A S T U D Y

O F

THE ECONOMIC EFFECTS OF THE PUNJAB CANAL COLONIES.

"Ye can know them from their dwellings,"

"God has said, from water all things are made. I consequently ordain that this jungle in which subsistence is obtained with thirst be converted into a place of comfort." 'Akbar'

KAPUR SINGH BAJWA,

c. 1925

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P R E F A C E.

To readers interested in the material progress of the Province, no introduction seems necessary for so fascinating a subject as the "Economic effects of the Punjab Canal Colonies." The origin, growth and development of the Canal colonies is an interesting and surprising miracle of the 20th century - a miracle which has given rise to an important trading city like Lyallpur, the capital of the Lower Chenab Colony.

The development of the Lower Bari Doab Colony has an importance of its own as it is the youngest of all its sister colonies and as most of us have seen the change that has come over the new Bar. One can see what it was like less than ten years ago as one passes in the Karachi Mail through the desert skirting the youngest Canal Colony, not a vestige of cultivation on either side; only sand hills and a barren plain; dreariness unreclaimed save by the vivid mirage of water and trees. How this blight and hideousness of land was redeemed by the miracle of the 20th century and what are the consequences of this change form the scope of my thesis.

I have chosen what appears to me to be the notable features and grouped round them the circumstances which led to them and the consequences which came from them. It has not been possible, however, to mention all the noteworthy points in the development of different colonies and my apologies are, therefore, due for any partiality or neglect which I may appear to have done.

I have deliberately given much attention and large space to Chapter IV (on means of communications) as the prosperity of colonies very much depends upon the progress and improvements effected in their means of communication and I feel therefore no hesitation in quoting A. Smith that

"improvement in the means of transport is the greatest of all the agricultural improvements." Chapter V (on population is meant to indicate the relation between migration of population and canal irrigation. Chapters VL & VII (dealing with depressed classes and the janglis respectively) are important both from social and economic point of view. The importance of Chapter VIII (unrecognised assets of the Canal Irrigation) lies in its exposition of a few important effects which are generally overlooked by a superficial observer. Chapters XI (experiment of co-operative sale) is very important from the present day stand point and the Chapter XIII dealing with the problem of indebtedness has much bearing upon the Chapter XI. The latter is a remedy of the economic ills of indebtedness diagnosed in the former.

As for my appendices, I may submit that they form an integral part of my thesis and therefore deserve a careful perusal. Appendix "A" is based on an inductive enquiry into the village No. 369 near Gojra, district Lyallpur. The usefulness of Appendix "B" lies in its reference to sufferings and hardships undergone by early colonists and also in its real story of a Sufaid Posh grantee.

It only remains for me now to express my thanks to those who have helped me and especially to my Professors, Messrs. G. D. Sondhi, M.A., I.E.S., and G. Auditto, M.A.,P.E.S. who have helped me with numerous suggestions and criticisms. I also wish to acknowledge my debt to books like "Wealth and Welfare of the Punjab" and "The Punjab peasant in prosperity and debt", which have been my guide books throughout this work. I am also indebted to L. Chanan Shah, a money lender of Chak No. 116 R.B., district Lyallpur, who has, although after many persuasions, given me the true copies of accounts which have been attached in the appendix "C". I am ready to acknowledge the help that I have received from the study of various reports on the subject.

If I do not go beyond this general acknowledgement it is due not to any wish to conceal an obligation but solely to the impossibility of tracing to their sources all conceptions and arguments that I owe innumerable publications. Last but not the least I am indebted to my father, who has allowed me to draw on his wide and diverse experience of the colonies.

I may also mention that I have been a little over bold as far as my chapters on the "problems of indebtedness" and "Fragmentation and smallness of holdings" are concerned. I would, however, shelter myself behind the words of Malthus that "when a man faithfully relates any facts which have come within the scope of his own observation, however confined it may have been, he undoubtedly adds to the sum of general knowledge and confers a benefit on society." I have also done nothing beyond collection of facts and drawing conclusions therefrom.

In spite of all the friendly help, it is because of the limited space and time at my disposal that my thesis is by no means what I could have wished it to be. I will, however, make an end of my apologies in the words of the author of the Book of Maccabees: "If I have done well, as is fitting the story, it is that which I desired; but if slanderly and meanly, it is that which I could attain unto."

K. S. Bajwa.

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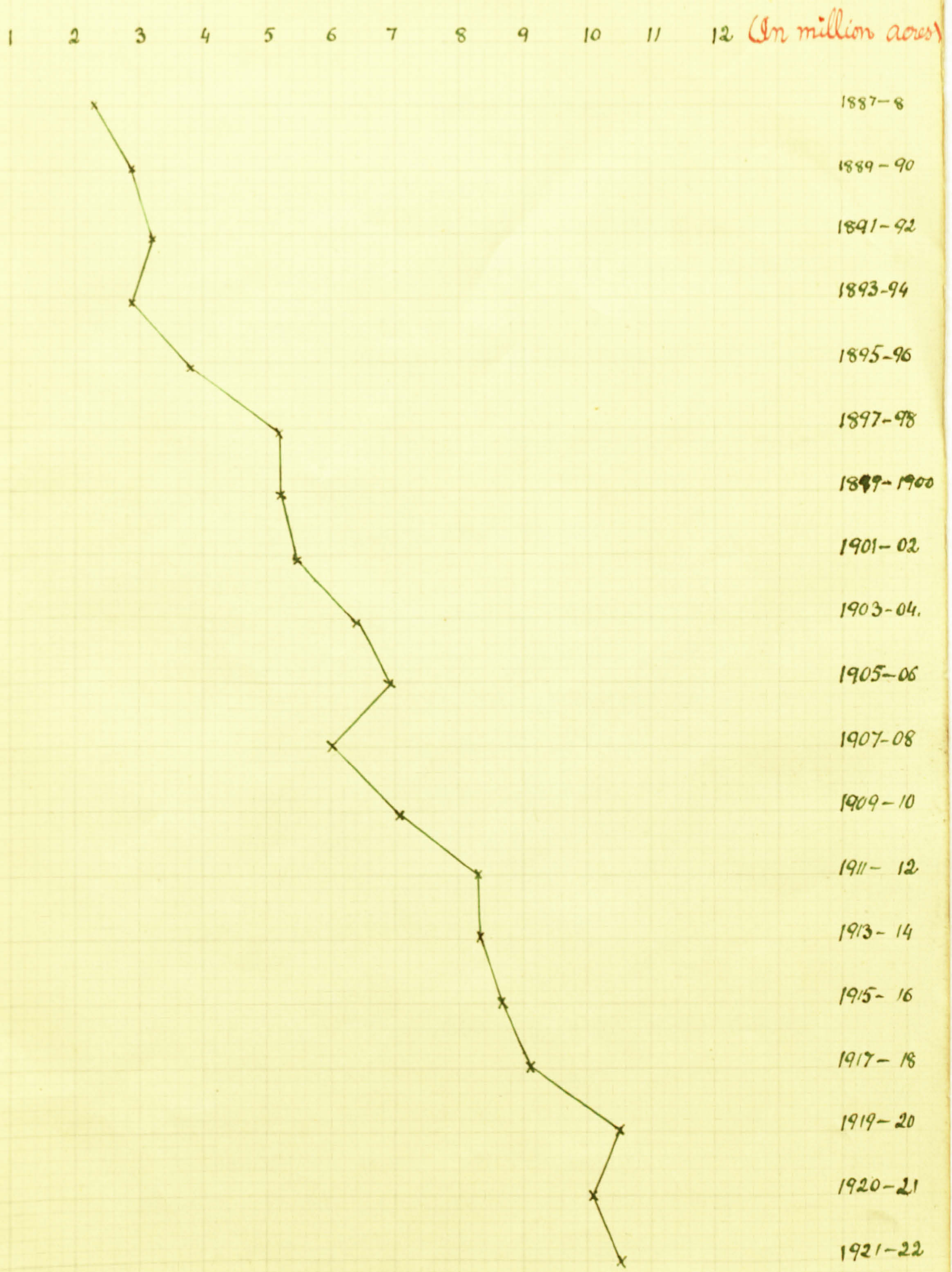

Note:- The Canal Irrigated area in 1920-21, (10.5 million acres) is equal to the total ploughed area in England and Wales.

K.S. Bajwa.

CHAPTER 1.

INTRODUCTION

1. FIRST PROPOSAL FOR CANAL COLONIES

The history of canal colonies in the Punjab may be said to open with the proposal for the construction of four inundation canals, which Sir Charles Aitchison laid before the Government of India in 1882 i.e. :-

(1) From the Chenab River at Ram Nagar in the Gujranwala District.

(2) From the Sutlej river (the Lower Sohag Para Scheme in the Montgomery District.

(3) From the Sidhnai reach of the Ravi river in the Multan District.

(4) From the Chenab river at Chiniot in the Jhang District.

It was explained that in classifying these projects the Lieutenant-Governor had been largely influenced by the fact that tracts of country to be benefitted by these irrigation works were all of them very sparsely populated, and that, in addition to the considerations of the nature of the soil and engineering facilities, there was a high probability of a speedy influx of cultivators to occupy the waste lands.

2. POLICY OF GOVERNMENT IN FOUNDING CANAL COLONIES

This anticipation of a flood of immigrants strikes but keynote of Govt's policy in founding its canal colonies, which is well summarized by the declaration made at the launch of the Chenab Scheme that the object of the Govt. was twofold.

(1) To relieve the pressure of population upon the land in those districts of the Province where the agricultural

population has already reached or is fast approaching, to the limit which the land available for agricultural can support.

(2) To colonize the area in question with well -to-do yeomen of the best class of agriculturists, who will cultivate their own holdings with the aid of their families and of the usual menials, but as far as possible without the aid of tenants, and will constitute healthy agriculture communities of the best Punjab type.

3. REASONS FOR THE CONSTRUCTION OF PERENNIAL INSTEAD OF INUNDATION CANALS

It will have been observed that the original design was to establish these contemplated settlements on Crown waste lands served by comparatively small inundation canals. The construction of this sort of canals was, no doubt, dictated by prudential considerations. The success of the perennial canals then working in the Punjab had, from causes which it is unnecessary to detail here, not been so unchequered as to inspire the irrigation engineers with any great enthusiasm for works of magnitude. The enormous strides made in the Science and art of canal-irrigation during the next 20 years were not then dreamed of and a cautious policy commended itself in 1882 to all concerned. But the vastness of the interests at stake and the insecurity of their foundations where agricultural prosperity is made to depend on the capricoys water supplies of inundation channels soon forced a change of front and to-day of all the Punjab colonies the small Sohag Para settlement alone relies for its vitality on a purely inundation canal. The earliest of the colonies, the Sidhnai, is watered by a canal which by reason of its permanent hardworks occupies a

position intermediate between a perennial and an inundation work. The Ram Nagar and Chiniot projects were merged in one Chenab inundation canal which early gave place to the perennial system serving the Lower Chenab Colony, and all the later Colonies draw their supplies from similar perennial canals.

4. ORDER OF ESTABLISHMENT OF CANAL COLONIES

1.	The Sidhnai Colony	1886.
2.	The Sohag Para Colony	1886.
3.	The Lower Chenab Colony	1892
4.	The Chunian Colony and extention in	1898 1904 - 1905
5.	The Lower Jhelum Colony	1906
6.	The Jhang Colony	1904
7.	The Lower Bari Doab Colony Scheme	1912 -1922
8.	The Upper Chenab Colony	1915.
9.	The Upper Jhelum Colony	1916.

CHAPTER II

A SHORT HISTORICAL AND GEOGRAPHICAL SURVEY OF THE IMPORTANT CANAL COLONIES

1. EARLY PROPOSALS FOR A CANAL

The necessity for artificial irrigation in the Rachna Doab, appears first to have been considered in 1862, when levels were taken in a portion of the Sialkot District with a view to ascertaining the possibility of providing irrigation from the Tavi rix river. But other ideas prevailed in the next year and investigations were set on foot in the country between Sialkot and Gujranwala on a proposal to construct a perennial canal from the Chenab river.

This scheme which was estimated to cost 345 lakhs of rupees was negatived by the Government of India on the ground that the estimates were insufficient and the financial results uncertain. In 1877 a modified scheme known as the Chiniot Foundation project was put forward, but this again, owing to inadequate date and dubious financial prospects, was indefinitely shelved.

This scheme was again sanctioned by the Secretary of State in 1884. and the canal was begun and it was opened for irrigation on the 9th July 1887' But it was an irony of fate, that after its successful working for two months enormous silt began to accumulate and before theriddle of September canal was virtually closed. The canal was cleared and re-opened in November; but the silt difficulty recurred in the hot weather of 1888. and convinced the engineering authorities that the canal would never carry the supply for which it was designed.

Proposals of the conversion of the inundation canal into a perennial canal were submitted by Major Ottley and were endorsed by Colonel Wace in the following beautiful lines.
He said "..... The only hope of augmenting considerably the

revenue derived by the State from the land lay in the utilization of the discharge of the Panjab rivers. While adding in this manner large sums to the State's revenue. we should at the same time attain results of the highest value to the content and prosperity of the Province. Nothing was so likely to strengthen our hold on the better feelings of the population than the extension of agriculture to lands now lying waste, and he had no fear that settlers would not be forthcoming to take up any areas to which the canal could be extended.*(X) The scheme was finally accepted by the Government in January 1890.

2. DESCRIPTION OF THE COLONY TRACT

The description of the Sandal Bar, the major portion of which is included in the Chenab Colony is taken from Captain Popham Young's report on the Colonization scheme written in 1896. There he says :-

"The Bar..... roughly includes the lower half of the Rachna Doab. Its limit on the north-west is defined with tolerable accuracy by the roads running from Lahore via Sheikhupura, Khangah Dogran and Pindi Bhatian to Shahpur. Below this line practically the whole of the country as far as the Junction of the Ravi and Chenab, with the exception of the part of Sharakpur Tehsil in the Lahore District and exclusive of the low lying belt of land on either side subject to river-rain influences, is included in the Sandal Bar"

The Sandal Bar is said to have derived its name from a noted dacoit(**) a Chuhra by caste , who according to the tradition used to dwell in a cave in one of the hills near Sangla in the centre of Bar. He is said to have been given to cannibalism. Many stories about his death are given to me and I quote one of them. Once a

(x) Ref. Revised Estimate of the Chenab Canal Project.

(**) This tale was told me by a Jat whose land is situated in the neighbourhood of Sangla.

marriage party was passing by that way and was attacked by Sandal All fled away leaving the bride at his mercy. The bridegroom in his effort to save his own life ran up the hill followed by the man eating Chuhra, and finding noway of escape hurled down a huge piece of rock, which struck the pursuer on the head and thus the notorious dacoit is said to have met his death. This Bar is also known as Dhulla Bhatike Bar — the name of another famous dacoit.

