of fit shows whether the model is good fit according to situation or not. This test works by checking the value of significance of the Hosmer and Lameshow test. If the value of significance is more than 0.05 it shows that model is good fit. The significance level less than 0.05 indicates that model is not good fit. The results of the Hosmer

and Lameshow tests shows that the current model is good fit. The results are presented in the respective chapters.

2.4.3. Variance Inflation Factor (Test of Multicollinearity)

Another important thing is to test multicollinearity. Multicollinearity is a situation in which independent variables are somehow correlated with each other which may affect the results of the model. Therefore it is important to test the multicollinearity. In current study Variance Inflation Factor (VIF) test was used to test collinearity. According to the interpretation of VIF, the value of VIF is tolerable if it is less than 5. High collinearity exists if the value of VIF is greater than 10. In current research the VIF was less than 5 in all cases, therefore there is no or tolerable collinearity. The results of VIF is presented in respective chapters.

2.5. Application of Binary Logistic Regression Analysis

Normal poverty or human poverty was treated as dichotomous variable in past studies. But with the advancements in research and availability of bulk literature, simple poverty is not simple anymore. Instead, poverty is now considered as multinomial phenomenon.

Since, the current research is not related to normal poverty, instead, it is a base study which is dealing with agricultural poverty because there was no prior study in this subject. The aim of the current research is to identify, whether human development among small farmers have any impact on agricultural poverty amongst them or not. The purpose is easily served by using binary logistic regression analysis. Since, there was no prior data or literature available about various levels of agricultural poverty. Keeping in view the scope of study, qualitative nature of research and available resources it was feasible to apply binary logistic regression analysis. In given circumstances, it was decided to use binary logistic regression analysis.

The current research will provide a base for future research to study various levels of agricultural poverty. Once the relationship between agricultural poverty and human development is scientifically proved, it will open further ways to treat agricultural poverty as multinomial phenomenon.

2.5.1. Pros and Cons of Using Binary Logistic Regression

There are always some pros and cons of using a statistical model especially in case of primary data. Same is the case with Binary logistic regression model.

2.5.1.1. Advantages of Binary Logistic Regression

- Binary logistic regression is applied to the research where dependent variable is qualitatively binary in nature.
- Binary logistic regression is less complicated.
- Binary logistic regression is easier to implement, interpret and it is very efficient.
- It not only provides a measure of how appropriate a predictor (coefficient size) is, but also its direction of association (positive or negative).
- Binary logistic regression gives good accuracy for many and simple data sets and also performs well when the dataset is linearly separable.
- The probabilities resulting from this approach are well-calibrated. This makes it more reliable than other models or approaches that only give the final classification as results.
- It is less prone to over fitting.

2.5.1.2. Disadvantages of Binary Logistic Regression

- The disadvantage of the binary logistic regression is that, it do not interpret multinomial nature of the variable.
- Binary logistic regression is a bit strict that it creates strict boundaries, which infact, sometimes better serves the purpose.
- It can not be used to solve non linear problems.
- It has difficulty capturing complex relationships.
- It requires comparatively higher number of observations.

In current research the advantages of using binary logistic regression were more important than the disadvantages. The disadvantages mostly were irrelevant in this case. Therefore, it was better choice to use Binary logistic regression analyses.

3. Chapter 3. Health of Small Farmers and Agricultural Poverty

In 1948, the World Health Organization (WHO) defined health with a phrase that modern authorities still apply. “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” In 1986, the WHO made further clarifications: “A resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.” (Felman, 2020).

Health is a positive state of wellbeing, where every part of the body and mind is in harmony and in proper functioning balance with every other part. In other words, when every organ and part of the body is functioning normally, the state of physical wellbeing is known as healthy. It has been well said that only that person can be called really healthy who has a sound mind in a sound body.

3.1. Importance of Health

Health is the characteristic of life that enables a person to live longer. Health is a resource which supports function of an individual in a wider society, instead of an end in itself. A healthy living style is responsible for leading a meaningful life. The trite saying ‘Health is Wealth’ explains the importance of health. Care of an individual's health is critical in deciding his length of presence as an individual. Research with the time endorses a concrete relationship between how an individual thinks, feels, and acts and how well they survive illness furthermore, unforeseen weakness.

Health plays a key role for the successful life and welfare. Health also plays an important role in human capital development. Good health increases the labour productivity as well as the efficiency (Akram and Khan, 2007). New innovations and technologies were introduced for betterment of human beings to improve their living standard as people were more focused to live better and healthy life. In developed countries, efficiency of human capital has been improved. The governments provide subsidies on health care expenses. People have also modified

their consumption patterns with according to the changes in market situations. Now a days, people are more concerned about their health and education as both of them played an important role in their productivity which indirectly improve their economic growth of the country (Boyle et al., 2010).

Better health conditions play a key role in wellbeing and human happiness. It also leads to the economic progress because the efficiency of healthier people is more than others. There are gross differences in health between different countries (WHO, 2008). Health inequalities are also present within the countries – a 36-year gap in life expectancy is present between the rich and poor population of USA (WHO, 2016).

Health is strongly affected by the social conditions in which the individuals live (WHO, 2004). Health care service can also be determined by availability of health care, use of medicine, affordability and quality of care (Wyss, 2003). Availability can be defined as the distance from the health care facility to patient home. It also includes total travel time, available service, waiting time and transportation (Hjortsberg and Mwikisa, 2002). It is claimed that utilization of health care service is a function of socio-economic, demographic and cultural factors (Bazant, 2008).

Different kind of diseases and health inequalities between and within the countries are determined by various factors such as unhealthy early childhood conditions, poverty, poor job status and bad shelter conditions (WHO, 2004). All poor and rich countries are struggled to improve their healthcare system by rising required funds to satisfy demand of population for health services. Every country struggled to provide medical facilities to its population with new technology and new interventions in the field of health for improving health status of the country. The share of health sector is higher in the budget of developed countries even they faced resources limitation. Different organizations work on to insure about access of basic health services to the people (WHO, 2010).

In most of the developing countries the expenditure on health is less than 8 percent of GDP and in many countries it is less than 5 percent as shown by medical fitness financing statistics (WHO, 2016). Despite improvements in recent decades, the availability of essential medicines at public sectors is still poor in developing

countries. Recent data show that, median availability for selected essential medicines was only 56-60 percent in the public sector of low income and middle income countries respectively. But in private sector availability may be better but is still suboptimal at 66- 67 percent (WHO, 2016).

3.2. Health Status in Pakistan

Pakistan is second largest country in South Asia and sixth most dense country in the world in terms of population. But it lacks far behind in terms of human development. The government spends 2% of its GDP on health but this spending is very low as compared to other South Asian countries like Bangladesh (Anwar et al., 2012). One of the main objective of health care service is to decrease death rate. In fact, Pakistan lies in the region where the death rate is still very high (Sadiqua and Arjumand, 2014). The main reasons behind increased deaths ratios are; lack of health care facilities, poor access and utilization of health care facilities, illiteracy, financial hurdles, poor nutrition and polluted environment. The traditional social and economic patterns in Pakistan also hinders the utilization of modern health care because people are illiterate and unaware of the importance of health and advance health system. Therefore, health is affected which results in various diseases and disabilities (United Nations, 1999).

Year	Infant Mortality Rate per 1000 live births	
2018	Male	62.5
	Female	51.5
Source: World Bank Data		

The table above shows infant mortality rate of both male and female infants per 1000 live births in Pakistan. Infant mortality is the death occurring before reaching the age of 1 year. The statistics shows that 62.5 out of 1000 male, and

51.5 out of 1000 female infants having live birth dies before reaching the age of 1 year. This mortality rate is very high. And the rate of infant mortality for male is significantly higher than that of female.

Year	Adult Mortality Rate per 1000	
2018	Male	172.896
	Female	137.509
Source: World Bank Data		

The table above shows the adult mortality rate in Pakistan for both male and female per 1000. Adult mortality is the probability of dying between the age of 15-60. This is the value of chances of death of a 15 year old boy/ girl before reaching age of 60 years. The statistics shows that 172.896 out of 1000 males and 137.509 out of 1000 females would probably die before reaching the age of 60 years. These value are too high in case of Pakistan. And the adult mortality rate of male is much higher than that of a female.

On one side, malnutrition keeps poor people in depraved growth and depraved health conditions. And on the other side, inadequate health care keeps the health status poor. Pakistan as a developing country based on agriculture sector which is labour intensive in its nature. Income of the labour force divided into two portions as consumption expenditure and savings for the future shocks. The household expenditures are affected by the changes in income. If the level of income increase, then the consumption expenditures on health may lead to the improved health standard of the people. Approximately 44 % of the population is involved in agriculture sector and most of them are poor and illiterate (GOP, 2015). The small farmer having lower level of income are unable to get proper nutrition which hinders proper biological growth and absence of proper health care system further deteriorates the condition.

3.3. Health Care System in Punjab

Coming specifically to Punjab, the health care system is a combination of both public and private sector.

3.3.1. Public Health Care System in Punjab

Punjab has a dispersed primary public health system that gives citizens access to doctors and staff, and to subsidized medicines. Both the use of these facilities and health outcomes, however, remain low. Punjab has about 3,000 medical facilities delivering subsidized healthcare to the public. These facilities are broadly divided into four types:

- Basic Health Units (BHUs),
- Rural Health Centers (RHCs),
- Tehsil Headquarter (THQ) Hospitals,
- District Headquarter (DHQ) Hospitals.

3.3.1.1. Basic Health Units (BHUs)

According to Punjab health department, there are about 2,461 BHUs in the province of Punjab. These units are meant to provide public health services to a vast majority, and these units are the first health station for rural the households seeking attention. The BHU is supposed to serve the people of one union council roughly. The BHUs have very small number of personnel who provide primary health service. According to rules, each unit must have a doctor who also serves as the administrative head of BHU. The doctor is supported by a female health worker and a dispenser. In reality, in most of the BHUs the doctor is either missing, or due to lack of proper monitoring the doctor is not available. Instead, the dispenser deals with patients. The BHUs services are limited to day hours only.

3.3.1.2. Rural Health Centers (RHCs)

While BHUs have limited usefulness for patients seeking medical care. To serve patients, the health system has next tier of health facilities which is known as Rural

Health Centers (RHCs). There are 293 RHCs across the province. RHCs are better than BHUs to manage minor treatments. According to rules, each unit is provided by two doctors, supported by dispenser and nurses. Unlike BHUs, these centers operate for longer hours. But, only one doctor is available. There are no specialized physicians available at RHCs. There is no patient bed, ward oxygen available in most of RHCs. The availability of testing lab in RHCs is out of question.

3.3.1.3. Tehsil Headquarter (THQ) and District Headquarter (DHQ) Hospitals

All tehsils and districts in the province are provided with a headquarter hospital. The DHQs are comparatively bigger than THQs, which are most advanced facilities available in regions far from big cities. These hospitals are headed and run by senior doctors and medical superintendents who oversees the medical staff comprised of doctors, nurses, and technicians. These facilities are exclusively located in urban centers. There are total 34 DHQs and 88 THQs in Punjab.

3.3.2. Private Health Care System in Punjab

In Pakistan, about 79% primary care is provided by private sector (Shaikh, 2015). Private sector is more market oriented. Thus the access to private health care is limited to the people who can afford to pay. However, the health care system has been inadequate in meeting the needs of fast growing population (Mahmood and Ali, 2002). In Pakistan private sector plays a key role in the delivery of health care services than that of the public sector. But most of the private clinics and hospitals are located in the urban areas and they are well equipped with the latest machinery (GOP, 2016).

Coming specific to Punjab, The private health care facilities range from private clinic of a single doctor to big private hospitals. Private clinics usually do not have big equipment, beds and laboratory. So, patients have to go to private laboratories for tests or examinations demanded by doctor. And for medicine prescribed by doctor, patients have to go to pharmacies where they must pay out of pocket. In case of private hospitals, heavy medical equipment, beds, laboratory etc. almost everything is available in the hospital premises. The advised tests and examinations

are usually available in the hospital but they are even more expensive than private testing laboratories in the market. Same is the case with prescribed medicine.

There are two main problems associated with the use of private health care facilities.

3.3.2.1. Urban Centered

The private health care facilities in Punjab are urban centered. In villages there is no concept of a private clinic or hospital. In big towns (Qasba) there are private clinics but usually they are not specialized doctors. These private clinics usually operated by a single doctor who is usually a general physician. Then, in Tehsils and Districts there are good hospitals and clinics with specialized doctors are available. SO. The villagers do not have spontaneous access to private hospitals. They have to move towards nearby bigger town or Tehsil or District.

Out of 250 respondents of the current research only 61 respondents reported that they have a clinic in near town, and only 30 respondents reported having a small private hospital in near town.

Private clinic or hospital availability	Yes	No
Clinic	61	189
Hospital	30	220
Source: Authors own contribution		

3.3.2.2. Unaffordability

The private clinics or hospitals available in big towns or cities are much expensive than public hospitals. Therefore, the poor people cannot afford to get treated in private clinics or hospitals.

The respondents of the current research are small farmers. Out of 250, only 45 respondents reported that they can afford treatment in private clinic or hospital. Whereas other 205 respondents clearly stated that they cannot afford private treatment.

Affordability of Private clinic or hospital		
	Yes	No
Number of Respondents	45	205
Total	250	
Source: Authors own contribution		

There are two main reasons for people do not go to hospital when ill: 1) the high user fees for health care in private sector and 2) due to congestion and lack of resources, the failure to receive proper health care in government hospitals (Pavel, 2015). Hence it causes a serious problem in the way of health care.

To conclude, the private hospitals in Punjab are well equipped with latest diagnostic facilities but are out of reach of small farmers and they are much expensive as compare to public hospitals. So poor people have to move towards the public hospitals and make the condition of the public hospitals miserable because of the overburden of the patients. The condition of the public health care system is far from satisfactory level.

The health system of Punjab is urban biased and curative. The number of hospitals in urban area has been insufficient in terms of both quantity and quality to meet the requirements of the people.

In rural setting, bulk of population lives below the poverty line because of lesser resources and basic facilities which negatively effects their health and social status.

People are mostly illiterate and unaware of social rights. Furthermore, Poor health affect the marginal productivity of labour class. Health services are very poor in rural areas; even the medicine is not available in health centers. People are mostly labour and they depend upon agriculture sector. These people must visit urban areas in order to utilize the health care facilities (Akram and khan, 2007)

The death ratio is also very high in rural areas as compare to urban. There is also a lack of trained staff in public health centers. This is also a reason of shifting of people from rural to urban area for better opportunities and (Toor and Butt, 2004).

3.4. Threats to Small Farmers Health

Good health has long been acknowledged as one of the most critical elements to quality of life. The health of farm workers is a vital resource to protect. Perhaps more than any other occupational group, agricultural workers are exposed to a tremendous variety of environmental hazards that are potentially harmful to their health and well-being. The use of machinery, fertilizers, agricultural medicines and sprays on one hand leads to better productivity, on the other hand they may cause serious threats to farmer health.

In Punjab, Majority of the rural population is directly or indirectly related to the farming. The main concern remain the small farmers, who actively work in the farms whereas, the big land holders have advantage over small farmers. The big farmers may adopt healthy life style or they may use protective measures or machines while farming. Whereas, small farmer is usually a hand worker. The direct contact with chemicals became a disadvantage for farmer health.

These Farmers and farm workers suffer from increased rates of respiratory diseases, noise-induced hearing loss, skin disorders, certain cancers, chemical toxicity, and heat-related illnesses. There are precautions that can be taken to minimize or eliminate these potential hazards (Bradley, 2002).

3.4.1. Respiratory Hazards

According to Rein (1992) Farming situations present several respiratory hazards to farm workers. Exposure to these hazards has been linked to excessive coughing, and congestion in farm workers and families.

Respiratory problem	Yes	No
Number of respondents	155	95
Total	250	
Source: Author's own contribution		

In the data collected for the current research, 155 out of 250 respondents reported having respiratory problems. In some cases, the respondents reported the respiratory problem had been diagnosed while others only feel problem in respiration. Upon asking about preventive measure adopted by the farmer while applying fertilizers and sprays in the fields, majority reported that they do not use any face mask. A few of them reported that they put a simple cloth on lower half face around their neck to protect mouth and nose.

3.4.2. Noise

Agricultural noise is another common health hazard on the farm. Prolonged exposure to excessive noise, such as that produced by tractors, combines, choppers, grain dryers, and chainsaws, can cause permanent hearing loss unless noise-control measures are taken. Ears provide two warning signs for overexposure: temporary threshold shift and ringing in the ears (tinnitus) (Rein,1992).

During current research the respondents were asked about their ability to hear. 75 out of 250 small farmers reported having hearing loss. This number is relatively small but not ignorable. One of the reason might be the lack of agricultural machinery. Due to less exposure to the loud noises of agriculture machinery these small farmer may have lesser effect on hearing ability.

Hearing loss	Yes	No
Number of respondents	76	174
Total	250	
Source: Author's own contribution		

3.4.3. Skin Disorders

Contact dermatitis is a skin disorder that occurs among agricultural workers. There are two general categories: irritant and allergic. Irritants act directly on the skin at the place of contact. Allergic sensitizers, however, cause changes in the immune system so that subsequent contact produces a reaction. Phototoxic or photo allergic reactions occur when light, in combination with certain substances, causes skin disease. Other types of agricultural dermatitis include heat rash, origin infections, and insect and plant irritants (Rein, 1992).

During the survey, the respondents were asked about their direct contact with fertilizers and other chemical. A large number of farmer reported that they use to throw fertilizer in their crops with bare hands.

A farmer during interview commented that "I have put fertilizer with my hand throughout my life and now skin of my hands is strong enough that no fertilizer can affect my skin".

Some farmers reported that they use to wear a polythene shopping bag on their hand while throwing fertilizers in their fields. But these polythene bags do not last long, after few minutes these polythene bags get small holes in it. Majority of the small farmers reported that they have problems of skin irritation and allergies whenever they come in contact with fertilizers and chemicals.

Skin problems	Yes	No
Number of respondents	179	71
Total	250	
Source: Author's own contribution		

Another respondent commented during the interview that, “I have problem of skin irritation or burning on my hands due to chemicals and fertilizers, But after putting fertilizers or chemicals I use to apply mud on my hands until it dry and then was my hands with cold water. It soothes my hands and finishes burning feeling”

3.4.4. Cancers

Skin cancer is a common type of cancer. It became a matter of importance when we talk about farmers who spend long hours under the sun which is a big cause of skin cancers. During the survey it was hard to ask directly about cancer because of harsh reaction of the respondents. So, researcher asked the respondent whether he know any person who works in the fields and had been diagnosed with the problem of skin cancer. Their response was noted if they reported any one in their family who work in the fields and having problem of skin cancer. The number is small but not negligible.

Skin cancer	Yes	No
Number of respondents	43	207
Total	250	

Source: Author's own contribution

3.4.5. Chemical Hazards

Many agricultural workers are exposed to chemicals on a daily basis. If they do not observe proper precautions, illness or even death may ensue. Pesticides can enter the body through many routes, but the most common ways are through the skin and by inhaling. These hazardous chemicals may cause serious respiratory and lungs disease. The initial problems of the skin can be felt immediate after contact with chemicals. But these chemicals may have adverse effects on the skin in long run. Similarly, the inhaling of chemicals may have adverse effects on respiration especially on lungs and in throat. The respondent was asked about any pulmonary problem, chronic cough or chest pain to any household member who came in contact with pesticides and chemical spray. The response can be seen in table below.

Chronic cough/chest and pulmonary disease	Yes	No
Number of respondents	103	147
Total	250	
Source: Author's own contribution		

3.4.6. Heat Stress

Heat stress occurs when the body builds up more heat than it can handle. High temperatures, high humidity, sunlight, and heavy workloads increase the likelihood of heat stress. Heat stress is very common and happens to everyone in

especially in summer because summer is very hot in Punjab. Skin rashes, Excessive sweating, vertigo and dizziness was reported by almost all respondents.

3.4.7. Traumatic Injury

The use of technology, farm machinery in the fields is considered to be beneficial for agriculture, but it may pose serious threats to the health of farmers including fatal and non fatal injuries. The tractor has been identified as the predominant instrument of traumatic death and disabling injury. These injuries includes from loss of a part of body to the loss of life. The use of tractors and other heavy farm machinery in the fields is usually unsafe because of absence of protective measures. Further, these tractors are also use as a means of transportation to bring produce to markets and mills. Overloading becomes a case of serious accidents causing threats to the driver (farmer) himself and for other traffic.

The traumatic injury is also very common among small farmers in Punjab. Small injuries without any permanent loss of a part of body was reported by almost everyone. Since, small farmers mostly use to work with hand. Therefore the probability of getting injured is greater. However, some farmers reported permanent injury ranging from loss of a finger to the loss of leg. Whereas, three respondent also reported agriculture related traumatic loss of life in their family.

Permanent loss of body part	Yes	No
Number of respondents	61	189
Total	250	
Source: Author's own contribution		

3.4.8. Mental Health

Another serious problem, which is most neglected is the farmer's mental health issues. Small farmers, being poor always live under stress. Mostly the only way of earning for whole year is small fields. Small farmer are insecure about the product due to lack of resources for fertilizer and water or debt burden in other case. And climatic changes, floods, heavy rains and attacks of pests poses further threats to the crop production, and always a cause of worry for small farmers. These long stresses ultimately effects farmer's mental health.

The quickest response of the respondent came in this case. Most of the small farmers reported always having been worried about their crops, loan repayment and social responsibilities. The intensity of this depression and anxiety could not be measured on the spot. But majority reported that they are always under pressure.

Mental illness	Yes	No
Number of respondents	204	46
Total	250	
Source: Author's own contribution		

3.5. Problems in Treatment of Small farmer's illness

The illness of farmer is sometime direct, as the traumatic illness or indirect, as the prolonged effect of the chemicals, dust and stress. All these problems need direct treatment. But the farmers, especially small farmers faces the following problems in the treatment.

3.5.1. Absence of Public Health Care Facilities

According to constitution of Pakistan, the state is responsible for providing subsidized health care facilities to all residents without any discrimination. But unfortunately, the health system in overall Pakistan, including Punjab is urban biased. In villages, there is no concept of the existence of hospital. In some bigger towns or Union councils there is a Basic Health Unit (BHU) which is indeed not completely functional. There is no doctor available. Only a dispenser, who is not a physician is available for a limited time in a day. The injured or ill patient must rely on this dispenser or they must rush toward big towns and cities. Many of the injured people loss their life until they reach to big towns or cities.

During the survey a large number of farmer reported that the access to hospital is a big problem for them. The private hospitals are urban biased. The only hope is public hospital, but public health facilities are not available in most of the villages. A large number of small farmers reported that they cannot go to cities for small illnesses so they have to ignore. But they would have definitely been to the doctor if public health care facility was available to them. Others reported that they manage somehow to go to nearest possible hospital.

Utilization of public health care facility	Yes	No
Number of respondents	195	55
Total	250	
Source: Author's own contribution		

3.5.2. Financial Problem

The financial problem is the biggest problem in the way of poor farmer. Due to absence of health facilities in rural areas, people have to rush toward cities. But, poor farmers, due to lack of resources and means of transportation are unable to

approach cities. The poor farmers, facing lack of financial resources, have to rely on self and informal medication. Since, there is no transport facilities provided by the government, the patients have to pay high prices for private transport or Taxi (if available). If somehow, they are able to reach city hospital, which are overburdened they have to wait a long and unavailability of medicine and testing facilities in public hospitals they must spend a lot on private testing and medicine. Hence, the financial problems stops the poor to avail better medical treatment.

During the survey, A vast majority gave their opinion that financial problem is the biggest problem in getting treatment for their illness. The following table shows how important is financial problem for these poor farmers.

Financial problem	Yes	No
Number of respondents	215	35
Total	250	
Source: Author's own contribution		

3.5.3. Self Medication

Self-medication is a common practice in healthcare system. People want to self-care using medicines following self-diagnosis. Management of minor ailments can be achieved using medicinal and non-medicinal agents. Self-medication has some pros and cons. It rivets some risks to human: consumers may incur significant financial costs; excessive antimicrobial use can lead to pathogen-resistance; many adverse drug events and drug–drug interactions can occur; and life expectancy can shorten. In rural Punjab, due to absence of proper medical facilities and pharmacies, poor people depends upon self-medication. The use of previous remaining medicines at home, or use of medicines subscribed to any other family member is most common.

Another self-medication is the use of herbal/Desi medicines available at home. Since, these medicines are not scientifically proved, so their use may have negative/side effects. A bulk of respondents reported that they usually practice self-medication for the illness at least in the initial stage until it gets serious.

Self medication	Yes	No
Number of respondents	181	69
Total	250	
Source: Author's own contribution		

3.5.4. Carelessness

Another factor which can be a problem for the poor farmer is the factor of carelessness. Small injuries and ailments are most common in the case of small farmers. But, most of the time, they don't bother small injuries and ailments. Which can lead to infections and major diseases. Therefore, carelessness can lead to serious threats.

During the survey, a segment of respondents have respondents that they have witnessed bad consequences of carelessness in past. They remained careless about any injury, pain or problem but with the passage of time it was converted into a bigger illness.

Bad consequences of carelessness	Yes	No
Number of respondents	77	173
Total	250	
Source: Author's own contribution		

3.5.5. Lack of Awareness

Due to lack of awareness people don't bother many dangerous practices which in fact, may cause serious health issues. When they are effected, then they moves towards medications. At that stage, the cost of treatment is very high or may not be easily recoverable. So, lack of awareness is also a big concern.

During the survey, the respondents were asked about any disease/accident they have experienced due to lack of awareness which they have latterly realized. Most of the respondents reported that it happened many times in their life. But 110 respondents reported that they have experienced such situation at least once in their lives.

Problem of lack of awareness	Yes	No
Number of respondents	110	140
Total	250	
Source: Author's own contribution		

3.6. Health Insurance

High cost of healthcare and poverty are commendable boundaries to accomplishing health care. Due to absence of insurance, destitute families having restricted resources confront numerous issues since of health care costs being paid Out of Stash. Due to lower income or nonappearance of medical services, these poor families particularly those living in lower socioeconomic setups are incapable to achieve health care and services. At whatever point they get sick or unfortunate, they ordinarily borrow cash from companions or families for their treatment since they don't have sufficient cash for treatment. Another way to urge freed of out of pocket payment for treatment incorporates health Protections Plans. These health protection plans are critical for ensuring poor or indeed middle-income families against disease or illness.

For the arrangement of quality healthcare administrations indeed within the confront of contracting budgets and organization hitches, the government and benefactors in developing countries are presently dealing within the execution of different Health-Based Protections Plans. Financing healthcare costs postures challenges to the poor countries, particularly when constrained tax policies and complicated administration of healthcare insurance plans are critical obstructions that are the most causes of lacking health spending per capita in such countries.

Medical Insurance is a way of paying some or full cost of healthcare for someone. It protects the insured people from paying heavy costs of treatment during sickness. The health insurance system consists of a regular payment by consumer to an insurance institute. This institute is holds the payments in a fund. At the time of need this institute pay for consumer's treatment to the health care service provider (Conn & Walford, 1998).

The history of Health Insurance is very old. Germany is one of the first countries which started social health insurance nationally in 1883 (WHO, 1999). The concept of health insurance reached the world since then. Currently, this system is being practiced in many countries over the world.

Medical coverage is a method of paying for a few or the entirety of the expenses of human health services. It shields people from paying high treatment costs during a scene of ailment. The fundamental medical coverage process is that an insurance provider company makes a customary installment to an overseeing base. This organization is answerable for holding the installments in a reserve and paying a medicinal services supplier for the expense of the buyer's care. General health consumption is pitiful in Pakistan (3.5% of the open spending is spent on health, and general health spending is 0.7% of GDP). National open spending on health is \$4 per capita, while absolute spending on health is \$18 per capita. This mirrors the high portion of private spending, including by family units, which represents 75.6% of human services consumption. Social health insurance (SHI) covers only 5% of the population but represents about 40% of federal and provincial governments spending on health (Asian Development Bank, 2005).

In the same way, as other developing nations, SHI is at the fundamental stage in Pakistan; in certain territories, it is being tested; while in different regions, there is no arranging by any stretch of the imagination. Numerous universal donors have demonstrated enthusiasm for giving or helping governments to give help with this respect. Even though social health insurance is only one segment of social security technique, if properly organized, it can wipe out numerous value issues in medical services arrangement the nation over. The government disability policy is limited to government employees, military, police, and formal segment undertakings (with at least five workers). This barely covers 3% of the all-out utilized workforces.

Some of the private medical coverage are as per the following:

3.6.1. Allianz EFU Health Insurance

Allianz EFU Health Insurance for individuals and groups started medical insurance with the pilot task of 100 family doctors. It permits on normal 6 visits for every year per individual for essential consideration. The appraisal shows that private protection right now covers a few individuals.

3.6.2. Adamjee Insurance

Adamjee insurance agency survey that littler organizations (300-400 representatives) settle on medical coverage through Insurance organizations. Bigger organizations watch out for self-safeguard or give their own social insurance offices, for example, in Pakistan International Airline, which runs astounding offices for its workers. Adamjee covers 30,000 individuals in Karachi and 150,000 throughout Pakistan.

3.6.3. Jubilee Insurance

Jubilee Insurance company also provide very limited medical coverage with very high price only in selected hospital in 4 big cities in Punjab. This is also out of reach of the poor.

None of these insurance have complete medical coverage. In this way, it tends to be proposed that if there is a coordinated methodology among these private endeavors as well as with the administration, these plans can be scaled up to the degree of manageability. Likewise, there are a few issues identified with SHI, which can be looked at by any nation while actualizing medical coverage. This must be considered while planning an arrangement: per capita salary, the structure of the economy (size of the formal and casual area), the urban/rustic circulation of the populace, the structure of social medical coverage (different or single, intentional or obligatory) and target gathering (mature age, workers, self employees). All these angles if not tended to satisfactorily issues can make imbalances over the populace in SHI, which may make this framework more entangled as opposed to supportive. (Abrejo and Shaikh, 2008)

3.7. Role of Small Farmer's Health in Determining Agricultural Poverty (The Binary Logistic Regression Analysis)

The literature relating health with the productivity of labour is constructed on the household production theory which way presented by Becker (1965). According to Becker, households are the producers of the commodities, not only consumer of goods and services. Grossman (1972, 1999) further extended this framework to analyse the demand for health. Grossman's model viewed health as a long term

capital stock which produce an output of healthy time. The individuals are having this initial stock which depreciates with time but it can be increased with investment. By this investment in health, the household try to raise this stock of healthy time, which increases the time for earning or for production of consumable goods. Pitt and Rosenzweig (1986) constructed a background which supports the evaluation of role of health on productivity, the labor supply and farmer income overall. Pitt and Rosenzweig's extension introduced the variable of health in the utility function and involvement of a categorical production technology for health.

Health as capital can either improve or deteriorates the productivity of the individual. A study related to female farmers found that a vast majority of these farmers suffered from muscular fatigue, heat stress and skin problem, resulting them to take days off from the farms (Cole, 2006). Poor health results in loss of work days and reduces working capacity, when the family and labor which is hired, are not direct substitutes of each other or when there is liquidity constraint, is more probable to reduce the yield (Antle and Pingali 1994). For Instance, exposure to the pesticides may cause cardiac or pulmonary problems, the neurological or hematological consequences, and dermal disorders, which may hamper farmers' capacity to work in field and also reduce his management or supervision capacity.

World Bank (2007), pointed that the illness from AIDS/HIV, tuberculosis, malaria and other diseases reduces the agricultural productivity by the loss of labor, knowledge and assets to deal with sickness. According to Lipton and de Kadt (1988), the lack of coordination between agriculture and health while policy making, undermines the efforts to control poor health among rural poor which gives a drawback to the role of agriculture in alleviating many serious health disorders.

The association between efficiency and poverty goes on both ways. As stated by Hawkes and Ruel (2006), poor health decreases productivity and income in farming community, further decreasing the ability to deal with poor health and hindering economic development. The agricultural productivity further affects the family earnings and also nutrition intake, which resultantly improves the labor productivity and also results in good health (Oshaug and Haddad 2002). The lower level of investment in farming assets, especially health of the small farmer can significantly decrease agricultural efficiency. Which ultimately results in either inferior quality

or insufficient quantity of crop, known as agricultural poverty. In order to check the effect of health of small farmers on his agricultural poverty, Binary logistic regression was applied on the selected health related variable. The results of the regression are presented below.

3.7.1. Hypothesis of the Variables Included in the Model

Independent Variable	Hypothesis	
General health status of the family (GHSF)	Null hypothesis H^0	There is no statistically significant relationship between GHSF and Agricultural poverty (AP)
	Alternate hypothesis H^A	There is a statistically significant relationship between GHSF and Agricultural poverty (AP)
Any disease to farmer (DF)	Null hypothesis H^0	There is no statistically significant relationship between DF and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between DF and AP
Physical disability of farmer (PDF)	Null hypothesis H^0	There is no statistically significant relationship between PDF and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between PDF and AP
Availability of hospital in vicinity (AHV)	Null hypothesis H^0	There is no statistically significant relationship between AHV and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between AHV and AP
Distance to hospital (DH)	Null hypothesis H^0	There is no statistically significant relationship between DH and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between DH and AP
Type of health care facility (THCF)	Null hypothesis H^0	There is no statistically significant relationship between THCF and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between THCF and AP

Availability of free medicine (AFM)	Null hypothesis H°	There is no statistically significant relationship between AFM and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between AFM and AP
Farmer's health awareness program (FHAP)	Null hypothesis H°	There is no statistically significant relationship between FHAP and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between FHAP and AP
Hygiene training (HT)	Null hypothesis H°	There is no statistically significant relationship between HT and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between HT and AP
Availability of clean drinking water (CDW)	Null hypothesis H°	There is no statistically significant relationship between CDW and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between CDW and AP
Consumption of balanced diet (CBD)	Null hypothesis H°	There is no statistically significant relationship between CBD and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between CBD and AP
Mental Depression (MD)	Null hypothesis H°	There is no statistically significant relationship between MD and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between MD and AP

3.7.2. Hosmer and Lameshow test (Test for Goodness of Fit)

Hosmer and lameshow test uses non significance as an indicator of goodness of fit. Which means that the significance value must be greater than 0.05 in order to consider the model as good fit. In current model the sig. value is 0.879 which shows that the model is good fit.

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	3.744	8	.879

3.7.3. Variance Inflation Factor (Test for multicollinearity)

Variance inflation factor (VIF) test is a measure of severity of collinearity in regression which shows variance of regression coefficient as a result of collinearity. There is no multicollinearity between the variables in this model because Variance inflation factor for all variables is less than 5 and tolerance is greater than 0.2.

Collinearity Statistics		
Variables	Tolerance	VIF
General health status of the family (GHSF)	.499	2.006
Any disease to farmer (DF)	.610	1.639
Physical disability of farmer (PDF)	.557	1.796
Availability of hospital in vicinity (AHV)	.439	2.280
Distance to Hospital (DH)	.417	2.399
Type of health care facility (THCF)	.418	2.394
Availability of free medicine (AFM)	.463	2.161
Farmer's health awareness program (FHAP)	.376	2.657
Any hygiene training (HT)	.739	1.353
Availability of clean drinking water (CDW)	.445	2.250
Consumption of balanced diet (CBD)	.386	2.592
Mental depression (MD)	.721	1.386

3.7.4. The Binary Logistic Regression Analysis

Dependent Variable = Agricultural poverty (AP)

Independent Variables	Coefficient		Wald	Df	Sig.	Exp (β)
	B	Std. Error				
General Health status of the family (GHSF)	-1.869	1.093	2.925	1	.087*	.154
Any disease to farmer (DF)	3.860	1.351	8.159	1	.004***	4.478
Physical disability of farmer (PDF)	3.461	1.282	7.285	1	.007***	3.835
Availability of hospital in vicinity (AHV)	-2.103	1.096	3.685	1	.055**	.122
Distance to Hospital (DH)	.837	.412	4.128	1	.042**	2.310
Type of health care facility (THCF)	-.535	1.380	.151	1	.698	.585
Availability of free medicine (AFM)	-1.248	1.585	.620	1	.431	.287
Farmer's health awareness program (FHAP)	-2.473	1.321	3.504	1	.061*	.084
Any hygiene training (HT)	-3.329	1.664	4.004	1	.045**	.036
Availability of clean drinking water (CDW)	-.352	1.122	.098	1	.754	.703
Consumption of balanced diet (CBD)	-.629	1.117	.317	1	.574	.533
Mental depression (MD)	2.097	1.125	3.477	1	.062*	8.145
Constant	-.828	1.797	.212	1	.645	.437
***, **, * indicates significance at 1%, 5% and 10% respectively.						

The interpretation and discussion of the results of the above regression analysis are presented below.

3.7.4.1. General Health Status of the Family

Question was asked about prevalence of any chronic disease to any family member of the farmer, which represents general health status of the family. The farmer was provided with two options "Yes" or "No". The table below shows the distribution

of the small farmers facing agricultural poverty according to the health status of the family. The cross tabulation shows that the health status of the 81 respondents among 122 small farmers having agricultural poverty was reported as poor while 41 reported having good health status. Whereas, the health status of the majority (103) of respondents out of agricultural poverty have good health status.

		General Health status of the family (GHSF)		Total
		Poor	Good	
Agricultural Poverty	No	25	103	128
	Yes	81	41	122
Total		106	144	250

The results of the logistic regression analysis shows that farmers reporting the health status of the family as good, are less likely to have agricultural poverty. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. In Punjab, the system of family farming is common. If the family overall enjoys good health, they may participate better in the fields which may lead to decrease agricultural poverty. On the other hand, if family is healthy, the farmer/family head can save health spending, which increases farmer's capacity to invest in next crop. In this way a good health status of the family may help the small farmer to remain out of poverty.

3.7.4.2. Any Disease to Farmer

In order to be specific, the farmer was asked about existence of any prolonging disease to him. The answer was categorized in two options "Yes" or "No". The table below shows that the majority (102) of the small farmers facing agricultural poverty are having any disease whereas, only 20 respondents reported that they do not have any disease. On the other side majority (101) of the small farmers out of agricultural

poverty do not have any disease. These statistics shows that presence of any sort of disease have relationship with agricultural poverty of the small farmer.

		Any disease to farmer (DF)		Total
		No	Yes	
Agricultural Poverty	No	101	27	128
	Yes	20	102	122
Total		121	129	250

The result of the logistic regression analysis also confirmed that the probability of the small farmer having agricultural poverty increases if he/she is having any prolonging disease. This result is highly significant at 1 percent level of significance. Therefore, the null hypothesis is rejected and alternate hypothesis is accepted. The analysis confirms a positive relationship between disease and agricultural poverty. This variable again confirms the importance of health of the farmer in determining agricultural poverty among small farmer. Due to disease, the ability of the farmer to work is affected negatively, hence leading to less productivity. Which may ultimately cause agricultural poverty.

3.7.4.3. Physical Disability of Farmer (PDF)

Same as disease, the physical disability is also an important part of health. And existence disability is also important in determining the status of agricultural poverty. Question was asked about presence of any physical disability in farm worker. The answer consisted of two options, “Yes” or “No”. The table below shows the distribution of the respondents according to the presence of disability. It is evident that 114 out of 128 small farmers out of agricultural poverty do not have any disability. Whereas, 96 out of 122 respondents having agricultural poverty

claimed having at least one disability ranging from loss of a finger to the hearing loss.

		Physical disability of farmer (PDF)		Total
		No	Yes	
Agricultural Poverty	No	114	14	128
	Yes	26	96	122
Total		140	110	250

According to the results of the model, if a farmer is having any physical disability, his/her chances of having agricultural poverty increases. This result is highly significant at 1 percent level of significance. Therefore, the null hypothesis is rejected and alternate hypothesis is accepted. Physical disability is clearly an obstacle in the physical performance of the farmer which is much important especially in case of small farmer because of absence of farm machinery. Due to absence of farm machinery, a small farmer has to use his physical abilities which also increase the chances of injury. Situation becomes worse, when farmer is facing disability, or his injury becomes a disability. Hence, the productivity is affected and farmer may fall in agricultural poverty.

3.7.4.4. Mental Depression (MD)

Along with absence of disease and physical fitness, the mental state of a human is also an important factor of the good health. The respondent was asked about existence of any mental illness like depression. The depression was well explained by the researcher before asking the question. The answer comprised of two options “Yes” or “No”. The cross tabulation shows that 97 out of 122 small farmers trapped in agricultural poverty reported having mental illness like depression. Whereas, 36

respondents who are not trapped in agricultural poverty also have the problems of depression/anxiety, but a big segment of such farmers do not have these problems.

		Mental Depression (MD)		Total
		No	Yes	
Agricultural Poverty	No	92	36	128
	Yes	25	97	122
Total		117	133	250

Interestingly, the results of the logistic regression analysis also proved that in case of small farmer the mental state plays an important role. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The chances of occurrence of the agricultural poverty among small farmer increases if he/she having any mental illness/depression. Since, most of the small farmers in Punjab leads a miserable life. Certain worries, like social responsibilities, lack of financial resources, weather changes and other factors may push a small farmer in mental depression. This situation may effect his/her capabilities and he/she may not be able to concentrate on work and perform. Thus, leading to the situation of agricultural poverty.

3.7.4.5. Availability of Hospital in Vicinity (AHV)

Injuries and illness are a matter of fact, especially in case of farming. Farmers are directly exposed to certain chemicals, agricultural medicines and physical efforts in the fields etc. Their chances of falling ill or accident are higher. Important is, timely diagnosis and treatment which is possible only if hospital is accessible. The question was asked about the availability of hospital in the vicinity. The answer had two options, “Yes” or “No”. The following table shows the correlation between occurrence of agricultural poverty and availability of hospital in the vicinity. 104

out of 122 small farmers facing agricultural poverty reported that they do not have any health care facility in the vicinity. Contrary to this, 109 small farmers out of agricultural poverty reported that they have health care facility nearby, ranging from basic health unit to a hospital.

		Availability of hospital in vicinity (AHV)		Total
		No	Yes	
Agricultural Poverty	No	19	109	128
	Yes	104	18	122
Total		123	127	250

The data analysis shows that, agricultural poverty is also related to the availability of hospital in the vicinity. The result is significant at 5 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The probability of the farmer having agricultural poverty increases if there is no hospital/ medical facility available in the vicinity.

3.7.4.6. Distance to Hospital (DH)

Another question was asked to the respondent regarding distance of health care facility nearest to their residence. The answer was categorized in 4 categories increasing from range increasing from level 1 to 4. The following table shows that the majority of small farmers having agricultural poverty reported larger distance between their residence and nearest health care facility available. On the other hand, majority of small farmers out of agricultural poverty reported having health care facility nearer. So, the health of the farmer and distance to the hospital seems reciprocal to each other. As the distance to the hospital increases, the health of the

farmer worsens. Due to long distance to the hospital, a poor farmer may do self-medication, or ignore illness because of long distance.

		Distance to Hospital (DH)				Total
		1	2	3	4	
Agricultural Poverty	No	105	15	1	7	128
	Yes	11	7	43	61	122
Total		116	22	44	68	250

The results of the logistic regression analysis confirms that the probability of the agricultural poverty among small farmer increases as the distance to the hospital increases. The result is significant at 5 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The poor farmers, due to lack of financial resources and transport are unable to approach hospital in far cities. Which may cause the illness or injuries to get worse. Which may result in poor investment and performance of farmer in agriculture. Which ultimately results in agricultural poverty.

3.7.4.7. Type of Health Care Facility (THCF)

The use of public or private health care facility was also included. Since private hospitals are expensive and patient must pay all charges of examination, testing, medicine etc. In Public hospital, which are available only in city, Tehsil or District, have subsidized treatment and basic medicines, but, all other medicines patients have to purchase at pharmacies outside the hospital. Similarly, these hospitals have some basic medical testing facilities. Question was asked about the type of health care facility the respondent use to utilize. The answer had two categories, “Public” and “Private”. Cross tabulation shows a correlation between the occurrence of

agricultural poverty and the type of health care facility utilized by the respondent. 108 out of 128 small farmers out of agricultural poverty stated that they are able to use public health care facility, only 20 of them have to go to private hospitals and clinics. Whereas, in case of small farmers having agricultural poverty 88 out of 122 have to use private health care facility.

		Type of health care facility (THCF)		Total
		Private	Public	
Agricultural Poverty	No	20	108	128
	Yes	88	34	122
Total		108	142	250

The results of the logistic analysis shows that the chances of agricultural poverty among small farmer decreases if he/she use public hospitals. But the result of the analysis is not significant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. Unfortunately, patients have to wait very long for the checkup, results of these tests and examinations. Patients who can afford, get their medical tests from private labs, which is quick but expensive. In case of farmer facing agricultural poverty, either the small farmer is not capable of bearing higher transportation costs needed to reach public hospital. Or the other farmers having their own means of transportation may afford to reach far away public hospital. In this case, when a small farmer have to pay higher cost in public hospitals his capacity to invest in next crop decreases, which may result in agricultural poverty.

3.7.4.8. Availability of Free Medicine (AFM)

Another financial hurdle in the health of farmer is unaffordability of medicines. The question was asked about the availability of free or subsidized in the hospital they

used to go. Not all, but some, Free or subsidized medicine is available in case of public hospitals only. The following table shows the correlation between occurrence of agricultural poverty and availability of subsidized medicine. According to the statistics, the majority (103 out of 122) of the small farmers trapped in agricultural poverty do not get subsidized/free medicine. Whereas, those small farmers who are out of agricultural poverty reported getting comparatively better situation. That is, 82 out of 128 of them are able to get subsidized/free medicine.

		Availability of free medicine (AFM)		Total
		No	Yes	
Agricultural Poverty	No	46	82	128
	Yes	103	19	122
Total		149	101	250

The results of the model shows that the probability of occurrence of agricultural poverty among small farmers decrease if they get free or subsidized medicine. But the result of the analysis is not significant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. A poor farmer may save a big amount to be spend on medicines otherwise which may help such farmer to invest in agriculture in the form of fertilizer, pesticides, technology or water which may bring him out of agricultural poverty.

3.7.4.9. Farmer's Health Awareness Program (FHAP)

Lack of awareness is a big problem in rural Punjab. Awareness about health become more important when we talk about the areas or segment of society which are more prone to disease, like rural Punjab and small farmers. Question was asked from the respondent about any health awareness program provided by any governmental/non-governmental organization they have ever attended. Answer was

categorized in to two categories, “Yes” or “No”. The cross tabulation shows a clear correlation between agricultural poverty and any farmer health related program the small farmer have ever attended. According to data, Majority (110) of the small farmers facing agricultural poverty stated that they have not attended any program/session/seminar related to farmer’s health in their life. Contrary to this, a clear majority (106 out of 128) farmers out of agricultural poverty have stated that they have attended any program/session/seminar related to farmer’s health at least once in their life.

		Farmer’s health awareness program (FHAP)		Total
		No	Yes	
Agricultural Poverty	No	22	106	128
	Yes	110	12	122
Total		132	118	250

Interestingly, the variable of health awareness program shows efficient results. According to results, the probability of agricultural poverty among small farmer decreases, if the farmer has attended any health related awareness program. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. These small farmers are usually uneducated. The health awareness program may improve the understanding of the farmer about his health concerns and safety which may protect him from hazards of the chemicals, fertilizers and physical accidents. Hence, Farmer remains conscious of the threats to his health, and improve is productivity and reduce expenditures on health, which ultimately help in reduction of agricultural poverty.

3.7.4.10. Any Hygiene Training (HT)

Similarly, poor hygienic conditions, absence of sewerage system in the villages may cause serious problem to the health of the villagers. Small houses, big families with animals and without any hygiene arrangement are common in rural Punjab. The sewerage and household and animal waste which is usually disposed off in nearby lands and marshes through open drains flowing through house and streets, which may become a disease factory. A question was asked from the respondent about any hygiene related program provided by any governmental/non-governmental organization they have ever attended. Answer was categorized in to two categories, “Yes” or “No”. The following table shows the correlation between agricultural poverty and attending of any hygiene related program/session/seminar. The data shows that 87 out of 128 small farmers who are out of agricultural poverty have attended any program/seminar or session related to hygiene at least once in their life. Whereas, a majority (98 out of 122) farmers having agricultural poverty have not attended any program/session/seminar related to hygiene in their whole life.

		Any hygiene training (HT)		Total
		No	Yes	
Agricultural Poverty	No	41	87	128
	Yes	98	24	122
Total		139	111	250

The results of the logistic analysis also confirms that, the chances of occurrence of agricultural poverty decreases if a farmer has taken any hygiene lesson/training. The result is significant at 5 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The trained farmer may take care of the hygiene of himself, his family and house which may protect him from getting

ill and ultimately improves his productivity and reduce medical cost. Hence, such farmer is physically and financially more able to invest in crops. Which leads to decrease in agricultural poverty.

3.7.4.11. Availability of Clean Drinking Water (CDW)

The unavailability of clean drinking water is an emerging issue in Punjab. This problem was obvious in cities since decades. But currently, the villages are also facing the problem of polluted ground water. There might be many reason behind the pollution of ground water. One of the reason is the seepage of fertilizers and chemicals and ultimately mix up with underground water. And unfortunately there is no system of clean water supply to houses in rural areas and small cities. Therefore, people have to drink polluted water. Due to the consumption of this polluted water several water borne diseases are being reported currently. A question was asked about the availability of safe drinking water to the small farmers in rural Punjab. The respondent was provided with two distinct options “Yes” or “No”. The table below shows that 95 out of 128 small farmers out of agricultural poverty have access to safe drinking water. Whereas, majority of the small farmers facing agricultural poverty do not have access to safe drinking water.

		Availability of clean drinking water (CDW)		Total
		No	Yes	
Agricultural Poverty	No	33	95	128
	Yes	107	15	122
Total		140	110	250

The results of the logistic regression analysis revealed that the probability of occurrence of agricultural poverty was greater among the small farmer when clean

drinking water was not available to them. But the result of the analysis is not significant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. Due to regular consumption of polluted water the farmer himself, or any family member may fall ill which may affect the performance of the farmer.

3.7.4.12. Consumption of Balanced Diet (CBD)

Along with other factors, balanced diet is necessary for a healthy life. But unfortunately, poor segment of society is facing malnutrition. Either enough quantity of diet is not available or the do not contain all necessary nutrients necessary to lead a healthy life. The requirements of the balanced and healthy diet was explained to the respondent by the researcher and then, a question was asked whether they feel that the respondent and his family is taking a healthy balanced diet or not. The answer was provided with two options “Yes” or “No”.

The data shows that, 100 out of 128 small farmers out of agricultural poverty informed that they themselves and their families are having balanced diet. Contrary to this, 109 out of 122 small farmers stuck in agricultural poverty thinks that they themselves and their families are not having a healthy and balanced diet.

		Consumption of balanced diet (CBD)		Total
		No	Yes	
Agricultural Poverty	No	28	100	128
	Yes	109	13	122
Total		137	113	250

The results of logistics regression shows that, the chances of occurrence of agricultural poverty increases if the small farmer and his family is not getting adequate food. But the result of the analysis is not significant. Therefore, null

hypothesis is accepted and alternate hypothesis is rejected. This lack of adequate food may cause physical weakness or poor immunity against disease. Which may lead to increase in medical expenditures and reduction in physical strength. In both cases the physical and technical performance of the farmer decrease. Which ultimately affect agricultural production and push small farmer in agricultural poverty.

3.8. Health Insurance

Health insurance might be a good option for the small farmers especially in case of emergencies and accidents. Unfortunately there is no system of public health insurance in Punjab. And private health insurance exists on a negligible scale. During the survey, it was found that majority of the small farmers even don't know what health insurance is.

Knowledge about health insurance	Yes	No
Number of respondents	15	235
Total	250	
Source: Author's own contribution		

3.8.1. Willingness to Pay (WTP) for Health Insurance

Since majority of small farmers did not know about health insurance. Upon explanation by the data collector about health insurance and its benefits an image of the health insurance system was built in the respondent's mind. And then, a question was asked that if health insurance is made available to them whether they are willing to pay for it or not. Only 113 out of 250 respondents showed their willingness to pay for health insurance.

Willingness to pay for health insurance	Yes	No
Number of respondents	113	137
Total	250	
Source: Author's own contribution		

The next question was about the amount which a farmer was willing to pay per person. The majority of farmer was not willing to pay health insurance on monthly basis. Therefore, the respondents were asked about their annual contribution in health insurance. The respondents who were not to pay for health insurance were marked as zero. From rest of 113 respondents majority (88) respondents were not willing to pay more than 2000 Rupees per person per year. Only 5 respondents showed willing to pay more than 5000 Rupees per person per year. The table below shows the details of amount small farmers are willing to pay per person per year.

Amount Willing to pay for health insurance per person per year (Rupees)	0	0-2000	2000-5000	More than 5000
Number of respondents	137	88	20	5
Total	250			
Source: Author's own contribution				

3.9. Health Policies in Punjab

In 2010, the draft of National Health Policy was made but before its approval, the 18th amendment in constitution decentralized the department of health to the provinces. This created a need to review the situation of Punjab health sector and constructing priorities for healthcare service delivery. Therefore, the first Punjab Health Sector Strategy was made to pull together the work to make Punjab a healthier place coming years. This policy was supposed to help Punjab Health Department to progress with a sense of purpose and direction, urgency by ensuring prioritization and other interventions consistent to the available resources.

3.9.1. Punjab Health Policy 2012

In 2012, the first health policy of Punjab was made with vision of “Ensuring health and productive lives for the people”. According to policy document of Government of Punjab, (GoP, 2012).

The policy was based on the following principles.

- The principles for the Strategy have been scientifically identified through the research, and also confirmed through various consultations carried out by the Strategy making team. The principle provide basis to raise health status and quality of life.
- Equitable and universal healthcare services – by making a roadmap with effective approaches for corresponding needs with recognition and response to cause and effect of health inequality for groups of population.
- Improving institutional capacities – with progressive development and having high quality capacities in public sector.
- Ensuring good governance at all levels – by promoting merit and transparency in all aspect of health service management.

- Optimal utilization of resources – by the adoption of health outcomes as achievable and efficient deployment of resources.
- Promotion of a results based culture and institutionalization of innovations – for maximum health benefits in the areas which need urgent attention. Innovative interventions should be institutionalized in order to provide immediate benefits.

3.9.1.1. Strategic Directions

Based on situation of health status of the people of Punjab and performance of health sector, strategic directions to guide the process of strategy development are set six fold:

- Enhance access to achieve universal coverage – by increasing operations in multiple dimensions to remove barriers for meeting the specific needs of various population groups.
- Focus on primary healthcare – will be rolled out through improving public expenditures aiming at delivery of essential package of health services for all members of society.
- Improve quality of care – through adoption of service standards and making investments in strategic health infrastructure as well as key areas of human resource development.
- Private sector mainstreaming – for maximizing health benefits for the population, specifically highly specialized care; and optimizing their service delivery through provision of appropriate regulatory framework.
- Redefining role of government– from provider of healthcare services to purchaser and regulator through taking up a facilitating position.

- Strengthening of institutional collaborations– for achieving efficiency gains, which are otherwise beyond the scope of health sector.

3.9.2. Punjab Health Sector Plan 2018

According to policy document of health department, Government of Punjab (GoP, 2018), The policy proposal states that Health Sector Strategy 2020 and Roadmap of health will be implemented and the health budget will be in line to the Strategy with focus on Millennium Development Goals and access equity.

Punjab health sector plan 2018 states that, the performance of Punjab health sector is lagging behind as compared to other regional countries (Bangladesh, India, Nepal and Sri Lanka). This comparison is particularly important as these countries share similar socio-economic conditions as Punjab but they are performing better than the Punjab, also indicating that Punjab can also perform better with efficient policies.

In challenges in service delivery, Punjab health sector plan 2018 states that,

1. The sector is suffering from lack of health professionals including doctors and nurses. The issue is profound in rural areas where the doctors and nurses especially female doctors are reluctant to go due to issue of safety. In general the health professionals tend to avoid the remote area assignments even in their early stage of career not only due to safety issue but also due to poor facilities and access issues. The young professionals are also averse to man the basic health facilities as the time spent at these facilities does not count towards eligible experience required for higher education. Linked with the non availability issue is absenteeism. Many basic health facilities are without doctors due to unavailability and still many suffer due to absenteeism where doctors go for couple of days a month.

2. Stock out of medicines especially at Basic Health Units (BHUs) and Rural Health Centres (RHCs) level is a critical issue. Multiple reasons contribute to this situation. Essential Drugs List exists but is not updated regularly to take into account the changing circumstance. A mismatch is at times found between the Essential Health Services Package and required drugs at health facilities. The procurement of drugs

often takes time due to issues related to poor understanding of procurement rules, centralized purchases, and budget releases.

3.9.2.1. Key Activities in Punjab Health Sector Plan 2018

1. In order to decrease the under 5 child mortality rate improved immunisation, improved nutritional status of the children, and prevention and treatment of diarrhoea and pneumonia are necessary. In order to improve the immunisation several steps will be taken. These include provision of cold chain equipment to districts; ensuring uninterrupted supply of vaccines through improvement in logistics; and capacity building of Expanded Program for Immunisation (EPI) staff. The districts will also be supported by providing information on gaps on the basis of data analysis. Linkage between Lady Health Workers (LHW) and EPI staff will also be established for effective immunisation campaigns. The vaccination staff will be increased systematically to improve coverage and manage work load. The activity will be supported by public awareness campaign to create awareness and demand.

2. For the improvement of maternal health and reduction of maternal mortality rate, it is essential to focus on antenatal care and delivery by skilled birth attendants. Steps to improve the nutritional status of mothers are also important. It is planned that 24/7 maternal and new born health services will be provided at the selected BHUs. The basic health facilities will be linked with secondary and tertiary care health facilities through Rural Emergency Ambulance Services. The gynae and labour rooms at District Headquarter (DHQ) and Tehsil Headquarter (THQ) hospitals will be improved to provide quality services. Comprehensive Emergency Obstetric and New Born care will be strengthened at all THQ and DHQ Hospitals. The recruitment of essential HR such as Gynaecologist, Anaesthetist, Blood Transfusion Officers will be allowed on flexi contracts to enhance their availability. Wherever possible they will be hired by the districts. Community Midwives will be trained and deployed in all the districts. The coverage of LHWs will be increased to cover the entire province.

3.9.3. 10 Years Punjab Health Sector Strategy

Provincial Minister for Health Dr. Yasmin Rashid has announced 10-year Punjab Health Sector Strategy and expressed the government's firm resolve to provide international standard medical facilities to the masses. The strategy was to ensure provision of international standard healthcare facilities to the patients in the public sector hospitals. She said that targets in health governance and accountability, public-private partnership, human resources, measures taken for safeguarding the mother and child, family planning, patients safety and availability of medicines in government hospitals was to be achieved through this strategy (GoP, 2019).

These were the ten areas identified with detailed interventions:

- Reproductive Maternal Newborn Child Health, nutrition and family planning;
- Preventive Health Services to Communicable and non-communicable diseases;
- Patient safety and quality of care;
- Medicines and Biomedical Equipment;
- Health Management Information System;
- Health Governance and Accountability;
- Human Resource for Health;
- Healthcare Financing in Public-Private Partnership;
- Health Disaster Management and Emergency Management, and
- One Health Including Environmental Health

The strategy envisages increased equitable access to, and of quality maternal and newborn child health, health, family planning and nutrition across all public and private sector facilities.

This strategy is embedded in the Sehat Insaf Card, which goes parallel with all interventions. The minister knows that the issue here is a system that rewards privileges to the rich; giving more opportunities, wealth and powers to those who did not earn them or have otherwise acquired them while excluding others of access to resources.

Major components in Pakistanis context for the next decade are the patient safety and quality of care, which are extremely crucial in Punjab context. The profiteering in the health sector has often been criticised and there have been voices wanting stricter controls. Besides regulatory bodies like Punjab Healthcare Commission, the emphasis has been laid on training on professional responsibilities and interconnection with the governance and accountability.

Similarly, another key edition is the concept of one's health, which sees infections in the larger zoological spheres. For the last several years, Punjab has faced some unexpected diseases like Crimean Congo Haemorrhage Fever, Swine Flu, Dengue Chikungunya.

3.9.4. Sehat Sahulat Program

Sehat Sahulat Program (SSP) is a milestone towards social welfare reforms; ensuring that the identified under-privileged citizens across the country get access to their entitled medical health care in a swift and dignified manner without any financial obligations. The SSP program's objective is to improve access of the poor population to good quality medical services, through a micro health insurance scheme (GoP, 2020).

3.9.4.1. Treatment Packages

1: Secondary care

Initial coverage = PKR 60,000 per family per year

Additional coverage = PKR 60, 000 per family

- In Patient Services (All Medical and Surgical Procedures).
- Emergency Treatment requiring admission.
- Maternity Services (Normal Delivery and C – Section).

- Maternity Consultancy / Antenatal Checkups (4 times before delivery and one follow up after delivery).
- Maternal Consultancy for family planning, immunization and nutrition.
- Fractures / Injuries.
- Post hospitalization.
- Local Transportation Cost of PKR 1,000 (thrice per year).
- Provision of transport to tertiary care hospitals.

2: Priority treatment

Initial coverage = PKR 300, 000 per family per year

Additional coverage = PKR 300, 000 per family

- In Patient Services (All Medical and Surgical Procedures).
- Heart diseases (Angioplasty/bypass).
- Diabetes Mellitus Completion.
- Burns and RTA (Life, Limb Saving Treatment, implants, Prosthesis).
- End stage kidney diseases/ dialysis.
- Chronic infections (Hepatitis/HIV/Rheumatology).
- Organ Failure (Liver, Kidney, Heart, Lungs).
- Cancer (Chemo, Radio, Surgery).
- Neurosurgical Procedure.

3.10. Comments on Past and Present Health Policies

Even after the restoration of democracy in Pakistan in 2008, the health sector remained marginalized. From 2008 to 2010, Health sector remained a national subject. But, after 18th amendment in the constitution of Pakistan, the health department was decentralized from national to provincial level. And Punjab constituted its first health policy in 2012. During these years, the sector remained ignored.

Unfortunately, there was no policy related to the health of the small farmers who are more vulnerable than anyone else. The health policy of 2012 aimed at provision

of better and equitable health services to all. This policy seems to be confusing in terms of role of government and institutions. The problem of accessibility was a rural phenomenon, but the policy remained urban centered, failed to deliver a change in rural Punjab. Punjab health sector plan 2018, itself states that health in Punjab is lagging behind even other regional countries like India, Bangladesh, Nepal having almost same socio economic system. Furthermore, Health sector plan 2018 realizes the deficiency of not only medical professionals, doctors and nurses but also the medicine and drugs. This plan also declared the rural Punjab as more vulnerable. Focusing on the strategy, the focus of the policy remained mother-child health. The most recent health sector strategy presented in July, 2019 have vast goals of reforms, technology and quality service. This strategy will need years to be fully implemented. The Sehat Sulat Program remains the point of interest.

The effectiveness of the past policies can also be observed by the statistics of the World Bank presented below in the table.

Year	Life expectancy	Infant mortality rate Per 1000 live births
2008	64.685	73.9
2009	64.969	72.1
2010	65.264	70.4
2011	65.562	68.7
2012	65.849	67
2013	66.117	65.4
2014	66.36	63.7
2015	66.577	62.1
2016	66.77	60.5
2017	66.947	58.8
2018	67.114	57.2

Source: World Bank

World health organization focuses on the life expectancy and child mortality rate of a country in order to assess its level of health. The table above shows the data of life expectancy and infant mortality taken from world bank. In both cases, the data is showing improvement in Pakistan. There is a little increase in life expectancy over years. But still life expectancy is very low in case of Pakistan. Similarly, Infant mortality rate shows improvement but still mortality rate is very high.

Coming to the current topic of study, Small farmers, being most vulnerable segment of society could not get any attention in past and current health policies.

3.11. Recommendations

Keeping in view the scope of study, the results of data analysis and the past policies, the following recommendations may be made.

- Since, the Basic health unit is the first place of relief for the rural residents. The Basic health Units should be made available at village level. The availability of the Basic health unit at village level will solve the problems of both accessibility and affordability for the small farmers.
- The Basic health units should be upgraded and presence of at least one Doctor and a Nurse should be ensured. So that, the poor farmers and their families can get early and subsidized basic treatment in case of illness or injuries. The problems of transportation and finance can be solved in this way.
- Rural health centers are the next station of treatment. At least one rural health center should be established in each union councils of the rural Punjab. These rural health centers should be operated 24 hours on day and night shifts basis with presence of at least 1 Doctor and supporting staff. These rural health centers should be provided with all basic facilities.

- The equipment for minor surgeries in emergencies, child delivery and bedding facility should be made available in rural health center level.
- Rural health centers should be provided with all necessary medicine.
- Each rural health center should be provided with an ambulance which provide free of cost transport service for patients.
- The public hospitals in towns and Tehsil level should be upgraded, so as to provide good health facility nearby and to reduce the pressure on the big hospitals in big cities.
- Since, health professionals are reluctant to go to villages and rural areas to serve. Therefore, health professionals being posted to these rural areas should be given extra incentive in order to attract their interest.
- Proper monitoring system should be formulated in order to ensure the presence and delivery of service by medical staff.
- Special awareness campaigns should be launched for the farmers, specially the small farmers working physically in the fields. This campaign should include both media campaign and physical visits of the health experts who can make them aware of the health hazards in agriculture and preventive techniques.
- There is a need of reforms in agriculture extension department. Agriculture extension department should be made practical. Medical experts should be appointed in agriculture extension department and should be assigned the task to visit farmers and provide them awareness about health and hygiene.
- The farmer community should be provided first aid training, so that in case of emergency at least they are able to get first aid at the spot.
- The Government should establish a 24 hour helpline with doctors available on telephone who may guide the patients in case of emergency or minor illness.
- Sehat Sahulat Program of the government is a good step in favour of the poor families. These poor includes both urban and rural. Due to lack of awareness

and information small farmers are unable to approach this facility. Therefore, it is suggested that small farmers should be included especially in sehat sahat program, and these poor farmers should be specially included in the underprivileged category and may provided with sehat insaf cards on priority basis. Further, the limit of the treatment cost might be increased for this most vulnerable society.

3.12. Expected Benefits

Since the health care system is not as efficient as it ought to be. And various policy documents of the government themselves indicated that the health care system in Punjab is lagging behind. Therefore, there is a need of practical steps to be taken to bring about a change and to increase the level of human development which is one of the point of focus of the government. Therefore, bottom to top approach is necessary to bring change in Punjab health sector. Also, these policies measures will decrease the pressure on the urban health system and population.

Along with other rural community, these suggested policies will raise the health standards of the small farmer. Since these small farmers, being physical worker are at greater risk. With improved health, these small farmers will be able to perform better in the fields. Hence, increasing their productivity. Which will ultimately lead to higher levels of production. Higher production levels as a result, will help to break vicious circle of agricultural poverty among small farmers.

Coming out of agricultural poverty, these small farmer can earn better revenues for themselves. These revenues will help these small farmers to invest in educating their children. Also to get rid of the debts. On the other hand, increased production may supply more food for the consumption of population. Also, better quality and quantity of production may increase exports of the country. Which is a big source of foreign exchange earnings for the government and also plays important role in the balance of payment.

The suggested policies may also build trust on government among bulk of population. Therefore, the suggested measures will have social, economic as well as political benefits.