3. THE LOWER JHELUM CANAL COLONY.

The idea of irrigating the Joch Bar by a canal drawing its supplies from the Jhelum river is one which dates back to pre-annexation days. In his diary of 1847, Sir Herbert Edwards wrote, "Having now once more traversed the breadth of this Doab, I have no hesitation in saying that two-third of it is an uncultivated waste. This waste is called the Bar and it uniformely consists, wherever I have seen it, of a rich maiden soil covered with grass and under-wood. Want of water has alone kept it fallow, till the present day, and it is thinly populated by wide-scattered villages of herdsmen and thieves who tend their own cattle and steal their neighbour's ".

4. THE PECULIAR FEATURE OF THE COLONY

The Colony was devoted almost entirely to horse-breeding and the majority of the grants was made to peasants on the horse breeding conditions. It was the first colony where this experiement was first tried. A peculiar feature of this colony is the law of primogeniture as applied to the land granted on horse breeding conditions. The land passes to the eldest son only and is not divided equally among all the sons of a horse breeding grantee. The main effect of this law is that the holdings are not sub-divided and pass from one to another without any fragmentation and sub-division.

5. THE LOWER BARI DOAB COLONY.

The area served by the Lower Bari Doab Canal consists of what

are now the Okara and Montgomery Tehsils of the Montgomery district and the Khanewak Tehsil of the Multan district, a narrow strip about 150 miles long by from 15 to 20 miles wide lying between the Ravi and the old dry bed of the Beas and comprising a total area of nearly 2600 square miles. About half thos area is a regular high Bar country, the remainder consisting of low lying lands on the south bank of the Ravi and the north bank of the old Beas. In the Bar before the construction of the canal there was practically no cultivation, but grass grow freely after rainfall and there were large areas covered with a considerable growth of Nan and Jand and in some places Farash trees. There were, however, also large expenses of absolute desert in parts covered with sand hills, in parts consisting of a hard impermiable soul, which has up to the present proved almost entirely unculturable by ordinary methods.

6. THE UPPER JHELUM CANAL

The importance of upper Jhelum canal to the Lower Bari Doab Colony is beyond question. The Lower Chenab colony has first claim on the Chenab Rabi water and unless the surplus supply from the Jhelum can be poured into the Chenab above Khanke, the upper Chenab Canal cannot take off sufficient supplies at Marala, higher up the stream, to meet the requirements of the Lower Bari Doab Colony. Consequently a breach on the Upper Jhelum may mean a closure on the Lower Bari Doab and the partial or total failure of the harvest there. In fact there is no exaggeration in making the statement that "without the upper Jhelum Canal there could be no Lower Bari Doab Colony"

CHAPTER III

ARBORICULTURE

1. THE PROBLEM OF ARBORICULTURE ...

Arboriculture is one of the most important economic problems. Its importance was recognised at such an early date as beginning of the Lower Chenal Colony. It was then one of the most pressing and perplexing problems with which the colonists had to deal. It was pressing because while the natural process of bringing land under cultivation resulted inmclearing of the tract of all the existing tree growth, it wa essential that the future need of the colony in respect of timber and fuel should be provided for. It was therefore that Mr. A. L. Jones, the Colonization Officer in 1902 recommended that tree planting should be made cimpulsory. In the letter No. 563 dated 1st June 1912, from the Revenue Secretary to Government effect was given to this recommendation and free planting was made compulsory.

2. ROAD SIDE AND CANAL SIDE PLANTATION

Apart from the encouragement to arboriculture, there is the question of planting with trees the long mileage of new roads. Th se road-side avenues are not only agreeable to the wayfarer. but they also assist the consolidation of roads and if properly manahed become a valuable source of income.(x)

The irrigation Department has made a number of plantations along branches of the canals, generally in the space between the branches and distributaries which run parallel to them. In some places roads running besides branches and distributaries which run parallel to them. In some places roads running besides branches and distributaries are planted with avenues; but a good many are still

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(x) Ref. Mustoe's notes on Road side arboriculture.

bare of trees. though such avenues are being gradually extended. The Irrigation Department has, of course, the great advantage that it can provide an unlimited water supply from separate outlets, because it has to pay no water rates and can sow in continuous rows. They are also comparatively free from being damaged as cattle grazing along the canal-side is strictly prohibited.

The progress in and success of tree planting along the canal sides is quite manifest even to a superficial observer. The course of the Rakh branch canal can be followed from a great distance by looking to the range of tall shisham trees along the sides of the canal-~~station~~. How beautiful is the growth of tahlis around the canal stations. There really is the thickest, the tallest and the most luxuriant growth of these beautiful trees.

3. THE EFFECT OF ARBORICULTURE AS A SAVING MANURE

In the early days-of the colony manure was not highly prized. The virgin soil of the Bar yielded bumper crops ungrudingly and the cultivator found an adequate recompense crowning his efforts; if he but scratched the soil, sowed his seeds and poured abundant water on the land. With the gradual impoverishment of the soil the necessity of manurial treatment has been fully recognised by the Kambos and Arain colonists, who by nature appraise namure at a higher value than other tribes.

With the rapid disappearance of all brush wood from jungle brought under the plough, the colonists have had to fall back for fuel on the cakes of dung. It is estimated on the Rakh branch, where wood is scantiest that almost 2/3 of the droppings of the cattle are reserved for fuel cakes. I have calculated the annual loss of the droppings of cattle in my own village. It consists of about 30 houses, and the total area of the land of the village is ten squares, which are generally cultivated by 14 Halls (ploughs) One day my experimental walk round the village showed that there were about 200 new dung cakes being the preparation of one day only.

Text cut off in original

I weighed a few of them and found that the average weight of each cake was about 2 seers. In this way I estimated that 400 seers of manure (dung) is being used daily in the place of fuel by the inhabitants of my own village. The annual loss of manure comes to be 3600 maunds, which is really alarming. It is here that we stand in the need of arboriculture.

It is very difficult to convince the women folk, who often talk of high utility of dung cakes for domestic purposes. However, plentiful wood may be, a certain proportion is reserved for fuel cakes by every housewife on the ground that milk is best cooked with this material. This loss of manure, however, can be remedied to a large extent, by artificial plantation. If there is an abundant supply of wood, then a foolish agriculturist will not turn to manure and deprive the land of what should properly go back to it. Here is the real agricultural economy, which must be brought to the notice of every agriculturist. "Fuel is already scarce" observes a Settlement Commissioner " and manure is being used in its place. Tree planting should, therefore, be encouraged in every possible way"

4. METHODS ADOPTED FOR ENCOURAGING ARBORICULTURE

There would have been tree-less colonies, if the importance of arboriculture had not been realised by the Colonization Officers A clause was inserted for the camel service grantees and for peasants in the Lower Chenab Colony, which laid down that the grantees must plant and maintain two trees for every acre of their holdings. A similar clause was inserted in all the statements of conditions framed for the lower Jhelum Colony. (x) I have come to know , however, that these conditions were not strictl enforced in the case of a few villages in the Jhelum Colony. I ha been to Chak. No. 29, district Sargodha and the Lambardar of the

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(x) The Punjab Colony Manual - Mr. J.C.Beazley.
Vol. V.P. 53.

village has told me that the officers responsible for arboriculture are seldom heard but never seen on the spot and this has given a severe set back to arboriculture in those villages.

The Colonies Committee while recognising the necessity of arboriculture, suggested the withholding of the proprietory rights until the grantee had given a reasonable attention to it (xx) This suggestion has been taken up in the case of the younger colonies, but came too late for the older ones, in which it had always been necessary to bribe colonists to take an interest in arboriculture. In the lower Chenab canal, the bribe took the form of small additional areas of land, generally in lines of 5 killas (acres) to the successful tree planters.

5. GENERAL SURVEY

To sump up, we may say that much has been done to encourage tree planting in the Colonies. Many a times my elders talk to me about the condition of the tract in which Lyallpur city is situated. It was a treeless waste covered with small thorny bushes. It was a deserted and dry place fit only for jackals and wolves and entirely uninhabitated. What a sudden change ! We have now the rows of tall shisham trees extending by the sides of various roads. The Lyallpur City the Capital of the Colony is now in the midst of grove of tall trees, which provide coal shade to way-farers, a comfortable retiring-place to the innumerably pouring litigants as source of income to the District Board and Municipality and a cause of agreeable surprise and pride both for the colonists and the Government.

(xx) Ref. Report of the Colonies Committee.
Chapter VII Sec. A Para.13.

The whole disparaging view of the vast desert is changed into a green shady haunt, where many gardens are being planted, and many green parks being trimmed. I may explain this miracle of the 20th century in four Punjabee words, which are carved on the memorial of Sir Lyall, in front of the Kaisri Gate at Lyallpur.' These four words speak volumes and suggest a train of ideas about the colony. They are, "Barkat Darya Chanham Di" - All peace and prosperity due to the river Chenab.

CHAPTER IV.

MEANS OF COMMUNICATION - ROADS.

1. GENERAL

Of all requisites to prosperity, perhaps the most indispensable is a well developed system of communications. Throughout the whole of the Punjab's history, the difficulties of communications have exercised a preponderating influence upon her political as well as her industrial development. The lack of improved means of communication imposes a tremendous barrier upon the industrial progress of a country. Unceasing effort and expenditure upon a scale hitherto impossible will be necessary, if communication, whether by road or by rail, are to be adequate to the requirements of the Province. The necessity for extending communication by road is becoming every year more apparent. At present the economic loss cuased by the inaccessibility of many agricultural districts in the rainy season is considerable; and this cannot be remedied until the system of trunk roads is developed. The progress which is being made year by year, while by no means neligable, is inadequate for the necessities of the country.

2. THE CASE OF LOWER CHENAB COLONY

Before the opening of the Lower Chenab Canal Colony, the whole of the tract, which at present comprises the districts of Lyallpur and Jhang was practically cut off from the main industrial centres by impenetrable jungles. Pre-existing roads were often merely rough tracks running through the waste on which no clearance had been effected; with the exception of the Mail road from Chicha Watni, on the Lahore-Multan Railway Line, to Jhang. The roads from Gogera to Samundri and Gojra to Jhang were used by

troops going to Frontiers and the road from Gogera to Chiniot was also fairly well known; but the majority of the old roads showed on the district maps were only alignments connecting the police stations scattered over the Bar.

3. EFFORTS OF THE IRRIGATION DEPARTMENT.

The importance of the improved means of communications was early recognised by the irrigation authorities, who gave every attention and consideration to the construction of roads. The extensive canal system of the Province supplements the road communication to very large extent. It is, certainly true, that the success of the canals in the Punjab depends upon the improved means of communications but the canal system itself has done much towards the construction and improvement of the road system. It is quite manifest in case of the canal colonies.

The main lines of canals run between broad banks and usually one of these is kept open to bullock carts and the other heavy traffic, while the other. though unmetalled is kept in excellent repair and except in the rains provides a first class motor road which, though not open to general public, as indicated by the notice put up at every canal bridge bearing the words "Reserved for touring officers; trespassers will be prosecuted", can be used by permission when occasion requires.

The Irrigation Department has also made some roads technically called the Canal Junction roads, which connect canal inspection houses on different tributaris. In addition to these roads this department has also taken up land for roads on each side of all the canals and distributaries. They are admittedly open to the public. The existence of these roads is

a great boon to the public and officers on tour. Originally constructed, as in the Lower Chenab Colony by the Irrigation Department they have long been handed over to the local bodies of the districts in which they exist.

4. RESPONSIBILITIES OF THE DISTRICT BOARDS.

The District Boards in this respect have not lagged behind the Irrigation Department. They have taken upon themselves the responsibility of constructing and metalling roads whenever possible. The Lower Chenab Colony is fortunate in this respect, as it has the Sangla and Shahkot hills for providing stones of good quality. In 1903,. the only provincial road was for Tanga-mail between Jhang and Toba Tek Singh; but the cost of administration was defrayed by the District Board.(x) The total length of the district board roads is at present about 2,000 miles .

5. VILLAGE ROADS.

The village roads provide communication between each village to the allotted squares and also between one village and the other. These roads may be divided into the Dihati roads and the Zamindari roads. They are also known as the inter-village and the Intra-village roads respectively. The former connect every village with circumjacent neighbours, and their width is about 22 feet (4 karams) in the Lower Chenab Canal Colony. The latter connect every square in a village road or with the Abadi side. Every colonist has a free right of way to and from his individual allotments. The width of these roads is from 11 to 22 feet (3 to 4 karams)(xx)

6. NECESSITY OF THE SYSTEM OF GOOD CULVERTS.

It must be admitted that for the maintenance of a good system of communication by means of roads in the colonies,

(x) Ref. Final Settlement Report - Mr. Dobson p. 48
(xx) Ref. The Colony Manual - Mr. Beazley. p.

a definite scheme of bridges and culverts is essential. My father has told me that culverts for village roads where they cross canal water courses, were originally erected by the Irrigation Department from the proceeds of an acreage rate paid by Zamindars. It is unfortunate that the cost of repairs is not now similarly levied, with the result that the culverts easily fall out of repair and Zamindars take no pains to remedy defects on account of accident of decay. A man who has often been to the colonies can very well see the bad condition of these culverts on account of the lack of attention given to their repairs both by the Irrigation authorities and zamindars I know from my personal experience that some of the culverts in the neighbourhood of my village are in such a deplorable condition that it is impossible for a horse rider to pass over them. Zny rash attempt on the part of a rider is sure to cause an injury to him or to his animal or to both. It is desirable that some provision must be made for the purpose of keeping these culverts in a good condition.

7. AN IMPORTANT INNOVATION

With the construction and improvement of the road system is connected the chief vehivle of transport-Gadda, (cart) The familiar country cart of the central Punjab is worthy of notice. Here it was an innovation for the Bar nomads, who knew no means of conveyance, except the camel or potter's donkey and these antiquated methods are still in favour with the mass of Jangli grantees.

The rapid increase in the number of carts in a village inhabited by nomads is sign of a tendency on the part of the villagers to accept novelties. This tendenot, if developed into a habit will certainly facilitate the introduction of

improved methods of cultivation. I have studied the rise in the number of carts in a village (Jhumra, Rakh Branch, District Lyallpur) which is only at a short distance from that of mine. I do not claim, however, that the following statistics are quite accurate. They have been given to me by an old and illitrate man. The figures indicate a rise in the number of carts in the village with the development of the road system in its neighbourhood. In reply to my questions which I had to repeat many times, in order to make him understand what I meant, the wordly wiseman said "Before colonisation there were no 'gaddas' in this village" I cannot help quoting his actual words :-

"I remember, " he continued " that it was only about 25 years ago that we realized the importance of a gadda, when we saw it in a neighbouring village of the Jullundharies, (peasants proprietors belonging originally to the Jullundur district)" About 20 years ago there was only one gadda in this village which belonged to the Lambardar. With the introduction of the pacca road that passes by our land, the number of carts has increased and at present we have about ten gaddas in our village"

What I have been able to gather from his talk may be tabulated as follows :-

	YEAR	NUMBER OF CARTS
Before	1896	Nill
About	1904	1.
"	1915	6
"	1924	10.

There are many families in the village which now depend for their livlihood on their carts. These carts are so much in use that a family in Chak No : 162 Rakh branch is generally designated as gaddianwali (possessors of carts) The sole occupation of the male members of this family is to convey the

produce of land generally to the near market and they get in return :Bhara (cartage) which varies according to the distance over which a load is carried. This gadda-system is a subsidiary means of livlihood to the agriculturists . A "Rain" family in my own village has two carts, and two male members earn much money through the use o. their carts side by side with the agriculture. The gadda has come to be of much use to this family. It is generally used for carting manure to the fields, for, conveying produce to the market and it is a means of employment for the surplus labour in the family. The rate per maund from my village situated at a distance of three miles from the market is about 2½annas per maund. The gaddawalas (cart owners) to whom I have referred above earned about 50 rupees in the previous season. It is therefore that he is often seen with beautiful muslin turban on his head and his wife always wears gold bangles. In short, cart is indeed the best of all the subsidiary industries for a poor agriculturist.

It may be noted in this connection that the Communications Board is devoting serious attention to the improvement of unmetalled roads (x) If it should prove practicable to adjust the proportions of sand and clay, so as to obtain a durable surface, there may be a great future before this kind of road making. It is estimated that roads on this system may cost no more than Rs. 400 a mile and the cheapness is an important consideration in these days of financial stringency.

9. RAILWAYS

The history of the Lower Chenab Canal very well illustrates the importance of railways as a means of transport. At the time of the colonisation of the tract now known as the Lyallpur district, the railway line was only extended up to Hafizabad.

(x) Ref. The land of the five rivers. Government publication P. 157.

The construction of the railway line commenced in 1895 and it was opened to Lyallpur in 1896. In 1899 it was further extended to Toba Tek Singh and was linked up with Khanewal in 1900.

The railway statistics show that from 1st July 1902 to 30th June 1903, 1,010, 464 passengers were booked to the Colony railway stations, while 1,00,392 left them. (x) The balance in favour of the Colony is very small , but it can not be taken as the indication of an increase in population as the most of the settlers camein with their carts and families by road.

Without the railways it would have been utterly impossible to export the enormous quantity of agricultural produce which leaves the colony every year for Karachi. The following statistics do indicate not to very little extent, the importance of railways to the colony.

RAILWAY STATIONS

	Year		Sangla	Chak Jhumra	Lyallpur	Gojra.
(x)	1903	Raw cotton	-97,588	102, 489	226,904	65,044
		Oil Cakes	1, 698	492	586	—
		Wheat	1,291,999	1,323,716	1,596,748.	1,885,329
(xx)	1913	Gur	4,302	7,841	21,438	57.722
	1913	Wheat	—	1,823,946	— —	— —
		Gur	— —	8,952	— —	— —
(xx)	1923	Wheat	— —	21,58.758	— —	— —
		Gur	— —	9.846	— —	— —

It is impossible to overlook what railways have done for the Canal colonies. It has been certainly through canals that the virgin soil is made to yield bumper crops, but the gigantic heaps of food grains wo-uld rot if there are no railways to convey them to the place where they are badly needed. Every

(x) Ref. Final Settlement Report - Mr. Dobson, "Chapter on Rys.
(xx) For these figures I am indebted to B. Sant Singh Goods Clerk Chak Jhumbra.

day thousands of wheat bags are booked from every mandi (market) for the purpose of exportation . The prosperity of zamindars depends and is even intimately connected with the export trade, which is only possible through railways which connect the colony with Karachi and consequently with foreign markets.

10. CONCLUSION

Even now the value of an agriculturist's produce is often seriously disco unted by the considerable distance from which the produce has to be brought to the market. My maternal uncle, whose village is situated at a distance of 10 miles from the market, and where there is no good road passing by that village, often sells his food grains at a rate which is generally four or five annas per maund lower than that prevailing in the market. The scarcity of unmetalled roads allied with a railway system which has only a few lines running through the colony leaves much to be desired and the communications are sadly behind the requirements of the rapidly increasing population of the Canal colonies.

Still the Lower Chenab Canal Colony needs more railways There ought to be a line connecting Sargodha and Lyallpur, in order to open up the country along the Chenab river in the Lyallpur as well as in Jhang districts. The importance of this suggestion was explained and brought home to me by Sardar Gurbakhsh Singh of Chak No. 29 District Shahpore. The Chenab river, being unbridged greatly obstructs the traffic and the transport of agricultural produce is very much hampered. It is desirable that if no railway line is to be constructed fro from Sargodha to Lyallpur, the road running from Jhang to, Chiniot ought to be bridged and metalled, so that full advantage may be taken of the facilities offered by the railways.

In short, the railways and roads have done wonders for the colonies. The difference in the value of goods traffic flowing from a tract which formerly exported only skins and ghee and from a flourishing agricultural Colony is enormous. In 1920 the Lower Bari Doab Colony's exports by rail amounted to about 3 maunds per irrigated acre, probably a tenfold increase in 5 years.

In the colonised districts (as in Lyallpur) a group of metalled roads is to be found radiating from head quarters while the railway is often the one means of communication with the neighbouring districts as well as with the outside world. In short, it may be said that the canals made the Colonies possible, but it were railways and roads which made them a success,

CHAPTER V

POPULATION

1. THE PROBLEM OF POPULATION IN THE COLONIES

The problem of population in the Punjab Canal Colonies is an interesting and important one. The present condition of the Lyallpur District is the result of many years of hard and laborious work both by the people and the government. Before 1846, there were no cities, no factories, no railway facilities and nothing of the sort. The tract, which at present is the best of all in every respect was merely a jungle and a favourite haunt of the cattle lifters. The only signs of population were a few nomadic tribes wandering here and there with their herds of cattle in search of food and fodder. The country was a den of the notorious dacoits of the time. Sandal, with whom is associated the name of Sandal Bar, and Dulla Bhati, another famous dacoit, were well-known for their marauding expeditions. Their names have even come down to us through the Wars (songs) of Mirasis and Bhatts (professional singers). The property was unsafe. Might was the only right to property. How to transform this howling wilderness into a populous, peaceful and prosperous country was the problem before the rulers of the day.

The question of irrigating the Sandal Bar, which later on came to be known as the Chenab Canal Colony was considered and finally adopted by the go-vernment. The hopelessness of ever bringing this wild tract into cultivation by any other means than a canal was apparent. It was not, however, before 1892 , that the Lower Chenab Canal was complete.

2. DIFFICULTIES OF THE PROBLEM

The educational and econmic conditions of the time clearly showed that the problems of colonisation was not an easy one.

There was no education among the masses. The people were quite stay-at-homes, a habit which made immigration into the colony a wild impossibility. They had no money to meet heavy expenses required for making a start in the new land. The Colonists were to buy plough-bullocks in order to break the soil, employ labout to level the fields and to cut all the unnecessary thick growth of Kair and Jand trees, which had made the cultivation impossible. All these needs could only be met through money which the Colonists had not. The land seemed to be quite unpromising and the difficulties on the way were innumerable.

How the best and enterprising colonists were selected and what promises made it possible for them to migrate, from where they got the necessary funds and the difficulties that they had to face are the problems which will form the subject matter of a separate chapter. Here I would like to confine myself to the actual migration of the colonists. The colony (Lower Chenab Canal) was opened in 1892. The officers were touring in the old districts to select the colonists best suited for the purpose and to encourage them to migrate to the colony. From 1892, the population of the colony shows a rapid increase.

3. THE POPULATION OF THE LOWER CHENAB COLONY IN 1901

In 1901, the Chenab Canal/Colony returns a population of 791,861 of whom 453,861 are males, there being only 745 females to every 1,000 males as yet, because the earlier settlers have only now begun to bring their families into the colony (x) Migration statistics show that of this population 532,187 (of whom 42.3.per cent were female) have come into the colony from other districts. This leaves 259,674 residents who were either inhabitants of the colonized area (Bar nomads and others)

(x) Ref. Punjab Census Report 1901."Chapter on immigration"

or children born to immigrants within the limits of the colony. The districts which have contributed most of the immigrants are given below. It will be seen that Sialkot has sent over 100,000, no other district approaching this number. Amritsar comes next with nearly 68.000 and Jullundur with clos on 57,000. The colonies is made up of six Tahsils which with their population in 1901 are given below.(xx)

1. Khangah Dogran ..... 133, 780.
2. Lyallpur ..... 263, 541.
3. Sammundri ..... 157. 285.
4. Toba Tek Singh ..... 125, 684.
5. Jhang (Colony) 28, 548
6. Chiniot ..... 83, 023.

4. POPULATION IN 1911

The census taken in 1911 shows a remarkable increase in the population during the last eleven years. In the Chenab Colony the population which includes the non-colony population of the Jhang District is 1,785,700 persons, of whom 34 per cent are immigrants from outside (x) This shows an increase of 993,839 over the regular census of 1901. The following table shows the contribution of a few important districts.

Sialkot .....96,984.
Amritsar..... 81,144
Jullundur..... 70,847.
Montgomery..... 68,581.

The total number of immigrants is 608,847 person, of whom 355,002 are males and 253,845 are females.

(xx) Ref. Punjab Administration Report 1900-1901. "Chapter on Colonies"
(x) Ref. The Punjab Administration Report.1911-12. pp. 162.

5. THE JHELUM CANAL COLONY

The problem of immigration into this colony was not difficult at all. The success of the Chenab Canal Colony made it possible for the Zamindars tom realize the worth and importance of the land in the colonies. This was explained to me by Sardar Awtar Singh of Wachhowa district Amritsar. " I was reluctant to migrate to the Chenab Canal Colony" said he "but only a few years after I realized the enormity of my mistake and therefore I never missed the chance of obtaining a grant of land in the Jhelum Canal Colony." There was, therefore a competition for the land in this colony which was very conspicous by its absence at the time of the establishment of the Chenab Canal Colony.

A peculiar feature of this colony was the grants of land made to the military pensioners in recognition of their services and who were, therefore, quite able to bear the hardships of making a start in the Colony. This encouraged other people to follow them and thus the problem of migration did not present itself in such an acute form as it did in the case of the Chenab Canal Colony. I had an opportunity of meeting a retired soldier of Chak No. 29. district Sargodha. "How much did you suffer when you first came to this Colony" I enquired. He replied in a very different manner and said "Oh ! We had already seen much of this sort during our military life."

6. THE POPULATION OF THE COLONY IN 1906.

In 1906, population of this colony stands at 73,734.(x) This figure has risen to 161,806 at the regular decennial census of 1911 and was probably 250,000 by the end of 1917. Of the four principal towns of Phullerwan, Bhalewal, Sillanwali and Sargodha, the last has a population of 17.728 in the last census

(x) Ref. Administration Report 1907-1908 "Chapter on the Jhelum Colony"

and is fast growing. The total population of a colony in 1911 stands at 161.808 (xx)

The following statistics are also important in so far as they show the growth of population from the very foundation of the following important cities in the Canal Colonies.

NAME	YEARS OF CENSUS				
	1881.	1891	1901.	1911.	1921.
Lyallpur	..	..	9,171	19578	28,136
Montgomery	3,178	5,159	6,602	8,129	14,601
Gojra	..	..	2,278	5,417	7,622
Sargodha	..	..	..	8,849	17.728

The figures show that population of the Lyallpur town has risen from 9,171 in 1901 to 28,136 in 1921 in 20 years, which means that the population has increased more than three times in the past 20 years. And the population of Sargodha has more than doubled in the past ten years. Similar is the case of other important towns.

7. EFFECT OF CANAL IRRIGATION ON THE DENSITY OF POPULATION

The influence of Canal irrigation as a factor in determining the density of the population is shown by the fact that the district of Lyallpur with an annual rain fall of 13" has a density of 301 per square mile. In 1891, before irrigation started, Lyallpur had only 7 inhabitants to a square mile. The canal was opened in 1892 and by 1901 the District had a population of 187 to the square mile. The density rose to 272 in 1911 and it is now 301. (x)

The present condition of important towns in the Colony can better be seen than described. No stretch of even the finest imagination can ever visualize the early state of the

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(xx) Ref. The Panjab Census Report 1911 "Chapter on Immigration"

(x) Ref. A comparative study inm population. Professor Brij Narain.pp.63.

tract which at present is the centre of all prosperity in the Province. "The town of Lyallpur, where was once " as my father says " "a barren tract of land, and which afterwards presented an appearance of a temporary halting-station of nomadic tribes with a few tents pitched here and there has grown into an important centre of trade and roaring traffic " This mushroom town which sprang up like mirage in the desert attained its prosperity even before the foundations of half its houses and shops were completed.

CHAPTER VI

7. THE LOCATION OF THE DEPRESSED AND ORIGINAL CLASSES ON LAND

1. GRANTS MADE TO INDIAN CHRISTIANS

In the Lower Chenab Colony certain peasant villages were settled with Indian Christians and grants were made to them on the peasant conditions. In special cases, however, missionary bodies were made Lambardars so that they might have their voice in the internal management of their villages. I have been to Jenkinsonabad, a village of Christian grantees and have very much been impressed with the improvements in their economic conditions. Rise in their standard of living is quite manifest even to a superficial observer. Most of them now live in beautiful mud-plastered houses, and wear neat clothes. I have also been given to understand that their desire for good clothes and for enormous expenses on marriages etc, has gone too far. They were, before the land had been granted to them under the ban of untouchability and the comfort s of life were mostly out of their reach. Now, however, it seems that the swing of the pendulum has gone too far in the opposite direction. They are becoming extravagant and spend large sums on marriages, etc and even drink is regarded as a necessary concomitant of the matrimonial ceremonies. I was rather astonished when I came to know that one of the grantees had purchased a cycle for his son.