4. Chapter: 4. Education of Small Farmers and Agricultural Poverty

Education plays a vital role in human capital development. It increases the efficiency and productivity of an individual and thus give rise to skilled manpower having ability of leading the economy on the path of sustainable development. Education is an important and necessary component of human development which make people more productive. Without human development, the goal of poverty eradication and development is not reachable and human development is largely based upon skills and education (Mughal 2007).

Qureshi and Arif (2001) argues that the attainment of education of head of the household is very important in determining poverty among household in Pakistan. An increase in level of education of the family head significantly decreases the chances of household to be poor.

Education is considered a vital element in the development of a society, a system, and a country. A well-supported, easily accessible education system is an efficient means to make people economically conscious, and thereby, make them actively participate in their economic prosperity and cultural development. Education should be given first and foremost in the service of democracy, which demands not only to be protected against decisions but to be a part of decisions that influence society in a positive way.

4.1. Education in Pakistan

The condition of the education sector overall in Pakistan is not much encouraging. The lower rates of enrollment at the primary level, and wide disparities between regions and gender, lack of trained teachers, deficiency of proper teaching materials and poor physical infrastructure of schools indicate the poor performance of this sector. The higher rate of drop-out rate could not be controlled even at primary levels. Moreover, lower teacher institute and higher teacher student ratio further worsens the condition.

The lower public investment is one of the main cause of the meager performance of education sector in Pakistan. The Public spending on education sector remained less than 2 percent of Gross National Product. In start of 21st Century it increased to 2.2 percent. Furthermore, the allocation of funds remained biased towards higher education. As a result, the benefits of public investment on education was mostly reaped by upper class. The highly educated people moved abroad for better jobs and higher education and did not returned back incurring high public losses. In 1980s and onward different governments designed programs for education. But, due to political instability, those programs failed to achieve their goals. The Social Action Program initiated in 1990s to deal the imbalances. The program aimed to enhance levels of education; to develop better environment in schools by providing skilled teachers, aids and quality text; and also to minimize regional and gender disparities (Nasir and Nazli, 2000).

Fair access and learning is indispensable for sustainable development. Education imbalance in different measurements results asymmetrical development that may consign the marginalized populace and groups of unending poverty. One of the vital dimension of disparity is the urban-rural gap. The relative hindrance of rural territories contrasted with the urban turns out to be all the more discriminating at the secondary school level or above.

4.2. Education System in Punjab

Education that influences the development of a country is determined by space, gender, socioeconomic status, etc. In the specific case of Punjab, more people living in urban areas are within the regulated education system than those living in rural areas; more boys than girls have access to school education (Ali, 2018); and the higher the cultural and economic level of a family, that is, if it belongs to the wealthy class, the more possibilities of studying, for longer and in better institutions their sons and daughters will have (Malassis, 2010).

Two parallel systems of education are working in Punjab. Which are the Public and the private education system. Both of these systems starts from primary levels and leads up to higher education level. There are some pros and cons of both systems. The major differences are the quality and affordability. The public education

institutes are subsidized. Therefore, they are much affordable than that of private educational institutes which are much expensive. On the other hand, the quality of education and infrastructure is much better in private institutes as compared to public institutes.

4.3. Structure of the Education System in Punjab

4.3.1. Formal Education

The Education System in Punjab is divided into school, higher education, the technical and vocational training, and also adult literacy and non-formal education. Separate institute of the government exist to manage all these areas. In addition to the provincial education departments, a few institutes run by the national government and some autonomous bodies also existing in the Punjab. The next and largest number of students are enrolled in the private sector. The private schooling continued to develop faster over the last two decades.

4.3.1.1. School Education Department

In both Public and private education sector, the School education in the public sector begins with the starting level 'kachi' class. These are children of preprimary age, normally accommodated with those in grade 1. The primary level consists of grades 1 to 5. The medium of instruction in the primary schools is either Urdu or English. In the Urdu medium schools, English is taught as a language from grade 1. The next level is Middle school, which consists of grades 6 to 8. The medium of instruction at this level is also Urdu and English. The Secondary level, which consists of grades 9 and 10, is the first important career deciding level where students can opt for either science or arts groups. The terminal examinations at the end of each of the two Secondary grades are conducted externally and form an important landmark for future options for the child. Secondary education has elementary character and occurs in middle schools. The centers that offer these elementary levels (primary and middle) follow similar programs, with the same subjects, whether boys or girls.

Grades 11 and 12 are part of higher secondary schools as well as a number of colleges. The latter fall in the jurisdiction of the Higher Education Department and

not the School Education Department. These grades provide the second important career direction as children opt for pre engineering or pre-medical groups (or other specialized groups), making them eligible for degrees in engineering or medicine, respectively. There are only four colleges in Punjab existing in only Public sector which provide agriculture as a subject at this higher 11 and 12 grade level.

Primary education begins with the minimum age of 5 years in schools created for this level and is part of elementary education that, in principle and according to the Constitution, should be compulsory and provided by the State, that is, free. Upon completion, those and those who wish to pursue higher education should address the secondary education (Shaikh and Khoja, 2011). Girls who intend to join the labor world soon may enter vocational training at the end of 5th grade, the level of demand being much lower than for boys. Therefore, after this poor preparation, the jobs that can be accessed are also of lower rank (Nawaz and Kundi, 2010).

The weakness of the government system is reflected in the low literacy rates already presented and in several international reports that are concerned with the issue of education or inequality in Pakistan. For this reason there is in the country a parallel system to that of the government for primary and secondary education chosen by 33% of students, which has private schools that have a higher level of education than the public system (Farooq, 2013).

4.3.1.2. Higher Education

The higher education sector consists of colleges managed by the provincial Higher Education Department and autonomous universities. These colleges are run by both Public and private sectors. At the time of independence, the province had only one general university - University of the Punjab. Presently, it has nine general public universities and nine public specialized universities. There are 14 private general universities and six private specialized universities. The colleges under the administrative control of the Higher Education Department normally run undergraduate classes but many also offer postgraduate courses. The University of the Punjab determines the curriculum for these courses. It also holds the examinations for these degrees. Currently, a two-year undergraduate degree

program is being pursued in these colleges, although, the Higher Education Commission (HEC) has developed a four-year degree program.

The Higher Education Department is headed by a Secretary. In addition to the colleges, the Higher Education Department has the following organisations under it as either attached departments or as autonomous bodies. i. 9 Boards of Intermediate and Secondary Education (BISEs) ii. University of Education iii. Directorate of Public Instruction (Colleges) At the district level, Director Colleges manages the institutions under the Higher Education Department. As has already been stated, all colleges also run the intermediate level classes, i.e., grades 11 and 12.

4.3.1.3. Technical and Vocational Education

The educational effort made by the province, through the public and private sectors, aims to achieve the full development of personality and the achievement of a healthy, educated, critical and fit man to live in a democratic society, fair and free, based on the family as a fundamental cell and on the valorization of work; able to participate actively, consciously and in solidarity in the processes of social transformation (Alam, 2015); consistent with the values of the national identity and with the understanding, the tolerance, the coexistence and the attitudes that favor the strengthening of the peace between the nations and the bonds of integration and Pakistan solidarity, contributing to form the citizen conscience to the conservation, defense and improvement of the environment, quality of life and rational use of natural resources (Razzaq and Forde, 2014).

Technical and vocational education institutions in the public sector are managed by the Punjab Technical Education and Vocational Training Authority (PTEVTA). The Authority, headed by a chairman, is an autonomous body with its own Board of Directorate. The vocational stream offers one and two year diplomas and certificates while the technical stream offers Diplomas (in 24 disciplines), diplomas, post-diploma (2 disciplines), B.Tech. (in 4 disciplines), and B. Tech (Hons) degrees (5 disciplines). The Punjab Board of Technical Education (PBTE) came into existence under the Punjab Ordinance No. II of 1971. It is a corporate body to control, develop and regulate technical, commercial and vocational education as well as Trade and Skill courses up to diploma level in the Province of Punjab.

Punjab Vocational Training Council (PVTC) is another autonomous corporate body established by the Punjab Government through the PVTC Act of 1998. Its mission is to alleviate poverty through Muslim charity (Zakat) and private sector participation by imparting demand driven skill training and enhancing employability for disadvantaged youth.

Infant education has little recognition, as it is barely regulated and there are few nursery and preschool centers that exist, and have emerged from private initiatives. Infant education is one that occurs in children under 5 years old (Rahman, 2014). This training is not included in the following scheme, since its level of organization and regulation is low or zero, so we doubt that it can be granted the denomination of educational stage. (Shaikh and Khoja, 2011).

4.3.2. Non-Formal Education

Non-formal education systems are being used in various other parts of the world as an effective tool for dealing with the problem of mass illiteracy and to create social awareness and civilization. It became clear that illiteracy and other educational problems cannot be solved solely through the formal system. Thus, realizing the advantages of the non-formal system, many countries in the world, both developed and developing, have adopted it and transformed it into an integral part of their national education system (Irvani, 2011). However, in Pakistan it is urgently necessary to launch a national movement in favor of literacy. This country is far from reaching the 100% literacy goal set in the Dakar Declaration (2000). This country is far from reaching the 100% literacy goal set in the Dakar Declaration (2000) (Ali, 2011).

The need for Non formal education in Pakistan has arisen not only because the formal system is unable to meet, due to its rigid nature, the growing demand for education in the country, but also because the cost of formal education is higher. In many of his writings, Ahmad and Rao, (2013) has identified two aspects that explain the slow progress of primary education, and they are internal and external school factors. Internal school factors include poor infrastructure, a deficit in teaching and learning materials, a shortage of trained and qualified teachers, insufficient teacher training, an inadequate learning atmosphere, a high teacher-student ratio, an

emphasis excessive in the matter in detriment of the development of the personality, rigid educational policies and practices, and an urban-based curriculum (Ahmad and Rao, 2013). As they have been identified, external school factors include low socioeconomic extraction of children, child malnutrition and socio-cultural problems associated with female education (Iravani, 2011).

Punjab Education System				
Official age	Grade	Formal Education		Non-Formal
		Exams		
16	12	HSSC	Higher Secondary Level	
15	11	HSSC	Two Streams: Academic or Technical	
14	10	SSC	Secondary Level	
13	9	SSC	Two Streams: Arts or Sciences	Formal TVET
12	8	PEC	Middle Level	
11	7			
10	6			
9	5	PEC		PNFEP Ages 4 to 15
8	4			
7	3		Primary Education	TSKL Ages 4 to 15
6	2			
5	1			
4			Katchi (pre-school)	Katchi Katchi

Source: Punjab Education Sector Plan 2019/20 -2023/24

The Literacy & Non-Formal Basic Education (L&NFBE) Department has the following structure:

The Department has three kinds of literacy interventions:

- Kachi, Grade 1 - 3
- Kachi, Grade 1 to 5
- Adult Literacy Centers

These schools are all cohort-based, run by single teachers, often in rooms and courtyards in their own houses. The schools have 55% girls and 45% boys, and 90% of their teachers are female. Once students complete Grade 5, they take the Punjab Examination Commission Grade 5 exam, required for students in formal schools to transition from primary to middle. Upon passing the exam, these children are eligible to enroll into middle school. Last year, over 12,000 non-formal students

participated in these exams, with a 96% pass rate. However, girls find it difficult to join middle and secondary schools because of distance constraints. The Department is therefore upgrading primary Non Formal Basic Education (NFBE) schools to provide continued access to girls, and providing them the option of taking the Grade 10 exam through the Allama Iqbal Open University. The Department recently carried out a needs-assessment of all its teachers to inform teacher support and trainings, which are delivered through a cluster-based training model. The Department deploys learning managers and program managers to support and oversee the operation of the centers.

A key challenge facing the L&NFBED is the project-based financing mode through which its schools are funded. Therefore, if a certain number of schools is approved for financing, the Department does not have the flexibility to set up additional schools, even if there is a critical need. The effectiveness of these programmes has been compromised because they did not get integrated into the national strategy (Gujjar, et al., 2010). For girls and women, one of the major initiatives was the "education for all" program as a part of the Social Action Program, strategy and as a part of the the National Action Plan and Education Sector Reforms. The aim was to focus on education of girls and significant resources were allocated for this purpose. As a result there has been an improvement in the gender equality in education system. This program was initiates as per the agenda of the National Action Plan in 2000 (Ahmad, 2014). It reflected the aspiration of leaders and the nation's combined effort to fight the evil of illiteracy and ensure that girls are able to access primary education throughout the country. The aim was to ensure that there was 100% participation in basic education by the end of 2015. However, due to political problems, this program failed to achieve its objectives (Iqbal and Ahmad, 2010).

4.4. Status of School Enrollment and Literacy in Punjab

Literacy rate in general terms is referred to as the population or the number of people who can read and write. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), the literacy rate is measured as the ability of people to write and read their names, which becomes one of the weakest indicator of education, both formal and informal (UNESCO, 2019).

Primary schools lies at the foundation of the educational system. The process of literacy starts from the primary school as formal education, which are the cornerstone of the education. The more there is an enrollment in the primary education, the more the children, the higher the literacy rates. Further, there would also be projected probabilistic children taking part in the higher studies.

Education is fundamental and constitutional human right. The literacy is a basic tool and the first step of progress. Illiteracy leads to a vicious cycle among people. That is, the illiterate people are poor, and the poor people are powerless and these powerless people are illiterate (Shami& Hussain, 2006).

Overall literacy rate in Pakistan is 60 % (i.e. 71 % for males, 49% for females). Literacy rate in urban areas is 74% which is higher than rural areas (51%). Whereas, in Punjab, the overall literacy rate 64 % (i.e. 73% for males, 57% for females. If we distinct between rural and urban literacy, the following table shows a big difference in urban and rural literacy rate in Punjab.

Literacy Rate in Percentage for age 10 years and above			
	2018-2019		
	Male	Female	Total
Punjab			
Overall	73	57	64
Rural	67	47	57
Urban	82	73	77
Source: Pakistan Social and Living Standards Measurement (PSLM) Survey,2018-19, Pakistan Bureau of Statistics			

Access to education is normally measured with enrolment rates, based on age group. The Net Enrolment Rates (NER) at primary education level is the number of students at the age of 6-10 years who are enrolled in the primary school for that level of education. Historically, In Pakistan, the rates of enrolment are calculated for the age group 5-9 years for primary and 10-14 years for secondary levels. In year 2011, 36 percent (about 10 million) children 5-9-year age were found out of school according to PSLM survey (PSLM, 2011). Whereas, the following table shows current NER and interestingly gender equality in NER in Punjab.

Net Enrollment Rate at primary level in Percentage			
Punjab	2018-2019		
	Male	Female	Total
	73	73	73
Source: Pakistan Social and Living Standards Measurement (PSLM) Survey, 2018-19, Pakistan Bureau of Statistics			

Youth and adult illiteracy is the consequence of defective education systems of the past. When people come out having insufficient basic skills of reading, writing and numeracy after many school years, they have to face a lifetime of disadvantage. They have damaged self esteem due to illiteracy and cannot improve their social and economic status. Resultantly illiterate people become the hurdle in societal growth. Society suffers from loss of higher productivity, collective prosperity and even mature political participation. Much has been achieved through the scaling up of literacy initiatives since 2000. Far more has to be done to accelerate progress.

4.5. Disparities in Education

Punjab's education system suffers from inherent inequalities. On the one hand, the net enrollment rate is 73%. Which shows a big portion of children out of school, whether due to lack of access to school, poverty, lack of teachers, gender bias or lack of access to schooling. Lack of teacher training. Even for children enrolled in school, access to quality education for the rural population remains limited (Ali, 2011).

Disparities in educational provision can be observed between different levels of income, between rural and urban and gender. The disparities between rural and urban areas are blatant: 77% of city-dwellers have attended school, compared to only 57% of rural dwellers. Economic factors remain crucial, especially with regard to access to quality education.

4.5.1. Rural Urban Disparity

Punjab has been affected by imbalances in its rural and urban education setups. Basic primary education is dominated by private institutes in urban areas where poverty is considerably lesser but, rural areas and farming population rely on government institutions for education. Rate of literacy among farmers in Punjab is low and they rely on support from the official platforms (Badar et al. 2007). This shows that literacy and poverty have an inverse impact on each other. Children doing labor work and poverty play a pivotal role in students' drop out from schools in Pakistan (Ahmad et. al 2014). Educating children via primary, middle or high schools for girls and boys is pivotal for reducing poverty of rural workers in Punjab.

The existence of parallel educational pathways in Punjab, with a public sector offering subsidized education leading to a local qualification and a private sector, providing expensive education and offering an international level qualification, is another obstacle to the standardization of the quality of education (Nadeem, et al., 2011). These disparities, fed by differences in the language of instruction (Urdu for the lower strata of society, English for the better-off classes), further accentuate the divisions. Later, these differences are reflected in professional life and further cement class divisions, which eventually lead to conflict (Gujjar, et al., 2010).

In Pakistan, higher education has experienced a recent upsurge with the establishment of a Commission on Higher Education. Low educational standards, low enrollment, lack of funding and relevance to research mean that higher education contributes very little to national development. Universities are controlled by the commission, while university colleges depend on provincial governments (Barber, 2010).

Private education has become an important player in the Pakistani educational scene. This particular context appears in the data available for 2007-2008. It represents 30% of the total number of institutions, 44% of teachers working in the country and 34% of the total number of registrations. It is not easy to assess the quality of private education compared to the public (Chohan and Qadir, 2013). Private schools have a positive outlook, but there are also very good public schools. In the future, the introduction of private sector regulation will equalize the conditions of competition between sectors. Pakistan's private sector growth offers a way to address the challenges of unequal access to school, gender disparities and access to quality education in an adverse economic environment (Razzaq and Forde, 2014). The private schooling is increasing in Punjab, specially at the primary and secondary level. These schools are urban elite phenomenon. Because they are not available in rural counties and also not affordable by poor groups and even to middle class. So, the urban-rural gap remained high.

4.5.2. Income Disparity

The very unfortunate disparity in education system is the income disparity. It prevails in both urban and rural areas. Urban areas are comprised of both higher income, middle and lower class. The public educational institutions are open for all. But, the standards of education in public institutions are not so good. Therefore people have to depend upon private institutes for better education. These private institutions are further having different classes. There are some chains of quality education but these institutions are not affordable by middle or poor class. The middle class then move to the private institutions of lesser quality. And poor class and a portion of lower middle class just seek education in urban public educational institutions.

Income disparities exist not only in urban system but also in rural system. Since, there are only small public educational institutions only in big villages, and there is usually no existence of private schools. Therefore, the big land owner having good financial position send their children to the best private schools in nearby city by their own cars and private drivers. The middle class and a segment of small farmer have to depend upon any public school nearby. And finally a big part of small poor farmers are unable to educate their children.

4.5.3. Gender Disparity

There seems less gender disparity in urban Punjab. Mostly urban woman is considered as comparatively free and more likely to get education and to do a job. In urban areas, women in modern time is seen working in different public and private institutions including, education department, Banks, shopping malls, police and civil services, telecommunication and industry. The ratio between male and female is still not equitable but the participation of women in labour force is encouraging.

Women in rural Punjab mostly work side by side with men in agriculture sector. Their services are a kind of free help which they provide to males of their family. This is the only opportunity for them in rural areas. Gender discrimination practices exist in Punjabi society. Females experience discrimination within the household in food distribution, education and healthcare. This is also evident from the gender disaggregated statistics, where female literacy is 57% as compared to the 73% for the men. With gender inequalities (boys are more educated than girls), poverty plays a key role in the problems of access to education, but this situation is changing (Farooq, 2013).

Literacy rate is different for males and females. The overall literacy rate for males is high, contrary to the induction into higher education; which is higher for females. Though, the prevalence of females for the higher education is decreasing due to numerous girl dropouts, according to survey conducted by Government of Pakistan (Ahmad and Rao, 2013). On the contrary, in visual learning, the enrollment of females is higher at university level in urban and rural areas (Afzal, et al., 2012).

Although global adult literacy rates in Pakistan are low, as more than half of the population is illiterate, significant progress has been made over the past two decades, especially in rural areas, where literacy rates have been duplicated in the case of women (Ahmad, et al., 2014).

4.6. Importance of Education for Small Farmers

The poverty of the people in the rural areas is a major determinant of less school participation. The problem of poverty is more prevalent in the rural areas of the developing countries as compared to the developed countries. Hence, there are certain steps needed to overcome this problem as it hinders the educational attainment of the people in the rural areas, making them struggle in the important aspects of the life. Moreover, it can also be assessed from the research of Irvin et al. (2012) that the people attending the schools in rural areas with low income tend to have four times less chances of getting the appropriate yearly progress in comparison with the other people in the rural areas with higher income. Therefore, low income groups in rural areas are more vulnerable. A major part of this rural poor consists of small farmers.

GLewwe et al. (2011) has mentioned that the rural areas lack the even the most basic infrastructure that can be used to improve the education. It can also be noted from the study that basic infrastructure in the rural schools such as the furniture, blackboards, building and libraries tend to have great impact on the students and their education. Furthermore, the teacher in the rural areas are also one of the reasons that are impacting the provision of rural education because of their increased absenteeism (Nedungadi, Mulki and Raman, 2018). The teachers in the rural areas do not go to the schools in which they are obligated to teach. It has been identified as the single most critical indicator of quality education in the rural areas, which has also been described through the different literatures on the topic. A study carried out by the World Bank conducted a survey on the education in the rural areas pertaining to the public sector with the help of using unannounced visits in the schools present in the rural areas of the developing countries of the world (Laszlo, 2013). The results of the study revealed shocking results that the absenteeism of the teachers was as high as 27 percent in the schools and even where the teachers were physically present in the premises of the schools, they were not

actively engaged in the teaching activities. However, there are also some studies available that suggest that the present of appropriate infrastructure in the rural schools can also serve to bring the absenteeism of the teachers down to a significant level.

The majority of the farmers, tenants and workers in Punjab are unskilled and uneducated. They are untrained to support up the agricultural efficiency. The significance of education in enhancing individual lives in the rural setting has been contended by (Jamal, 2014) that education encourages the development in country side. Studies on returns of education come usually from urban labour surveys, but there is little information available on how education affects rural incomes. Moreover, the basic education also helps to decrease pressure on agriculture and protect the environment. Rural families having better taught parents and thus less children, less weight on natural assets and environment. Educated individuals can absorb more information and utilize means to ensure the better environment and better oversee the assets (Filmer, 2000).

Tamim, (2013) noted in case of African countries that the realization of agricultural potential in African countries will depend on education, which is a crucial factor. They also wondered if rural farmers could participate in an economy increasingly linked to knowledge and if small farmers could compete in the local and international market, in an increasingly globalized world and in markets where the demand for consumers, food safety and health requirements become rigorous. Inferable from their enhanced basic managing abilities, the educated agriculturists typically incline toward riskier production techniques advances that have expected higher returns since they can evaluate the risks and opportunities (Knight et al., 2003; Asadullah and Rahman, 2009; Reimers and Klasen, 2013). As the level of education of farmer rises it leads to a reduction in seeking economic support by the state (Fielke & Bardsley, 2014).

The integration of various sources and learning forms comes to the forefront as a key aspect in surviving, adapting, developing and prospering in modern agriculture. Knowledge from the various sources can be complementary and when optimally combined creates sustainable solutions (Ingram, 2008; Fonte, 2008; Lyon et al; 2011, Lehébel-Péron et al, 2016). The inverse relationship between education and

poverty has been recognized. There is also a debate related to various educational levels; Like, primary, secondary or higher and which level have to be focused simultaneously. But unfortunately, there is no debate on the education of farmer or its role in eradicating agricultural poverty especially in Pakistan there is no prior study on this issue. Secondly, no attention has been paid to the informal education, training or any awareness campaign for farmers in Pakistan. The new educated generation is not willing to work in farms. And formal education may help far future farmers to some extent but the current farmers along with formal education also need informal education.

Similar is the case of Punjab where, unfortunately, lack of effective policies and low funding have resulted in very poor education system, low literacy rate, low educational attainment and outcomes, and low enrolment rates. The political instability that characterized the first years of life of that nation hindered the efforts to crystallize these reforms. In the long term, education in a rural setting should be focused on making rural people responsible for their participation in the following elements of rural development:

4.6.1. Employment and Income Opportunities

Education make rural community to develop understanding of the job market and income generation. Further, by improvement in quality of education can significantly develop the employment opportunities. The educated rural population may search jobs suitable to their knowledge and skills outside the agriculture. Which will reduce burden on the farms. Extra labour from the agriculture will move towards other sectors and raise level of income of the family. This may bring a decrease in agricultural poverty among small farmers by increasing level of living standard, eliminating debt burden and purchasing farm machinery and technology. Studies have shown that the availability of skilled labour, transportation infrastructure, and local markets are prime factors in selecting a community for an industrial placement. Therefore, presence of educated and skilled labour may also attract attention of the investors to invest in that area where these rural residents may find employment opportunities.

4.6.2. Increase in Agricultural Productivity

Education creates understanding of various daily life matters. Education creates awareness in individual and in an overall society. Agriculture itself is a science, and education has changed traditional structure of agriculture in advance countries. Unfortunately, In rural Punjab, the farmers, especially small farmers are still following traditional patterns of farming. Therefore, education can improve the understanding of these small farmers about new technologies, new varieties of seeds, modern patterns of cropping, increasing fertility of the soil and irrigation etc. In this way the overall agricultural productivity may increase.

4.6.3. Increase in Labour Productivity

Talking about rural labour force, a majority of which is directly or indirectly employed in agriculture, education may improve their productivity. The small farmers who directly work in their farms as labour or family labour, education can improve labour productivity in them. Through education an understanding of the modern farming may develop in these farm labour which motivate them to adapt new technology and modern farming. Education brings awareness among individuals which may help the small farmers to optimally utilize their abilities. A farmer having awareness about health hazards, safety measure, food and hygiene can protect himself and his family from various diseases, leading to good health. In this way overall productivity of the labour may increase which will lead to increase in the wealth of a region or area.

4.6.4. Education Develops Leadership

With education, individuals gain knowledge, confidence, experience and skills, — all the factors which increases abilities of individual to efficiently and effectively lead a group of similar people towards success. The education also helps to identify and produce the leaders in societies who play their role in quality education, reducing poverty and leading towards a strong and successful community. The education of the farmer can benefit himself and also allow him to lead other farmers towards betterment. In short, an educated and well aware farmer may lead whole society towards development.

4.6.5. Knowledge about Product Market

A big reason of poverty among rural areas is the absence of knowledge about product market. The small farmers are usually exploited by the big landlords or middle man who purchase their product cheaper and sell it in markets at higher prices. Due to deficiency of knowledge about the market prices, the small farmers cannot get just price of their product. Therefore, the small farmers get lesser revenue, which decrease their capacity to invest in next crop. They need either loans for investment in next crop or let their crops to grow inferior in quality or insufficient in quantity. Which leads to agricultural poverty. Therefore, education can create awareness in small farmers to understand market prices and negotiate with middle man or big landlords to get a just price for their product.

4.6.6. Credit and Finance

Farmers, especially the small farmers usually need credit for investment in next crops. Small farmers being uneducated are reluctant to go to formal institutions of the agriculture finance because they are unable to understand complicated procedures and documentation of the formal institutions. Therefore, they find it easy to use informal sources of credit for which, they have to pay heavy interest rate and have to face hard terms and conditions. If these farmers are provided with adequate education they may use formal channels of credit and finance. In this way they may save themselves from higher interest rates and hard terms and conditions.

Therefore, education has an important role in overall rural development. It is a basic factor in development of people in rural area, the society, and also the land itself. Education leads to a bright future of rural societies.

4.7. Hurdles in Schooling of Small Farmers

There might exist several obstacles in the way of schooling of the small farmers. The literature shows various obstacle in the way of education. But there is no literature on the specific topic which is related to the education of small farmers. According to the collected data of 250 respondents, the small farmers face the following main hurdles in the way to education. The respondents were offered to choose more than 1 options if they want.

4.7.1. Unavailability of School Nearby

During the survey, 188 respondents mentioned the unavailability of school in the vicinity as a hurdle in their way or in the way of their children to get education. If school is not available in the vicinity, the villagers have to go to other nearby towns or cities for schooling which is not easy for small farmers. Whereas, only 62 respondents reported that unavailability of school in the vicinity is not a big problem for them.

Unavailability of school	Yes	No
Number of respondents	188	62
Total	250	
Source: Author's own contribution		

4.7.2. Financial Constraints

The hurdle most selected by the small farmer was financial constraints. Since, small farmers living in poverty cannot afford to get education or to educate their children. 201 out of 250 small farmers reported financial constraint in the way of their education. Even the respondents having a public school in the village reported that they cannot afford even this subsidized education while they have to bear costs of books, notebooks and stationary, uniform etc. themselves. And those who do not have public schools in their village, cannot afford to send their children daily to other towns or cities.

Financial constraints	Yes	No
Number of respondents	201	49

Total	250
Source: Author's own contribution	

4.7.3. Unwillingness

Traditional and old fashioned villagers were unwilling to get education or to educate their children, especially girls. But surprisingly contrary to the anticipation, only 35 small farmers selected the option of unwillingness to get education or to educate their children. This is a change in state of mind of the poor villagers. Either majority of small farmers now realize the importance of education or they want to educate their children in order to cope with poverty.

Unwillingness	Yes	No
Number of respondents	35	215
Total	250	
Source: Author's own contribution		

4.7.4. Transportation Problem

A large number of respondents (166) reported transportation problem as a hurdle in the way of education. Since, most of the villages lack basic infrastructure like paved roads and streets. And there is no existence of public transport in the villages. The public transport is available only in few cities only in urban areas. Therefore, in case of villages, the villagers must use private means of transportation or their own vehicle. Since, most of the small farmer do not have their own vehicle and private

transportation is expensive. In this way, transportation is a big problem in the way of small farmer and education.

Problem of transport	Yes	No
Number of respondents	166	84
Total	250	
Source: Author's own contribution		

4.7.5. Insecurity

The traditional villager was insecure while sending their children for education especially in case of girls. But again surprisingly and contrary to anticipation only 27 respondents out of 250 reported the problem of insecurity. In this case, either the importance of education have taken over the sense of insecurity or due to social connectivity these small farmers feel safe while sending their children to school. There might be some cases who are still insecure in sending their females to schools.

Insecurity	Yes	No
Number of respondents	27	223
Total	250	
Source: Author's own contribution		

4.7.6. Lack of Teachers/Adequate Facilities

This is quite unfortunate that in this modern period, most of the schools in rural area lacks basic infrastructure like class rooms, electricity, chairs and even toilets. In these schools children sit on grounds in open air. The availability of teachers is also unfortunate. Usually teachers are not willing to serve in rural schools. There is always a deficiency of teachers. Also, due to lack of supervision teachers are often absent from the schools. They only appears in papers and take monthly remuneration. About half of the respondents opted the constraint of lack of teachers and facilities in the nearby school which is quite understandable.

Lack of teachers/Adequate facilities	Yes	No
Number of respondents	126	124
Total	250	
Source: Author's own contribution		

Concluding the situation, Most of the farmers reported financial and conveyance problems. Because of long distance to school, they cannot drive their children to and from the school on bicycle. Motorbike and cars are unaffordable for them. Even they are unable to afford means of transportation like vans (if available), Since, public transport facilities are not present in the villages. So, conveyance and financial problems appears to be major hurdles in the schooling of the children or siblings of the small farmers.

The place where the educational institutions are placed also have a great impact on the participation of the rural people in the educational activities. The importance of the location of the schools in the rural areas hold significant importance due to which it has been the topic of debate among the researchers. The study of Laszlo (2013) has indicated that the infrastructure of the school cannot be deemed to

provide any help if the school is located at a place where it is difficult for the rural population to reach which may be due to the lack of availability of roads or because of the increased distance. The report put forward by CIDA (2013) has also reported that the geographic location of the schools as well as the travelling conditions also tend to significantly affect the participation of rural people in the education system. The distance of the schools from the rural areas is of considerable importance due to which it must be ensured by the government that the educational institutions must be built in the places that are not present in the areas where the rural people cannot have free access to them. The research of Swain, Rodriguez and Springer (2019) can be used in support of the claim that poverty leads to less school participation as it has mentioned that the youth with low income families in the rural areas tend to have low aspirations of education which makes them significantly less likely to complete college education as compared to their urban counterparts. There are both internal factors and external factors (Ahmad and Rao, 2013) that hinder the overall participation of the children in education. There are various factors that could restrict the education and these include internal factors and external factors. The internal factors include the collective society behavior, whereas the external factors can include distant schools, lack of infrastructure, lack of trained teachers, and inadequate learning environment (Ahmad and Rao, 2013). The overall income of a family or household is also an important factor that could affect the education (Shah, 2010). For example, if the parents of the to be students are rich, or they have sufficient money above their basic needs, they are more likely to send their children to the schools as compared to the parents who could only contain to the basic living needs with their overall income.

There are various factors that are hindering the process of getting education. These problems are interwoven in a complex environment and many of these factors are interlinked. For example, the increase in income can increase the literacy rate in a farmer's family, and on the contrary, increased education can result in increased income (Darling & Cassidy, 2014). These reflect the two different banks of the river that can never meet. There is a need to resolve these complex issues. Long distances are one of the main problems. The farmers in the rural areas may not have access to transportation or there may not be appropriate roads and infrastructure as compared to the urban areas (World Bank & IMF, 2013). Above financial costs,

long-distances to schools and lack of conveyance has always been a problem for farmers in Punjab. For access by low-income farmers, transportation is an issue and, transport has been a problem for rural, farming population in Punjab.

4.8. Role of Agriculture Extension Department

The agriculture extension department in Punjab may play an important role in training the small farmers. The basic function of the agriculture extension department is to provide advisory services to the farmers. Extension is actually an informal way of educating the rural community through advising and providing solution to the agriculture related problems. The aim is to increase efficiency and productivity in family farms. Hence, over all living standard of the farmer.

The agriculture extension department is existing in Punjab but unfortunately, the department is very limited and having very weak structure. The extension services programs use conventional, top-down philosophy which do not consider diversified ground problems and farmers' needs in the period of rapid marketization. Small farmers are the most disadvantaged and vulnerable in Punjab, as they tend to be poor, illiterate, lacking in basic farm implements, and heavily dependent on purchased extension services and inputs. In some instances, if extension services are available, the small farmers find them useless as the services are devised without the due consideration of the farmers and specific conditions. So, farmers do not even bother accept these extension services (Siddiqui and Mirani, 2012).

The low use extension services is not only due to the farmers' unwillingness, but also due to other factors which include poor service delivery mechanisms, a lack of adequate personnel and a shortage of the required equipment, arrogant and untrained extension officials, lack of transportation, untrained extension workers (if few professional and trained ones), with low morale and required resources (Baloch and Thapa, 2019).

The only so called extension services (Training and Visits), if made available, are not enough for small farmers to get out of agricultural poverty because small farmers lack basic agriculture inputs and farm machinery, hence, involved in traditional methods. Targeting the right and relevant clientele is the key to success of any extension approach. Overwhelming majority of country's farmers are

smallholders but evidence indicates that in both public and private sectors target large and medium scale farmers and they seldom reach small and resource poor farmers. Consequently, the small farmers mostly depend on private companies for agricultural information who may not be well informed and are inclined towards the promotion of their own business. Similarly we find a gendered information gap among farming community. Evidence also indicates that there is no significant improvement in extension services after decentralization rather in some cases decentralization has added complexity in the situation. District extension offices are under the administrative control of District Coordination Officers who sometimes use extension field staff in irrelevant tasks. Absence of local governments has further aggravated the issue (Shahbaz and Ata, 2014).

4.9. Role of Small Farmer's Education in Determining

Agricultural Poverty (The Binary Logistic Regression

Analysis)

Agricultural poverty is considered as the threat that is undeniable for the existence of the humanity, specifically for the small farmer in Punjab. Education is considered as the main key that promotes the social, political as well as economic development. The role of farmer education is considered as indispensable as it fosters creativity, productivity as well understanding of the situation in advanced manner. Education is considered as the base that helps in removing the poverty as it helps to foster the economic development in the country. It is considered as the ground work on which a large amount of social as well as economic well-being is built.

Education is considered as the main tool that can enhance the economic efficiency along with the social consistency. This can take place by enhancing the efficiency and value of the farmers by which the poor is consequently raised from the agricultural poverty. Education enhances the productivity among the farmers as well as the flexibility of the farmers which ensures that the competitiveness in the country. Education is also considered as the main factor that helps in eradication of the poverty by several means by fostering social consistency and economic efficiency at the same time. The value of labor force in the country is enhanced by

the education. By interpreting in negatively, it is analyzed that the cycle of poverty is perpetuated by the education (Saqib, et al. 2018). The productivity of the workers is enhanced by the productivity of the workers through using the knowledge of technology and health.

Agriculture is affected by many factors and education of the farmers is one of them. Along with education of farmer himself, the education of his family may also be a point of focus as, it creates an environment of awareness and understanding with in the family. Education may help small farmers to increase their productivity that is considered to be important for getting rid of agricultural poverty. Due to the less education in the farmers they are still using the conventional farming practices due to which they are not able to enhance their productivity which is a reason for their agricultural poverty. By incorporating the modern methods of farming, the farmers are able to enhance their productivity. Due to the lack of education the farmers are not aware of the modern post-harvest technologies which also slows down the process of the farming (Lalani, et al. 2016). By using the modern technologies of farming, it is easy for the farmers to enhance the productivity and profits which serves to decrease the poverty among them. Along with education of the small farmer, the practical knowledge and awareness about agriculture and farming is also important. As, the farming involves direct efforts of the farmers. The role of agriculture extension department is worthy in providing knowledge and guidelines to the farmer.

Television and Newspapers are also considered as a useful mediums to reach the masses not only in the urban areas, but rural areas also. Awareness about the education among the farmers is very low and television and newspapers can play a great role in that. On the other hand, hand Media and social media may also play important role in providing knowledge and information to the farmers.

The following table shows the results of the binary logistic regression analysis carried out to analyse the impact of various education and information related variable on the agricultural poverty among small farmers in Punjab.

4.9.1. Hypothesis of the variables included in the model

Independent Variable	Hypothesis	
Literacy of the farmer (LF)	Null hypothesis H^0	There is no statistically significant relationship between LF and Agricultural poverty (AP)
	Alternate hypothesis H^A	There is a statistically significant relationship between LF and Agricultural poverty (AP)
Formal education of farmer (FEF)	Null hypothesis H^0	There is no statistically significant relationship between FEF and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between FEF and AP
Technical education or training of farmer (TETF)	Null hypothesis H^0	There is no statistically significant relationship between TETF and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between TETF and AP
Education of Female household (EFH)	Null hypothesis H^0	There is no statistically significant relationship between EFH and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between EFH and AP
Availability of school (AS)	Null hypothesis H^0	There is no statistically significant relationship between AS and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between AS and AP
Distance to school (DS)	Null hypothesis H^0	There is no statistically significant relationship between DS and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between DS and AP
Education of children (EC)	Null hypothesis H^0	There is no statistically significant relationship between EC and AP
	Alternate hypothesis H^A	There is a statistically significant relationship between EC and AP

Extension services availability (ESA)	Null hypothesis H°	There is no statistically significant relationship between ESA and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between ESA and AP
Visit of Extension service representative (VESR)	Null hypothesis H°	There is no statistically significant relationship between VESR and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between VESR and AP
Number of literate family members (NLFM)	Null hypothesis H°	There is no statistically significant relationship between NLFM and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between NLFM and AP
Use of social media (USM)	Null hypothesis H°	There is no statistically significant relationship between USM and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between USM and AP
Use of formal media (UFM)	Null hypothesis H°	There is no statistically significant relationship between UFM and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between UFM and AP

4.9.2. Hosmer and Lameshow test (Test of Goodness of Fit)

Hosmer and lameshow test uses non significance as an indicator of goodness of fit. Which means that the significance value must be greater than 0.05 in order to consider the model as good fit. In current model the sig. value is 0.689 which shows that the model is good fit.

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	5.628	8	.689

4.9.3. Variance Inflation Factor (Test of Multicollinearity)

Variance inflation factor (VIF) test is a measure of severity of collinearity in regression which shows variance of regression coefficient as a result of collinearity. There is no multicollinearity between the variables in this model because Variance inflation factor for all variables is less than 5 and tolerance is greater than 0.2.

Collinearity Statistics		
Variables	Tolerance	VIF
Literacy of the farmer (LF)	.735	1.361
Formal education of farmer (FEF)	.542	1.847
Technical education or training of farmer (TETF)	.823	1.214
Education of Female household (EFH)	.605	1.653
Availability of school (AS)	.539	1.856
Distance to school (DS)	.387	2.584
Education of children (EC)	.575	1.740
Extension services availability (ESA)	.597	1.676
Visit of Extension service representative (VESR)	.514	1.946
Number of literate family members (NLFM)	.273	3.664
Use of social media (USM)	.408	2.448
Use of formal media (UFM)	.409	2.447

4.9.4. The binary logistic regression analysis

Dependent Variable = Agricultural poverty (AP)

Independent Variables	Coefficient		Wald	Df	Sig.	Exp(β)
	B	Std. Error				
Literacy of the farmer (LF)	-1.299	.786	2.734	1	.098*	.273
Formal education of farmer (FEF)	-.335	.768	.190	1	.663	.715
Technical education or training of farmer (TETF)	-1.551	.765	4.112	1	.043**	.212
Education of Female household (EFH)	-1.027	.761	1.824	1	.177	.358
Availability of school (AS)	-.896	.755	1.407	1	.236	.408
Distance to school (DS)	.681	.300	5.143	1	.023**	1.976
Education of children (EC)	-.917	.745	1.515	1	.218	.400
Extension services availability (ESA)	-.860	.858	1.005	1	.316	.423
Visit of Extension service representative (VESR)	-1.683	.777	4.698	1	.030**	.186
Number of literate family members (NLFM)	-.540	.271	3.958	1	.047**	.583
Use of social media (USM)	-.823	.914	.811	1	.368	.439
Use of formal media (UFM)	-.855	.789	1.176	1	.278	.425
Constant	4.136	1.341	9.507	1	.002	62.561
***, **, * indicates significant at 1%, 5% and 10% respectively.						

The results of the analysis, interpretation and discussion of the above analysis is presented below. All variables and their role in determining agricultural poverty among small farmers are discussed one by one.

4.9.4.1. Literacy of the Farmer (LF)

Literacy is an art of reading and writing. The importance of literacy remained obvious not only in present but also in past. The ability to read and write is important for all segments of society. Coming to the current subject question was asked to the small farmers about their ability to read and write. The answer had two options “Yes” or “No”. The following cross table shows the correlation between agricultural poverty and literacy of the farmer. According to the data, 79 out of 122 small farmers facing agricultural poverty are unable to read and write. Whereas, majority (101 out of 128) of the small farmers who are out of agricultural poverty are able to read and write.

		Literacy of the farmer (LF)		Total
		No	Yes	
Agricultural Poverty	No	27	101	128
	Yes	79	43	122
Total		106	144	250

The results of the logistic regression analysis of data shows that the literacy of the farmer is inversely related to agricultural poverty among small farmers. The result is significant at 10 percent level of significance, therefore, null hypothesis is rejected and alternate hypothesis is accepted. The results revealed that the probability of occurrence of agricultural poverty decreases if farmer is able to read and write. This result is in line with (Agwu, 2013). Acquisition of fundamental literacy makes farmers’ understanding of the language and content on different

information channels. Acquisition of basic literacy skill is needed by farmers to be able to read and understand instructions on farm input utilization; sign vital documents and keep simple records and other farm transactions.

These findings are significant to the study because the educational benefits of farmer literacy education are what is needed to empower rural farmers to increase their farm production, improve their income generating capacities, raise their living standards and in the long run reduce poverty and hunger. The findings also indicated that farmer literacy offers rural farmers a second chance, having missed the opportunity or were denied access to mainstream formal education.

4.9.4.2. Formal Education of the farmer (FEF)

The question was asked to the respondent about the schooling, whether he/she has attended any school for formal education. The answer was categorized in two distinct options “Yes or “No”. The cross tabulation shows that majority of the small farmers out of agricultural poverty have attended school. Contrary to this, a large number (100 out of 122) of the respondents stuck in agricultural poverty have not attended any school.

		Formal education of the farmer (FEF)		Total
		No	Yes	
Agricultural Poverty	No	27	101	128
	Yes	100	22	122
Total		127	123	250

According to the results of the logistic regression, the attainment of education of the farmer is inversely related to agricultural poverty. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is

rejected. Formal education may provide farmer an ability to derive modern scientific agricultural knowledge and technologies that enables small farmers to intensify and diversity their production systems for increased farm production and income generation.

4.9.4.3. Technical Education or training of the farmer (TETF)

Technical education or training of the small farmer is an important variable. Agriculture is a field where technical knowledge is more important than literary knowledge. Since, farmer has to perform practically in the farms. When the case comes to small farmer, the importance of technical training increases further because small farmer usually lack farm mechanization, technology and finance. Therefore, the question was asked to the respondent about any training course or technical education they have ever attended. The answer was categorized in two distinct categories “Yes” or “No”.

The following table shows the distribution of the respondents according to the technical education or training program. According to the data majority (90 out of 128) respondents out of agricultural poverty have attended any technical education or training at least once in their life. Contrary to this majority (88 out of 122) respondents trapped in agricultural poverty have not attended any technical education or training session in whole life.

		Training/Technical education		Total
		No	Yes	
Agricultural Poverty	No	38	90	128
	Yes	88	34	122
Total		126	124	250

Upon conducting logistic analysis of data it was confirmed that the chances of occurrence of agricultural poverty among small farmer decreases if the small farmer have attended any training or technical education regarding agriculture. The result is significant at 5 percent level of significance, therefore, null hypothesis is rejected and alternate hypothesis is accepted. Hence, the probability of the farmer to have agricultural poverty decreases if the farmer has gained relevant technical and practical knowledge. Interestingly, the results of the logistic regression shows significant results for technical education/training than that of formal education. As the central focus of Farmer Training exposes farmers to the acquisition of skills and modern agricultural and occupational competences. These elements develop the capacity to locate and use agricultural information. The training and technical education enable rural farmers to acquire new techniques and develop new attitudes. The results are similar as (Davis et al. 2012) which confirmed the positive effects of farmer's field school on farm productivity.

The acquisition of knowledge and competences needed for initial farm – gate processing of produce, including the application of modern storage and preservation methods bring about higher producer prices and enhance farm incomes and product availability all year round. The improved ability of the small farmer may help to make better decisions and choices about combinations of inputs to obtain maximum output, which may ultimately decrease the chances of occurrence of agricultural poverty.

4.9.4.4. Education of Female Household (EFH)

Talking about the case of small farmers, the concept of family farming is common. Mostly, the female members of the family also directly take part in farming activity. A question was asked by the researcher to the respondent regarding the literacy of female household. 99 out of 122 respondents facing agricultural poverty reported that the female of their household are illiterate. On the other hand, majority (91 out of 128) female household members of the small farmers out of agricultural poverty were literate.

		Education of Female household (EFH)		Total
		No	Yes	
Agricultural Poverty	No	37	91	128
	Yes	99	23	122
Total		126	124	250

The results of the logistic regression reveals that the education of the female household is inversely related to agricultural poverty among small farmers. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. The chances of occurrence of the agricultural poverty may decrease if the female household is educated. If the female is actively taking part in agricultural activities, then she may participate in understanding agriculture related problems and decision making. On the other hand, if she is not taking active part, then she is looking after and managing house activities. An educated woman can better take care of the food and health of the family.

4.9.4.5. Education of Children (EC)

The question was asked to the respondent whether any of his/her children are getting education or have already completed their education. The answer was categorized in two options “Yes” or “No”. The following cross tabulation shows that the majority of small farmers out of agricultural poverty have reported that their children are getting education. Whereas, bulk of the small farmers facing agricultural poverty reported that their children are out of school.

		Education of children (EC)		Total
		No	Yes	
Agricultural Poverty	No	24	104	128
	Yes	87	35	122
Total		111	139	250

The results proved that, if children of a small farmer are getting education or are already educated, the probability of incidence of agricultural poverty decreases. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. Education of children may play role to some extent in transmission of specific information as well as the formation of general skills and proficiencies. Education also produces non-cognitive changes in attitudes, beliefs and habits.

4.9.4.6. Number of Literate Members (NLFM)

Education of the small farmer, his children and female household has been proved having relationship with agricultural poverty. Another variable was added to check the effect of number of literate members in a household on the agricultural poverty. The question was asked to the respondent about the number of learners in his family. The following table shows an increasing trend in number of literate members in household of the small farmer out of agricultural poverty. Whereas, a decreasing trend in number of literate family members can be observed in case of small farmer having agricultural poverty.

		Number of literate family members (NLFM)							Total
		0	1	2	3	4	5	6	
Agricultural Poverty	No	3	9	9	24	42	33	8	128
	Yes	76	22	16	7	1	0	0	122
Total		79	31	25	31	43	33	8	250

As expected, the results of the logistic regression shows that greater the number of educated people in the household, lesser will be the chances of occurrence of agricultural poverty. The result is significant at 5 percent level of significance, therefore, null hypothesis is rejected and alternate hypothesis is accepted. which once again confirms the importance of education for the small farmer to avoid agricultural poverty. According to results, with each unit increase in educated member of the family the chances of incidence of agricultural poverty decreases. Increasing literacy and numeracy may help farmers to acquire and understand information and to calculate appropriate input quantities in a modernizing or rapidly changing environment. Improved attitudes, beliefs and habits may lead to greater willingness to accept risk, adopt innovations, save for investment and generally to embrace productive practices (Appleton and Balihuta 1996).

4.9.4.7. Availability of School (AS)

The education of farmer or his children along with other factors, depends upon availability of school in the vicinity. Question was asked about the availability of school in the vicinity. The provided answers had two options “Yes” or “No”. The data shows that the school was available in the vicinity of the 105 out of 128 small farmers out of agricultural poverty. And 98 out of 122 small farmers facing agricultural poverty reported that the school is not available in their vicinity.

		Availability of school (AS)		Total
		No	Yes	
Agricultural Poverty	No	23	105	128
	Yes	98	24	122
Total		121	129	250

According to results of the logistic regression, the probability of the occurrence of agricultural poverty among small farmers decreases if a school is available with in the village. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. Availability of school may become a motivation for the villagers to get education, or to educate their children. Since, mostly public schools exists in some villages, therefore they might be affordable for the small farmers. If, elder segment cannot utilize the facility, they may have positive externalities. Hence, an overall level of knowledge increases in the village. Unfortunately, School is not available in all rural settings of Punjab, and a bulk of rural population do not have access to education. And again, small farmers cannot afford to send their children daily to other towns or cities. Therefore, situation remains the same.

4.9.4.8. Distance to School (DS)

The school distance is also an issue and it varies to several kilometers, and in the poor circumstances, it is very difficult for the children of small farmers to go to schools. The overall population demography has also contribution in it because most of the population among farmers are living in the rural areas, and the density of population there is low. If the schools are developed and fullest efforts are made in developing the schools, there are still the chances that the dispersed population

may not have the schools in their neighborhoods (Planning Commission Pakistan, 2013).

Question was asked by the researcher to the respondent regarding the distance of school from their home. The following cross tabulation shows that the range of distance to school is lesser in the case of majority of small farmers out of agricultural poverty. Contrary to this, most of the small farmers stuck in agricultural poverty reported long distance between their residence and school.

		Distance to school (DS)				Total
		1	2	3	4	
Agricultural Poverty	No	105	15	1	7	128
	Yes	11	7	43	61	122
Total		116	22	44	68	250

The results of the logistic regression shows that, as the distance between the school and residence of the small farmer increases, the chances of occurrence of the agricultural poverty also increase. The result is significant at 5 percent level of significance, therefore, null hypothesis is rejected and alternate hypothesis is accepted. which shows the importance of location of the school. Due to large distance between residence and school, the small farmer might not be willing to send their children in distant schools. The cost of schooling also increase with the increase in distance due to transport cost. And in many cases, the transport is totally unavailable. Therefore, a villager is less likely to send his children to school which resultantly cause agricultural poverty especially among small farmer.

4.9.4.9. Extension Service Availability (ESA)

Agricultural extension is the application of scientific research and new knowledge to agricultural practices through farmer education. The field of 'extension' now encompasses a wider range of communication and learning activities organized for rural people by educators from different disciplines, including agriculture, agricultural marketing, health, and business studies. Extension Service Availability is a crucial element in escalating the overall poverty among the farmers. Extension services include human capital-enhancing inputs, flow of information, health and social care facilitations (Anderson & Feder, 2003).

Extension Service may be an alternative to the education in which a small farmer is lacking behind. The agriculture extension department exists in Punjab, but it is not efficient and practical. The department is mostly existing in big cities and areas nearby big cities. The relevant extension service availability could include trainings provided to farmers about various aspects of farming using the agricultural science backed evidences and this can greatly improve the overall output and effectiveness of the farmers. The agriculture extension department exists in Punjab but its services are not available in all areas. Either the extension officers are not present or they are not doing relevant tasks. As mentioned by (Shahbaz and Ata, 2014) that the District extension offices are under the administrative control of District coordination officers who sometimes use extension field staff in irrelevant tasks.

During the survey it was found that majority of small farmers did not know what extension service is. Upon explanation about the extension services by the data collector an image was built in the mind of the small farmer. Then, a question was asked about the availability of extension services in the area. The answer consisted of two options “Yes” or “No”.

The following table shows the correlation between availability of extension service in the region and prevalence of agricultural poverty. 84 out of 128 small farmers out of agricultural poverty reported that extension services are available in the region. Whereas, 99 out of 122 small farmers stuck in agricultural poverty reported that they do not know any such kind of service in the region.

		Extension service availability (ESA)		Total
		No	Yes	
Agricultural Poverty	No	44	84	128
	Yes	99	23	122
Total		143	107	250

Upon logistic regression analysis of the data it was discovered that the existence of extension services in the area had positive effect on the farmers. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. The probability of agricultural poverty among small farmer may decrease if extension services are available in the area.

4.9.4.10. Visit of Extension Service Representative (VESR)

The extension department is meant to visit the farmers and provide them with necessary guidance. The visit of extension service representatives is necessary to understand the nature of the given type of agricultural and its requirement analysis. An expert can understand the desired changes that can be made to the subject area and in this way, with the availability of the research-based support, the overall productivity can be greatly increased. The extension services should be provided the knowledge they have and utilizing their experience (Baloch & Thapa, 2019). In this way, a better care of farming can be done.

The existence of the extension services in the area is not sufficient. But, the field visit of extension officer and their interaction with small farmers is much important. Unfortunately, majority of small farmers have no interaction with the extension officer for and above years. A question was asked about the visit of the extension service representative to the respondent at least once a year. The answer comprised

of two categories “Yes” or “No”. The data shows that 100 out of 128 small farmers out of agricultural poverty stated that the extension services have visited their area at least once a year. On the other hand, majority of the small farmers who are facing agricultural poverty reported that they have not witnessed any visit from the extension service representative over year.

		Visit of extension services representative (VESR)		Total
		No	Yes	
Agricultural Poverty	No	28	100	128
	Yes	104	18	122
Total		132	118	250

The results of the logistic regression suggests that the chances of incidence of agricultural poverty among small farmer decrease if the extension service representative have visited small farmer at least once in a year. The result is significant at 5 percent level of significance, therefore, null hypothesis is rejected and alternate hypothesis is accepted. Which shows the importance of extension service representative visit.

The core task of the extension officers is to make the farmers aware of new agricultural technologies and finally motivating them for adoption (Khan et al. 2010). Targeting the right and relevant clientele is the key to success of any extension approach. Overwhelming majority of country’s farmers are smallholders but evidence indicates that extension sector target large and medium scale farmers and they seldom reach small and resource poor farmers (Shehbaz and Ata 2014). Therefore, guidance of extension service representative can reduce agricultural poverty among small farmers to a great extent and they can provide profession

related education to the needy farmers. In this way, farmers can make better decisions and they can use the limited resources in a way that results in maximum and most feasible output possible. Through this facility, their socioeconomic aspects can be greatly improved with significant increase in income.

4.9.4.11. Use of Formal Media (UFM)

In modern era, the role of mass media in sharing information and educating various groups, communities and nation cannot be neglected. Information through media can reach everywhere and quicker. The formal media includes electronic and print media. In modern period the facility of television is available in almost all villages but majority of small villages still lacks the facility television cable system and newspaper. A question was asked to the respondent whether he/she read newspaper or watch television daily. The answer was categorized in two options “Yes” or “No”. The data shows that majority (100 out of 128) of the small farmers who are out of agricultural poverty watch television or read newspaper regularly. On the other extreme majority (109 out of 122) small farmers facing agricultural poverty do not watch television or read a newspaper daily.

		Use of Formal Media (UFM)		Total
		No	Yes	
Agricultural Poverty	No	28	100	128
	Yes	109	13	122
Total		137	113	250

The results found that the chances of agricultural poverty prevalence among small farmer decreases if he/she read a newspaper or watch television at least once a day. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. (Khan et al. 2010) states that Mass media

(electronic and print) can play a central role in bridging the knowledge gap among farmers. However, access to media in rural areas is limited due to varied reasons, and consequently farmers are unable to utilize the full potential of media for improving their agricultural knowledge.

4.9.4.12. Use of Social Media (USM)

The social media includes various social platforms individual can use through internet like, Facebook, twitter, whatsapp and youtube etc. In modern period, cellular phone connectivity is available almost everywhere. Social media is a quicker source of information if properly utilized. A lot of information, problems and solutions are always available on one click. For the study purpose a question was asked to the respondent regarding use of social media. The answers were provided as “Yes” or “No”. The data shows that majority (95 out of 128) of the small farmers who are out of agricultural poverty use social media. On the other end majority (107 out of 122) small farmers facing agricultural poverty do not use social media.

		Use of social media (USM)		Total
		Yes	No	
Agricultural Poverty	No	33	95	128
	Yes	107	15	122
Total		140	110	250

According to the results of the survey, those small farmers who use social media like facebook, twiter, youtube, whatsapp etc are less likely to face agricultural poverty. But the result of the analysis is not significant. Therefore null hypothesis is accepted and alternate hypothesis is rejected. The effectiveness of social media depends upon its use. Many farmers did not know that agriculture related

information is available on their cell phone. There is a need to provide awareness to such farmers.

4.10. Education Policy in Punjab

Historically education remained joint function of federal and provincial governments. Federal Ministry of Education used to formulate the policies and national curriculum. The provinces developed their own plan and schemes in accordance with national policies. The structure of management for education remained complex and multi layered. It involved the inputs at federal level, provincial level and also district level. In 2001, a new political tier of decision making was introduced as District Governments. The powers and plans were devolved to the districts under this devolution plan. Each district was then supposed to plan in accordance with national and provincial policies. The districts lacked enough resources and the overlapping of multi layered decision making created further problems. After the 18th amendment in Constitution there was a new ray of hope that the federal and provincial governments will perform better. The Government of the Punjab unfolded a roadmap to ensure 100% enrolment rate and retaining children in school.

4.10.1. Responsibilities of the Provincial Governments as a

Consequence of 18th Amendment in constitution

The 18th amendment in constitution of Pakistan has brought a legal challenge with multiple administrative and jurisdictional implications at National and provincial level. The 18th amendment has transferred forty seven subjects, to the legislative and executive domain of the provinces. It is the responsibility of provincial governments to devise education policy after 18th amendment.

The educational policy formulation is not a big deal but real challenge remained its implementation. The policies devised by the federal government had concurrence and input of all stakeholders. That policies were devised after due consultation keeping in view the national goals. After 18th amendment the provincial governments are taking care of educational policies without consultation of federal government.

The key educational policy documents after 18th Amendment are the following

- Punjab School Education Sector Plan (PSESP) 2013-2017
- Punjab School Education Sector Plan (PSESP) 2019-2024

4.10.2. Education policy 2009-2013

According to (GoP, 2009) The following are the main principles on basis of which the Punjab education policy 2009-2013 was devised.

- Achievement of Millennium Development Goals (MDGs) regarding education by 2015.
- Universal Primary Education
- Completion of full Primary Schooling by all children
- Ensure 100% participation rate at primary level by 2011 and participation enhancement at the Elementary & Secondary level
- Promote Gender Equality
- Improving quality of education
- Promotion of Science & Computer education up to secondary level
- Provision of quality education for deprived and marginalized segments of society

4.10.2.1. Strategic Interventions of School Education Department

4.10.2.1.1. Punjab Daanish School System & Centers of Excellence Authority

Provision of quality education is priority area of the Government of the Punjab, Daanish School and Center of Excellence Authority has been established in 2010. With the goal that poor will get education of International Standards in these

institutions. The main objectives of Daanish School System and Center of Excellence Authority are:-

- To provide high quality education to the most deprived segments of the society.
- To combine best features from traditional education in context of the modern and Islamic learning with focus on science
- To develop the student's character, intellect and physique.
- To cater overall development of marginalized students

The main components of this scheme included

- (a) Free boarding and lodging
- (b) Provision of infrastructure
- (c) Establishing I.T. and Science Labs
- (d) Establishing Libraries
- (e) Providing transport
- (f) Construction of buildings for these Schools.

4.10.2.1.2. Provision of Computer and I.T. Education in

Elementary Schools:

Construction of IT labs in elementary schools in order to provide computer and information technology education to the students.

4.10.2.1.3. Provision of Science Labs in Secondary Schools

The provision of Science Labs in Secondary Schools to strengthen Practical and scientific education.

4.10.3. Punjab School Education Sector Plan (PSESP) 2013-2017

According to (GoP, 2013), The PSESP 2013-2017 envisioned the improvements to the access, equity, quality, relevance and management of the education. Key targeted achievements by PSESP included:

4.10.3.1. Quality

- Preparation of a comprehensive curriculum implementation framework
- Standards development for textbooks and capacity development of PCTB
- Merit-based teacher recruitment
- Introduction of the Punjab Strategy for Teachers Education for improved quality of teacher education
- Standards for teacher education, and revision of the curriculum and training material of in service teachers reviewed as per National Curriculum
- Improved standards for the development, conduct and marking of Punjab Education Commission exams

4.10.3.2. Access and Equity

Early education introduced in primary schools – Punjab Education Foundation schools expanded in underserved districts, offering free education through vouchers and subsidies - Stipends distributed to middle school girls- Improved community engagement and role of School Councils; head teachers trained in community mobilization.

4.10.4. Provincial Policy Frameworks Guiding the PESP 2019/20

– 2023/24

According to (GoP, 2019), There have been a series of legislation and policies, strategies and plans developed to strengthen and reform the delivery of education in the province of Punjab. The Punjab Free and Compulsory Education Act of 2014, while not yet ratified, is the draft legislation elaborating the provision of free

education as mandated by Article 25A of the Constitution. The Special Education Department Institutional Plan laying out six core sector plan priorities and institutional capacity required to strengthen the delivery of educational services to Children with Disabilities and special education needs. The draft Punjab Non-formal Education Policy, 2018-2030, is the first NFE policy for the province and seeks to provide structure and organization to the delivery of non-formal education, including a dedicated budget for NFE programming. In the late 2018, the New Deal 2023 was developed and charts a transformative path towards improving the quality of teaching and learning, to ensure that all children benefit from a quality education.

- Punjab Free and Compulsory Education Act, 2014 (not yet ratified)
- The Punjab School Education New Deal 2023
- Institutional Plan for Special Education Department, 2017-2020
- Punjab Literacy and Non-formal Education Policy (PLNFEP), 2019 approved and notified

4.10.4.1. PESP 2019/20 - 2023/24 Goals and Objectives

The PESP 2019/20 - 2023/24 sets an ambitious agenda that seeks to deepen transformations in the education system in Punjab. As a guide for improving the quality of teaching and learning, has established the following goals and objectives for the next five years. It focuses on three key areas: improving quality, increasing access, and ensuring effective leadership and management.

4.10.4.1.1. Goals

The overarching goals that have been proposed to guide long-term priorities in education in Punjab are to:

1. Ensure free and compulsory, universal, equitable and inclusive education for all children; at all educational levels including NFE, TVET and lifelong learning; with particular attention to children with special needs, marginalized groups and out of school children; creating safe, protective and enabling learning environments.
2. Ensure quality teaching and improved learning for all.

3. Promote effective leadership, management, governance and education service delivery, and availability of enhanced resources and their efficient use at all levels.

4.10.4.1.2. Objectives

In order to contribute to the achievement of the overarching goals, the PESP 2019-2023 has the following general objectives:

1. Promote quality education in a safe, inclusive and conducive learning environment for children
2. Improve teaching and learning practices for better learning outcomes
3. Provide adequate and sufficient access to education for children from pre-primary to secondary (including marginalized and children with special needs) and youth/adults
4. Strengthen governance of the education sector for equitable access and high-quality education.

4.10.4.1.3. Principles of the New Deal:

Developing skills and knowledge: Ensure every child, irrespective of gender, location or socio-economic class should learn appropriate skills and knowledge to help him or her prepare for a better future.

Promoting equity:

Provide every child access to a public-school programme that meets basic standards, irrespective of gender, location or socio-economic background. This is critical to the creation of a fair and just education system that bridges existing differences between public, low-cost private, and elite private schools.

Developing Pakistanis:

Embedded in our national ideology and culture, nurturing children into productive citizens who are equipped with the knowledge and understanding to engage and contribute as active citizens in all walks of life.

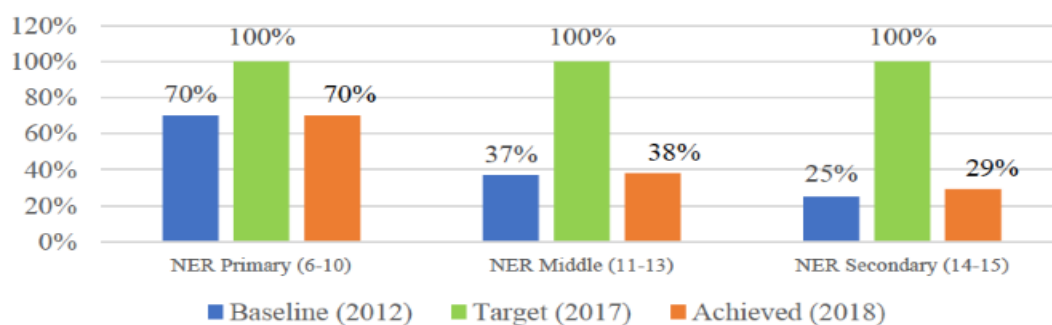
Clean and Green Pakistan:

Every student, teacher and the school will be aware of their responsibility and the role towards environment through conservation and plantation. Every school will play its role not only in tree plantation campaigns, but also in raising a generation of children who value and strive for protection of environment.

4.11. Comments on Past and Present Policies

After 18th Amendment in constitution, the Punjab province has undergoing 3rd phase of political government and policy. The political governments made detailed policies and plan in order to promote quality education. These plans were themselves good to an extent but the implementation remained a hurdle.

The net enrollment rate (NER) is an indicator of the educational status. The NER indicates enrollment of the number of student of a particular age enrolled at a particular level of education. The following table shows the NER from 2012-2018. This is the period during which the effectiveness of the PESP should be reflected.



Source: Punjab Education Sector Plan 2019/20 -2023/24

According to the NER statistics, the net enrollment rate for primary level was targeted to 100 % but actually it remained unchanged from 2012 to 2018 which is 70 %. Similarly there was only 1 % increase in middle and 4% increase in secondary school enrollment rate during this period. The target was 100 % but in fact it remained 38% and 29% respectively, which is much lower.