The women are said to have gained more than the men from the rise in the standard of living. In the old days they had to sweep the houses and perform everything that needed the help of labour of the menial class. Now most of them perform very little of this work and I have seen them gossiping under the shade of Tut tree and the only work that they have now to do is to take

meals in the field for the men-folk and even that not very often. They now use high-heeled shoes and put on neat and simple clothes but after the European fashion. All this shows a tendency towards a rise in their standard of living.

2. ALLOTMENTS IN THE LOWER BARI DOAB

The success of the experiment first tried in the Lower Canal Colony made it possible for the government to take a broader and more liberal view than before and land was granted to all the reforming bodies who were making some attempts to improve the conditions of the depressed classes. Allotments were, therefore made to the Salvation Army the Roman Catholic Bishop of Lahore , the Arya Megh Udhar Sabha and the nominees of the protestant missionary bodies.(x) These grants have proved a success. The Salvation Army villages and also the Roman Catholic settlements are flourishing. I have, however, been given to understand that the Arya Megh Sudhar Sabha's settlement is the best if all (xx)

The Manager of this Sabha is a young spirited gentleman and is said to be exercising an effective control over his tenants.

3. GRANTS OF LAND TO THE CRIMINAL TRIBES

Another experiment tried in the Lower Bari Doab Colony is the locating of criminal tribes on land and it is the first of its kind. The Punjab has from times immemorial been the favourite hunting ground of criminal tribes. All the attempts of the Government to wean them from their Criminal instincts having failed, it was then decided to remove the comparatively well-behaved members of these tribes to agricultural settlements.(x) The highest type of settlement is the new agricultural settlement

(x) Ref. The Colony Manual - Mr. Beazley P. 42.
(xx) I am indebted for this information to S. Gopal Singh of Chak No. 16. L (xx) Land of five rivers. P. 52. Sec. 91.

in the Lower Bari Doab Colony, where the most promising of the reformed members of the criminal tribes are settled on land both by way of reward and as an encouragement to others. The transformation which has been wrought in the habits and modes of living of these tribesmen placed in the settlement, is most remarkable, and the results are quite encouraging. It is said that even those who were quite destitute of morality and were given to all sorts of filthy habits, after a year's stay in the settlements bear an appearance of respectability. The ultimate object of these settlements is to assimilate the outcasts in the general body of the community.

4. --CONCLUSION

The majority of the people who came to the Colony did so to seek new fields on account of the continual sub-division of paternal acres. Thereare, however, many other classes as given above, who have been benefitted by the Colonies. To the depressed classes, the colonies have given them a chance of raising themselves from their menial position to which their hereditary occupation had condemned them. The reclamation of the criminal tribes, has, of course met with conspicuous success. A military grantee has told me that the criminal tribes have been located in the villages laid out in the form of walled barracks with a single entrance which can be closed at night and none of them is allowed to leave the settlement without a pass.

The majority of them, it is said have become reconciled to these restrictions largely through the prospect of occupancy rights. "Visitors to these farms" says a report "are struck with the genial air of content" Very few of these never-do-wells are tempted to break away into the old vagabond life. The criminal

tribesmen form only a fraction of the colonies, yet in estimating their importance in general one must remember that the Government in providing for this class is killing three birds with one stone an incidental result of the salvage of bad land and thievish men is the increased security of the property. Of this class and of others, it may be said that the Canal Colonies have "gentled" their conditions.

What a sublime change !!

CHAPTER VII

THE RECLAMATION OF THE NOMADS.

The success of the Lower Chenab Canal Colony is mainly due to the immigrant peasant settlers, who form the backbone of the whole agricultural community in the colony. These peasants brought with them and finally established the best agricultural traditions of the province, but the part played by the aboriginal communities in the development of the colony was both conspicuous and extensive.

1. THEIR CHARACTERISTICS

The weak point in the immigrant peasants is the want of natural leaders. The heads of the Jangli (nomads) clan are, on the contrary, genuine aristocrats and often men of intelligence and ability and exercise a "patriarchal authority over their followers" and are of real assistance in checking the tendency to crime, to which the aboriginal population is still unfortunatel addicted. These leading men are bulwarks to the administration of the rank and file.

Among the peasant immigrants there seems to be a stringency of females. There are, according to the last Census reports 700 females to every 1,000 males, but this stringenty as regards dfemales does not exist among the Janglis, whose marriages and customs are in many ways admirable. My father has often told me that female infanticide is very rare and divorce uncommon among the Janglis. It used to be the custom among them to marry very late, the men between 30 and 35, the women between 25 and 30 years. To this salutary rule their fine physique is doubtless due. I had once an opportunity to talk with a well informed friend of mine, who was a Jangli and was a lambardar in his village - Jhumra, district Lyallpur- about the system of marriage

among the members of his clan and he said " We have not certainly been able to escape the vices of the immigrant population. Their bad example of early marriages has slightly changed our social customs. It is due to the effect of their social customs upon us that we marry now earlier than before. Apparently the promise of a son or a daughter in marriage now can no longer be relied upon unless marriage follows quickly upon betrothals."

The Janglis formerly took pride in their unsettled state and turbulent demeanour, holding all peaceful pursuits in contempt The breeding of horse and cattle was and even now is their favourite in fact the sole occupation. Theft they regarded as a manly accomplishment and a recognised means of replenshing the flocks and herds by which they lived. A handsome and hardy race they were capable of great feats of courage and endurance with such a past "their reclamation through the opening of canals, is an achievement both economic and administrative of the finest magnitude", writes a gentleman who knows them very well. (x) They are still prone to cattle theft and being on this account much disliked by the neighbours and are of great anxiety to the police. They still devote excessive attention to cattle but their profits from the sale of ghee (purified butter) and live stock are very small . The family budget of Farida Jangli (which I have attached in the appendix C. page 106, shows no sale of ghee in spite of the fact that he possesses eleven buffaloes. I have been given to understand that ghee is now generally consumed by the Jangli families themselves and nothing is left for sale - a reason which may account, though only to some extent, for the rise in the price of ghee.

In their knowledge of agriculture, they do not now much lag behind even the immigrants with best agricultural traditions. They were once careless irrigators; but they have learnt by this time to effect every economy in the use of canal water. I asked

(x) Ref. The Final Settlement Report- Mr. Dobson. P.34.

an ordinary Jangli about his method of using the water and he replied

i. e. the water is at the root of all agricultural prosperity and if we fail to take care of it we are sure to be ruined .

They live in simple and primitive fashion, but their homes are neat and tidy.' Their residential portion is in the form of a thatched roof, supported by pillars of mud or beams of rustic timber. Pakka houses are conspicuous by their absence. Unlike the immigrant the Jangli never stalls his cattle within the village site. An expert himself he has little fear of other thieves. His cattle are generally folded within a rough thorny hedge (warah) on some fallowland, which in the next harvest will reap the benefit of cattle droppings. It is a sensible custom, which immigrants are doing well to follow.

2. A CHANGE

The reclamation of these nomads was so speedy that even as early as 1904, they began to show a love for agriculture. One of the most striking features of the Agricultural show held at Lyallpur in 1904 was, as the Colony report mentions, "The success attained by Janglis with their exhibits " Considering that agriculture has been their accepted pursuit for only half a dozen to a dozen years, it was a distinct triumph for them to complete successfully with some of the finest agriculturists in the world."

It may be mentioned, in passing, that the Janglis were at first quite unwilling to accept grants for lands which the Government intended to make to them. Their reluctance to accept the land is a very beautifully expressed in the following lines of a Punjabi poem. The Colonization Officer presses them to accept the land but their reply is:-

" All the Janglis requested with folded hands,
Hang us but never give us land.

We are ready t o leave the country and become beggers
We will never wait for to-morrow and are ready to leave our huts to-day

Not even grains sufficient for our food can be produced in this jungle.
From where shall we pay the land revenue do not destroy us ?
But young Sahib made them put their thumb marks
They went on repeating " Do not deceive us Sir"

جتنے بچارے ہتھ جوڑ دکھلوتے سارے ۔
کھان جوگے دانے ریتلے ہوئے نیں فرجاڑ وچے
پھانسی منکور تو زمین نہ دیوائیں جی ۔
ہالہ کتیں دیئے سانوں پٹ دنہ جائیں جی ۔
چھڈ جائے بس بھیس کردا گلے فقیر والا
کل تے لودیاں جو ہراں صاحب نے دھیان نال
کل کیتوں آوے ہتھے جتھیاں چھکائیں جی ۔
دار دار کہندے کیتے دھوکا نہ کمائیں جی ۔

In matters of social customs as also in agriculture , it seems to me that there is a decided tendency on the part of the Janglis to assimilate new ideas. This tendency is visible among the immigrants too. The Sikh Jats and Kambohs of Amritsar and the Arains of Jullundur have, of course, little to learn but the nomad grazier as also the less skilled peasants have adopted new methods of agriculture and the former has even begun to use bullock carts (Ref. Ch. IV. P. 17.) In matter of custom the Gurdaspore peasants have gradually overcome their deep seated fear of building pakka houses, and the Arain women of Jullundur have supplemented their scanty petticoats with voluminous trousers. In Jullundur their previous style was too well known to excite comment. Here they have found that trousers on holidays are essential to dignity and the social status to which the colonies with their increasing wealth have made them to aspire. To a European mind this change may seem insignificant, but it strikes a native as peculiarly remarkable in view of the fundamental aversion in which the Arains women were used to be held by the colonists on account of their particular form of dress.

The dress of a Jangli, in this connection, deserves a special mention. My friend, to whom I have already mentioned says

" We did not know of a shirt before the colonization. Our favourite dress only consisted of a chadir (sheet of cloth) tround our loins and a patka (a turban about 2 yards long) on our head " The intimate connection with the immigrants has now brought about a complete change in their dress. Most of them now wear long shirts and full turbans - a dress which gives their tall and beautiful forms a gentlemanly -appearance. The dress of a jangli woman has also undergone a remarkable change.

It will be interesting to mention that they have also begun to recognise the worth of education . They notice the children of immigrants going to school with interest and seem to follow them in this respect too.

The successful settlement of the nomads is an important economic effect of the colonies. Their criminal ardour having been cooled by vigorous repressive measures, their disinclination to take land was gradually overcome. The belief that the canal had come to stay began to force itself upon them and they found it advisable at last to make for themselves the best terms they could. They were treated with great liberality in the matter of grants and have long since settled down to a peaceful agricultural life. They have acquired much knowledge from the immigrants and most of them are now fair and many of them decidely good cultivators. The standard of living of the janglis is rising no doubt but as yet it is lower than that of the immigrants, With the result that a jangli is able to make a living off a land that the central punjabi would not look at.

No one could ever phophesy the era of tranquil devotion to the acts of peace that was in store for these marauders of the Bar.' The success of the jangli settlements is a striking instance of the triumph of environments over heredity. The Canal colonies have converted these janglis from pastoral nomads in to industrious agriculturists.

CHAPTER VIII

UN-RECOGNISED ASSETS OF CANAL IRRIGATION

Most people are aware of the millions of acres that have been reclaimed by Irrigation from the jungles of the Punjab, The Irrigation is not merely useful for maturing crops throughout the tracts of precarious or light rain fall. There are, however, many other indirect benefits which accrue to the irrigated countries, even where the rainfall is fairly good. The indirect benefits of canal irrigation may be summarised as follows:-

(i) Power of substituting immediate sowing, in case of destruction to advanced crops.

(ii) Diversity of cropping i.e. Insurance against losses.

(iii) Maintenance of cultivation and demand for labour throughout the season.

(iv) Prresence of fodder, pasturage, and water for cattle.

(v) Improved sanitary conditions.

(i) Power of substituting immediate sowing, in case of destruction to advanced crops :- In the absence of the irrigation facilities, an agriculturist cannot substitute a crop when the original crop is destroyed either by frost or pests etc., Here I may mention the case of my own village. Wheat crop was excellent in the last year and gave a splendid promise of bumper harvests We were all happy as the prospects were exceptionally good. However, a severe shower of extraordinary hailstone in the beginning of the month of Baisakj (April) completely changed those happy conditions. All matured crops were utterly ruined. A few villages in the Sialkot District which depended for the most part on Barani cultivation were similarly affected by the nature's wrath. The plight of these cultivators was very miserable and they had no irrigation facilities for the growth of next crop. The case was, however, different with the tenants in my own village on account of the Canal Irrigation. The ruined wheat

fields were quickly ploughed into the soil and sown with Zaid crops as melons, etc., These tenants also began to prepare the land for sugar and cotton. It is quite easy to contrast the conditions of the tenants in both villages -in the Sialkot and Lyallpur Districts respectively. The tenant in the latter district had an assured supply of water, which enabled him to grow some other crops, while the poor cultivator in the former district had nothing to fall back upon on account of the fact that there were no facilities for irrigation and consequently the growth of the next crop was sure to be delayed.

Irrigation is also the cause of other benefits. It saves crops from the frost in the cold seasons. If there are severe frost in the month of February Horia (coil seeds) crop is then liable to much damage. But the irrigated fields escape almost entirely from the damaging effects of this calamity. This point has very well been explained to me by my father who says " The cultivators are constantly on the look out in the months of Poh and Magh (December and January) and freely irrigate their young crops to prevent mischief. The idea of irrigating the fields against frost is similar to that held by cultivators of irrigated soil. They rejoiced exceddingly when propitious rains arrive before the frosty season " As for its scientific reason we both know nothing.

All these instances are to show that many trials beset a cultivator and his chances of profits from the harvest are very speculative. The danger of risk is got over, not to a very little extent, by means of renewing his sowings without delay, which is possible only through the facilities for irrigation. Canals in this respect help the Zamindars to a great deal. They save them from seasonal clamaties and if in spite of their efforts the existing crops are ruined, canals do make it possible for every cultivator to renew his sowing.

(2)Diversity of cropping. i.e. insurance against losses:- All

the wise agriculturists agree in the advantage of cultivating a variety of crops. that is ("in not carrying all the eggs in one basket") A peasant in the old districts like Sialkot and Gurdaspur, follows this idea in a rough way by sowing various mixtures as wheat and Grams or Grams and barley. This however is not right form of insurance, as the mixed quality depreciates the market price of both kinds of grains. The underlying idea of sowing the joint crops is that dry weather will suit one plant and rainy season the second. Hence some measures of insurance may be expected. In the Canal colonies, however, the position of a cultivator is much sounder. The principle generally followed by the agriculturists is not to grow joint crops but to grow different fields under different crops. I had an opportunity of discussing this problem with Sardar Budh Singh Zaildar of Chak No.185 district Lyallpur and he said "The efforts of the Agricultural Department and the experience gained by the Agriculturists have made them wiser than before. They do not now grow mixed crops which reduce the price of their commodities to them, but different fields are now sown under different crops with a view to secure a diversity in cropping and to maintain a good quality of the produce raised." The benefit of this way of sowing is important and obvious too. Continuous and heavy rains are disastrous to cotton and millets, etc., but are advantageous to sugar cane and rice. This diversification of crops is seldom possible in non-irrigated areas and this form of insurance is, no doubt very sound. If one crop fails through seasonal calamities the success of another may make good the loss suffered by an agriculturists.