There was no policy for formal or non formal education system for small farmers in Punjab. School education can be indirectly beneficial for farmers as, this education can educate the children of poor farmers. Punjab school education system is available, which claims to provide subsidized education. But children of the poor farmer faces problem of accessibility and affordability. There are number of expenses that parents have to bear and finance out of their pockets in order to ensure their child's education. Some of these expenses include tuition fee, stationary, uniform, transportation, after-school coaching and extra-curricular activities. Out-of-pocket expenses have an impact, especially for lower income families, on managing their household finances.

Teachers of non formal education have lower qualification levels than those in the formal system. However, due to the need to cover the offer, the standards are further lowered. This has a direct impact on the ability of the teacher to differentiate and support students in a multi-grade environment and that need additional support. This could also be influenced by the type of contracts and low salaries.

Other than education, Agriculture extension services in Punjab aims to focus on crop management and production by increasing farmer's technical and management skills. Since, the structure and administration of this department is poor. The department is facing lack of staff, transport and funds. Without sufficient staff, transport and funds the department is useless. Therefore, this department lacks policy implementation.

Mass media (electronic and print) can play a central role in bridging the knowledge gap among farmers. However, access to media in rural areas is limited due to varied reasons, and consequently farmers are unable to utilize the full potential of media for improving their agricultural knowledge (Khan et al. 2010).

4.12. Recommendations:

Keeping in view the existing situation, there is a need of special and extensive education policy with special focus on rural communities especially the small farmers. Since, rural population, especially small farmers remained neglected in policy. Therefore, government should focus

this ignored segment while devising policy. The following are some suggestions in this regard

- There is no formal record of small farmers in Punjab. Therefore, government should initiate a registration program for small farmers. So that, departments can get exact data of the small farmers.
- Education of children of small farmer is also important. It is suggested that Government should initiate a special program for educating children of small farmer. By educating children of small farmer, pressure on small lands can be reduced. Educated children may help their family head in understanding of various issues related to agriculture which may lead to reduce agricultural poverty. On the other hand, these educated children may find work opportunities in other sectors like industry and services sector.
- There is a need to address the hindrances in the way of schooling of the children of small farmers. The main hindrances are accessibility, affordability, transport and facilities available in schools.
- To get education is basic right of every citizen. The government of Punjab should increase the number of schools in rural areas, make it available to all. And, for small villages where the establishment of school is not feasible, the government should provide free pick and drop through schools bus or small vans to schools in nearby villages or towns.
- To cope with the problem of affordability, the government should start a scholarship program for the children of small farmers along with provision of subsidized education. So that, the children of small farmer can be able to fulfil expenses of books, notebooks, stationary, uniform and other everyday expenses.
- The quality of education should be improved and monitored, in order to build the trust of the farmer on education system and reduce the extra cost of after school coaching on poor parents. Qualified teacher should be appointed and government should provide other basic facilities like class rooms, furniture, toilets and other basic infrastructure.
- The school uniform pose another burden on poor, while, they have to purchase and maintain it. The government should lift the condition of

uniform. Since, uniform have nothing to do with education, instead, it is an extra burden on the parents.

- The government should introduce basic agriculture as a subject from primary level and continuing to middle and secondary level. Along with other subjects, special understanding of agriculture science and management is also necessary. In this way, children will be able to understand technicalities of agriculture while other subjects will help in better understanding of the agriculture for them.
- The network of TEVTA should be expanded. More institutes under TEVTA should be formed especially in rural settings and these institutes should introduce special and free courses or training programs for the farmers.
- Also the network of non formal education should be extended to village level. The Literacy & Non-Formal Basic Education (L&NFBE) Department should be broadened. Better qualified teacher should be hired and be provided with basic infrastructure.
- Since farmers themselves cannot start schooling, There is a need to educate them by providing them practical knowledge, information and skills. In this regards, there is a need of reforms in Agriculture extension services department. Government should initiate a farmer registration process of all farmers including small farmers at union council level. And, allocate extension services representatives to visit one union council at least once a week and interact with farmers, provide them advisory, educate them with their problems and solutions, without ignoring small farmers.
- Separate representatives should be allocated for farm management, technical skills, environmental knowledge, farm mechanization, agriculture marketing and other related fields. These field workers should also be trained time to time so as to keep their expertise updated.
- Government should expand the extension department with offices and staff at tehsil levels. Also, government should hire field related qualified field officers and staff, provide enough transportation funds to the department. SO as to make them able to visit the villages included under their jurisdiction.

- Proper monitoring system should be initiated in order to monitor the fulfilment of the duties of the field officers and staff using GPS and internet technologies.
- An extensive media campaign should be initiated in order to make ignorant farmers to realize the importance of education and agriculture extension services for their children and for themselves respectively. Government should involve agriculture specialists and arrange special television programs discussing agriculture issues and providing guidelines to the farmers, especially the small farmers. Similarly, print media should be used for the said purpose by writing articles on agriculture and crop management.
- Social media being an important source of information in modern age should be used in order to educate the farmer. The agriculture and extension department should launch special web and social media pages with the facility of direct questions and answers between farmers and experts. Various groups on facebook/whatsapp should be established and experts should post regular information in such groups regarding agriculture, ongoing crops and weather etc.

4.13. Expected Benefits

Since the education system is not as efficient as it ought to be. And various policy documents of the government indicated that the education in Punjab is still lagging behind. Therefore, there is a need of practical steps to be taken to bring about a change and to increase the level of human development which is one of the point of focus of the government. Therefore, bottom to top approach is necessary to bring change in Punjab education sector.

Along with other rural community, these suggestions will raise the education of the small farmer and his family. The educated small farmers, will be able to perform better in the fields. Hence, increasing their productivity. Which will ultimately lead to higher levels of production. Higher production levels as a result, will help to break vicious circle of agricultural poverty among small farmers. On the other hand, education of the family will decrease the pressure on the small lands. The educated family members may go for off farm employment. Hence, contributing overall living standard of the family.

Coming out of agricultural poverty, these small farmer can earn better revenues for themselves. These revenues will help these small farmers to invest in health. Also to get rid of the debts. On the other hand, increased production may supply more food for the consumption of population. Also, better quality and quantity of production may increase exports of the country. Which is a big source of foreign exchange earnings for the government and also plays important role in the balance of payment.

The stated recommendations may also build trust on government among bulk of population. Therefore, the suggested measures will have social, economic as well as political benefits.

5. Chapter 5. Living Standard of Small Farmer and Agricultural Poverty

Living standard usually refers to the wealth, quality of life and material comfort of individual and society as a whole. Living standard represents the style of living in various societies. The meaning of the word “standard” becomes quite clear at the first glimpse. However, putting closer attention reveals that it is a fix level of completeness and execution. Living standard among individual represents this firm level of accomplishment. Whereas, the living standards of the society can be restrained in both non-material and material standard of living. Where material living standard represents the access to possessions of physical comforts and conveniences. And non-material standard of living is represented by quality of life, which cannot be measured or physically touched. Generally, the term living standard is used for economic achievement in public interest. It usually represents the quality and quantity of good available (Fah, 2010)

There exists different living standards among population of different countries, also with in a country. The living standard is the third indicator of level of human development index calculated by United Nations Human Development program (Cvrlje and Ćorić, 2010). Third world countries having lower living standards are ranked much lower than that of the developed countries having higher living standards. Every individual, society or nation has different needs, therefore living standard is expected to be different in different regions (Fah, 2010).

The issue of living standard became rather more interesting subject in modern era. The understanding of concept of living standard gone through long period of time for evolution. The living standard was perceived only as a quality of life for a long time, and even today this perception is very strong. So it becomes necessary to take quality of life in consideration. Therefore living standard becomes the ease with which people accomplish their needs. It also consists the circumstances in which people live, availability of goods and the services and their ability to consume. The idea of living standard needs a broader framework, usually it is measured as real

income per person measured as Gross National Income (GNI) per capita (Cvrlje and Ćorić, 2010).

5.1. Living Standard in Punjab

Punjab being most densely populated province of Pakistan has a highly differentiated society in terms of living standards. The variation in the living standards exists inter-city and also intra city. Clear difference can be observed among the cities of upper Punjab and south Punjab. The cities of upper Punjab are comparatively more developed in terms of infrastructure, availability of facilities like, education, health and services. Whereas, the cities in south Punjab are lagging behind. Further, the employment opportunities and income are also comparatively higher in comparatively advanced cities in Punjab. Along with pros there are also some cons related to these cities. The developed cities of upper and central Punjab are highly populated. Due to high population there is a burden on the facilities and infrastructure.

5.1.1. Rural Urban Disparities

One important point of concern is the vast disparity in living standard among rural and urban areas. The urban areas of Punjab are comparatively better in terms of income, employment opportunities, infrastructure and basic facilities like education, health, financial institutions and services. Whereas, the rural areas are vulnerable in this context. The rural areas are lagging behind in infrastructure as well as basic facilities like education, health, financial institutions and services. The industry in Punjab is also urban biased. Therefore, rural areas also lacks employment opportunities and economic activities. Agriculture remains the only source of income for majority of the rural population. The rural population has to rely upon agriculture for their living. Therefore, the agriculture sector is overburdened. The hereditary division and sub division of lands from generation to generation has shrunken the farm size. Therefore, a majority of farmers are small farmers.

5.2. Living Standard in Rural Punjab

Since, the rural settings of Punjab are lagging behind in economic activities and employment opportunities, therefore, the only major source of income remains the agriculture sector and farming remains the only economic activity and opportunity for the farmers. The lack of facilities like education, health and services further deteriorates the rural community. The lack of infrastructure creates a division among urban and rural settings.

Majority of the farmers in Punjab are small farmers. There is considerable evidence for the marginalization of small farmers, most disadvantaged in terms of access to services, education, health and also worst served by infrastructure of various types. Moreover, rural people in many settings are most likely to be amongst those who do not seem to benefit from the Millennium Development Goals (GOP, 2005).

5.3. Causes of poor living standard in Rural Punjab

Some major causes of poor living standard of the villages are as follows

5.3.1. Rapid Population Growth

The fertility of the women in Punjab depends upon various cultural factors, religious factors, poor educational standards, lack of employment and income. Usually, Along with increase in education the employment opportunities increases. As result, women also get opportunity to work other than house. Which results in lesser number of children produced by her. But it is not the case in rural areas of Punjab. But, In rural Punjab women, due to lack of education is only a housewife. Or may participate in agriculture. Due to abundance of leisure time, there is a rapid growth in population.

5.3.2. Unequal Land Holdings

In rural Punjab there exist disparities in farmer's access to cultivable lands. It is obvious that greater is access to land holdings greater will be possibilities for income and employment. As in Punjab the lands, particularly the big land holdings are concentrated into the hands of a few big land lords having greater incomes.

Thus, when the population is rising fastly among small farmers, the urban centers are unable to absorb them. Due to small land holding of small farmers, there is a reduced access of farmers to cultivable land the poor farmers will remain poor. Again, the Green Revolution has also benefited the big land lords as they could easily purchase tube wells, tractors and superior seeds, whereas the poor farmers could not do so. Accordingly, the incomes of big landlords increased for more than those of small farmers. Moreover, the advent of new seeds and technologies have also been availed of by those who were prepared to accept them. This segment of rural society was of big landlords and feudals. The staff and officers of agriculture extension services also served the big lords. Perhaps for the sake of their boarding and lodging etc. Thus it can be simply conclude the big farmers got the benefits of rural development while the small farmers could not do so. Consequently, the poor went on becoming poor with low living standard, while rich got the affluence. Small land holding is one of the main causes of low productivity of agriculture in Pakistan. More than 70 percent of the farmers in Punjab own less than 2 hectare of land (Garcia et al., 2003).

5.3.3. Unavailability of Rural Credit

Agriculture credit is most important in rural settings of Punjab. If small farmers and land less farmers are provided with loans their productivity and incomes could have risen. But such situation could not procreate in Punjab, as the major share of finance was taken away by the big land lords. Therefore, small farmers and tenants remained deprived of them. The commercial banks and agriculture bank also follow the traditional way while lending to the farmers. It means that they ask for mortgages while lending. The small farmers do not like it, while big farmers are ready to do so. The big farmers also follow the practice of political pressure while borrowing from banks. In such circumstances the departmental formalities, social influences and allocative mechanism- all go in favour of big land lords. It has also been observed that small farmers fail to repay the loans. When the debt burden on the small farmers is high, they do not serve as good customers for the banks. Therefore, they do not get more loans from banks and fail to start developmental

activities on their farms. As a result, their incomes and living standards remained lower.

Despite their distinctive and critical position, small farmers belong to the poorest sector of population and therefore cannot invest on their farm. The vicious cycle of poverty has led to the unimpressive performance of the agricultural sector. Lack of access to extension services and information; lack of access to agricultural credit due to lack of collateral to satisfy credit institution; limited land area and inadequate resource distribution are some of the constraints for small farmers. And the production elasticity of land is substantially higher for rich farmers compared with poor farmers (Ahmad, 2003).

5.3.4. Lack of Employment Opportunities

In agriculture sector of Punjab, it has been observed that farmers fail to get stable incomes even if they are having lands. As in agriculture sector most of the work is seasonal and people fail to get the productive opportunities for the whole year. And, in rural settings agriculture is the only source of employment. Industry in Punjab is urban centered which can hardly absorb urban labour. Similarly, services and business sector also remained urban centered. That's why, the small farmers either remain unemployed or disguised unemployed. In this way, their incomes and living standards remain lower.

5.3.5. Impact of Mechanization

Farm mechanization is usually biased towards big land lords. There was an opportunity for rural labour to get work opportunities at lands of big land lords especially during the season of sowing and harvesting. But, due to the use of tractors, threshers and other farm machinery by big land lords, the demand for labor has decreased. Particularly, at the time of harvesting when the demand for labor was higher and there was the chances of increase in incomes of rural labor, the greater use of machinery had result in decline in demand for labor. Consequently, the incomes and living standards of the small farmers remained low.

5.3.6. Reduced Socialization

The poverty of small peasants can also be ascribed to poor and reduced socialization in the villages. It means that the combined role of feudal set-up, political instability, rigid social behavior, bureaucratic dictatorship, departmental formalities, rising defense expenditures, class conflicts and improper priorities resulted in reduced education, poor infrastructure, marginal health facilities, limited health and medicinal facilities for the people living in villages. The resources were diverted to big cities to please their elites at the cost of villages. As a result, the rural poverty went on increasing.

5.3.7. Inadequate Policy

Inadequate policy is also responsible for poor living standards in rural areas. Since, The political history of overall Pakistan remained compromised facing dictatorships and weak democracy. The dictators promoted big land lords, feudals and industrialists for the sake of their own survival. These big land lords and industrialists became influential in politics. During democracy regimes, these powers served the interests of industrialists and big land owners. The poor segment was ignored in legislation, policy making and implementation. For example, the policy of minimum wage laws remained only in documents. Rural population is still unaware of minimum wage laws. Therefore the rural labour is exploited and they remain in poverty and lower living standards.

5.3.8. Lack of Awareness

The big land lords and feudals has kept poor population of the village in darkness. They did not allowed the poor community to flourish. That's the big reason that, still a lot of villages lacks schools. Hence, the rural population remained unaware of their rights, hence served only the big landlords and feudals. Theses feudals kept poor villagers as their servants for ages mostly on basis of providing them food only. Therefore they remained poor and their living standard remained low.

5.3.9. Corruption

Another big hindrance in the way of progress of the poor rural community was the corruption. Mostly the political elite remained indulged in corruption. Unfortunately, the political system of the country is complicated. The members of the National and Provincial Assemblies are still interested in getting funds from the government in the name of development like building of roads instead of doing legislation. These funds came direct to members of assemblies and therefore not fully utilized for the said purpose due to corruption. Hence, the rural areas remained under developed and villagers could not get benefit of the development.

5.4. Condition of Small Farmers Household

Smallholder families in Punjab are usually large. On average, the families of small farmer are having seven family members, and out of these seven at least two are below 10 years of age. The data did not show specific gender differences in family composition. On average, there are as many adult women as men. The families are living in the houses, which in majority, they owns themselves. The housing patterns of the villages had passed through various stages; traditionally the kacha houses were made with soil and wood. But gradually trend of traditional housing reduced and people started to construct pakka houses by using bricks and cement to shelter their families and livestock from rain and weather extremes. But in the hottest areas, people still preferred to construct kacha houses (soil made houses) as earth is bad conductor of heat and kacha houses saved them from severe hot and cold weathers.

A respondent explained while talking about kacha houses that, after 1980, large land holders and rich people having resources and income other than agriculture started building brick houses. Which attracted the attention of the poor also. And then he built his house himself with bricks in his own land.

5.4.1. House Ownership

The data collected from the small farmers shows that a majority, 210 out of 250 owns a house. This house is usually too small for the number households. Some small farmers have built own houses in their own lands outside village. In some cases, landowner has provided a small house to the tenants.

Housing status	Own	Rented
Number of respondents	210	40
Total	250	
Source: Author's own contribution		

But although, smallholders own their dwellings, housing conditions are poor. Most of these houses have a dirt floor and even some of them having walls made of mud. These houses of small farmers lacks basic infrastructure of house hold including kitchen, paved toilets and boundary wall. These small households are mostly located in remote areas, lacking basic infrastructure like roads and electricity. Lack of access to roads constrains households' access to markets and services. For smallholders, limited access to markets increases their vulnerability to shocks and hinders economic opportunities that could arise if trade was easily available.

Housing status	Kacha	Pakka
Number of respondents	29	221
Total	250	
Source: Author's own contribution		

5.4.2. Rural Roads

Rural roads enable people to have access to social and economic services. It helps in improving the farming and non-farm activities. Also the connectivity of rural and farm to market roads with the urban centers made the rural life easy and

comfortable. The road network facilitates farmers a lot and help local people in improving the socio-economic conditions, quality of life and social mobility.

A respondent explaining the importance of road said, “Our village is located on Sargodha-Mianwali road. So travelling to Mianwali or Sargodha was not difficult. But it was very difficult to travel to the interior areas. We used to travel on foot, by donkeys or horses. But after overtime developments in the rural area roads network he stated that in early 21st century, the Government started working on the development of rural roads which benefited our village and a road by which you reached here was built. people were happy for this road and they started using bicycles and motor vehicles. However, after 2-3 years, the road was damaged due to rains because of its low quality and became dangerous.

5.4.3. Electricity

Initially the electricity was provided to only influential people of the villages but it was extended lately. Currently about 90 percent of the small farmers reported having access to electricity at their homes. 10 percent respondents still lack this facility. The electricity is provided for the domestic use. The farmers are still running their tube wells on diesel for irrigation purpose. Secondly, Pakistan is facing a shortfall of electricity. There is a power load shedding (both scheduled and unscheduled) in both urban and rural areas. The time of load shedding in rural areas is more than time of load shedding in urban areas.

Access to Electricity	Yes	No
Number of respondents	225	25
Total	250	
Source: Author’s own contribution		

In view of the respondents, provision of electricity had great impact on the social, economic and even cultural aspects of the village life. Households having electricity may have electric appliances like televisions, refrigerators, ceiling fans etc. Among these, the use of TV is important because it can keep farmers aware. The introduction of electronic media had raised awareness and inspired youth to their life styles. There was a general consensus among the farmers that provision of electricity has made their life easy and comfortable.

5.4.4. Telephone

Weak research extension linkage and poor information system have been identified as the most important source of lower growth in farm productivity (Kumar and Rosegrant, 1994). The access to information can possibly enable to improve income and farm productivity. Moreover, information based decision making in agriculture is described as the next great evolution in agriculture. Unfortunately, these parameters of growth are weak in Pakistan. The present telecommunication facility has potential to provide solution to the existing information asymmetry in various lagging sectors like agriculture, marketing and trade.

In view of the importance of improved information sources the availability of telephone facility was explored in the villages. The landline department was unable to fulfil the requirement even in cities. So, the cellphone network provider companies brought revolution after 2005 in Pakistan. It was found that majority of sample farmers were presently using cell phone facilities, which were available in the village.

Use of telecommunication	Yes	No
Number of respondents	220	30
Total	250	
Source: Author's own contribution		

Explaining further, it came out that up to 1990, there was no mobile phone facility in the village. Only 3-4 influential families were availing the telephone facility in big villages/towns, while rest of the community was either dependent on them or was utilizing the postal services for communication purposes. During 21st century, the use of cell phone started in the village and it was gradually spread to lower income classes. Presently, less than 90 percent household have at least 1 cellular phone in the household. Interestingly, household having no access to electricity were found having cellphones. Even they go to other household in the village for charging batteries of their cell phones. While, others reported that they have to go to other villagers for making emergency calls or conveying messages.

5.4.5. Water and Sanitation

The means of water and sanitation is falling short in the urban areas. Even the biggest city of Pakistan “Karachi” is facing shortage of water and sanitation facilities till now. There is no system of water supply and sanitation available in villages and remote areas. Naturally the ground water in most of the villages is not much polluted till now. So, people can drink normally or after boiling. But the absence of sanitation and sewerage facilities is attention worthy. Normally, the waste water from household flows through open kennel and to the marshes and land nearby, which is causing health concerns.

During the survey, majority of the respondents reported that they do not have adequate system of water and sanitation in their houses.

Inadequate water and sanitation	Yes	No
Number of respondents	175	75
Total	250	
Source: Author’s own contribution		

5.4.6. Economy of Small Farmers

The village economy was mainly based on agriculture. People only cultivate land to meet their household needs. Financially people are poor and even unable to purchase essential farm inputs and implements. Traditionally, they followed single crop system due to non-availability of improved techniques. Gradually, the interventions have benefited the farming communities and raised their income level. But these innovations have mostly benefited large and rich farmers. In the villages, both male and female members are involved in agriculture and they jointly worked hard to meet their family needs. The natural resources of the village are squeezing rapidly due to over and excessive use. This situation has disturbed household economy and also created unrest among the rural youth. The change in population immediately needs new development initiatives and off-farm employment opportunities in the village, which are not available yet.

5.4.7. Employment

Employment is an important parameter to measure poverty and prosperity of the local communities. Comparatively in Punjab, off-farm employment opportunities in rural areas are less than the urban areas. So for employment purposes people mostly migrate from rural to urban areas. Moreover, employment opportunities in rainfed areas are also less as compared to the irrigated area. It was only due to limited industrial base in the rainfed region.

A respondent Mr. Sajid explained that “We were 4 brothers and 2 sisters. My father had 15 acres of land and a common home. The village life was simple and there were no expenditures like electricity and gas bills, cell phones. We were rich at that time. After the marriage of both sisters, my father divided the land in us. And each of us got less than 4 Acres of Land. Now we have separate families and living in miserable condition. I am unable to build my own house till now. Whereas, the son of my eldest brother moved to city and got job. Now they have a good house and a car. They are now richest amongst 4 of us”.

This statement shows the importance of employment. Off farm employment can bring a small farmer out of poverty.

During the survey, only 118 out of 250 respondents reported that the respondent himself or any other family member have an opportunity to get off farm employment.

Off farm employment	Yes	No
Number of respondents	118	132
Total	250	
Source: Author's own contribution		

5.4.8. Social Rituals

Generally, traditional rural societies maintain their social order by strictly observing cultural norms and values. The events like births, deaths and marriages have great importance in villagers' life because on such events people mostly ignore their conflicts by participating in their joys and sorrows. In this way, basically they show their solidarity with the visited families who are mostly their close relatives or close friends. Furthermore, on death events, neighboring families and closest relatives feel moral obligation to provide food to the aggrieved families and their guests for at least three days. This custom of hospitality still prevails in the studied village. The philosophy of this cultural practice is to provide moral and financial support to the aggrieved families. Even after the burial of dead body, people of the neighboring villages both male and females pay visits to grieved families, offer "Dua" (Prayer) for the departed soul.

The segment of society under study was traditional in nature. Therefore, local people strictly observe societal customs, norms and values. They are committed to perform their social obligations on the events of child birth, Aqiqah, marriage, deaths

etc. At the time of births and marriages they congratulate the respective families and also exchange gifts and donate money called in the local dialect as "Wartan Banji". Customarily, in these events, respective families invite their friends and relatives through a special messenger called "Nai" (a traditional village barber), and host lunch or dinner in their honor. In reciprocity, every participating person presents gifts and money according to his financial status to show loyalty and intimacy to the host family. The gift exchange was a strong cultural norm observed in the rural Punjab.

The culture of Dowry to the daughters at the time of their marriage is also a huge burden on the poor. People think that it is the matter of their respect in the society, and respect of their daughter in her inlaws. They make savings whole life, take loans and even sell their properties to pay dowry to their daughters. This type of rituals further worsens the economic condition of the small farmer.

5.5. Agriculture Credit and Finance

The credit provided to facilitate the needs of agriculture, or the loans provided for the development of agriculture and agriculture sector are known as Agriculture Loans or Agriculture credit. The concept of agriculture credit is different from rural credit. The concept of rural credit is wider one, rural credits represent all these loans which are provided for the whole rural development. Accordingly, the agriculture loans are a part of rural loans. At present we are concerned with agriculture credit or agriculture loans.

Small Farmers overwhelm agriculture landholding designs in Pakistan, where monetary prohibition remains alarmingly high. Farmers, especially the small landholders are confronting issues in getting back from the financial segment because of their powerlessness to give guarantee worthy to banks. Hence, they are compelled to depend on the casual segment to meet their agricultural credit requirements. These factors likewise limit the capacity of small farmers to help their homestead profitability because of the absence of access to yield upgrading inputs like improved seed and fertilizers and data on the most proficient method to get credit to fund interest in Agri. creation and advancement exercises. Also, they normally need the capacity to advertise their products at serious rates which confine

them to put resources into land improvement. Therefore, little and underestimated ranchers can't convey the volume and nature of products that business buyers, retailers, processors, and other agri-business firms require, which thus restricts the advancement of business sectors for rural produce. Small farmers, despite representing a major chunk of overall farming households, have very little access to formal credit. The credit which is available to these small farmers, mainly from informal sources, is of very high cost, which escalates their cost of production. As a result, these small farmers have to bear the financial burden which traps them in perpetual cycle of poverty due to low margins and limited income (NRSP, 2019).

5.5.1. Classification of Agriculture Credit

According to Shahid (2008) there are following three classifications of agriculture credit.

5.5.1.1. Short Term Credit

The short term credit is of one year or of below one year period. Such borrowing is made to meet the routine and day to day needs of the farmers. As, the farmers have to purchase the seeds, fertilizers, pesticides, ploughs, implements, as well as have to meet the consumption needs upto the harvesting. Accordingly, such credits may be treated as a part of working capital, and they are needed in order to meet the annual production costs.

5.5.1.2. Medium Term Credit

The period of medium term credit lasts for 1 year to 5 year. Such loans are raised in order to purchase the livestock, implements, the construction or improvement of water courses, and for equipment not expected to last more than five years. While getting such loans from the specialized institutions or banks the farmers have to pledge their movable or immovable property.

5.5.1.3. Long Term Credit

Such credit consists of the duration of more than five years. Such loans are asked in order to make improvements of more lasting character like the sinking of the wells and tube wells, reclamation of land, the purchase of additional land for repayment of old and outstanding loans, to purchase the tractors, harvesters and

agriculture machinery, to start poultry and dairy farms and to install agro-based industries.

5.6. Sources of Agriculture Credit

The farmers have two main sources to get loans:

- (1) Non institutional sources of credit
- (2) Institutional sources of credit.

5.6.1. Non- Institutional Sources of Agriculture Credit

In order to meet the daily expenses, the small farmers usually depends upon their neighbor, friends, relatives, commission agents and money lenders. Since, these sources are available to the small farmer at farm or house gate. These money lenders and agents use to advance the loans to the small farmers at strict conditions and comparatively higher rates of interests. Friends and relatives usually helps by providing smaller loans for shorter durations of time. Then the traders, big landlords are the major non-institutional source of bit longer period of time.

The following are some problems attached with non-institutional credit.

- (1) These loans are not sure to be actually availed of.
- (2) The charges of interest against such loans are usually very high. So, there is glimpse of exploitation of the poor farmer. It has also been observed during study, that the traders who advances loans to the small Farmers usually pay them less prices for grains after harvesting.
- (3) These sources of credit do not have defined regulations, conditions and interest rates. As the borrowers small farmers and they are weaker, therefore they must act as according to the lenders.
- (4) Mainly these types of loans are spent in unproductive ways and, things and events which further pushes small farmers under debt burden.

5.6.2. Institutional Sources of Agriculture Credit

The institutional sources for credit in Punjab comprise of the following institutes:

- Agricultural Development Bank of Pakistan (ADBP)
- The commercial Banks
- Provincial government
- Cooperative bank

5.6.2.1. Agricultural Development Bank of Pakistan (ADBP)

The ADBP provides loans to farmers in terms of short, medium and long. The purpose of short term loans is to raise, process and market the crops and other agriculture based industry. The medium term credit is provided to purchase agriculture inputs, organize lands and starting up of agriculture industry. Whereas, the long term credit is usually provided to purchase tractors, tube wells and other agriculture machinery.

5.6.2.2. The Commercial Banks

The commercial banks on one hand provide banking facility to farmers like other customers, they also facilitates agriculture sector by providing agriculture loans. The commercial banks also have plans to advance loans to the small farmers. But generally the small farmers complains that these loans are actually not reaching the small farmers. Big landlords and influential people avails these loans usually.

5.6.2.3. Provincial Government Loans

The Punjab provincial government also sometimes provide loans to the farmers through special schemes. Such loans are provided to farmers in case of natural quirks. However, currently, such loans are provided on very less interest rates to purchase livestock, inputs or in case of natural disasters. Such loans are also known as Taccavi loans. These types of loans are not popular among farmers because of very long delays because of petty officials.

5.6.2.4. Cooperative Credit Institutions

The cooperative societies got fame in rural areas of Punjab under the cooperative movement and became important. These societies provide loans to the farmer on personal security. Usually a society consists of 10 to 100 members who live in the area of that society. The capital comes from shares, deposits and other credit institutes. Most of these loans are related to consumption or payment of interests or installments of other loans. Most of these cooperatives network depends upon provincial cooperative bank.

These loans mostly require the security of the land double than the amount of loan. The credit policy of the Punjab Provincial cooperative bank fails because of high rate of interests, high securities, lesser period of finance and meagre amount of loans.

In case of societies loan, the poor farmers are humiliated because, the influential segment of the farmers take the loans in names of the small poor farmers. Therefore, the benefits are enjoyed by the influential/big farmers and the fate of small farmer remains unchanged. And In case of individual loans, the small farmer are unable to get efficient loans because of lesser land holding. The small farmer cannot afford high interest rates and tough conditions of pledging and documentation.

5.7. Need for Agriculture Credit

Now the question rises why there is need for agriculture loans or what is the justification of agriculture loans. There are following arguments in this regard.

5.7.1. Subsistence Farming

Most of the farmers in Punjab holds smaller lands, and hence, are small farmers. In this situation, the incomes and savings of the farmers remain very low. Consequently, the farmers have always been needy. As told above, the farmers have to depend upon loans to meet their developmental as well needs relating to consumption, marketing and litigation.

5.7.2. Payment of Debts of Forefathers

About farmer in Punjab, it is said that he is born in debt, grows in debt and dies in debt. In such situation the poor farmers have to pay even those debts which were borrowed by their forefathers. And in most of the cases they have to go for additional loans to make the payment of their ancestral loans.

5.7.3. Loans for Agriculture Needs

As the resources and incomes of the farmers are limited but they have to utilize the lands as well as produce the grains. They have to purchase the cattle, ploughs, fertilizers, seeds and other agri. Implement. Again, the farmer has to make the payments regarding water charges. Moreover, he have to make expenditures during sowing and harvesting. Thus to meet such all expenses they have to depend upon agri. loans.

5.7.4. Uncertainty Element

There exists big uncertainty in agriculture sector of Punjab. The floods and droughts are recurring feature of sector. In such circumstances, the farmers are not sure of their crops and incomes. This also happens that because of bumper crops of potatoes, onions and wheat their prices are depressed down. Thus to meet such like situation, the farmers have to depends upon loans.

5.7.5. Social Needs

Rural life in Punjab is furnished with customs, taboos and traditions. The customs of marriages, death and birth, even the litigation are celebrated with pomp and show. Thus to meet the expenditures of social set-up the farmers have to go for loans.

5.7.6. Unorganized Agriculture Markets

The agriculture markets in Punjab are very much unorganized. They are furnished with lot of problems like shortage of ware houses, lack of means of transportation and communication and existence of lot of intermediaries in agri. markets. As a result, the farmers fail to get fair prices for their goods and poverty remains the destiny of the farmers. Therefore, they have to borrow from village shop-keepers,

arthiyas, commission agents, friends, relatives and money lenders and financial institutions.

5.7.7. Modern Technology

When agriculture sector moves from subsistence farming to mixed and commercial farming the changes have to be brought in pattern of cultivation. They have to purchase seeds, technology, tractors, threshers and fertilizers as. As their resources are limited, so they have to ask for loans.

5.7.8. Agriculture Development

Now a days, agriculture sector has assumed the status of industry. As a result, the agriculture products are being produced on commercial lines. Thus the farmers have to perform so many developmental works like land reclamation, drainage system, storage and ware-houses and the buildings on the farms. For such all, they will be in need of loans and finance.

5.8. Access to Agriculture Credit

Access to formal credit sources in Pakistan is still limited. According to a World Bank study the average Pakistani household remains outside the formal financial system. Fourteen percent of Pakistanis are using a financial product or service of a formal financial institution (including savings, credit, insurance, payments, and remittance services). When informal financial access is taken into account, 50.5 percent of Pakistanis have access to finance (Nenova and Niang, 2009).

Looking at the overall picture of agriculture credit disbursement the fact becomes clear that outstanding agriculture advances account for about 6% of total advances of banks and the current flow of credit meets only 40% of the agriculture credit requirements of the farming community. Out of 6.6 million farmers, 2 million have access to formal credit and the rest have to rely on informal sources at exorbitant rates that at times ranges from 40% to 50% per annum (Anwar, 2008).

The fact that 70% of agriculture credit requirements not being met had resulted in charging of extremely high (50% to 100%) interest rates by the informal agricultural

credit providers from the needy farmers in every province of Pakistan (State Bank of Pakistan, 2001).

This is even more unfortunate there was no progress in the balance between credit required and credit disbursed over years of time. Any increase in one year followed by a decrease in credit in next years. It is evident that a sustainable method of delivering Agriculture Credit to the capital starved farming community of the country has yet not been adopted in Pakistan. The critical shortage of capital in rural areas is further confirmed by the fact that the rural poor readily pay the 20% mark-up charged by Micro Finance (Nenova and Niang, 2009).

5.8.1. Share of Small Farmers in Formal Agriculture Lending

The share of small farmers in formal agriculture credit remained low. The World Bank has come up with some data indicating the share of the small farmers in the disbursed agriculture credit. The data indicates that the farms having area up to 5.06 hectares were 80.9 percent of the total farms, while the coverage under disbursement of institutional credit was only 1.24 percent. The average amount of loan given per farm was Rs.20.58, whereas it was Rs.1.81 per acre. In case of owning farm land above 5.06 hectares to 20.23 hectares, the total farm were 17.0 percent, while 3.75 percent of the farmers of this category were brought under coverage of loan distribution. However, the amount of credit disbursed was Rs.355.73 per farm and Rs.8.32 per acre. The highest coverage 5.98 percent with respect to disbursement of institutional credit was in case of the farmland owners with above 20.23 hectares, while the average amount of loan disbursed was Rs.788.03 per farm and Rs.42.43 per acre (Nenova and Niang, 2009).

An increasing gap between the richest and poorest section of the rural population in access to formal credit was also found in another study (Khandker and Faruquee, 2001). Small farmers and poor households were failed to access to institutional sources of credit. Small and tenant farmers rely predominantly on non-institutional sources for their credit needs (Scott and Redding, 1988; Malik, 1999; Qureshi et. al, 1992).

5.8.2. Challenges to Small Farmers in Accessing Formal Credit

5.8.2.1. Loans to Corporate Sector and Industry in the Name of Agriculture

A big chunk of agriculture loan goes to the industrial sector. This loan is very tactfully diverted to the industry in the name of agro based industry. The agricultural credit policy of the state bank of Pakistan reads as under. “loan to entities exclusively engaged in processing, packing and marketing of agricultural produce shall not fall under agricultural financing and would be covered under commercial financing, however the agricultural financing can be extended to entities (including corporate firms, partnerships and individuals) engaged in financing activity as well as processing packing and marketing of mainly their own agricultural produce, produce provide 75% of the agricultural processed, packed and marketed is being produced by the above mentioned entities themselves. According to the farmers the officials of the ZBTL very tactically misuse the above mentioned policy of state Bank as they provided loans to the non agricultural influential people bringing their loan portfolio into the agriculture loan. In this way the loan portfolio of the small growers is in fact used by the non agricultural influential people. Despite strict and clear cut instructions of state Bank of Pakistan, the commercial Banks are still reluctant in increasing their agriculture loan portfolio. Therefore the agriculture sector is still not properly benefiting from the commercial banks lending.

5.8.2.2. Inadequate Network of Bank Branches in Rural Areas

In Punjab the banking infrastructure is still mainly focused in the urban areas. Considering the urban population as their key clients the banks usually focus on opening their new branches in the urban areas. For small farmers, who are less mobile, it is difficult to visit bank branches located in urban or semi-urban areas.

Only 25 percent of the total bank deposits and 17 percent of the total borrowers are from rural areas. In value terms, their shares are even smaller, 10 percent and 7 percent of the total value of deposit and advance, respectively. The access to finance gap is even starker in the case of farmers. The few upper income large farmers enjoy almost 10 times higher access to formal finance (38.7 percent) than the farmers in

poorest quintile (6.5 percent). Large formers get even more informal credit than their less fortunate counterparts---82 percent vs. 70.2 percent. Such skewed distribution of farm credit negatively affects the poverty level of agricultural households, and prevents faster development in rural areas (Nenova and Niang, 2009).

5.8.2.3. Non Availability of Passbooks with Many Farmers

Passbook is a pair of two booklets having the records of land ownership by the farmers having other details like the ownership of Land and address, field location Khewat, Khatooni & Khasra, Market Value, transfer information, loan history and mortgage etc, this pass book is authenticated by a revenue officer. However, the process of getting passbook issued is cumbersome and the farmers allege that the Revenue Department has made the process lengthy only to open window for bribes of issuing passbook. Non availability of passbooks has emerged as the key challenge faced by the small growers in receiving credit from the banks. So far, it has been a duty of farmers to get the passbook from local revenue officer (patwari), who according to the growers charges around Rs 20, 000 per book. Without the book, the banks do not lend money. As a result, a large number of farmers in Punjab are still without passbook. As a result these farmers are unable to receive credit from the banks for agriculture purpose.

5.8.2.4. Cumbersome Loan Sanction Process

One of the key issues the small farmers face in acquiring credit from the formal sources especially banks is the lengthy process of the approval of loan. Although, on the governmental level steps have been taken to simplify the loan procedure, however, still there are many steps the growers has to take for receiving credit for agriculture purposes. Some of the steps in this regard are given below:

- Letter issued from the Bank to Revenue Department
- Form -7
- Form -7 of mortgaging the land
- Passbook

- Charge creation certificate
- Genuineness of Passbook
- No dues certificate from all the banks
- Loan Proposal by the concerned Bank official
- Visit to the land by the bank officials
- Credit Information Report from State Bank etc
- Approval of the loan
- Disbursement of loan

The above steps show clearly that still the farmer has to take long efforts for receiving credit from any bank. This usually results in delays in the disbursement of the credit. This lengthy process also some times is used by the officials of bank to blackmail the growers to pay them some kickback for timely loan approval and disbursal. More over sometimes unnecessary objections by the bankers on the passbook are also reported by the small farmers.

5.8.2.5. Inordinate Delays in the Disbursement of Agriculture Credit

According to the growers inordinate delays are made in the approval and disbursal of credit to the extent that they usually lose the cropping season by waiting for the credit. In case the growers wait and depend on bank loan, usually they fail in cultivating their crops. A number of farmers who had previously applied for formal credit informed that farmers usually apply for credit from banks but due to delay in the loan disbursement they borrow the inputs from private money lenders. The delay on the part of banks is a serious problem to the extent that loan is usually approved when the grower already grows his crop. Thus the grower is compelled to fail victim of the middlemen.

The main reason for the delayed disbursement of loans was as noncooperation and lengthy procedure. According another study most of loans were sanctioned and disbursed in a period of 1-3 months. Across the agro-climatic regions, more than 75 percent credit was disbursed in one quarter. Though the figures were acceptable but in Pakistan majority of loans were for short-term production with a per acre upper limit (Akram, 2008).

5.8.2.6. Inadequate Indicative per Acre Credit Limit

The State Bank of Pakistan (SBP) has mandate to fix indicative per acre credit limit for major and minor crop. The last revision in the indicative credit limits was made in 2005 when Agriculture Credit Department, SBP issued a circular in October 2005 wherein indicative per acre credit limits for major crops as well as for minor crops, including orchards, were revised to meet the genuine credit needs of the farming community. However, according to the farmers there has been drastic price fluctuations especially increase in the prices of different commodities resulting in increase in the input prices of almost all the crops. Therefore, it is important that the indicative per acre limit of all the crops should be revised and increased. This is important for ensuring that the growers receive adequate credit to cultivate per acre crops.

5.8.2.7. Insufficient Authority to Bank Managers for Sanctioning Credit

Managers of Commercial Banks of Rural Branches have insufficient powers for sanction of Agricultural Loan, as a result delay in finalization of cases, due to want of its approval by their Regional office. Contrary to this, the managers have more powers to punish the growers. For example, a bank manager or Tehsildar can declare anyone as defaulter. While there are two methods of default, one is willful default and other is circumstantial default. Usually this legal framework is being used against the farmers and sometimes this legal framework is used to blackmail the small farmers. Meanwhile, when government declares any area as disaster hit than all kinds of recoveries from that particular area are stopped. However, there are many evidences which show that the managers of banks including ZTBL usually

issue notices for payment to the growers in the districts which have been declared calamity hit by the provincial government through proper notifications.

5.8.2.8. Institutionalized Commission System

Majority of the respondents told that bank loan is not possible without 10% commission. A commission system has been almost institutionalized. Bank officials mostly receive the amount of mark up and commission from the creditor and in most cases the rest of amount is managed by bank officials themselves till reissuance of the credit. The staff of commercial banks are involved in corruption who demand percentage amount from the farmer for finalization of loan case.

5.8.2.9. Lack of Proper Information to Farmers

According to majority of the farmers bank officials do not provide information to them. The farmers were of the view that they are not properly guided about the process of getting loan easily and also the process of paying back the loan including the mark up and other conditions of seeking loan etc. According to the farmers, the bankers keep in dark the common farmers about the terms and conditions of the repayment of loans because, they later on add up their commission also in the interest rates and charge more interest rate than the actual one from the growers.

5.8.2.10. Lack of Field Monitoring by State Bank of Pakistan

State Bank of Pakistan has taken a number of policy and administrative steps to ensure that agriculture sector especially the small growers receive adequate institutional credit. However, the key step which is missing is the field level monitoring of the process and other issues related to the agriculture credit disbursement by the banks. According to the field observations and interviews with the concerned stakeholders, there is almost no field level monitoring by the State Bank of Pakistan on the credit disbursement by the banks. The State Bank of Pakistan usually depends on the reports of different banks being submitted to the concerned departments of State Bank with regard to the monitoring of the field level realities of agriculture credit in Pakistan.

5.8.2.11. Usury

Usury is forbidden in Islam. So, in an Islamic society like Punjab people avoid paying interest.

5.8.3. Moral Hazards in Use of Agricultural Credit

The agriculture credit will be least beneficial if it fail to increase the agriculture output, increase the cultivable area and improve the lot of farmers. But in Punjab, the productive use of agriculture loans is limited. The agricultural loans taken by small farmers from both non-institutional sources and institutional sources are usually used in non-productive things other than agriculture.

In case of Non-institutional loans, poor farmer face double exploitation. On one hand, poor farmer has to pay high rate of interests. On the other hand, the money lenders exploits the farmers by bounding them to sell their produce to the money lender on lesser price. Poor farmer, when use this money in non-productive things, he has to sacrifice the quality or quantity or both of his product because of lesser or no use of good seed, fertilizers or pesticides. And by selling this poor production on lesser rate further worsens his condition. And debt burden remains still.

Whereas, in case of credit from institutional sources, due to use of agricultural credit in non-productive tasks, the farmer compromise on the production but, at least he has liberty to sale his produce in market at marketable price.

Most of the loans taken by the farmers are for social needs and consumption. The farmers are prepared to sell their seeds, bulls and ploughs to perform their rituals, fairs and the marriage and funeral ceremonies. Thus the agri. loans fail to alter the lot of small farmers. The burden of debt on them goes on to increase and they may leave this world even without making payment of such loans. Against small loans, the big loans taken away by the landlords are diverting towards power, prestige, litigation and politics. Thus, the agri. loans are not bringing change in our agri. sector. In certain cases, when the major share of agri. loans is taken by landlords, the agri. loans are becoming responsible for increasing inequities in rural sector.

A respondent, responding to the question regarding use of loans stated that, "My father has taken medium term agriculture loan from commercial bank by pledging

our lands, the loan amount was used for the marriage of my sister. After two years of marriage my father died. After the death of my father, me and my brother faced much difficulties. Even a time came when we eat dry bread (Roti) with water for many days. It took 10 years for us to stand again on our feet”

Another respondent said, “I took loan from a big landlord of the area and used amount in treatment of my sick wife and promised him to payback after the payments of my coming sugarcane crop in winter. My wife could not survive and it was a burden on me having two adult daughters at home. I was worried about their marriage. Before I got payment of my crop, I found a good match for my both daughter. They were two brothers and their family asked me to arrange marriage of children in coming winter. I again took some more loan from that landlord and from other relatives and friend. But I was unable to pay back the loan of influential landlord in next one year. He pressurized me, and finally I have to transfer a part of my land in the name of that landlord in about half price”.

Another farmer stated that, “we had a family tractor which we had taken from the bank(as long term agriculture loan). After division of land between us (Brothers) I got tractor and I had to pay rest of the installments. My eldest son wanted to go abroad for the purpose of earning good money. I sold the tractor to pay amount to an agent for visa of my son. But my son could not get visa and we lost the money. But I had to pay the rest installments. At the end, I have nothing”.

A small farmer reported that, I had 4 daughters, and 3 years ago my wife was pregnant again. We came to know that this time she has a baby boy and doctor suggested caesarian. It was a time of extreme pleasure for us. I took loan from a local money lender and used the amount for the operation of my wife and celebration of birth of a baby boy. We also distributed sweets in whole village on birth of his son. Now three years have passed, but still I have to pay back some amount. I hope that I will pay back in next crop”.

This type of stories are common in every household especially in rural areas. But in fact, this type of loans are taken on the name of agriculture because it is a good excuse to take loan because moneylender hopes that the farmer will have good produce at the end and he will pay back the loan with interest.

5.9. Role of Small Farmer's Living Standard in Determining Agricultural Poverty (The Binary Logistic Regression Analysis)

The concept of living standard and agricultural poverty has a close relationship. Generally rural development programs were initiated to improve the social and economic conditions of the people. But the method of measurement of the living standard is different. According to United Nation' Human development theory, Living standard is measured by Gross National Income (GNI) per capita. GNI includes Gross domestic product plus income from outside. In short living standard is represented by income per capita which is obtained by dividing GNI by total population.

Keeping in view the objectives of the current research, the living standards of the small farmer can be measured by the domestic product of the farmer plus any income from outside. Precising the concept of GNI to the small land holder, the living standard of a small farmer can be measured by total income from all sources of the small farmer family divided by number of family members. In this way we can find per capita income of the family. Going further in depth, this per capita income of the family determines the living status of family like, housing, household facilities, utilities, means of transportation and communication etc. To study the effect of various measures of living standard on agricultural poverty, the current research included not only per capita income of the family but also other aspects of living standard.

The binary logistic model shows whether and how independent variable is affecting the dependent variable. The aim of current study is to check the effect of living standard and related variables on agricultural poverty. It can be imagined that if the Per capita income (Which is main indicator of living standard according to United Nations Organization) of the small farmer is higher, his capacity to invest in agriculture will be better. And finally the agricultural product will be of good quality or sufficient quantity, bringing his agriculture out of agricultural poverty.

Similarly other related variables may also have effect on farmer's capabilities to make his agriculture better.

5.9.1. Hypothesis of the variables included in the model

Independent Variable	Hypothesis	
Per capita income of the family (PCIF)	Null hypothesis H^0	There is no statistically significant relationship between PCIF and Agricultural poverty (AP)
	Alternate hypothesis H^1	There is a statistically significant relationship between PCIF and Agricultural poverty (AP)
Off farm employment (OFE)	Null hypothesis H^0	There is no statistically significant relationship between OFE and AP
	Alternate hypothesis H^1	There is a statistically significant relationship between OFE and AP
Participation of female (PF)	Null hypothesis H^0	There is no statistically significant relationship between PF and AP
	Alternate hypothesis H^1	There is a statistically significant relationship between PF and AP
Live Stock (LS)	Null hypothesis H^0	There is no statistically significant relationship between LS and AP
	Alternate hypothesis H^1	There is a statistically significant relationship between LS and AP
Methods of irrigation (MI)	Null hypothesis H^0	There is no statistically significant relationship between MI and AP
	Alternate hypothesis H^1	There is a statistically significant relationship between MI and AP
Type of crops grown (TCG)	Null hypothesis H^0	There is no statistically significant relationship between TCG and AP
	Alternate hypothesis H^1	There is a statistically significant relationship between TCG and AP
Ownership of agricultural machinery	Null hypothesis H^0	There is no statistically significant relationship between OAM and AP

(OAM)	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between OAM and AP
Own means of transportation (OMT)	Null hypothesis H°	There is no statistically significant relationship between OMT and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between OMT and AP
Access to agriculture credit (AAC)	Null hypothesis H°	There is no statistically significant relationship between AAC and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between AAC and AP
Source of agriculture credit (SAC)	Null hypothesis H°	There is no statistically significant relationship between SAC and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between SAC and AP
Usage of agriculture credit (UAC)	Null hypothesis H°	There is no statistically significant relationship between UAC and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between UAC and AP
Distance to Bank (DB)	Null hypothesis H°	There is no statistically significant relationship between DB and AP
	Alternate hypothesis H^{\wedge}	There is a statistically significant relationship between DB and AP

5.9.2. Hosmer and Lameshow test (Test of Goodness of Fit)

Hosmer and Lameshow test uses non significance as an indicator of goodness of fit. Which means that the significance value must be greater than 0.05 in order to consider the model as good fit. In current model the sig. value is 0.141 which shows that the model is good fit.

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	12.236	8	.141

5.9.3. Variance Inflation Factor (Test of Multicollinearity)

Variance inflation factor (VIF) test is a measure of severity of collinearity in regression which shows variance of regression coefficient as a result of collinearity. There is no multicollinearity between the variables in this model because Variance inflation factor for all variables is less than 5 and tolerance is greater than 0.2.

Collinearity Statistics		
Variables	Tolerance	VIF
Per capita income of the family (PCIF)	.298	3.360
Off farm employment (OFE)	.416	2.405
Participation of female (PF)	.727	1.376
Live Stock (LS)	.374	2.677
Methods of irrigation (MI)	.537	1.863
Type of crops grown (TCG)	.464	2.153
Ownership of agricultural machinery (OAM)	.484	2.066
Own means of transportation (OMT)	.504	1.984
Access to agriculture credit (AAC)	.796	1.256
Source of agriculture credit (SAC)	.546	1.830
Usage of agriculture credit (UAC)	.444	2.252
Distance to Bank (DB)	.339	2.949

5.9.4. The binary logistic regression analysis

Dependent Variable = Agricultural poverty (AP)

Independent Variables	Coefficient		Wald	Df	Sig.	Exp(β)
	B	Std. Error				
Per capita income of the family (PCIF)	-3.962	1.989	3.969	1	.046*	.019
Off farm employment (OFE)	.803	2.514	.102	1	.749	2.232
Participation of female (PF)	-3.934	2.134	3.397	1	.065*	.020
Live Stock (LS)	1.070	2.188	.239	1	.625	2.915
Methods of irrigation (MI)	1.080	1.804	.359	1	.549	2.946
Type of crops grown (TCG)	-2.916	1.637	3.171	1	.075*	.054
Ownership of agricultural machinery (OAM)	-2.662	1.552	2.941	1	.086*	.070
Own means of transportation (OMT)	-2.345	1.611	2.118	1	.146*	.096
Access to agriculture credit (AAC)	-.842	1.450	.338	1	.561	.431
Source of agriculture credit (SAC)	-3.195	1.682	3.608	1	.058*	.041
Usage of agriculture credit (UAC)	-3.407	1.817	3.518	1	.061*	.033
Distance to Bank (DB)	1.238	.713	3.013	1	.083*	3.448
Constant	6.854	3.718	3.398	1	.065*	948.058
***, **, * indicates significant at 1%, 5% and 10% respectively.						

The results and interpretation of the binary logistic analysis are presented below. All variables are discussed one by one.

5.9.4.1. Per capita income of the family (PCIF)

According to United Nations human development program, income per capita shows the standard of living. Therefore the variable of per capita income of the small farmer's family was included. A question was asked about total income of the household and total number of family members. The following cross tabulation shows that 115 out of 128 small farmers out of agricultural poverty have per capita income of the family above the poverty line. Whereas, 116 out of 122 small farmers having agricultural poverty reported per capita income of the family below the poverty line.

		Per capita income of the family (PCIF)		Total
		No	Yes	
Agricultural Poverty	No	13	115	128
	Yes	116	6	122
Total		129	121	250

The results of the logistic regression analysis shows that the per capita Income of the small farmer household has strong and negative relationship with agricultural poverty. The result is significant at 5 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. Results shows that, as the per capita income of the family increases, the chances of prevalence of agricultural poverty among small farmer decreases. Higher Income provides ability to small farmer to invest in crops, like use of good quality seed, fertilizers, pesticides and timely watering etc. as well as increased investment in human capital. Which leads to increase in productivity. And hence, higher productivity may bring a small farmer out of agricultural poverty.

5.9.4.2. Off Farm Employment (OFE)

To check the effect of off farm employment on agricultural poverty, a question was asked from the respondent about off farm employment by himself or any family member. The table below shows that 106 out of 128 small farmers out of agricultural poverty reported that at least 1 member of the household have employment other than farms. Contrary to this, majority (108 out of 122) of the small farmer stuck in agricultural poverty do not have any off farm employment.

		Off farm employment (OFE)		Total
		No	Yes	
Agricultural Poverty	No	22	106	128
	Yes	108	14	122
Total		130	120	250

The statistical analysis of data shows that the small farmers himself or any one from his family having another employment out of agriculture are less likely to have agricultural poverty. But the result is statistically insignificant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. The off farm employment may add to the family's income from outside their agriculture. Which may increase capacity of the farmer to invest in his agriculture and other social rituals instead of taking loans and selling his lands..

5.9.4.3. Participation of Female (PF)

Usually in Punjab, in case of small farmer the female house hold work side by side with men. If they are not participating directly, they are definitely helping indirectly by looking after the animals, cooking and bringing food for the male family members to the fields. Question was asked by the researcher about the participation

of female household members in agricultural activities. The table below shows that 99 out of 128 small farmers out of agricultural poverty reported that the female member of the household also participates in agriculture. Contrary to this, majority (90 out of 122) of the small farmer stuck in agricultural poverty do not have any female participation in agriculture.

		Participation of Female (PF)		Total
		No	Yes	
Agricultural Poverty	No	29	99	128
	Yes	90	32	122
Total		119	131	250

Interestingly, the results of the logistic regression confirms that the small farmers having direct participation of their female family members in agriculture are less likely to have agricultural poverty as compared to others where female do not participate in the agricultural activity. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The results confirms the importance of female participation in agriculture in Punjab because if female participates in agriculture, the agricultural poverty is less likely to occur.

5.9.4.4. Live Stock (LS)

Live stock provides both direct and indirect support to the farmer and agriculture. One hand, live stock provide direct financial benefits in form of milk, butter, live stock generation and increasing the income by selling animals. On the other hand, the wastes from the animals increase the fertility of the soil. In Punjab, big landlords mostly have good live stock, but in case of small landowners both cases exists. A question was asked to the respondent whether they have live stock or not.

The table below shows that 112 out of 128 small farmers out of agricultural poverty reported having live stock. Contrary to this, 106 out of 122 of the small farmer facing agricultural poverty do not have livestock in their agriculture.

		Live Stock (LS)		Total
		No	Yes	
Agricultural Poverty	No	16	112	128
	Yes	106	16	122
Total		122	128	250

The results of the research analysis shows that, the small farmers having live stock are less likely to have agricultural poverty as compared to the small farmers without live stock. But the result is statistically insignificant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. By selling the milk, butter and reproduced animals, the small farmer can generate extra income. But on the other hand, investment in live stock is also a burden on small farmer.

5.9.4.5. Methods of Irrigation (MI)

The irrigation in Punjab can be broadly divided in two categories i.e. Traditional methods of irrigation including Canal irrigation and tubewell and the modern irrigation like drip irrigation or sprinkler. Traditionally using Canal water is cheaper and also fertile because it bring many minerals necessary for the fertility of soil when it flows through different areas. But due to scarcity of water the rivers and canals remains dry. The other option is, private irrigation system like private or rented tube wells. On the other hand modern irrigation technologies are drip irrigation and sprinklers. These modern methods are efficient, as it save a lot of water and also reduce cost of watering. But the initial cost of installing the technology is high and small farmers may not afford.

Question was asked to the respondent about the method of watering they use to irrigate their crops. The cross tabulation shows that 99 out of 128 small farmers out of agricultural poverty reported partial or complete use of modern irrigation system. Contrary to this, 104 out of 122 of the small farmer facing agricultural poverty are using traditional irrigation system in their agriculture.

		Method of Irrigation (MI)		Total
		Traditional	Modern	
Agricultural Poverty	No	29	99	128
	Yes	104	18	122
Total		133	117	250

The results of the logistic regression shows that the small farmers having an opportunity to water their crops by using modern watering system have lesser chances to have agricultural poverty. But the result is statistically insignificant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected. Since canal water is not available in all areas, and also scarce and unscheduled therefore farmers have to support irrigation by tubewell. Mostly small farmers can not afford to install tubewells therefore they have to rent tubewell from others. The water flows from one end of field to another through whole field. In this way a lot of water and fuel is wasted, incurring higher cost of irrigation to the farmer. Therefore, they have to bear a big cost of irrigation in terms of tube wells and fuel/electricity costs.

5.9.4.6. Types of Crops Grown (TCG)

There are usually two types of crops being grown in Punjab. These types includes Food crops and Cash crops. The small farmer is mostly doing subsistence farming. And subsistence farming is based upon food crops. The major food crops in Punjab

usually includes wheat and rice. Whereas, cash crops includes usually sugar cane and cotton. A question was asked to the respondent about the types of crops they mostly grow.

The cross tabulation shows that 110 out of 128 small farmers out of agricultural poverty responded that they use to grow cash crops in their farms. Contrary to this, 104 out of 122 of the small farmer facing agricultural poverty are growing food crops in their fields.

		Type of crops grown (TCG)		Total
		Food Crops	Cash Crops	
Agricultural Poverty	No	18	110	128
	Yes	104	18	122
Total		122	128	250

The results of the logistic regression revealed that the probability of occurrence of agricultural poverty among small farmers decreases if the small farmer is growing cash crops instead of food crops. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted.

The small farmers are usually insecure about their basic food needs, therefore they are risk averse and tends to grow food crops. Secondly, the cash crops need more investment. Therefore, the small farmers are biased towards subsistence farming. But the results of the analysis shows that the farmers taking risk of growing cash crops are less likely to have agricultural poverty. Cash crops are more beneficial in terms of income which may improve the living standard of the small farmer and also the ability of the farmer to invest in next crops also increase. Therefore, growing cash crops reduces the probability of agricultural poverty.

5.9.4.7. Ownership of Agricultural Machinery (OAM)

Agriculture machinery is of much importance in the modern time. The use of tractors, trolley, harvesters, modern plough etc are time saving and efficient. But these technologies require capital investment. The farmers owning these machinery are better off as compared to others who rent these facilities or use manual methods of plough and harvesting. A question was asked to the respondent about agricultural machinery.

The cross tabulation shows that a majority (109 out of 128) small farmers out of agricultural poverty responded that they own farm machinery. Contrary to this, Majority (103 out of 122) of the small farmer facing agricultural poverty do not own any kind of farm machinery.

		Ownership of agricultural machinery (OAM)		Total
		No	Yes	
Agricultural Poverty	No	19	109	128
	Yes	103	19	122
Total		122	128	250

The results of logistic regression revealed that the probability of agricultural poverty among small farmer decreases if he/she is owning farm machinery as compared to the small farmers using rental machinery and manual techniques. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. The small farmers have to pay heavy rent for the machinery when they hire from outside. And if they don't hire, the productivity decreases. In both cases, small farmer may suffer agricultural poverty.

5.9.4.8. Own Means of Transportation (OMT)

The problem of transportation remains a crucial problem for the village residents. The private means of transportation, motor bike/car may help the small farmers to provide transportation to their children to school to get education, to help small farmers to reach to hospitals in case of illness and emergency, to bring fertilizers and pesticides or to bring fuel for irrigation and farm machinery. On the other end, this private transport might be used to transport the agricultural output to the market. The own transport is cheaper than the rented one.

Therefore, a question was asked about the own means of transportation. The cross tabulation shows that a majority (104 out of 128) small farmers out of agricultural poverty responded that they have own means of transportation. While, Majority (104 out of 122) of the small farmer facing agricultural poverty do not own any kind of motor vehicle.

		Own means of transportation (OMT)		Total
		No	Yes	
Agricultural Poverty	No	24	104	128
	Yes	104	18	122
Total		128	122	250

The results of the logistic regression shows that, the chances of occurrence of the agricultural poverty decreases if a small farmer is having their own means of transportation (motor vehicle). The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted.

5.9.4.9. Access to Agriculture Credit (AAC)

Capital is blood life of production. But unfortunately, majority of farmers in Punjab are small land holder and lack resources. Their incomes are low and they are unable to fulfil their daily needs. These poor small farmers are unable to make any savings. Therefore they usually need credit for investment in crops for fertilizers, pesticides, plough, harvesting etc. Otherwise, the crop will be lesser in terms of quality, quantity or both. Which will result in agricultural poverty.

A question was asked to the respondent whether he/he has access to credit when needed. The answer contained two options “Yes” or “No”. The data shows that 97 out of 128 small farmers out of agricultural poverty responded that they have access to agriculture credit. While, 84 out of 122 of the small farmer facing agricultural poverty do not have access to agriculture credit.

		Access to agriculture credit (AAC)		Total
		No	Yes	
Agricultural Poverty	No	31	97	128
	Yes	84	38	122
Total		115	135	250

The results of the logistic regression shows that, the chances of occurrence of agricultural poverty decreases if a small farmer is having access to agriculture credit. But the result is statistically insignificant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected.

5.9.4.10. Source of Agriculture Credit (SAC)

The source of agriculture credit is important. There are 2 categories of the sources of credit. The formal credit through formal credit institutions and informal credit by non-institutional loan provider. The formal sources of credit are usually out of reach of small farmers due to certain barriers and complications. Therefore, these small farmers have another option of non institutional sources of credit which is usually expensive and exploiting.

The researcher explained about both distinct categories of credit and it was made clear to them. Then question was asked to the respondent about the source of credit they usually avail in the time of need. The respondent was provided with two options “Formal” and “informal”.

The following cross tabulation of the data shows that a majority (104 out of 128) small farmers out of agricultural poverty responded that they use formal source of agriculture credit. On the other end, Majority (106 out of 122) of the small farmer facing agricultural poverty use informal sources of agriculture credit instead of formal sources.

		Source of agriculture credit (SAC)		Total
		Non Institutional	Institutional	
Agricultural Poverty	No	24	104	128
	Yes	106	16	122
Total		130	120	250

The results of the logistic regression shows that the small farmers who avail loans from formal institutional sources are less likely to face agricultural poverty as compared to those who avail loans from non-institutional sources. The result is

significant at 5 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. Therefore, the probability of the occurrence of agricultural poverty increases if a small farmer take loans from informal sources.

5.9.4.11. Usage of Agriculture Credit (UAC)

It is not enough to get easy agriculture credit from financial institutions to get out of agricultural poverty. The proper use of the credit matters a lot. Unfortunately, their exist moral hazards in the society in Punjab which may make this agriculture credit an extra burden instead of relief. These hazards are related to the use of the loans. Use of agriculture loans on social rituals like marriages, dowry, births and deaths are common practices due to lack of monitoring. These problems on one hand, keep the agriculture poor and on the other hand, bring farmers under debt burden. A question was asked by the researcher about the usage of credit. Whether the small farmer have used the credit for agriculture or non-agricultural purpose. The following cross tabulation of the data shows that a majority (113 out of 128) small farmers out of agricultural poverty responded that they use agriculture credit only for agriculture purpose. On the other end, Majority (102 out of 122) of the small farmer facing agricultural poverty reported that they have used agriculture credit for other purpose instead of agriculture.

		Usage of agriculture credit (UAC)		Total
		Non Agriculture	Agriculture	
Agricultural Poverty	No	15	113	128
	Yes	102	20	122
Total		117	133	250

The results of the current research shows that the probability of the small farmers to have agricultural poverty decreases if the agricultural loans are purposively

utilized for the said purpose as compared to the farmers who use agricultural loans in other practices. The result is significant at 10 percent level of significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. This phenomenon confirms the loss related to moral hazards associated with the use of agricultural credit.

5.9.4.12. Distance to Bank (DB)

The banking system in Pakistan is urban oriented. The rural areas do not have easy access to the banking system. In big towns small branches of few banks might be available but the villages totally lacks the banks. Especially agricultural bank is only present in cities. Therefore, the small farmers in rural areas do not have access to banking system. And formal credit is far away from the rural farmer. They have to visit again and again to banks which they feel difficult. Therefore, the question was asked to the respondent about the distance between their residence and banks. The following cross tabulation of the data shows that a majority of small farmers out of agricultural poverty reported lesser distance to the bank. On the other end, Majority of the small farmer facing agricultural poverty reported comparatively larger distance between their residence and bank.

		Distance to bank (DB)				Total
		1	2	3	4	
Agricultural Poverty	No	104	17	1	6	128
	Yes	2	7	43	70	122
Total		106	24	44	76	250

The results of the logistic regression analysis shows that the probability of occurrence of agricultural poverty increases with the increase in distance between residence of the farmer and banks. The result is significant at 10 percent level of

significance. Therefore, null hypothesis is rejected and alternate hypothesis is accepted. This results again proves that the accessibility to the banks is important. Otherwise, the small farmer have to move towards informal sources of credit which is ruthless for small farmer.

5.10. Living Standard Policies in Punjab

There are no past policies existing about raising the living standards of the small farmers directly in terms of increasing their per capita income of the household. And it is a reality that government cannot provide direct cash out of pocket to all small farmers to raise their living standard. Various governments introduced policies about rural development, which may have indirect benefit to the small farmer also. However, small farmers seek financial support. Also, it is necessary to bring them out of agricultural poverty.