(3) Maintenance of cultivation and demand for labour throughout the season. In the Canal Colonies the sowing as well as the maturing of crops does not very much depend upon the mercy of rains; but on the assured supply of canal water. With the result that the agricultural operations never cease throughout the year

"In Magh and Phagan (January and February)) he says "The ground is prepared for sugar cane while the matured cane is harvested and pressed for juice. The spring crop requires greater attention. Weeding, watering, fencing and keeping off animals that damage the crops occupy a number of hands. Harvesting of Toria is carried out in February. Picking of cotton also absorbs a good deal of labour (especially the women folk) In Chetar and Bisakj (March and April) the cutting, carrying and threshing these spring crop is in full swing and there, is moreover, an increased demand for labourers to hoe and tend the young sugar plants. Much difficulty is experienced in finding hands for sowing cotton, etc, at this time. In Jaith (May) the threshing is still often incomplete and the young irrigated crops require great attention. In the month of Har, Sawan and Bhadun (July August and September) if the rains are good ploughing, sowing and weeding occupy many people. If, on the other hand the monsoons fail labour is in great demand to push on irrigation for sowing field crops Asuj, Katak and Maghar (October, November and December) are absorbed in sowing the spring crop, in irrigating it and in completing the Kharif harvest"

Thus it is easy to see that in the canal irrigated tracts labour is in demand throughout the year.

It is this very fact that accounts for the higher wages paid to a ploughman in the canal irrigated areas than in the old districts. A ploughman in the Lyallpur district is generally paid 4 manis (32 maunds) of grains excluding his food and lodging.(x) This difference in the rate of wages is responsible to some extent for the movement of labour from the old districts to the Canal irrigated areas.

(x) I am indebted for this to S. Randhir Singh of Saidoke, Distt; Sialkot.

(4) Presence of fodder pasturage.

"Those who have experienced severe drought can hardly forget the terrible mortality amongst cattle" said a Jangli friend of mine, when I was discussing the cattle problem with him. I asked him of the effect that the opening of Chenab Canal had produced upon their favourite profession of breeding cattle. His reply was quite reasonable. "Although the reduction under pasturage area" said he " has led to the reduction in the number of cattle, yet it has certainly improved their quality. How often we had to migrate to the Ravi Banks in search of fodder and water and in the periods of severe drought many of our cattle died on the way. Now With the introduction of Canal Irrigation all this horror is avoided and a regular fodder supply keeps cattle in a very good condition"

I have als o been given to understand that the straw of all the cereal crops raised on the canals makes the condition of cattle still better. This straw may be regarded as a supplementary source of the supply of fodder. If rains are good and a consequent plentiful growth of herbage is sufficient for the cattle than the whole or a part of the straw can easily be disposed of while in the period of drought ca ttle are fed upon it.

(5) Improved sanitary conditions.

Years ago it was thought that canal irrigation wouldbe the cause of many forms of diseases. This belief bore good fruit in one way. The Government sanctioned large sums of money for the execution of drainage works, with the result that cities like Lyallpur, Gojra, etc, in the Chenab Canal Colony have become the model of improved sanitary conditions.

At the opening of the Chenab Canal Colony nothing was so scarce as the drinking water. The virgin soil, in the beginning yielded bumper crops and hence there was no scarcity of food grains, but drinking water could not be had at all. All the wells, constructed by the Government at Lyallpur were brackish and unfit

for drinking water. With the development of irrigation, however, the wells that used to be brackish have now become sweet. Every year an interesting experiment is tried at Lyallpur. A well is selected for drinking purposes and canal water is poured into it. This is done three or four times during the cold season and the well who opened for use in the beginning of hot season affords very sweet and cold water. Every year this process is repeated and a new well is made fit for drinking purposes. In my own village the experiment has been performed in the similar lines with excellent results.

This supply of good drinking water made available through the canal water is really a great boon to the people, who used to struggle for the vessels of drinking water at only a few wells that were not bitter.

CHAPTER IX

SOME IMPORTANT CONSIDERATIONS

1. INCREASE IN THE LAND REVENUES

Agriculture is no longer a "gamble in rain" Rains at proper times are, no doubt, very much useful even in the best irrigated tracts , yet we can now safely assert that even under years of scanty rains, agriculture in the colonies is more secure now than it had been only thirty years ago. The canal irrigated area is increasing every year and from 1887-88 to 1921 - 22 it has increased by five times.(x)

The effect of this increase in the total canal-irrigated area is very easy to realise. Every new acre brought under cultivation adds to the land revenue of the Province and to the prosperity of the cultivator. The remarkable increase in the land revenue from the years 1879-80 can be seen from the following figures :-

(Years)	1879 - 80	2,09.01. 437. (In Rs)
	1889-90	2,63,90,100
	1899 - 1900	2,71,12,178.
	1909 - 10	3,08.46.483.
	1920-21	4,69,00,104
	1921-22	4,90,48,564

The figures show that total land revenue in 1879-80 is Rs.2,09,014,37, but in 1921-22 the total stands at Rs. 4,90,48.564 it has more than doubled during the past 42 years, The land revenue is no longer a "gamble in rains" but, on the other hand, goes on steadily increasing.

It does not now fluctuate with seasonal variations as it used to do before the opening of canal colonies. It should also be remembered that portion of land revenue due to irrigation may be shown separately as Irrigation

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(x) (x) Ref. Agricultural Statistics of India. Vol 1

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(indirect receipts) and the rise in irrigation receipts both direct and indirect (see Fig IV. P. 69. Supp.) is a sufficient tribute to the profitable nature of the colonies. To sum up, it may be said that the canal colonies have not only increased the revenues of the state but have also stabilised them.

2. RISE IN THE PRICE OF LAND

One of the most conspicuous feature in the economic history of the Punjab has been the rapid and continuous rise in the price paid for agricultural land (x) This rise has a marked effect on the development of the province. It has attracted non-zamindars to the land and have encouraged the investment of money in the purchase of land. An intense land hunger has risen among the zamindars and most of them are consequently trying their luck in the inhospitable jungles of Bikaner, where vast tracts of land have been made available for cultivation, on account of the Sis-Sutluj Project. The rise in the price of land is quite remarkable in the colonies and the results of auction of colony land at different times may be tabulated as follows:- (x) (x)

NAME OF THE COLONY	YEARS OF SALE	AVERAGE PRICE PER ACRE
1. Chenab (Rakh Branch)	1892	Rs 43-6-0
2. Chunian	1896	" 5005-0
3. Chenab (Rakh Branch	1899	" 134-0.0.
4. Jhelum	1902	" 153-0.0.
5. Chunian	1905	" 266-0-0
6. Upper Chenab	1920	" 793-0-0-

The highest price paid per acre is Rs. 793, in 1920 This amounts to Rs. 19825, for a square of 25 acres. It may be interesting to mention in this connection, that it is only a few days ago that a landlord near the Lyallpur city has sold a square of his land for Rs 25 thousands, which amounts to Rs 1,000 an acre.

This rise in the price of land is no way the result of the improve-

Ref. Wealth and Welfare of the Punjab Mr. Calvert P. 97.
Ref. The Punjab Colony Manual - Mr. J. C. Beazley. Vol. 1. P. 245.

ments effected in the land. It may be due to high price for the produce of land, social prestige that attaches to the ownership of land and last but not the least to the development of the colony. It is mostly due to, if I may be allowed to quote Hill " the general progress of civilisation"

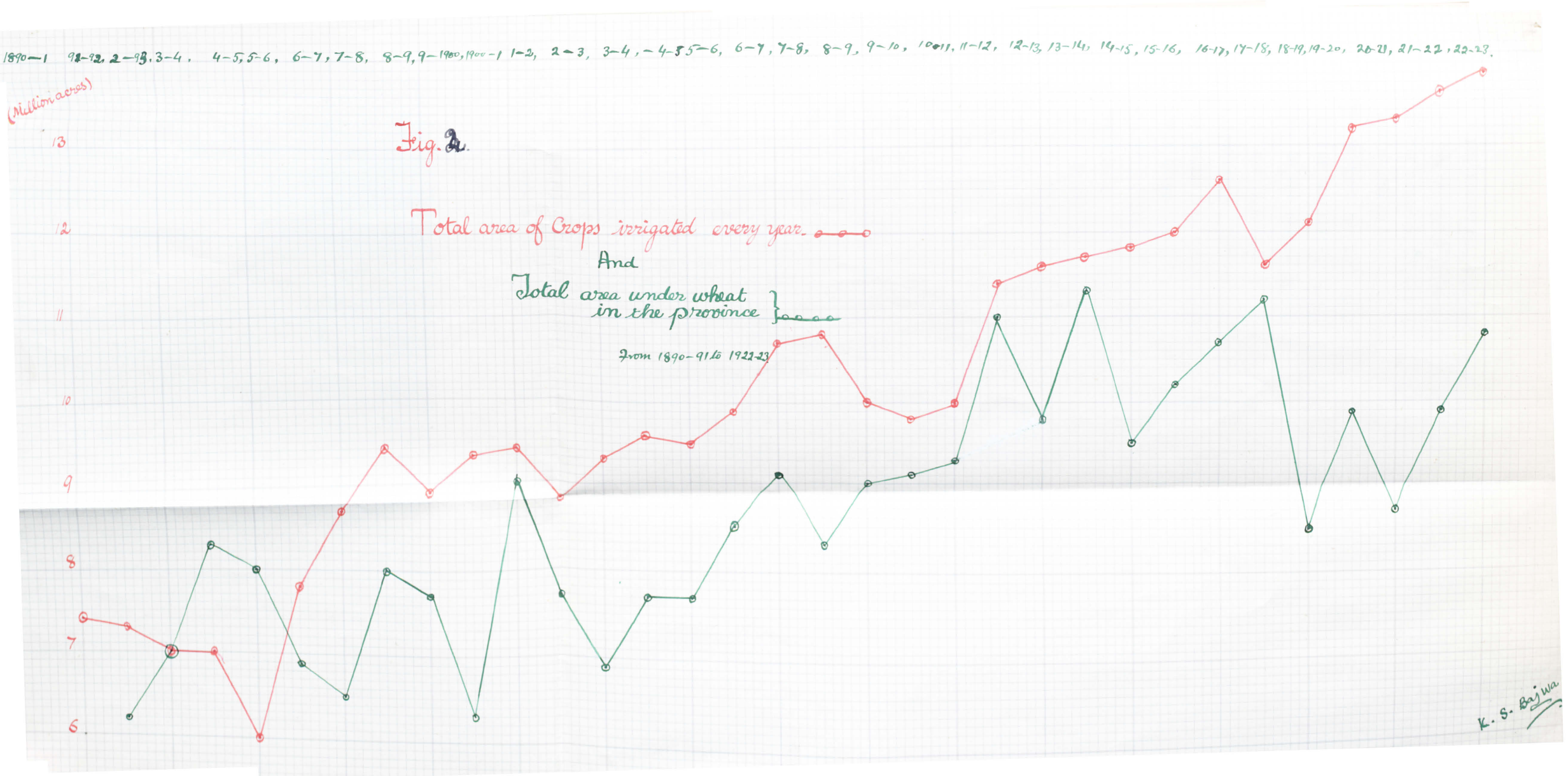
3. INCREASE IN THE TOTAL AREA UNDER WHEAT

Wheat is by for the most important Punjab crop both in value and in acreage. It is the staple food of most punjabis and is also the chief crop for sale and export in most districts. The area is generally over 9 million acres of which half is irrigated and half unirrigated or Barani.(x) As the total area under all crops is generally about 8 million acres, it will be seen that wheat constitutes from 30 to 35% of the area of crops. It must also be of interest to note that 40 per cent of the wheat area of India is found in the Punjab(xx) I have myself collected figures for the area and yield of this staple crop from the year 1891-92 to 1922-23 which may be tabulated as follows :-(xxx)

Year	Area	Total yield in tons
1891-92.....	6,224000.....	1,420,000
1901-2	7,227,100.....	1,846.332.
1909-10.....	9,142,000.....	3,434,000.
1921.22.....	9,981,000.....	4,185,000
1922-23.....	10,870,000.....	

As the graph indicates the total area under wheat has risen from about 6 million acres in 1891-92 (the year of the opening of the Lower Chenab Colony) to 10 million acres in 1922-23. Although there are many fluctuations in the annual area under wheat, yet the course of line in the graph shows a rising tendency - I have not been able to get separate figures for the canal colonies.

(x) Ref. The Land of Five rivers - P 258.
(xx) Ref. " " " Section 492
(xxx) See graph P, next 41. supp.


1890–1 91–92, 2–93, 3–4, 4–5, 5–6, 6–7, 7–8, 8–9, 9–1900, 1900–1 1–2, 2–3, 3–4, –4–5 5–6, 6–7, 7–8, 8–9, 9–10, 10–11, 11–12, 12–13, 13–14, 14–15, 15–16, 16–17, 17–18, 18–19, 19–20, 20–21, 21–22, 22–23.
(Million acres)
13
12
11
10
9
8
7
6
Fig. 2.
Total area of Crops irrigated every year.
And
Total area under wheat in the province
From 1890–91 to 1922–23
K. S. Bajwa

It is, therefore, the total area under wheat (both irrigated and unirrigated) which is represented in my graph. It may be safely asserted that it is generally the Barani area which is mostly responsible for these fluctuations in the total area under wheat and not the canal-irrigated one, where there is greater security of crops on account of perennial irrigation than in the case of Barani lands.

The figures for the export trade of wheat are equally illustrative. Before the annexation there was no export of wheat but during the decade 1886-95 (the period of the opening of Lower Chenab Canal) the export averaged to 278 thousand tons and during the last decade, in spite of the artificial restrictions, the export by rail and river averaged over 840 thousand tons per annum (x)

To sum up, it may be said , that the canals have added much to the food supply of the province, without which the Punjab would have been unable to support its population, and the main factor in the movement of the rural population for the last twenty years has been the extention of the canal system Districts such as Jhang, Lyallpur and Montgomery which now support a dense population were practically deserts before the canals opened them up, and were then inhabited by a very sparse population of shephards and graziers.

4. LOCAL DISTRIBUTION OF BEGGARS

The total number of persons under the group of beggars vagrants, witches and wizards Group No. 189 Punjab Census Report 1921) is 590,514. The local distribution of this class corresponds very closely with what we call the distribution of material wealth in the Punjab, the canal colonies showing the largest porportion of beggars. It is all natural. A beggar would never go to a place where people are poor and have no

(x) Ref. Land of Five Rivers. - P. 282.

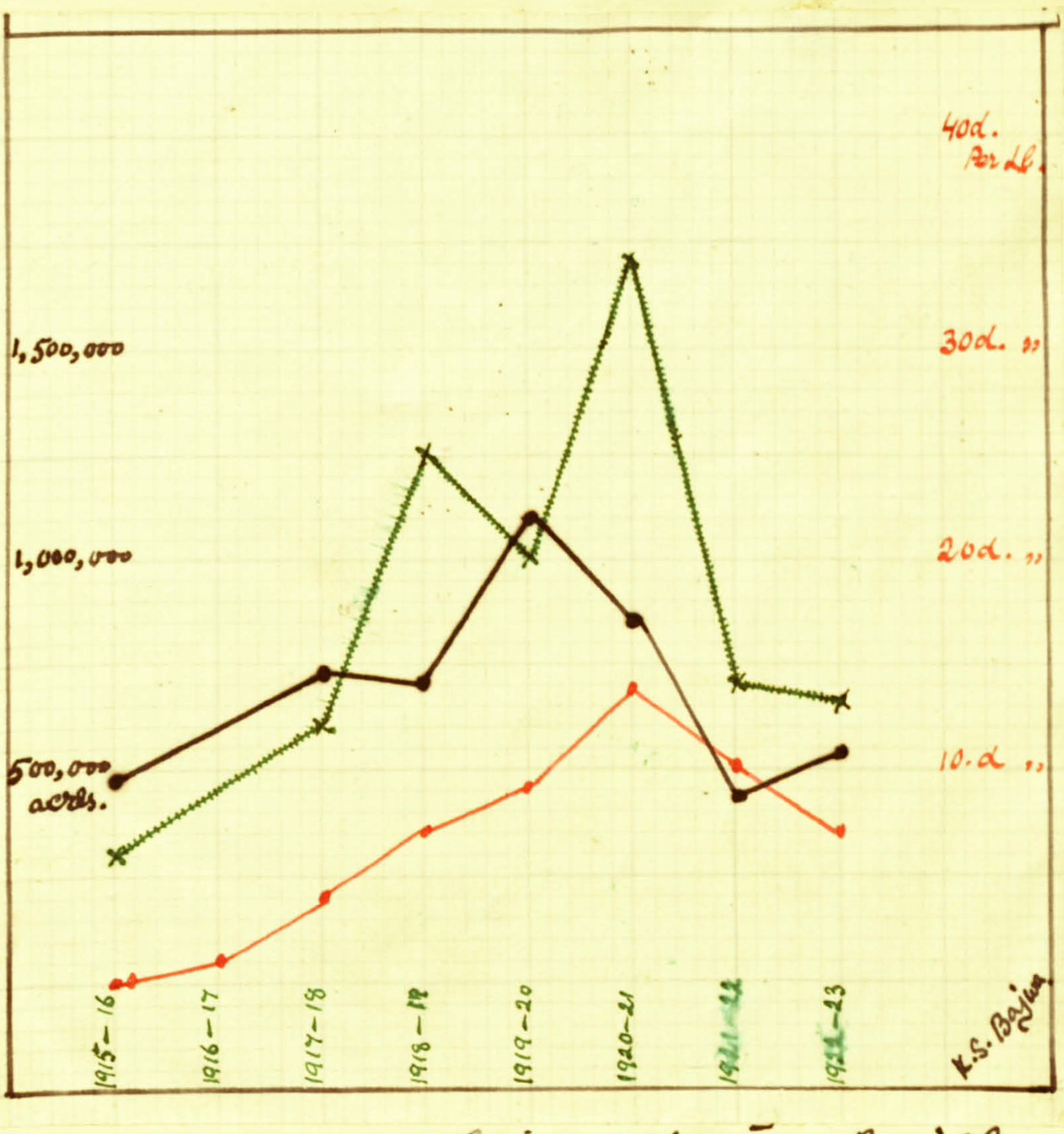
surplus over and above what they require as necessary for their existence and it is this factwhich accounts for the smallest proportion of beggars in South East, extreme North and the Himaliyan region. The local distribution of beggars is surely an indication of the prosperity of colonies.

1. Sown area under the American Cotton ————

2. " " Desi " ————

3. Annual average price of American Middling fair in Liverpool in January preceding Sowing. }

Fig-3.



In the Canal Colonies of the Punjab.

CHAPTER X

COTTON

There are two main classes of cotton in the colonies the desi (country), which is itself a mixture of varieties, and American, which is a comparatively recent introduction. These varieties are very different in appearance, the American being a bushy plant, whilst the Indian cotton plant is tall and slender. One of the most striking achievments of the Punjab Agricultural Department since its inception has been the introduction of an apparently acclimatized variety of American cotton denominated as 4.F.

The American Cotton is very popular in the Canal colonies. It has certain advantages over the desi. My father has told me that the yield of the desi cotton per acre is higher than that of the American but it is the higher price of the latter in the market that has made this variety acceptable to the Zamindars. It may be noted that American cotton is also superior to the desi so far as even picking is concerned. The latter if not picked up once a week will at once fall down, while the former is quite good in this respect. It never falls down even if it is picked up after 20 days. This very fact that the American Cotton stands good to picking, has done much towards making this variety popular among the Zamindars.

The popularity of this American Cotton is only of recent growth. From its use in a negligible area in 1913, it became increasingly popular in the Canal colonies, till in 1921-22 it formed no less than 54 per cent. of the cotton on all the colony canals, whilst in that year in the Lower Bari Doab no less than 13 acres out of 14 sown were under the American*. It covered a maximum area of seven hundred thousand acres in 1920-21. Meanwhile the area under desi cotton was also undergoing an expansion in a smaller degree, consequent on the great rise in cotton prices during the years 1917-18 to 1920-21 The area under desi cotton in the colonies reached its maximum

*Ref. The Land of five Rivers - Page 269, Sec. 518.

in 1919-20, when no less than one million acres were under these types, commonly classed together under the trade designation of Sciinde-Punjab Cottons. But in the years 1921-22, the area under both 4.F. and desi cottons markedly decreased, once more in sympathy with the drop in cotton prices (F.g.3). It seems that there is a tendency among the Zamindars to produce what the market requires. But this tendency requires much development in order to enable the producer to effectually emancipate himself by learning to produce what the market requires.

Moreover, during the five years (1917-22) the out turn per acre of unginned 4.F. cotton has shown a general decline. There is evidence that the 1919-20 and subsequent crops have undergone a deterioration of quality-fibre. This diminution in yield and quality may be due to progressive deterioration due to the resurgence of impure dominant characteristics or it may be due as a well informed agriculturist has told me to want of water in the critical months of September and October.

(i) Physiological researches are needed to elucidate the present low yield of many types of cotton. It is also needed that the causes responsible for the loss of crop due to bud and ball shedding must be found out.

The work of the Agricultural Department has already added enormously to the profits of cotton growers, and if the problems which await solution before a further advance can be made demand time and patience, we can go forward with the knowledge that the scientific results achieved can undoubtedly be given effect to in the general cotton cultivation of the Province through the organization which the Department of Agriculture has built up.

(ii) The isolation of the best unit from the existing mixed crops.

This has already met with conspicuous success in the canal colonies. A short staple cotton (Desi) has been replaced by a long staple variety. But there again seems to

be a process of progressive deterioration. Pure seed is not available in the small markets with the results that the ordinary shop keepers sell a mixed seed under the name of farmka Bij (seed produced by the Agricultural Department).
This mixed quality of seed is very much responsible for the deterioration of our kapas (cotton).

(iii) No less important than agricultural researches is the improvement of cotton marketing, the object being to obtain for the grower the fullest possible price for the cotton he produces. The possibility of introducing certain improvements into general agricultural practice will depend largely on such a market organization. It is not sufficient that the major markets are willing to pay enhanced prices for superior or for clean cotton. This premium must reach the grower. To effect this purpose the organization of primary markets requires improvement to bring them in touch with the major markets.

A satisfactory improvement in the marketing of cotton as well as of other agricultural produce can only be effected by co-operative sale. The first experiment has been tried in Lyallpur, the centre of the Lower Chenab Canal Colony. The results are very much encouraging and convincing.*

Of all the new varieties of cotton and wheat introduced by the Agricultural Department, this American cotton is by far the most important and is very much accepted by the zamindars; There is, no doubt, a rising demand for the seeds of improved qualities of wheat; but I can say from my own experience and from what I have been able to gather from the zamindars that the American Cotton is much more popular in the colonies than the selected varieties of wheat.

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*See Chap. XI P. 51.

CHAPTER XI.

Experiment of cooperative sale.

The problem of marketing is a fundamental one. Wealth is increased by increasing production or by diminishing consumption. Production may be increased by diminishing the cost of producing a commodity. The process of production is not complete till the commodity produced reaches the consumer. Markets have come to be the centre of all exchanges. It is therefore that in estimating the cost of production the market charges must also be taken into consideration. In the case of agricultural produce, the production may be divided into (a) crop raising and (b) marketing. The cost of production of every maund of wheat produced is made up of the costs of raising and marketing of that particular amount.

In order to effectually emancipate himself the Zamindar must learn to produce what the market requires. This he has learnt to some extent. As a result of the great rise in cotton prices during the years of 1917-18 to 1920-21, the area under desi cotton in the colonies reached its maximum[x]. And also in the years 1921-22 the area under cottons of bothe the varieties markedly decreased, in sympathy with the drop in cotton prices (Ref. Fig 3. Pars) It seems that there is a tendency among Zamindars of the Canal Colonies to produce what the market requires. The next important point is that the Producer must also arrange for marketing in a business-like way. And in this the cultivators are deplorably lacking.

Lyallpur is the centre of an important area. The development of irrigation combined with access by rail to the sea and other parts of India have enabled a large exporting industry[xx]

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[x] Ref. Area and yield report of 1920-21.

[xx] Ref. Wealth & Welfare of the Punjab- Mr. Calvert P.54.

to be developed in wheat, cotton and oil-seeds. Wheat as distinguished from other food crops has an international value and Lyallpur is regarded as the granary of wheat. The marketing problems were quite manifest in this important city and it was therefore that it was selected for the first experiment in the cooperative sale in the Punjab.

The first attempt of the sale of cotton by auction resulted in failure on account of the combination of muddlemen and big buyers both of whom refused to attend. It was then decided to invade "enemy's camp" and establish a co-operative commission shop in the market and a society containing both individuals and cooperative credit societies was organised. Members now take their wheat and other produce to the commission shop where they learn what are the current prices. If there is a demand for immediate sale, the produce is sold out on the commission basis if demand is slack the produce can be stored and the cultivator is allowed up to 74 percent of the extimated value on the security of his stock, the balance being paid when the produce is sold.

The position is sufficiently clear and benefit to the cultivator is quite manifest to silence the man who denies the profitable nature of the system of the co-operative sale. I am very much indebted to Sardar Kartar Singh Sandhu, the Inspector of the Co-operative Credit Societies who tried his best to explain the importance of the system of cooperative sale to me. Sales are made by the commission shops to a broker on the behalf of the producer. The commission charged is annas 8 as against 12 per cent charged by an Ahrti. In addition to this the Ahrtis make the producer pay for the Poledar, who empties and fills the bags, the Toledar, who does the weighing, the Changar who separates the dust from the grains and to Ganesh (a fund of charity) and the maintenance of a Gaoshala. For all these the Ahrtis' charges are about 14 per cent; but the commission shop charges only annas 10 per cent. Apart from this the Ahrti also charges for the Langri (cook) Mahra

(water career) and the sweeper, who are all paid in kind out of the great heap i.e. by the producer. I have calculated that total of the charges both in cash and kind amounts to rupees 3 per cent. in the case of Ahrti while Rs. 1/6 per cent. as charged by the commission shop. It is n ot too much to say that under the cover of these latter charges the Ahrti makes further appropriations for himself too and the ignorant agriculturist never suspects his Shah. My father has mentioned many instances to me when the produce sent to the market was first weighed, but the Ahrti never credited us with the full amount. When he was asked to explain the discrepancy in those two weighings, he would always say that the wheat was very dusty. An interesting case was given to me by Chaudhari Din Mohd. the Inspector of the Co-operative Credit Societies in the Lyallpur District. A big landlord living near Lyallpur sent some of his produce to an Ahrti and some to the commission shop. He weighed both amounts before hand and found that while the shop credited him with full weight, the Ahrti's estimate was considerably less. In this way Co-operative shops are building up a reputation for "honest dealing as well as for lower charges"

The importance of these co-operative sale shops lies in the fact that they enable the cultivator to hold his produce in expectation of higher prices. The under lying idea is that the growers require financial assistance in order not to be forced to sell their produce too early. "It has been found" says a shrewd observer, "that if this be not done, it simply means that the speculators step in and secure the grain in order to hold thx them for higher prices.[x] It is not in the interest of the Ahrtis to advance money to a cultivator in order to help him

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[x] Ref. The marketing of farm products. Weld.

for holding his produce with a view to sell it in future. The Shah on the other hand buys up the produce as soon as it is available at lower prices, to sell it or to hold it himself as the case may be. Zamindars are generally in debt to these Ahrtis and the important result of this indebtedness is the control of the crops supply of the Zamindars by the Ahrti.* Even the big landlords with every sign of outward prosperity are often heavily indebted to their Ahrtis who go even further than this. His capitalistic relation with the landlord enable him to control the produce of the tenant, who cultivates the land of that landlord. An illustration will serve to make it clear. A Sufedposh Zamindar holding about 5 squares of land is under debt to his Ahrti. He has, in turn, capitalistic relation with his tenant and also the small peasant proprietors of the neighbouring villages with the result that the Ahrti has a direct control over the produce of the Sudedposh and an indirect one over that of the tenants. It is here, that the cooperator sale shops come to the help of both the landlords and his tenants with a view to save the poor, ignorant, and hard working Zamindars from the tenacious clutches of the Ahrti.

One of the Zamindar's chief difficulty lies in the necessity for immediate sale of their,produce at artificially low prices. This is met by the commission shops, as the Inspector of the Co-operative Credit Societyies has informed me, by arrangin to advance seventy five percent. of the value of all grains brought in whether sold or not. Every facility is provided and every arrangement is made by the commission shops if the

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* Ref. Wealth and Welfare of the Panjab- Mr. Calvert

desires to store his produce. A further facility is provided by making small advances up to Rs. 50/- to approved gentlemen dealing with the shop, who find themselves in Lyallpur without ready money with them.