Easy credit might be an important instrument in enabling farmers to acquire command over the use of working capital, fixed capital and consumption goods. After emergence of green revolution, there have been overtime changes in crop production technology, so credit requirements have increased for both inputs for crop production and farm investment.

Taccavi loans were disbursed through revenue departments of the provincial governments. The contribution of these loans towards total institutional credit declined overtime with the development of new institutional sources. Small amounts were allocated in provincial budgets for these loans. Moreover, delays and procedural difficulties in sanctioning and disbursement of loans rendered the system of taccavi inefficient and ultimately these loans are discontinued since 1993-94.

The cooperatives for credit exist in Punjab region since their introduction in India under the Cooperative Credit Societies Act of 1904. The objective was to provide loans to small farmers through their own local associations on relatively easy terms to free them from clutches of moneylenders and grain merchants. The scope of cooperative activities was enlarged through the Cooperative Societies Act of 1912 to other fields besides agricultural credit and cooperative technique could also be used by urban dwellers. The Act gave powers to Provincial Governments to make rules to carry out the purpose of the Act including the settlement of disputes among

members and their societies by arbitration. Punjab continued with the Act of 1912. In 1976, the Federal Government established the Federal Bank for Cooperatives (FBC) and the philosophy behind cooperative credit changed in a fundamental manner. An explicit relationship between the credit and input use and the credit and farm size was postulated. The FBC depends on the State Bank of Pakistan for financial support. Meanwhile to further reduce the dependency of farmers on the non institutional credit sources, two specialized agricultural financial institutions, namely; the Agricultural Development Finance Corporation (1952) and the Agricultural Bank of Pakistan (1957), were established. These two institutions were later merged to form the Agricultural Development Bank of Pakistan (ADBP) on 18 February 1961. Recently, it is renamed as Zarai Taraqati Bank Limited (ZTBL) and is the leading source of institutional agricultural credit in the country. ZTBL mainly borrows from the State Bank of Pakistan. However, some special funding programs of the Bank are funded by multilateral agencies like the World Bank, the Asian Development Bank, and the International Fund for Agricultural Development (Iqbal et. al, 2003).

The commercial banks have also emerged important formal source of agricultural credit in Pakistan with the passage of time. Prior to the Banking Reform of 1972, commercial banks were generally reluctant to lend to agriculture sector. The financing was limited to agricultural marketing with produce as collateral for the loans. Under the 1972 reforms commercial banks were required to broaden the scope of lending to finance modern farm inputs and investments. The banks are required to fulfill a target lending for agricultural sector and are subject to penalties if they do not meet the target. Unlike the other formal credit institutions, the commercial banks depend entirely on their deposits for financing agricultural credit.

5.11. Different Schemes for the Agriculture Lending in Pakistan

The following are various schemes announced by government through Agricultural development Bank (ZTBL, 2020)

5.11.1. Revolving Credit Scheme

Revolving Credit Scheme was introduced by the State Bank of Pakistan in 2003 with consultation of other banks. Under this scheme, the banks may provide credit

for the agricultural use with one time documentation, on the base of revolving the limits for defined period of 3 years. The farmers are required to pay the amount and interest rate back each year to the bank and then take principal amount back again. There is flexibility in installment payment and multiple withdrawals. This loan can be availed for running finance (ZTBL, 2020).

5.11.2. Supervised Agricultural Credit Scheme

According to ZTBL (2020) Supervised Agricultural Credit Scheme was a system designed for providing credit with in easy access of the farmer or the door step. The package included the provision of the farm inputs and guidance and supervision of the use of finance. This Scheme was designed to cover entire Pakistan, which comprises 458 tehsils with no restriction of territorial jurisdiction. All commercial and cooperative banks agreed to participate in this scheme.

According to the scheme, the credit can be provided to all categories of farmers in Punjab (owner, owner cum tenant and tenant). The Commercial Banks may reject the loan application on the basis of the following:

- If applicant is not an original farmer.
- The name of applicant does not appear in Revenue records.
- The applicant is defaulter of banking system.
- If applicant is unable to produce proper securities / sureties / pass book.
- Credit proposal is not adequate

5.11.3. Group Loaning for Small Farmers

The State Bank of Pakistan developed another credit Scheme on group-based technique for small farmers who are involved in crop or non-crop activities. Under this scheme, banks may provide loans under joint guarantee of the members of farmer group with compliance to the rules of SBP on agriculture credit. The amount of credit is limited up to 200,000 Rupees. The farmer is liable to pay back principal amount with mark up once in a year (ZTBL, 2020).

5.11.4. Mark up Free Agri E Credit Scheme for Small Farmers

This credit scheme was initiated in 2016 through ADBP, which is valid until 2021. This scheme was aimed to facilitate small farmers in Punjab. According to the policy, the eligibility criteria is as follows

- The farmers owning the land from 2.5 to 12.5 acres.
- The applicant farmer must be residing in same union council as that of land.
- The borrower must have valid copy of National Identity Card.
- Clear Character Report
- Obligor risk rating (ORR) rating upto 4

The verification of processed loans is conducted by the GoPb through chartered accountant firms hence utilization of loans should be vigilantly/timely checked by the respective MCOs in 100% cases, Branch Managers, Zonal Chiefs and Internal Auditors of the Bank as per prescribed criteria/ standing instructions of the Bank.

Mark-up of loans under the scheme is charged by ZTBL which is 12.50% annually. Mark-up subsidy by Govt. of Punjab is being provided for 05 years on timely repayment of loan. According to the policy, the loan for first two years would be free of Mark-up whereas for the third, fourth & fifth year the borrowers would bear 4%, 8% & 12 % Mark-up cost respectively.

5.11.5. Agriculture Loan through National Rural Support

Program

According to NRSP (2019) the government of Punjab has taken an initiative to improve wellbeing of farmers by providing interest free loans to the small farmers having upto 2.5 acres of land, or 5 acres in case of tenant/sharecropper in selected districts of Punjab. The criteria of eligibility for this scheme and details are as follows

- The scheme is for entire Punjab, NRSP will provide loans to 150,000 farmers in selected districts of Punjab.
- Farmers having land holding of up to 2.5 acres are eligible for loans.
- Tenants and sharecroppers of up to 5 acres are also eligible for loans.

- All six monthly crops are covered under this scheme.
- Farmers must be registered in Land Records Management & Information System maintained at Arazi Record Center

Terms and conditions for this loan are as follows

The borrower will be entitled not more than PKR 25,000 per acre for Rabi crops and not more than PKR 40,000 per acre for Kharif crop. The actual loan size for each borrower will be determined based on his ability to produce, seriousness and repayment capacity.

- A household will not be eligible for more than one loan at a time.
- Defaulters of any Financial Institution are not eligible for loan under this scheme.
- The applicant farmer/Tenant/share cropper should be the resident of same rural Union Council where the land is located.
- Land of the farmer must be verifiable with the Land Record

5.11.6. Kisan Dost Scheme (Farmer friendly scheme)

Kissan Dost Scheme has been launched on concessional rate of mark-up for financing crop production loans, (seed, fertilizer, pesticides etc.). The financing is for one season crop i.e. either Rabi or Kharif. This loan is provided by Agriculture Development Bank all over Pakistan. The maximum loan limit is Rs. 100000 per borrower/party

All new borrowers are eligible for this loan, also the old borrowers having good track record can also avail this facility upon successful finishing old credit plan. The borrower must pledge tangible property. The markup rate is decided by the bank.

5.11.7. Sada Bahar Scheme

In order to facilitate the farmers to have easy access towards credit with the facility of one time documentation for three years period, withdrawal of loan amount as per

their requirements and deposit the same as and when funds are available with them, Bank has revived Sada Bahar Scheme. This credit is provided by Agriculture development bank. The scheme primarily caters to the financing requirements for working capital as well as input needs to all eligible fresh & existing farmers across the country. The beneficiaries under the “Sada Bahar Scheme (SBS)” would be facilitated for any number of withdrawals and repayments (multiple operations), within the limit for a period of three years with one time yearly clean up from date of first withdrawal. Revolving credit limit would be worked out as per prevalent per acre crop-wise ceilings. Revolving credit limit may be sanctioned by the branch manager upto Rs. 0.700/- million per borrower/party with season-wise break up i.e. (Rabi & Kharif). The farmer must pledge tangible properties and all other forms of securities acceptable to the Bank and 10% of the loan amount will be deposited by the borrower as self-contribution. In case of non-repayment on agreed due date, the revolving limit would be ceased. Fresh request with new L.C No. with full charges would be considered by respective Branch Manager after clearance of all outstanding dues plus total accrued mark-up. Enhancement of limit in such cases shall not be allowed within the prescribed 3 years limits. The mark up rate will be as per policy of the bank (ZTBL, 2020).

Validity/Renewal

1. The loan limit sanctioned under Sada Bahar Scheme would be valid for three years with one time documentation. The borrowers would be required to clear the outstanding liabilities under the scheme once in a year by the due/expiry date and the limit can be availed from next working day on the request of borrower.
2. The due/expiry date of renewed limit would be for one year after the availment/1st withdrawal or completion date of three years period whichever is earlier.
3. All debit entries/withdrawals (excluding those relating to charging of Mark up) in a year would be treated as disbursement.
4. Withdrawals after renewal of a limit would be treated as disbursement against the annual limit.

5.12. Comments on Past and Present Policies

The small farmer in Punjab facing a high exploitation by non-institutional credit sources seeks relief from the institutional sources of credit and Government schemes. Focusing on the various steps taken by State Bank of Pakistan, All commercial and cooperative banks may provide agriculture loans to the farmers. Also various schemes introduced by the Governments have positive intension. But, the fruit of these initiatives could not reach the small farmer. These credit institute are urban oriented. Therefore small farmers in rural areas are reluctant to visit again and again to the cities in seek of credit. Also, the documentation remain complicated. Therefore small farmer find it easy to get credit from non-institutional sources. Some time, due to lack of proper information, the small farmer is unaware of these credit schemes. As a result, most of the small farmers remain poor.

The credit schemes mostly remain political and hence short termed. The eligibility, documentation and process is complicated, whereas, the amount advanced per acre is very low and short termed. There is always a sword of fear on the heads of the small farmers availing these schemes.

The Government of Punjab markup free E credit scheme scheme seems good, but actually it is not interest free, instead it has subsidized interest rate. This scheme do not include only small farmers but also medium farmers which are often influential, having better financial condition and good connections in the society. This loan is a seasonal loan which facilitates seasonal crops only. Therefore, it is beneficial for one segment of the small farmers. A big segment of the small farmer who grows annual crops like sugarcane, fruits like Mango, Orange can not utilize this facility. Again the documentation is difficult and expensive for small farmers and loan amount is less. Therefore, the cost of taking loans is high.

Interest free loan through NRSP is a good step for the empowerment of the small farmer. According to the criteria of this loan, the scheme covers the small farmers holding maximum upto 2.5 acres of land in case of direct ownership and maximum 5 acres as a tenant/sharecropper which is very low. This scheme only benefits the growers who grows the biannual produce. Again the growers of annual crops are not benefitted with this scheme. The amount of loan per acre is also very less

whereas the documentation is tough and expensive. The factor of seriousness of the farmer is also complicated.

Kisan dost scheme is also for seasonal crops only. In this case, the amount of credit is very less and the range of landholding is not clear. Therefore, the small farmers are ignored because of their lesser ability to pay back. The rate of interest is also unclear. Also in Sada Bahar scheme, there is no special provision for the small farmer. The rules of renewal and repayment are comparatively strict.

5.13. Recommendations

After 18th amendment in constitution of Pakistan, when majority of the departments of the government were handed over to provincial governments, the financial department remained in between, making it a complicated department. There are both federal and provincial tax and finance department. State Bank of Pakistan is governed under federal government, and provincial governments have their own Banks. But these banks are influenced by the State Bank of Pakistan. That's why, this department is not completely a provincial subject. Some policies/ schemes are provided by federal Government. Provincial governments can also introduce/implement their own policies.

The fore mentioned policies/ schemes are good in nature but they need some improvements. Following improvement are important for both government agencies and financial institutes to utilize the credit in efficient way so that farmer will get maximum profit which improves their living standard.

- Since majority of the population in Punjab lives in rural areas. Therefore, the government of Punjab should focus on the development of the rural areas, especially the infrastructure development. The development of infrastructure and development in rural areas may attract investment in these areas which may further develop the area and increase in overall rural wellbeing. And it will also decrease burden on the urban areas. It will also help to build the trust on the government in the majority of the population.
- Establishment of the Industry should be promoted in rural areas, so that the villagers can get off farm employment and ultimately their living standard will

be increased. Agro based industry should be especially established in rural areas. So that, the small farmers can easily transport their output to industry.

- Industrial estates should be made in rural areas with special incentives to promote industry. And the rural industry should be given tax relaxation.
- Women should be provided opportunities to perform economic activity. The present federal government announced to provide poultry and goats to provide females of the poor household which actually could not happen. Therefore the provincial government should ensure the provision poultry and goats especially to the women of small farmer household.
- Easy access to credit should be ensured to small farmers through commercial banks.
- The agriculture development bank and commercial banks are usually urban biased. The banks should establish small branches at least in bigger villages so as to facilitate daily banking of the farmers and also to provide information and agriculture credit facility to the bulk of small farmers.
- Interest free loans should be provided to small farmers for agriculture mechanization. Especially for irrigation methods.
- The procedure for obtaining loan should be made simple and easy to understand in term of time, documentation and repayment.
- There should be tracking system or monitoring system on farmer's field so that credit should be used for right purpose.
- The banks should also consider to facilitate by providing the small farmer with direct implements, or clearing the bills of implements instead of providing them cash.
- The rate of interest should be lower for small farmers specially. Farmers can pay it easily on time with low rate of interest.
- Agriculture Development Bank should provide credit to farmer according to their need. In case of any natural calamities or failure of crop time of repayment should be extended.
- The Punjab provincial cooperative bank should reconsider its policy to make the credit system efficient. The proper monitoring is required to make sure that that the credit amount reaches the documented benefiteurs, and used for the required purpose.

- State Bank of Pakistan and all other banks including the Agriculture development Bank should review their lengthy process of approval of the credit. There is need to make the process as simple as possible. It is important especially in the case of agriculture financing because the lengthy process takes time and in many cases the growers miss their crop cultivation due to delay in the disbursement of the loan and second, the farmers being illiterate or simple literate to some extent are unable to follow up the difficult procedures.
- SBP should properly monitor the different banks credit schemes and ensure the transparency in the field. Although State Bank has been pushing the banks at provincial level in the meetings and monitoring, however, there is a need of strong field level monitoring of the banks etc.
- Registration of the farmer should be done immediately and Practical steps should be taken for the automation of land record and facilitation in issuance of the Agriculture Pass Books, other Revenue Documents in a timely manner.
- There should be strong coordination between the banks and Revenue Department. Revenue Department should play role of focal point. At least one day in a week should be fixed on which the bank officers should sit with the officials of Revenue Department office to finalize and approve the loan application of the growers. And the banks could directly verify the authenticity of the farmer from the revenue department instead of asking each farmer to bring certain documents from the revenue department.
- There is a strong need of reforms in revolving credit scheme. Growers have paid least 50 percent of the principle amount along with interest should be made illegible for receiving more credit.
- The limits of the credit per acre in various credit schemes are very low, these credit limits should be increased in balance with the current inflation levels.
- The restriction of payback full principal amount or credit once in a year should be relaxed.
- Banks should also advance the consumption loans to small farmers. Especially in case of a crop failure.
- The banks especially the Agriculture development bank should introduce an agriculture credit card for the farmers with reasonable credit limit.

- The livestock is also an important element of the value addition in agriculture. Government should increase institutional loans for livestock and dairy production in order to achieve higher level of agricultural growth.
- The governments should make monitoring network in cooperation with credit institutes and agriculture department. These field monitors should frequently visit the field and make a report on the basis observations and meeting with farmer. Female field workers should also be appointed in order to communicate with female farmers.
- Government should also make laws to regulate the business of local money lenders and they should be bound not to charge more interest rates than the bank rates. And the restrictions of selling the output to the money lender only, should be declared as illegal in order to ensure the freedom of the small farmer to sell in the market.
- The staff of the banks should be well trained and qualified. Especially the credit officer in the banks should be specialized in economics of agriculture.
- Most of the credit schemes addresses the needs of the seasonal crops. Whereas, a large number of small farmers grows the crops which have longer harvesting time. Therefore, agricultural loan for these crops should be allowed for 1 year.
- Media should pay its role for providing awareness to farmers regarding about institutional credit and schemes. There is a need for extensive media campaign, including social media for providing information to the farmers regarding various schemes introduced by government and credit institutes. Also for publicizing the important features of the institutional credit by circulating brochures in national and regional language.

5.14. Expected Benefits

Since the living standard of the small farmer is not as sufficient in Punjab. Therefore, there is a need to take important steps to bring about a change and to increase the level of human development which is one of the point of focus of the government. Therefore, bottom to top approach is necessary to bring change in living standards of people.

The suggested recommendations will not only raise the living standard of the small farmer and his family but also lead to overall rural development. The established

small farmers, will be able to perform better in the fields. Hence, increasing their productivity. Which will ultimately lead to higher levels of production. Higher production levels as a result, will help to break vicious circle of agricultural poverty among small farmers.

Coming out of agricultural poverty, these small farmer can earn better revenues for themselves. These revenues will help these small farmers to invest in health and education. Also to get rid of the debts and attaining freedom in the society. On the other hand, increased production may supply more food for the consumption of population. Also, better quality and quantity of production may increase exports of the country. Which is a big source of foreign exchange earnings for the government and also plays important role in the balance of payment.

The suggested recommendations may also build trust on government among bulk of population. Therefore, the suggested measures will have social, economic as well as political benefits.

Chapter 6. Conclusion

Historically, agriculture remained source of food and fiber. In the beginning of human life, agriculture was the only source of livelihood and subsistence. With the passage of time, increase in population and human needs increased the pressure on agriculture. In order to fulfil human needs, it was necessary to transform the structure of agriculture according to the modern needs. Developed countries successfully undergone the transformation process and shifted from subsistence to mixed, and then towards commercialized agriculture. Along with development in agriculture, these developed countries established industrial and services sector which became backbone of their economies. Whereas, In Asia, especially in South Asia, Agriculture remained the major sector in the economies.

In case of Pakistan, Agriculture sector is still a major contributor in the economy. On one hand, agriculture is responsible for food and employment to the bulk of population, On the other hand, Agriculture sector is also responsible for provision of raw material to the industry. Since, The major industry of Pakistan is agro based. Especially in Punjab, The textile and sugar industry is directly depending upon agriculture sector for their inputs.

Punjab, the biggest province of Pakistan in terms of population and agriculture, is biggest responsible for feeding the population nationwide and providing raw material to the industry. Whereas, the density population has put great pressure on the lands. The division and subdivisions of the land in generations resulted in smaller and smaller farm sizes. Hence, majority of the farmers are small farmers. These small farmers lacked resources to adopt modern technology, education, health and a decent living standard. Which are the indicators of human development according to the United Nations Organization. As a result, the agriculture production of these small farmers remained inferior in quality or insufficient in quantity which is termed as “Agricultural Poverty” in the current dissertation. The term “Agricultural Poverty” is introduced for the first time in this study.

The inadequate public policies mostly benefited the large land holders. As a result the small farmers remained marginalized. The agriculture scientists focused on the scientific development of the agriculture by the used of improved seed, innovations

in fertilizers, pesticides and mechanization. These innovations have not benefitted the small farmers completely. There was a need to focus on the human development among these small farmers. The current research aimed to investigate whether the human development play any role among small farmers in Punjab in determining their Agricultural Poverty. For this purpose, Primary data regarding all three indicators of human development i.e. Health, education and living standard was collected from 250 small farmers in Punjab having less than 2 hectares of land. The Binary logistic regression was used to analyze the data. And all these indicators are discussed in details in separate chapters.

The results of the analysis revealed that all these indicators determines the agricultural poverty among these small farmers in Punjab. The variables regarding health shows that the health status of the family or farmer himself plays important role in determining agricultural poverty among small farmer. The financial hurdles and distance to the hospitals are the biggest hurdles in the way of maintaining good health among these farmers. Whereas, the health and hygiene awareness are also important. The results shows that, if a farmer and his family enjoying good health, having medical facilities available nearby are less likely to fall in agricultural poverty.

The education of the farmer and his family is also important for bringing these small farmers out of agricultural poverty. The results of the analysis revealed that, the literacy of the farmer and his family plays an important role in determining his agricultural poverty. Interestingly, practical training of the farmer proved as more important than his education. The small farmers having school available in their vicinity, having practical training or workshop regarding agriculture and having visited by extension service representative are less likely to fall in agricultural poverty. Whereas, unavailability of the school nearby, lack of financial resources and transport are the biggest obstacles in the way of education of the small farmer and his family.

Finally, the living standards of the small farmers are also important determinant of their agricultural poverty. The analysis discovered that the average annual income of the small farmer's family, the types of crops grown, the ownership of mechanization, availability of formal credit and its usage are important for the small

farmers. The small farmers having greater annual income, growing cash crops, having farm machinery and formal sources of credit are less likely to fall in agricultural poverty. The use of the credit and distance to credit institute also plays important role. The moral hazards associated with the use of agricultural credit, the complex systems of the credit institutes, social rituals, large spending on deaths, marriages and dowry deteriorates the living standards of the small farmer.

Thus, all three indicators of the human development shows inverse relationship with agricultural poverty. By improvement in health, education and living standard, the small farmer may fight out their agricultural poverty. Therefore, the study concludes that human development may play important role in determining agricultural poverty among small farmers in Punjab, Pakistan.

The past policies regarding these indicators of the human development mostly ignored the small farmers. There is a need of an extensive policy focusing on the small farmers. The small farmer is at greater health risk as compare to other rural community. On the other hand rural health care system is negligible as compared to its demand. There is a need to focus on small farmers while devising health policies. The current initiative of the government for providing health card to the poor families should be provided to small farmers on priority. Also, the rural health system and infrastructure should be upgraded.

The education policies also need to be revisited. Many rural areas still lacks schools. The available rural education system lacks infrastructure and basic facilities and monitoring. Therefore there is a need of policy reform in education sector in Punjab. These reforms may benefit the farmers by bringing knowledge to his home by his children and will also help the future generation. On the other hand, there is a need of the training and provision of practical knowledge to the small farmer. For this purpose, the agriculture extension department should be mobilized. There is a need to register all farmers, and these farmers should be divided in groups according to their areas of living. And the extension service representatives should be assigned the groups of the farmers and should be tasks to train and guide the small farmers by visiting them regularly. Online monitoring of the extension service representatives and their visits to the farmers should be conducted. Also, a massive

media, including social media campaign is needed to aware the small farmers in Punjab.

Finally, the living standards of the small farmers should be focused in the policy making. Since, the government cannot provide free money to all small farmers in order to raise their living standards. For this purpose, the government of Punjab should promote agriculture based industry, including medium and small scale industries in rural areas. For this purpose Government should declare industrial estates in the countryside with special incentives to the investors like tax concessions. This initiative will, on one hand increase the revenues of the Government, improve infrastructure in rural areas, on the other hand, it will create employment opportunities for the rural community. In this way the small farmers might be able to raise their incomes. Secondly, the agriculture credit system should be made farmer friendly. Various credit schemes are announced time to time by agriculture and commercial banks, but these banks are urban centered. Therefore, information either don't reach the small farmers or small farmers consider it difficult to visit far away banks by the time and again. Also, the complex formalities, documentation and lengthy procedures halts the small farmers to avail these credit schemes. Also, due to the long distance to banks, there is a lack of monitoring of the use of agriculture credit. Therefore, it is suggested that the sub branches of the agriculture and commercial banks should be established in order to facilitate and monitor these small farmers.

All these policy measures will benefit the small farmers and rural community as a whole. The investment of government in human development of the small farmers may bring the small farmer out of agricultural poverty. Therefore, these farmers will, on one hand financially better off themselves also they will be able to contribute in the economy. These policies may build trust and goodwill for the government among small farmers and overall rural community. These human development policies will help in development of the backward rural areas also the development of future generations.

References

- Abrejo, F.G. and Shaikh, B.T., 2008. Social Health Insurance: can we ever make a case for Pakistan. *Journal of the Pakistan Medical Association*, 58(5), p.267.
- Aftab, S., Hamid, N. and Prevez, S., 2002. Poverty in Pakistan-Issues, causes and Institutional Responses. *Islamabad: Asian Development Bank-Pakistan Resident Mission*.
- Afzal, M., Malik, M.E., Begum, I., Sarwar, K. and Fatima, H., 2012. Relationship among education, poverty and economic growth in Pakistan: An econometric analysis. *Journal of Elementary Education*, 22(1), pp.23-45.
- Agwu, A.A., 2013. Farmer Literacy Education Strategies for Achieving Poverty and Hunger Reduction among Rural Farmers in Abia State, Nigeria. *A Ph. d Thesis Submitted to the Department of Vocational Teacher Education University of Nigeria Nsukka*.
- Ahmad, I., Said, H., Hussain, A. and Khan, S., 2014. Barriers to coeducation in Pakistan and its implications on girls education: Critical review of literature. *Science International*, 26(1).
- Ahmad, I., Kahil ur Rehman, A.A., Khan, I. and Khan, F.A., 2014. Critical Analysis of the Problems of Education in Pakistan: Possible Solutions.
- Ahmad, I., 2014. Critical Analysis of the Problems of Education in Pakistan: Possible Solutions. *International Journal of Evaluation and Research in Education*, 3(2), pp.79-84.
- Ahmad, M., 2007. The effects of AKRSP's micro-credit programme on agriculture and enterprise development in district Astore Northern areas implication for poverty alleviation. *M. sc (Hons) Thesis, Deptt. of Agric. Econ. Agric. Univ. Peshawar, Pakistan*.

Ahmad, M., 2003. Agricultural productivity, efficiency, and rural poverty in irrigated Pakistan: A stochastic production frontier analysis. *The Pakistan Development Review*, pp.219-248.

Ahmad, S. and Rao, C., 2013. Applying communicative approach in teaching English as a foreign language: A case study of Pakistaner. *Porta Linguarum: revista internacional de didáctica de las lenguas extranjeras*, (20), pp.187-203.

Akram, M. and Khan, F.J., 2007. *Health care services and government spending in Pakistan* (No. 22184). East Asian Bureau of Economic Research.

Akram, W., 2008. Constraint's analysis of agricultural credit use: Implications for poverty reduction in Pakistan. Doctoral dissertation, University of Sargodha, Sargodha.

Alam, N., 2015. The role of technical vocational education and training in human development: Pakistan as a reference point. *European Scientific Journal*, 11(10).

Ali, S., 2018. The Education Crisis.

Ali, T., 2011. Understanding how practices of teacher education in Pakistan compare with the popular theories and theories and narrative of reform of teacher education in international context. *International Journal of Humanities and Social Sciences*, 1(8), p.208.

Anderson, J.R. and Feder, G., 2003. *Rural extension services*. The World Bank.

Antle, J.M. and Pingali, P.L., 1994. Pesticides, productivity, and farmer health: A Philippine case study. *American Journal of Agricultural Economics*, 76(3), pp.418-430.

Antle, J.M., Cole, D.C. and Crissman, C.C., 1998. Further evidence on pesticides, productivity and farmer health: Potato production in Ecuador. *Agricultural Economics: The Journal of the International Association of Agricultural Economists*, 18(968-2016-75732), pp.199-207.

Anwar, M., Green, J. and Norris, P., 2012. Health-seeking behaviour in Pakistan: A narrative review of the existing literature. *Public health*, 126(6), pp.507-517.

Anwar, Y., 2008. Knowledge sharing between State Bank of Pakistan and Central Bank of Srilanka, APRACA FinPower programme on rural finance, 22 december, 2008.

Appleton, S. and Balihuta, A., 1996. Education and agricultural productivity: evidence from Uganda. *Journal of international development*, 8(3), pp.415-444.

Aregawi, M., Cibulskis, R.E., Otten, M. and Williams, R., 2009. *World malaria report 2009*. World Health Organization.

Arif, G.M. and Farooq, S., 2014. Rural poverty dynamics in Pakistan: Evidence from three waves of the panel survey. *The Pakistan Development Review*, 53(2), pp.71-98.

Asadullah, M.N. and Rahman, S., 2009. Farm productivity and efficiency in rural Bangladesh: the role of education revisited. *Applied economics*, 41(1), pp.17-33.

ASIAN DEVELOPMENT BANK, 2005. TECHNICAL ASSISTANCE TO THE ISLAMIC REPUBLIC OF PAKISTAN FOR THE DEVELOPING SOCIAL HEALTH INSURANCE PROJECT. ISLAMABAD

Badar, H., Ghafoor, A. and Adil, S.A., 2007. Factors affecting agricultural production of Punjab (Pakistan). *Pak. J. Agri. Sci*, 44(3).

Baloch, M.A. and Thapa, G.B., 2019. Review of the agricultural extension modes and services with the focus to Balochistan, Pakistan. *Journal of the Saudi Society of Agricultural Sciences*, 18(2), pp.188-194.

Barber, M., 2010. Education reform in Pakistan: This time it's going to be different. *Islamabad Pakistan Education Task Force*.

Bazant, E.S., 2008. Women's place of delivery and experience of quality in delivery care: a quantitative and qualitative study in Nairobi's informal settlements. The Johns Hopkins University, School of Public Health and Hygiene.

Becker, G.S., 1965. A Theory of the Allocation of Time. *The economic journal*, 75(299), pp.493-517.

Bhutto, A.W. and Bazmi, A.A., 2007, November. Sustainable agriculture and eradication of rural poverty in Pakistan. In *Natural Resources Forum* (Vol. 31, No. 4, pp. 253-262). Oxford, UK: Blackwell Publishing Ltd.

Bosc, P.M., Eychenne, D., Hussein, K., Losch, B., Mercoiret, M.R., Rondot, P. and Mackintosh-Walker, S., 2002. The role of rural producers organizations in the World Bank rural development strategy.

Boyle-Holmes, T., Grost, L., Russell, L., Laris, B.A., Robin, L., Haller, E., Potter, S. and Lee, S., 2010. Promoting elementary physical education: results of a school-based evaluation study. *Health Education & Behavior*, 37(3), pp.377-389.

Bradley, K.R., 2002. Health hazards in agriculture: an emerging issue. *A publication of NASD, Department of Agriculture, United States*.

Brown, P.H. and Park, A., 2002. Education and poverty in rural China. *Economics of education review*, 21(6), pp.523-541.

Chandio, A.A., Yuansheng, J. and Koondher, M.A., 2015. Raising Maize Productivity through Agricultural Credit A: Case Study of Commercial Banks in Pakistan. *European Journal of Business and Management*, 7(32), pp.159-165.

Chew, P. and Soccio, M., 2016. Asia-Pacific: agricultural perspectives.

Chohan, B.I. and Qadir, S.A., 2013. Academic failure at primary level: A qualitative approach to primary education in Pakistan. *Journal of Research and Reflections in Education*, 7(1), pp.27-40.

CIDA. 2018. S THE FUTURE OF CHILDREN AND YOUTH: CIDA'S CHILDREN AND YOUTH STRATEGY. AVAILABLE AT

[HTTP://WWW.ACDI-CIDA.GC.CA/INET/IMAGES.NSF/VLUIIMAGES/YOUTH-AND-CHILDREN/\\$FILE/CHILDREN-YOUTHSTRATEGY-E.PDF](http://www.acdi-cida.gc.ca/inet/images.nsf/vLUIimages/youth-and-children/$file/children-youthstrategy-e.pdf) [ACCESSED 2018].

Cole, DONALD., 2006. Understanding the links between agriculture and health. *International Food Policy Research Institute*, 13(8).

Conceição, P., 2019. Beyond Income, beyond Averages, beyond Today: Inequalities in Human Development in the 21st Century. UNDP; New York, NY, USA: 2019. *Human Development Report*.

Conn, C.P. and Walford, V., 1998. An introduction to health insurance for low income countries. *London: Institute for Health Sector Development*.

Croppenstedt, A. and Muller, C., 2000. The impact of farmers' health and nutritional status on their productivity and efficiency: Evidence from Ethiopia. *Economic Development and Cultural Change*, 48(3), pp.475-502.

Currie, J. and Madrian, B.C., 1999. Health, health insurance and the labor market. *Handbook of labor economics*, 3, pp.3309-3416.

Cvrlje, D. and Ćorić, T., 2010. Macro & micro aspects of standard of living and quality of life in a small transition economy: The case of Croatia. *EFZG working paper series*, (02), pp.1-12.

Darling, C.A. and Cassidy, D., 2014. *Family life education: Working with families across the lifespan*. Waveland Press.

Davis, K., Nkonya, E., Kato, E., Mekonnen, D.A., Odo, M., Miiro, R. and Nkuba, J., 2012. Impact of farmer field schools on agricultural productivity and poverty in East Africa. *World development*, 40(2), pp.402-413.

Dixon, J., Taniguchi, K. and Wattenbach, H., 2003. Approaches to assessing the impact of globalization on African smallholders: Household and village economy modeling. *Proceedings of a working session on Globalization and the African Smallholder Study. FAO (Agricultural Support Systems Division [AGS] and Agricultural and Development Economics Division [ESA]) and the World Bank. Rome: Food and Agriculture Organization of the United Nations.*

Fah, B.C.Y., 2010. Living standard, living level and economic wellbeing of older persons: Similarity and differences in measuring these concepts. *Canadian Social Science*, 6(5), pp.145-150.

FAO., 2018. *Extreme poverty in rural areas*. Food and agriculture organization.

Farooq, M.S., 2013. An Inclusive Schooling Model for the Prevention of Dropout in Primary Schools in Pakistan. *Bulletin of Education and Research*, 35(1), pp.47-74.

Felman, A., 2020. What is good health? Available at <https://www.medicalnewstoday.com/articles/150999>

Fielke, S.J. and Bardsley, D.K., 2014. The importance of farmer education in South Australia. *Land Use Policy*, 39, pp.301-312.

Filmer, D., 2000. *The structure of social disparities in education: Gender and wealth*. The World Bank.

Fink, G. and Masiye, F., 2015. Health and agricultural productivity: Evidence from Zambia. *Journal of Health Economics*, 42, pp.151-164.

Fonte, M., 2008. Knowledge, food and place. A way of producing, a way of knowing. *Sociologia ruralis*, 48(3), pp.200-222.

Garcia, O., Mahmood, K. and Hemme, T., 2003. A Review of Milk Production in Pakistan with Particular Emphasis on Small-scale Producers. *PPLPI Working Papers*, (23782).

Gillespie, G.W. and Johnson, S.E., 2010. Success in farm start-ups in the Northeastern United States. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), pp.31-48.

Glewwe, P.W., Hanushek, E.A., Humpage, S.D. and Ravina, R., 2011. School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010.

GoP., 2005. *Economic survey of Pakistan*, Ministry of Finance, Pakistan.

GoP., 2006. *Economic survey of Pakistan*, Ministry of Finance, Pakistan.

GoP., 2007. *Economic survey of Pakistan*, Ministry of Finance, Pakistan.

GoP., 2009. National Education Policy 2009. Ministry of Education, Government of Pakistan Islamabad. Retrieved from <http://isc.org.pk/wp-content/uploads/2012/03/National-Education-Policy-Draft-2009.pdf>

GoP., 2011. *Pakistan Social and Living Standards Measurement Survey (2010-11)*, Pakistan Bureau of Statistics.

GoP., 2012. *Pakistan agriculture census report 2010*, Bureau of statistics, Pakistan.

GoP., 2013. Punjab School Education Sector Plan 2013-2017. School Education Department, Government of Punjab, Lahore. Retrieved from

http://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/pakistan_punjab_sector_plan_2013-2017.pdf

GoP., 2015. *Economic survey of Pakistan*. Ministry of finance, Pakistan.

GoP., 2016. *Economic survey of Pakistan*, Ministry of Finance, Pakistan.

GoP., 2017. *Economic survey of Pakistan*, Ministry of Finance, Pakistan.

GoP., 2018. Punjab health sector plan 2018, Ministry of health, Government of Punjab

GoP., 2019. 10 years Punjab health sector strategy, Policy and strategic planning unit. Government of Punjab.

GoP., 2019. *Economic survey of Pakistan*, Ministry of finance, Pakistan.

GoP., 2019. *Pakistan Social and Living Standards Measurement Survey (2018-19)*, Pakistan Bureau of Statistics.

GoP., 2019. Punjab Education Sector Plan 2019-2024. School Education Department, Government of Punjab, Lahore.

GoP., 2020. Sehat sahulat program under <https://www.pmhealthprogram.gov.pk/>

Grossman, M., 1972. On the concept of health capital and the demand for health. *Journal of Political economy*, 80(2), pp.223-255.

Grossman, M., 1999. The human capital model of the demand for health (No. w7078). *National Bureau of Economic Research, Cambridge, MA*. doi, 10, p.w7078.

Gujjar, A.A., Naoreen, B., Saifi, S. and Bajwa, M.J., 2010. Teaching Practice: Problems and Issues in Pakistan. *International Online Journal of Educational Sciences*, 2(2).

Hanjra, M.A., Ferede, T. and Gutta, D.G., 2009. Pathways to breaking the poverty trap in Ethiopia: Investments in agricultural water, education, and markets. *Agricultural Water Management*, 96(11), pp.1596-1604.

Hawkes, C. and Ruel, M.T. eds., 2006. *Understanding the links between agriculture and health*. Washington, DC: International Food Policy Research Institute.

Heidhues, F.R.A.N.Z. and Brüntrup, M., 2003. Subsistence agriculture in development: Its role in processes of structural change. *Subsistence agriculture in Central and Eastern Europe: How to break the vicious circle*, 1.

Hjortsberg, C.A. and Mwikisa, C.N., 2002. Cost of access to health services in Zambia. *Health policy and planning*, 17(1), pp.71-77.

Howitt, P., 2005. Health, human capital, and economic growth: A Schumpeterian perspective. *Health and economic growth: Findings and policy implications*, 1, pp.19-40.

Huvio, T., Kola, J. and Lundström, T., 2005. *Small-scale farmers in liberalised trade environment*. Helsingin yliopisto, taloustieteen laitos.

Ingram, J., 2008. Agronomist–farmer knowledge encounters: an analysis of knowledge exchange in the context of best management practices in England. *Agriculture and Human Values*, 25(3), pp.405-418.

Inwood, S., 2017. Agriculture, health insurance, human capital and economic development at the rural-urban-interface. *Journal of rural studies*, 54, pp.1-14.

Iqbal, M., Ahmad, M., Abbas, K. and Mustafa, K., 2003. The impact of institutional credit on agricultural production in Pakistan [with comments]. *The Pakistan Development Review*, pp.469-485.

Iqbal, M.J. and Ahmad, M., 2010. Enhancing quality of education through e-learning: the case study of Allama Iqbal Open University. *Turkish Online Journal of Distance Education*, 11(1), pp.84-97.

Iravani, M.R., 2011. Brain drain problem: A review. *International Journal of Business and Social Science*, 2(15).

Irvin, M.J., Byun, S.Y., Meece, J.L., Farmer, T.W. and Hutchins, B.C., 2012. Educational barriers of rural youth: Relation of individual and contextual difference variables. *Journal of career assessment*, 20(1), pp.71-87.

Jamal, H., 2014. *School participation in rural Pakistan: A situation analysis*. University Library of Munich, Germany.

Khan, G.A., Muhammad, S., Chaudhry, K.M. and Khan, M.A., 2010. Present status and future preferences of electronic media as agricultural information sources by the farmers. *Pak. J. Agri. Sci*, 47(2), pp.166-172.

Khandker, S.R. and Faruquee, R.R., 2001. The Impact of Farm Credit in Pakistan. *World Bank*.

Knight, J., Weir, S. and Woldehanna, T., 2003. The role of education in facilitating risk-taking and innovation in agriculture. *The Journal of Development Studies*, 39(6), pp.1-22.

Kumar, P. and Rosegrant, M.W., 1994. Productivity and sources of growth for rice in India. *Economic and Political Weekly*, pp.A183-A188.

Kuznets, S., 1961. *Economic growth and the contribution of agriculture: notes on measurement* (No. 979-2016-77077).

Lalani, B., Dorward, P., Holloway, G. and Wauters, E., 2016. Smallholder farmers' motivations for using Conservation Agriculture and the roles of yield, labour and soil fertility in decision making. *Agricultural Systems*, 146, pp.80-90.

Laszlo, S., 2013. Breaking Down the Barriers to Rural Education.

Lehébel-Péron, A., Sidawy, P., Dounias, E. and Schatz, B., 2016. Attuning local and scientific knowledge in the context of global change: The case of heather honey production in southern France. *Journal of Rural Studies*, 44, pp.132-142.

Lipton, M., Kadt, E.D. and World Health Organization, 1988. *Agriculture-health linkages*.

Lipton, M., 2005. *The family farm in a globalizing world: The role of crop science in alleviating poverty* (Vol. 40). Intl Food Policy Res Inst.

Lockheed, M.E., Jamison, T. and Lau, L.J., 1980. Farmer education and farm efficiency: A survey. *Economic development and cultural change*, 29(1), pp.37-76.

Lyon, A., Bell, M.M., Gratton, C. and Jackson, R., 2011. Farming without a recipe: Wisconsin graziers and new directions for agricultural science. *Journal of Rural Studies*, 27(4), pp.384-393.

Madan, S., 2012. Human development and poverty-a perspective across Indian States. *STATISTIKA-STATISTICS AND ECONOMY JOURNAL*, 49(4), pp.81-94.

Mahaliyanaarachchi, R.P. and Bandara, R.M.A.S., 2006. Commercialization of agriculture and role of agricultural extension.

Malik, S., 2005. Agricultural growth and rural poverty: A review of evidence.

Mahmood, N. and Ali, S.M., 2002. The disease pattern and utilisation of health care services in Pakistan. *The Pakistan Development Review*, pp.745-757.

Mahmood, N., Khalid, M. and Kouser, S., 2009. The role of agricultural credit in the growth of livestock sector: A case study of Faisalabad. *Pakistan Veterinary Journal*, 29(2).

- Malassis, L., 2010. *The rural world: education and development*. Routledge.
- Malhotra, R., 2006. Towards implementing the right to development: A framework for indicators and monitoring methods. Chapter 10 in Andreassen BA and Marks SP (2006) *Development as a human right. Legal, political and economic dimensions*. Harvard School of Public Health.
- Malik, S.J., 1999. Poverty and rural credit: the case of Pakistan.
- Mansfield, C. and Novick, L.F., 2012. Poverty and health. *NC Med J*, 73(5), pp.366-373.
- McGillivray, M., 1991. The human development index: yet another redundant composite development indicator?. *World Development*, 19(10), pp.1461-1468.
- McGillivray, M. and White, H., 1993. Measuring development? The UNDP's human development index. *Journal of international development*, 5(2), pp.183-192.
- Michler, J.D. and Josephson, A.L., 2017. To specialize or diversify: Agricultural diversity and poverty dynamics in Ethiopia. *World Development*, 89, pp.214-226.
- Murray, S., 2006. Poverty and health. *Cmaj*, 174(7), pp.923-923.
- Mondiale, B., 2008. World development report 2008: Agriculture for development.
- Mughal, W.H., 2007. Human Capital Investment and Poverty Reduction Strategy in Pakistan. *Labour and Management in Development*, 7(4), pp.1-33.
- Nachmias, C. and Nachmias, D., 1992. *Research Methods in The Social Sciences* (St. Martin Press, New York, USA).
- Nadeem, M., Rana, M.S., Lone, A.H., Maqbool, S., Naz, K. and Akhtar, A., 2011. Teacher's Competencies And Factors Affecting The Performance Of Female

Teachers In Bahawalpur (Southern Punjab) Pakistan. *International Journal of Business and Social Science*, 2(19).

Narayanan, S. and Gulati, A., 2002. Globalization and the smallholders: A review of issues, approaches, and implications.

Nasir, Z. and Nazli, H., 2000. *Education and earnings in Pakistan* (No. 2000: 177). Pakistan Institute of Development Economics.

Nasir, M., Alam, M. and Alam, M.T., 2016. Role of education in poverty alleviation in Pakistan. *Journal of Research in Social Sciences*, 4(2), p.52.

Nawaz, A. and Kundi, G.M., 2010. Demographic implications for the user-perceptions of E-learning in higher education institutions of N-WFP, Pakistan. *The Electronic Journal of Information Systems in Developing Countries*, 41(1), pp.1-17.

Nedungadi, P., Mulki, K. and Raman, R., 2018. Improving educational outcomes & reducing absenteeism at remote villages with mobile technology and WhatsApp: Findings from rural India. *Education and Information Technologies*, 23(1), pp.113-127.

Nenova, T. and Niang, C.T., 2009. *Bringing Finance to Pakistan's poor: Access to Finance for Small enterprises and the Underserved*. The World Bank.

Nagayets, O., 2005. Small farms: current status and key trends. *The future of small farms*, 355.

Neumayer, E., 2001. The human development index and sustainability—a constructive proposal. *Ecological Economics*, 39(1), pp.101-114.

Noorbakhsh, F., 1998. The human development index: some technical issues and alternative indices. *Journal of International Development: The Journal of the Development Studies Association*, 10(5), pp.589-605.

Noorbakhsh, F., 2002. Human development and regional disparities in Iran: A policy model. *Journal of International Development*, 14(7), pp.927-949.

NRSP., 2019. ACCESSED 2019 UNDER [HTTPS://NRSP.ORG.PK/E-KISSAN.HTML](https://nrsp.org.pk/e-kissan.html)

Onphanhdala, P., 2009. Farmer education and agricultural efficiency: Evidence from Lao PDR. *Graduate School of International Cooperation Studies*, (20).

Oshaug, A. and Haddad, L., 2002. Nutrition and agriculture. a foundation for development. *Geneva: United Nations Administrative Committee on Coordination Nutrition/Standing Committee on Nutrition*.

Pavel, M.S., Chakrabarty, S. and Gow, J., 2015. Assessing willingness to pay for health care quality improvements. *BMC health services research*, 15(1), pp.1-10.

Pitt, M. and Rosenzweig, M., 1986. Agricultural prices, food consumption, and the health and productivity of Indonesian farmers. *Agricultural household models: Extensions, applications and policy*, pp.153-82.

PLANNING COMMISSION PAKISTAN, 2013. PUNJAB ANNUAL PLAN. PLANNING COMMISSION PAKISTAN.

Qureshi, S.K., Shah, A.H. and Vosti, S.A., 1992. A Critical Review of Rural Credit Policy in Pakistan [with Comments]. *The Pakistan Development Review*, 31(4), pp.781-801.

Qureshi, S. and Arif, G., 2001. *Profile of Poverty in Pakistan, 1998-99* (No. 2001: 05). Pakistan Institute of Development Economics.

Rahman, T., 2014. The internet, youth and education in Pakistan. *UNDP Pakistan*.

Raviagric., 2019. Pakistan's Agriculture Sector, Agricblog1 Available at <https://www.raviagric.com/blog1/>

Razzaq, J. and Forde, C., 2014. The management of large-scale change in Pakistani education. *School Leadership & Management*, 34(3), pp.299-316.

Reimers, M. and Klasen, S., 2013. Revisiting the role of education for agricultural productivity. *American Journal of Agricultural Economics*, 95(1), pp.131-152.

Rein, B.K., 1992. Health Hazards in agriculture-An emerging issue. *NIOSH Publ. No. 000102014, USDA Ext. Serv., Washington, DC.*

Sadiqua, N. J. and Arjumand R., 2014. Maternal Mortality in Pakistan. *National Committee on Maternal Health Newsletter*, 4(3): 134-136.

Saqib, S.E., Kuwornu, J.K., Panezia, S. and Ali, U., 2018. Factors determining subsistence farmers' access to agricultural credit in flood-prone areas of Pakistan. *Kasetsart Journal of Social Sciences*, 39(2), pp.262-268.

Scott, W.E. and Redding, D.A., 1988. Agricultural Credit in Pakistan. *Islamabad: US Agency for International Development. March.*

SEN, A., 1984. *Resources, Values & Development*. New Delhi: Oxford University Press, p. 497.

Shah, I.H., 2010. Structure of technical education and vocational training in Pakistan. *Journal of Technical Education and Training*, 2(1).

Shah, S., 2010, December. Higher education expansion in Pakistan and issues of quality. In *3rd International Conference on Assessing Quality in Higher Education, Lahore, Pakistan.*

Shahbaz, B. and Ata, S., 2014. Enabling agricultural policies for benefiting smallholders in dairy, citrus and mango industries of Pakistan—Project No. ADP/2010/091.

Shahid, A.H., 2008. *Agriculture Economics*. Ilmi Kitab Khana, Urdu Bazar, Lahore, Pakistan.

Shaikh, Z.A. and Khoja, S.A., 2011. Role of ICT in Shaping the Future of Pakistani Higher Education System. *Turkish Online Journal of Educational Technology-TOJET*, 10(1), pp.149-161.

Shaikh, B.T., 2015. Private sector in health care delivery: a reality and a challenge in Pakistan. *Journal of Ayub Medical College Abbottabad*, 27(2), pp.496-498.

Shami, P.A. and Hussain, K.S., 2006. *Development of education in Pakistan*. Academy of Educational Planning and Management, Ministry of Education.

Shaukat, M.Z., 2011. Rural Credit in Pakistan and role of ZTBL. *By Technology Times at July*, 17.

Siddiqui, A.A. and Mirani, Z., 2012. Farmer's perception of agricultural extension regarding diffusion of agricultural technology. *Pakistan Journal of Agriculture: Agricultural Engineering Veterinary Sciences (Pakistan)*.

Srinivasan, T.N., 1994. Human development: a new paradigm or reinvention of the wheel?. *The American Economic Review*, 84(2), pp.238-243.

STATE BANK OF PAKISTAN, COMMITTEE ON RURAL FINANCE IN JULY 2001

Streeten, P., 2000. Looking ahead: areas of future research in human development. *Journal of Human Development*, 1(1), pp.25-48.

Šūmane, S., Kunda, I., Knickel, K., Strauss, A., Tisenkopfs, T., des Ios Rios, I., Rivera, M., Chebach, T. and Ashkenazy, A., 2018. Local and farmers' knowledge matters! How integrating informal and formal knowledge enhances sustainable and resilient agriculture. *Journal of Rural Studies*, 59, pp.232-241.

Swain, W.A., Rodriguez, L.A. and Springer, M.G., 2019. Selective retention bonuses for highly effective teachers in high poverty schools: Evidence from Tennessee. *Economics of Education Review*, 68, pp.148-160.

Tamim, T., 2013. Higher education, languages, and the persistence of inequitable structures for working-class women in Pakistan. *Gender and Education*, 25(2), pp.155-169.

Todaro, M.P. and Smith, S.C., 2012. *Economic development*. 11th edition, Boston: Addison-Wesley

Tonelli, S., Culp, K. and Donham, K., 2014. Work-related musculoskeletal disorders in senior farmers: Safety and health considerations. *Workplace health & safety*, 62(8), pp.333-341.

Toor, I.A. and Butt, M.S., 2004. Health Demand and Outcomes in Pakistan.

Ullah, R. and Shivakoti, G., 2017. Managing Dynamic Natural Resources in 21st Century in Asia. In *Redefining Diversity & Dynamics of Natural Resources Management in Asia, Volume 1* (pp. 371-385). Elsevier.

UNESCO, 2019. *EDUCATION AND LITERACY*. [ONLINE] AVAILABLE AT: [HTTP://UIS.UNESCO.ORG/EN/COUNTRY/PK](http://uis.unesco.org/en/country/pk)
[ACCESSED 2019]

United Nations, 1999. *The progress of Nation*. United Nations New York, USA.

Von Braun, J., 1995. Agricultural commercialization: impacts on income and nutrition and implications for policy. *Food policy*, 20(3), pp.187-202.

World Bank and International Monetary Fund, 2013. *Global monitoring report 2013: Rural-urban dynamics and the millennium development goals*. The World Bank.

World Bank, 2007. *The World Bank Annual Report 207*. The World Bank.

World Bank, 2007. *World development report 2008: Agriculture for development*. The World Bank.

World Bank, 2018. *World development report 2019: The changing nature of work*.

World Health Organization, 2004. *The World health report: 2004: changing history*. World Health Organization.

World Health Organization, 1999. *Highlights on health in Germany*. WHO REGIONAL OFFICE FOR EUROPE, COPENHAGEN: 1999.

WORLD HEALTH ORGANIZATION. 2008. *World malaria report 2008*. World Health Organization.

World Health Organization, 2010. *World health statistics 2010*. World Health Organization.

World Health Organization, 2016. *World health statistics 2016: monitoring health for the SDGs sustainable development goals*. World Health Organization.

Wyss, K., 2003. Access of the urban poor and vulnerable to healthcare in Africa. *Switzerland: Swiss Agency for Development and Cooperation*, 2(7): 45-48.

Zheng, X. and Zimmer, D.M., 2008. Farmers' health insurance and access to health care. *American Journal of Agricultural Economics*, 90(1), pp.267-279.

ZTBL., 2020. Avail Zarai Loans, retrieved March, 2020

<https://www.ztbl.com.pk/product-services/agriculture-loans/>

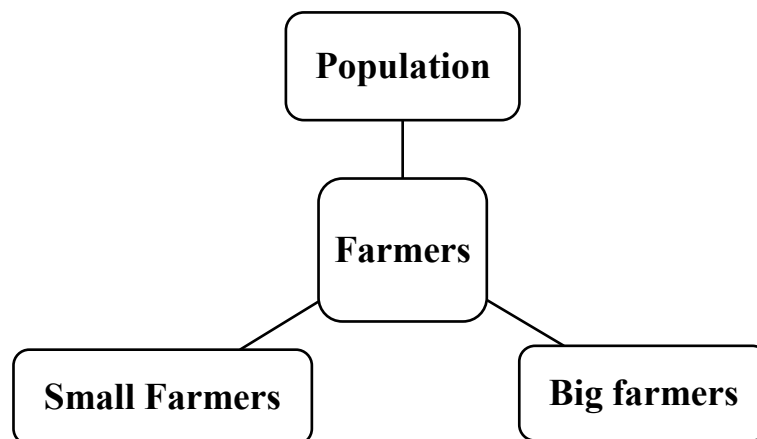
Appendix

Sampling Approach

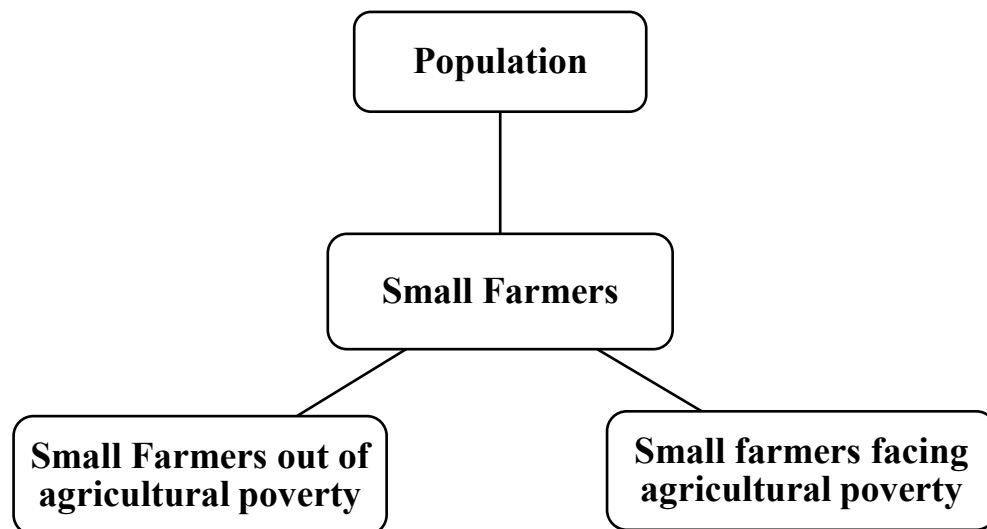
Data might be collected from the primary source or secondary. Primary data is first hand data obtained by the researcher. Five districts of Punjab were selected for the data collection. These districts includes the following

- Rawalpindi
- Sargodha
- Faisalabad
- Multan
- Rahim Yar Khan

These five districts represents the true picture of the situation in Punjab. The primary data was collected from the rural areas of these 5 districts. Data was collected from 50 small farmers from rural area of each district. For the current study the information was required from small farmers only. Therefore at first stage Purposive sampling was used. Instead of taking data from the conveniently available respondents, it is sometime necessary to get information from the specific target group. Therefore, due to criteria of the research, this purposive sampling was confined to small farmers only, who can provide the desired information. This type of sampling is known as purposive sampling.



Now small farmers became the population for the research. Because of the nature of the study and statistical tool being used for analysis it was necessary to further specify two different strata of the target population. Therefore, Stratified random sampling was used at this stage in order to ensure the requirements of the data. In stratified random sampling, population was divided into meaningful segments. For the analysis of current research the information from both small farmers facing agricultural poverty and those who are not facing agricultural poverty was required. Therefore, these two different strata was formulated and primary information from 25 small farmers each was collected from both these strata in all five districts. The advantage of the stratified random sampling is that, it is the most efficient method amongst all probability designs because all groups are truly sampled and a clear comparison is possible.



(Questionnaire)

Human Development and Agricultural Poverty among Small Farmers in Rural Punjab, Pakistan

Hello, My Name is Hasan, and currently I am pursuing my Ph.D studies at Humboldt University of Berlin, Germany. I am doing research for my dissertation on the above mentioned topic, therefore this research is purely for study purpose. I need to request you for your help and few minutes.

Name (Optional) _____	Age of Respondent _____
Location details	
1.1 District _____	1.2 Tehsil _____
1.3 Village _____	

Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female
Role of respondent at home	<input type="checkbox"/> Head of household	<input type="checkbox"/> Member of household
Total number of family members _____		
How long in total have you been a farmer _____ (years)		
What is the size of your Farm? _____		
Do you have livestock/animal husbandry?		Yes <input type="checkbox"/> No <input type="checkbox"/>
Do you have another farm or animal husbandry unit somewhere else?		Yes <input type="checkbox"/> No <input type="checkbox"/>
Nature of farm ownership	<input type="checkbox"/> Own	<input type="checkbox"/> Rented in/Contract
Can you read or write?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Do you have any healthcare facility available in the vicinity?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Distance to healthcare facility	<input type="checkbox"/> 0-10 km	<input type="checkbox"/> 10-20 km
	<input type="checkbox"/> 20-30 km	<input type="checkbox"/> More than 30km
Is any Public health care facility available in Village or nearby	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Type of available public health facility available?		
Is any Private health care facility available in Village or nearby	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Type of available private health facility available?	<input type="checkbox"/> Clinic	<input type="checkbox"/> Hospital
Which type of healthcare facility do you use	<input type="checkbox"/> Public	<input type="checkbox"/> Private
Do you get subsidized medicine in the healthcare facility you use?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Can you afford treatment in Private health care facilities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have/had any respiratory problem?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have any throat, cough, pulmonary or lungs problem?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you use any protective mask while applying fertilizer or spray?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you feel little or more hearing loss?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Do you have any skin allergy of irritation because of chemicals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you know any farmer diagnosed with skin cancer?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Who is diagnosed with skin cancer?	<input type="checkbox"/> Member of household	<input type="checkbox"/> Other than family member
Do you feel any health problem due to heat especially in summer?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever had any traumatic injury during agricultural activity?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Permanent loss of body part?		
Do you feel worry, mental pressure or depression because of agriculture?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you use Public health care facility?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is access to public hospital a hurdle in the way of treatment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is financial constraint a hurdle in treatment of your illness?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you use self medication at any stage of illness?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever witnessed consequences of carelessness in treatment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever experienced any illness due to lack of awareness?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is/are any family member facing a chronic disease?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are you facing any chronic health problem?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have any physical disability?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever attended any health awareness program by any Governmental / Non-Governmental organization?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever attended any hygiene program by any organization?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have safe drinking water available in the village?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you think that you and your family are consuming healthy and balanced diet?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you know what is health insurance?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are you willing to pay for health insurance?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Willingness to pay for health insurance	<input type="checkbox"/> 0	<input type="checkbox"/> 0-2000
	<input type="checkbox"/> 2000-5000	<input type="checkbox"/> More than 5000

Is a school available in your vicinity?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Distance to school	<input type="checkbox"/> 0-10 km	<input type="checkbox"/> 10-20 km
	<input type="checkbox"/> 20-30 km	<input type="checkbox"/> More than 30km
Is unavailability of school in vicinity a hurdle in the way of schooling?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Number of literate members in the household		
Is financial problem is a hurdle in the way of education?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever attended a school for formal education?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you ever attended a training course or technical education?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is/are any female member of the household literate?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is/are your children getting education?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are you willing to educate your children?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you think that transport problem is hurdle in the way of education?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you feel insecure while sending your children to school?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is lack of basic infrastructure and staff in the school is a hurdle in schooling?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Are extension services available in your area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do the extension service representative visits you atleast once in a year?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are you satisfied with extension services?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you read a newspaper or watch Television regularly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you use any social media? Twitter, facebook, whatsapp, youtube etc	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Do you have own house?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
What is the condition of your house?	<input type="checkbox"/> Kacha	<input type="checkbox"/> Pakka
Is road to the nearest city is Paved?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have electricity connection at home?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have telephone/mobile connection?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have adequate water and sanitation at your home?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you or any family member have any off farm employment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have you or any family member had an opportunity of off farm employment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
What is your total family income?	RS	
Do the female members of household participate in agriculture?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Which method of irrigation do you use?	<input type="checkbox"/> Traditional	<input type="checkbox"/> Modern
Which type of crops do you grow mostly?	<input type="checkbox"/> Food crops	<input type="checkbox"/> Cash crops
Do you own any Farm machinery?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you have your own means of transportation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you usually need loans?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Why do you need loans?		
Do you have access to agriculture credit?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Which source of agriculture credit do you utilize?	<input type="checkbox"/> Formal	<input type="checkbox"/> Informal
What are the hurdles in the way of formal agriculture credit?		
What are the problems associated with informal sources of credit?		
Do you always use agriculture credit for right purpose?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Distance to the bank	<input type="checkbox"/> 0-10 km	<input type="checkbox"/> 10-20 km
	<input type="checkbox"/> 20-30 km	<input type="checkbox"/> More than 30km

Informed Consent

Title of the Study

Human Development and Agricultural Poverty among Small Farmers in Rural Punjab, Pakistan

Principal Investigator

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Purpose of the Study

I am pursuing my Ph.D studies at Humboldt University of Berlin, Germany. I am doing research for my dissertation on the above mentioned topic, therefore this research is purely for study purpose. Through this research I will check the effect of human development among small farmers in rural Punjab on the agricultural poverty among them.

Study Procedure

For the research we have prepared a questionnaire containing questions on socioeconomic conditions of the small farmers and questions related to the level of human development among them including education, health and living standard. The researcher will read the question in English and then translate in to local language and then request you for your response. The researcher will mark your response on the questionnaire. It may take from 20 to 30 minutes to complete the interview.

Risks and Benefits

This study do not involve any type of risk. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose. There will be no direct benefit to you for your participation in this study. However, we will use the information for study purpose, on basis of which, we may give recommendations. The policy makers may use the recommendation for making suitable policies for small farmers in the future.

Confidentiality

Your responses to this survey will be anonymous. You may not provide any identifying information on questionnaire. Your name and comments will not be mentioned without your permission. Every effort will be made by the researcher to preserve your confidentiality. The collected information will be used for the mentioned study only. Collected information will not be shared with any other individual, firm, governmental or non-governmental organization.

Compensation

You will not be provided any compensation for this study.

Voluntary Participation

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign this consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be destroyed.

Consent

I have read/understand the provided information and have provided the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I voluntarily agree to take part in this study. I authorize the use of my records, any observations, and findings found during this study for education, publication and/or presentation.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Abstract (Deutsch)

Der Agrarsektor spielt eine dominierende Rolle in der pakistanischen Wirtschaft, indem er einen größeren Beitrag zum Bruttoinlandsprodukt leistet und einem großen Teil der Erwerbsbevölkerung Arbeitsplätze bietet. Punjab ist die größte Provinz Pakistans in Bezug auf landwirtschaftliche Produktion und Bevölkerung. Die Mehrheit der Bauern in Punjab sind Kleinbauern. Diese Kleinbauern sind größtenteils arm und haben eine geringere menschliche Entwicklung. Infolgedessen bleibt die landwirtschaftliche Produktion entweder qualitativ minderwertig oder quantitativ unzureichend, was als landwirtschaftliche Armut bezeichnet wird. Agrarwissenschaftler haben viel Arbeit geleistet, um die Produktivität des Agrarsektors durch die Verwendung von besserem Saatgut, Düngemitteln, Mechanisierung usw. zu verbessern. Die aktuelle Studie zielte darauf ab, den Zusammenhang zwischen landwirtschaftlicher Armut und menschlicher Entwicklung bei Kleinbauern in Punjab zu untersuchen. Primärdaten wurden von 250 Kleinbauern in 5 Distrikten von Punjab gesammelt. Die Analyse der binären logistischen Regression wurde verwendet, um die Beziehung zwischen den Dimensionen der menschlichen Entwicklung und der landwirtschaftlichen Armut eingehend zu analysieren. Bei der Analyse der Daten fand die Studie einen umgekehrten Zusammenhang zwischen landwirtschaftlicher Armut und allen drei Dimensionen der menschlichen Entwicklung, d. H. Bildung, Gesundheit und Lebensstandard der Kleinbauern in Punjab. Die Ergebnisse zeigten, dass die bessere Bildung, Gesundheit und der bessere Lebensstandard die Wahrscheinlichkeit verringern, dass der Landwirt landwirtschaftliche Armut hat. Die Regierung von Punjab der menschlichen Entwicklung von Kleinbauern bei der Ausarbeitung einer Politik besondere Aufmerksamkeit widmen sollte. Die Regierung sollte sicherstellen, dass die Kleinbauern in Punjab über Bildung und Sensibilisierung, Gesundheitseinrichtungen und einfache Kredite verfügen.

Abstract (English)

Agriculture sector plays a dominant role in Pakistan economy by making a greater contribution to Gross Domestic Product and providing employment to a huge portion of labor force. Punjab is the largest province of Pakistan with respect to agricultural production and population. Majority of the farmers in Punjab are small land holders. These small farmers are mostly poor and having lower levels of human development. low level of human development among small farmers obstructed the growth of agriculture in Punjab. As a result, the agricultural output remains either inferior in quality of insufficient in quantity which is termed as Agricultural poverty. A lot of work has been done by agricultural scientists globally on improving the productivity of agricultural sector by the use of better seed, fertilizers, mechanization etc. The current study aimed to explore the relationship between Agricultural poverty and human development among small farmers in Punjab. Primary data was collected from 250 small farmers in 5 districts of Punjab. Binary Logistic Regression analysis was used to analyze the relationship between the dimensions of human development and agricultural poverty. The study found inverse relationship between Agricultural poverty and all three dimensions of human development i.e Education, health and living standard of the small farmers in Punjab. Results revealed that the better education, health and living standard decreases the probability of the farmer to have agricultural poverty. Agriculture sector and farmers remained one of the most neglected part of the society by policy makers. Among farmers, the small farmers are most vulnerable. There is a need of extensive policy. It is suggested that the Government of Punjab should pay special attention to the human development of small farmers while devising policy. Government should ensure the provision of education and awareness, health facilities and easy credit to the small farmers in Punjab.