The result in the rise of the sales is quite apparent. Up to the middle of September 1922, the amount of wheat alone rose from 300 tons in 1921 to 1,050 tons in 1922. The amounts may appear small, though the rise is quite remarkable; but the figures conceal a very important fact. In 1921, practically all the wheat had come in by August, while in 1922 it was estimated that more tha half the produce had been hold up. The figures representing the total sale through the co-operative sale shop Lyallmur may be tabulated as follows:x

Year	Wheat sold.	Cotton sold.
Up to the 31st. July, 1920	4907 mds.	2161 mds.
" 1921	20212 "	4322 "
1922	28059 "	1245. "
1923	46845 "	1868 "
1924	43483 "	5270 "

The important point to notice is that the commission shop has put the cultivators who deal with it, in a position to hold their produce if they wish and if all the Zamindars join hands with the shop they can, no doubt control the supply of their produce by holding up, and thus can prevent prices from falling below what is reasonable.

The Lower Chenab Canal Colony, to sum up, has offered a field for this interesting and useful experience of the sale

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x I am indebted to Ch. Din. Mohd. the Co-operative Inspector Lyallpur for these figures.

by co-operative commission shops, which aim at the welfare of many voiceless but hard working tillers of the soil.

CHAPTER XII.

Relation between Agriculture and Industries.

It is a well-known fact that agriculture is a universally prevelant occupation of the 25 million inhabitants of the Punjab no less than 14¾ millions are of agricultural occupation, while many more follow agricultural pursuits in addition to some other occupations.* The regions in which the percentage is below average are those which are favourable to industry or trade. The Census Report of 1921, clearly shows that the Tahsils in which resides the greatest percentage of persons supported by agriculture are in those zones where no alternative occupation is possible, namely, in the sub-Himalayan region and in the tracts lying outside the area of perennial canal irrigation. If we exclude the sub-Himalayan area the apparently anomalous conclusion is reached that "the area which is most favourable to agriculture has the smallest proportion of persons engaged in this pursuit."** While the unwatered deserts of south-east Punjab, Dera Ghazi Khan and the Thall support a very high percentage of persons by agriculture.

The explanation of this strange coincidence of facts is given by the Superintendent of Census Operations, Punjab. @ "Agriculture", he writes, "is the primitive industry of the Punjab, and in those areas in which agriculture flourished in the past trade sprang up, roads were built, and there resulted that surplus of wealth which has always formed the loadstone of ability and enterprise. Where agriculture flourished industries have more readily flourished too." Put in other words we may say that surplus wealth is essential for industrial development and the surplus wealth in the Punjab can only be obtained if the land, which is the potential source of wealth, is cultivated to its utmost profitable use. Mr. Calvert in his Wealth and Welfare of the

* Ref. Punjab Census Report 1921 Chapter 1 Page 9.
** Ref. Punjab Census Report 1921 do. " 10.
@ Ref. Punjab Census Report 1921 do. " 10

Punjab has emphasised this very point that the prosperity of the Punjab industries is likely to depend on the prosperity of the basic occupation of agriculture.

There is, of course, one exception to this general rule. A very notable area in which there is high percentage of agriculture occupation, inspite of the fact, that it is well-served by perennial irrigation is the Lower Bari Doab Colony. The explanation given by the Superintendent of the Census Operation is quite convincing. "This Colony" says he, "is of recent development and though many mandis and cotton ginning factories have been set up, agriculture still supports more than 60 per cent of the population." It will not, therefore, be very surprising if in the next decade the pressure on agriculture in this Colony will come to less than 60 per cent. This is also true of the Lower Chenab Colony. With development of mandis and ginning factories even the agricultural labourers are tending to leave their occupations. It may be noted in this connection that in the factories even women and children get employment, while there is no subsidiary occupation for them in the villages. This reason accounts, to a large extent, for the paucity of agricultural labour in the Lower Chenab Colony.

The same tendency is bound to be perceptible in the new areas, where the extention of irrigation will be completed in the near future. The 68 per cent and 69 per cent of persons engaged in agriculture in the Fazalka and Muktasar Tahsils respectively, will certainly be very much reduced by the completion of irrigation and the development of the tract from the industrial point of view. To sum up, therefore, we may say that canal irrigation draws people away from agriculture towards trade and industry. Paradoxical as it may seem the "Punjab canals are the chief industrialising agents of the Province".

The following groups have been selected as representa-

tive of the Industries of the Punjab.

Group	Total workers and dependents.
25 Cotton-ginning, cleaning and pressing	91,886
26 Cotton spinning	108,201
27 Cotton-sizing and weaving	756,001
44 Carpenter, turners and joiners, etc.	407,267
48 Other works in iron implements	211,486
55 Potter and earthen pipe maker, etc.	294,443
81 Barbers, hair-dressers and wig-makers	276,095
Total	2,144,379

These groups support 2,144,379 persons, being 8.2 per cent of the total population and being over 44 per cent of the persons engaged in all industries. The local distribution of these industries is as Superintendent of Census Operations writes, "a T-shaped distribution, the head of the T- stretching along the North-Western Railway from Rawalpindi to Ambala and the leg of the T- down the Lyallpur Colony. In short, Punjab industries are flourishing in those areas where agriculture flourishes and where good railway communications have been developed as a matter of course. The Punjab canals are, therefore, promoting the Industrial development of the Province side by side with agriculture.

C H A P T E R XIII

Problem of indebtness.

Every one will be ready to admit that the Lyallpur district is the richest of all. The agriculturists have migrated from the old districts to this important centre of trade and industry. Those who were poor find themselves prosperous and those who were prosperous find themselves rich. Large areas are reclaimed, production is increased and with compact holdings, regular harvests and high prices enormous profits are made. "The ultimate effect", says Mr. Darling, "is likely to be different". With an improvident and almost wholly illiterate peasantry wealth is equally dissipated, and what remains has to be divided amongst a larger population. .... It is profoundly significant that in the last ten years debt in the Lyallpur district has increased by nearly 1½ crores".x

I have made an attempt to study the problem of indebtedness in the villages situated in the neighbourhood of my own chak. The balance sheet of Kundan Lal Ode (Ref. Appendix "C" Page shows that he is under debt to the extent of Rs.774, as 2. He opened his accounts with the present money lender in Sambat 1976 (1920 A-D). After a year the total debt came to Rs 424, as 14 p. 6, after the second year it rose to Rs 609, as 6, after the second year it rose to Rs 609, as 6, after the third year the total debt is shown to be Rs 718 as 7 and now he is indebted to the extent of Rs 774, as 2. These figures my be tabulated as follows.

Year	Rise in the debt.
Sambat 1976 (1920 A-D)	opened his accounts.
1921	Rs.424-14-6
1922	609- 6-0
1923	719- 7-0
1924	774- 2-0

These figures clearly illustrate the steady growth of debt.

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xRef. The Punjab Peasant in prosperity and debt.

P.253 (Mr. Darling).

The balance sheet of Sayad Chima of Chak No. 162(ARK C. R. 102), is equally illustrative. The growth of indebtedness will be seen from the following figures, which give in brief the results of my enquiry:-

1974 Sambat (1918 A-D.)	total debt was		Rs 708. 0. 0
1919	"	"	782. 0. 0
1920	"	"	1194. 0. 0
1921	"	"	933. 0. 0
1922	"	"	1229 1229. 0. 0

The debt of this peasant proprietor rose to Rs. 1229, in 1922, and it was the time for the money lender to oust the cultivator from his land. An additional sum of Rs. 995, was paid to the agriculturist, who in return, mortgaged his half a square of land for six years.

All the balance sheets repeat the same woeful tale. The land is passing from the agriculturist to the money lenders. The Zamindars are being reduced to the level of mere cultivators and they feel no interest in the improvements of thier land with the result that their labours become forced and slavish. Economic loss resulting from this state of affairs both to the cultivators and the province can very well be imagined.

All this is very pessimistic and it may be prophesied that the canal colony districts will eventually become as indebted as any other part of the province.

I am ready to admit, at the outset, that like many others I always regarded that land revenue was a primary cause of debt. This point of view of mine was very often confirmed by the agriculturists themselves. I have had an opportunity of meeting an old and well informed villager of Chak No:162, Rakh branch, district Lyallpur. "What is the cause of your indebtedness", I asked, "Land revenueais the sole cause of our ruin" was the frank reply[x]. His statement was coroborated by many of his co-villagers. Every body tried to impress upon me the severity of the land revenue. They held and I was made to hold that land revenue was the main cause of their indebtedness

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[x] "Muamla Ne ujar sytia Ae".

The balance sheets prepared by me, throw sufficient light on the problem of indebtedness in those villages, from which the facts have been collected. It may be interesting to mention in this connection that many difficulties lie in the way of an investigator of economic conditions in the rural areas. The Bania of Chak No: 162 Rakh Branch is very well acquainted with me, as this village is situated only a distance of a mile from that of mine. But, even then, he suspected me for a man having some connection with the Income Tax Department and was therefore quite reluctant to show me his Bahi Khata (Account Book). I explained the whole situation and gave him an assurance that he would never come to the slightest harm for allowing me to see the required accounts. He was convinced and I am indebted to him for the valuable information that he has given me.

A close study of the balance sheet of Kundan Lal Ode, (Appendix "C" Page 91) who owns and cultivates eight acres of land. From Katak, Sambat 1976 to Magh 1977, that to say, in less than a year, interest charges on his debt are Rs. 86. The indidence of these charges on the land of Kudan Lal is Rs. 10, as 10 per acre. Let us consider a little further, as the accounts of the next year are still more interesting. The interest charges from Magh Sambat 1977 to March 1978 i.e. for, a full year are Rs. 94, as 6. pies 6. This incidence on his land is about Rs.11, as 12 per acre.

Let us take the balance sheet of Gaman Chiman, a peasant proprietor of Chak No: 160, Rakh Branch, district Lyallpur (App. "C" P. 93). He owns about 12 acres of land and cultivates it himself. The total borrowed money from Chet 1973 to Har Sambat 1975, that is to say, in almost a year is Rs.933, as.6, and the interest charges alone amount to Rs.103, as 4. The incidence per acre of his land is Rs.9. It may be pointed out in this connection that the rate of interest in both the above cases is only 12% per annum.

This low rate is due to the reason that money is advanced on the security of land, and without such security the rate may rise to 24 % or even 30 % or even more than this as the case may be.

It may be concluded that in above mentioned instances the annual incidence of the interest charges on land is about Rs.10 an acre, if not more. The land revenue including abiana charges Local rates and cesses, is also not more than Rs. 10 an acre. W We may roughly say that the demand of money lender is equal to if not higher, than the demand of the Government. Therefore there is no justification in the statement that land revenue is the primary cause of debt.

The balance sheet of Sayad Chima is important from another point of view (App."C" P.[illegible]). It gives the ratio of the money borrowed from land revenue to the total amount borrowed. The total money borrowed from Sambat 1974 to 1978, that is, say in four years, is Rs. 3211-14-6. The total amount borrowed for the purpose of land revenue, local rates, abiana charges cesses etc. cannot be more than (All those chrages amount to Rs. 10 in these villages and 12 acres will pay Rs. 120 in a year and the total amount for four years will be Rs. 480) Rs. 480. The result is obvious. The money borrowed for the purpose of land revenue etc. is only 14.9 % of the total amount borrowed in four years. It may also be noted that the debts multiple of land revenue etc. in this case, is only 6.6. What is true of this balance is true of the others too. I have calculated that while between 14 to 16 % of the total borrowed money goes to the payment of land revenue etc., the rest 84 to 86 % of the total sum b borrowed is used to replace cattle, meet interest charges and for Akhrajat-i-Khnagi(money for household and domestic purposes), a big item indeed. The absurdity of the statement that land revenue is the primary cause of debt is so glaring that it needs no comment.

In the above case the debtor, ultimately mortgaged his land for six years. Thus the man, whom the Colony tried to make

a prosperous and rich peasant fell an easy prey to the money lenders and was reduced to the rank of agricultural labourer.

The balance sheet of Gulab (App."C" P.) is full of interest and instruction. He is a tenant, cultivating one square of land on the Batai system (half and half system) and therefore ordinarily he may be compared to a peasant proprietor who cultivates 12½ acres of land. The total amount of money borrowed in a year (from the 24th:Har 1976 to the 7th:Har 1977) is Rs. 837-5-9. The money borrowed for land revenue is only Rs 131 i.e. about 16.8% of the total borrowed money. Interest charges alone amount to 24%. The remaining 60% is borrowed for the marriage of his son feasts and Akhrajat-i-Khang as detailed in the balance sheet. The marriage of his son did not cost him less than Rs.400 i.e. 3½ times of the land revenue. I am quite sure of every detail in this balance sheet; as the tenant belongs to my own village.

It may be interesting to note another important point. The accounts of Gulab give us a starting point for comparison of the material prosperity of the colonies with other districts. The total amount borrowed in a year is 6½ times of the land revenue, while the districts of Sialkot, Gurdaspur, Ambala and Hoshiarpur, the debts's multiple of land revenue is 17, 18, 27 and 20 respectively.* The balance sheet of Khundan Lal Ode to which I have already referred, clearly shows that his debts 'multiple of land revenue has not risen more than 7.15 in spite of the fact that he has added to his debts by purchasing a bride for Rs.371-6 and has also incurred additional expenses on account of his marriage.**

It may be summarized that land revenue is not the primary cause of debt in the villages investigated by me. Although I have been able to give only a few instances, yet these have enabled me to study the situation as it is and not as it is generally shown to be. The main cause of debt may be the

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* Ref. The Punjab Peasant in prosperity and debt-Mr. Darling. P.24.

** The Debt of 1st. year is Rs. 572, land revenue 80 and debts multiple of land revenue is 7.15.

necessity of replacing the cattle, interest charges and Akhrajat-i-Khnagi. The last item many include some necessaries a few luxuries and many wastes. The money spent on drink is also inserted under the heading of Akhrajat-i-Khangi by the money lenders and it is this big item which is mostly responsible for the growth of debt in all the above cases.

One may ask, why land revenue is generally regarded by the Zamindars as the primary cause of their indebtedness. The explanation of this is very simple. Their attitude towards debt is quite passive. They borrow money from bania and most of them pay him back in kind. They have large supplies of wheat and other products, but it is money that they want in return for all their produce from the land. A Zamindar values more a rupee than eight seers of wheat (Rs. 5 a maund) because he has an ample store of the commodity. All this is due to the law of marginal utility. This tendency of valuing a unit of money greater than the amount of the commodity which that unit can purchase (only of those commodities, which Zamindars generally produce themselves) is quite manifest in the case of females. If a beggar comes, the old lady of the house will never grudge the pleasure of giving him two propies (½ a seer) of wheat, but she will be quite reluctant to give him an anna which is the price of that amount of wheat. All this is to point out that the agriculturists, as they are, attach greater importance to a rupee than the amount of corn which a rupee can purchase; because they have anough of the corn as compared with the money. At the time of paying the land revenue they pay in cash and therefore with wistful eyes, as they are quite unwilling to part with their money. But they have to pay it before a certain date. It is this apparent compulsion of the payment of the land revenue as contrasted with the seeming leniency of the money lender and coupled with the reluctance of parting with the money, that makes an agriculturist think that all the payments land revenue is the hardest and therefor the primary cause of his

indebtedness: but they never give a second thought to those silent figures which go on multiplying day and night on the bahi of the village Bania. In the payment of land revenue, an agriculturist is to pay in cash for which he very much longs, while to his Shah he has simply to offer his left hand thumb and even that only twice a year. When after a few years the land is mottgaged, the old wrong notion gets confirmed in him that it is the land revenue which is responsible for his ruin and not his friend bania. Sooner he realises the enormity of his mistake the better will it be for him.

CHAPTER XIV.

Conclusion.

A Short Historical Survey.

Seventy years ago the Punjab, now the greatest wheat producing area in India, offered a precarious source of livelihood to the cultivators. There were no irrigation works and their concomitant railways which are the great features of the Punjab in modern times. Famines were frequent and immense tracts of arid land, now under the plough, were capable of supporting only a sparse population of nomad cattle graziers.

Statistics of canal irrigation at the time of the annexation in 1848 are scanty, but the only canals then in existence were the Hasli Canal, irrigating from the Ravi river portions of the Gurdaspur, Amritsar and Lahore districts and some innundation canals from the Sutlij, Chenab and Indus rivers. The areas irrigated by these canals are not on record in any accurate form, but, so far as can be ascertained the Hasli canal irrigated some 50,000 acres annually, the Sutlij and Chenab innundation canals about 20,000 acres and Indus innundation canals perhaps 100,000 acres, while, later on the transfer, in 1858, of the Western Jumna Canal to the Punjab, a canal which had already been greatly improved under British adminstration in the North West Province, now the United Provinces, added upwards of 300,000 acres to the area irrigated annually in the Punjab from canals. The majority of these canals were mere scratches in the low lying land near the rivers which in the summer when the rising floods sent their spill over the riverrain, drew off the water a little further from the bank.

The changes that have occurred among the innundation canals alone are most substantial. In 1922-23 more than 1,800,000 acres were irrigated by the various innundation canals of the Province.* But after all innundation canals are but improve-

*Ref. The Marvel of Punjab Irrigation- Col. O'Brien P.2.

ments upon the improvisations of the cultivators themselves. The real work of the Punjab Engineers began when they started to harness the rivers with works of great magnitude and to take possession for the benefit of the country of all the winter flow and a portion of the summer floods.

In 1851 the Upper Bari Doab Canal project was put in hand, replacing the HasLi Canal and extending the benefit of irrigation to areas hitherto dependent on a precarious rainfall. The construction of this canal was originally regarded as a matter of political necessity. It was important to provide employment and an early supply of water for irrigation for the large bodies of disbanded sikh soldiery, whose homes were in the water shed between the Ravi and the Beas. This canal irrigated in 1922-23, about one and a quarter million acres.

Then came the Lower Chenab Canal which was constructed to change the arid waste of Bar than suitable for grazing purposes only into a populous and prosperous Colony. The irrigation from this is the biggest of any one system and amounted in 1922-23 as to a little more than two and a half million acres. This was followed by the Lower Jhelum Canal which turned another desert into the wealth Jhelum Canal Colony. This canal waters some 800,000 acres annually.

Then came the world wonder known as the Triple Canals system. It is the largest irrigation work executed in India up to date and which constitutes a striking monument to the engineering skill of those who were entrusted with its design and construction. The total area commanded by the Triple Canal system is 3,997,000 acres or 6250 square miles.*

The existing achievments of the Punjab canals may now be summed up. What they have done may be gathered from the fact that in 1919-20 when prices were at their highest, (Fig.1,page Vii) ten and a half million acres were irrigated

*Ref. The Punjab Canal Gazetteers. Vol.11.chap. "Triple Canals."

from the Punjab Canals out of 25 million acres irrigated in this way in the whole of India. In the old days there were no records and it is not until the year 1863-64 that the statistics are available. From these incomplete as they are in many respects, we are able to estimate the progress that has been made during the last seventy years. Seventy years ago 1,952 villages were irrigated and 621,000 acres were brought under cultivation by canal water, *while to-day 13,425 villages are irrigated and 10,456,658 acres have been brought under cultivation. During this period the length of canals in use has increased from 2,750 to 19,458 miles, while the value of crops produced has increased from 20 millions rupees to 630 millions. In 1863-64 the working of the canals resulted in a net loss to Government of Rs. 2,81417 whereas at present there is a net profit of a little more than 330 lakhs. Of wheat alone the out-turn now amounts to sixty million maunds.**

The main heads of the Provincial revenue are shown in the graph (Fig.). Of these land revenue is the most continuously important. It should be remembered that the portion of land revenue due to irrigation is shown separately as irrigation (indirect receipts). This consists of the estimated extra land revenue resulting from canal irrigation after deducting the additional expenditure of adminstration. In a district like LYallpur which was developed from a sandy waste, it is particularly the whole land revenue less the whole cost of adminstration.

The rise in irrigation receipts, both direct and indirect (Fig.4) is a sufficient tribute to the profitable nature of irrigation as an investment. From these working expenses as well as the interest on the capital invested should be deducted, and net profit from the canals will thus be arrived at. This amounted to RX. 223 Lakhs in 1921-22.

* Ref. The Marvel of Punjab Irrigation. Col. O'Brien. P.5.
** Ref. do. do. do. do.

P. 69. Supplement.

Fig. 4.

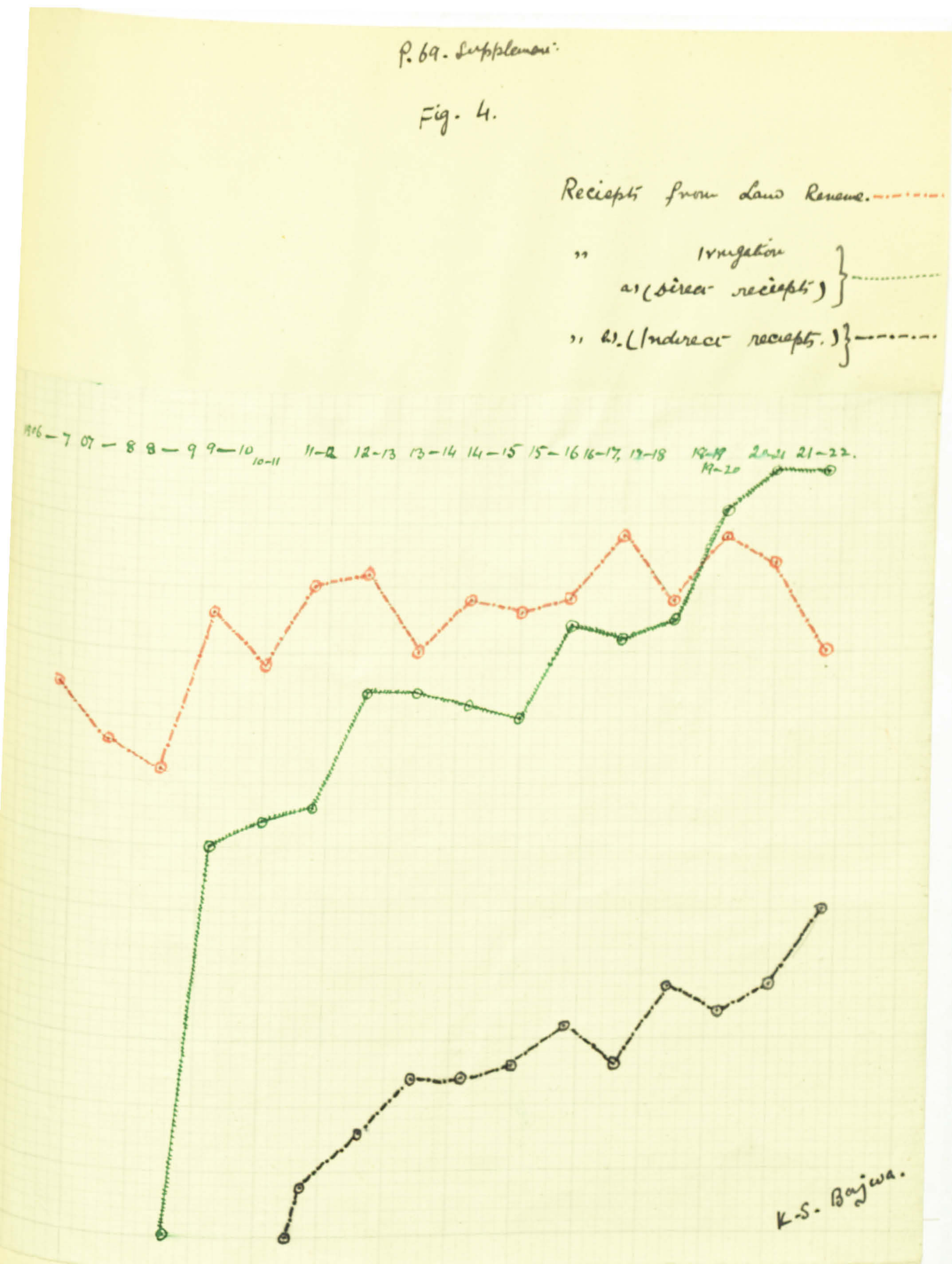

Fig. 4.

and Rs 270 Lakhs in 1922-23.* Working expenses and interest taken together roughly amount to the indirect receipts so that direct receipts give a rough estimate of the net profit due to irrigation. Fig.4 gives an indication of the annual increase in the profits of irrigation as indicated by the rise in direct receipts.

The profits realized from irrigation give some indication of the advantages which accrue to an economically virgin country from the scientific development of its resources. This is absolute profit after deducting the interest on the loans raised. Put into another form the Lower Chenab Canal is paying 45 per cent on Rs. 3¼ Crores invested in it, the Lower Jhelum 19 per cent on Rs. 1.7 crores, the Upper Bari Doab 16 per cent on Rs. 2¼ crores. The percentage of net revenue on capital outlay on the canals may also be noted.*

1. Upper Bari Doab Canal.....21.06
2. Lower do. do. 10.70
3. Upper Chenab do. 14.05
4. Lower do. do. 42.05
5. Upper Jhelum do. 1.03
6. Lower do. do. 16.83

It would be indeed difficult to find such a profitable investment as the Punjab canals. This, of course, leaves out of account the other revenue that Government derives from the Canal Colonies, all ultimately due to the Irrigation Department. And the Government receipts are but a fraction of the total increase of wealth to the people of the Colonies.

The results of the great irrigation works in the Punjab have amply been justified. Famines are now done away with. The dense population of the older districts have very much been relieved. The great infructuous dry jungle wastes of

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* Ref. The Land of Five Rivers. Page 73. Sec.127.
** Ref. Irrigation Report.....22-23

the Lower Bari Doab are rapidly turning into one of the richest and most fruitful tracts in the province. By 1922-23, the canal irrigated area in the Punjab has risen to more than 10.5 million acres. (Fig.): an area equal to the total ploughed area in England and Wales.

The completion of the canal colonies and the subsequent development of the agricultural resources of the irrigated areas have brought about a complete change in the colonized areas. The relief given to the congested districts of the province by the transference of the enormous numbers to areas of previously uninhabited desert is immense; and that the wealth earned in the colonies is very largely distributed over the whole province is shown by the large amounts of money annually despatched by money orders from the colonized areas. The protective character of the canal colonies is further examplified by the train loads of Rhusa which the concession rates admit of being despatched in every direction to districts suffering from scarcity of fodder. It is unlikely that famine relief will ever be required in future, at any rate on anything like the scale of the past, for on the appearance of distress in the least secure tracts like Hissar and Hoshiarpur, the population readily migrates to the colonies, where labour is always in demand, retiring with money in pockets and wearing beautiful clothes, on the return of favourable season.

The main factor in the development of canal colonies was to select good colonists and the extent to which they form a picked body of the more progressive elements in the population must not be lost sight of. In the early days of colonization on the Rakh branch of the Lower Chenab Canal the difficulties and dangers of the first colonies certainly eliminated all but the stoutest.

Later on all the many reward grants, whether to civilis or soldiers, were of necessity granted to such as had dis' guished themselves in their various walks of life, and

the competition for peasant grants rose to such a pitch that a selection of the best was possible and in general was made. This consideration does not, however, apply to the enormous body of non-grantees, who have swarmed to the colonies as labourers and traders, but even among them the sacrifice and risks involved in cutting adrift from old associations and family ties have ensured that the general body of immigrants of these classes too come from the more progressive people of the province.

Thirty years is a short span in the history of the development of a country. Progress which can not be gauged by scale and measure is sometimes hardly perceptible in the brief period. Of lack of statistics we can not complain. As far as the development of the Canal Colonies is concerned, every acre of irrigated land is a living testimony of progress and prosperity in the colonies. Of material progress there are, indeed, on every hand abundant signs. All sections of the agricultural community are from year to year better housed, better clothed and better fed. A short journey from Lahore to Lyallpur, Montgomery or Sargodha is more than sufficient to convince the man who denies the existence of prosperous, healthy and peaceful community of agriculturists in the colonies. From in the train one can notice the stacks of cotton bales in the trucks and sidings and the high bulging snow-like freights of the bullock carts labouring along the country roads. The smoke of the ginning factories in the small towns like Chuharkana, Sangla and Chak Jhumra, is further evidence of the reclamation of the desert; but the collected proof of it is most visible in the small mandis as Chak Jhumra Sangla, where the maunds of white cotton over top the market walls.

The tract which the canal was designed to serve was one of extreme desolation. Water lay for the most part from eighty to a hundred and twenty feet below the surface of the soil, which the rainfall was scanty and uncertain.

With the exception of snakes and lizards the country was extraordinarily devoid of animal life. The vegetation, such as it was, consisted mainly of dusty shrubs, some of a certain value as fuel but others of no use either to man or beast and grazing was, generally speaking, conspicuous by its absence. The onlt inhabitants of the country were the indigenous nomads, a simply and hardy who eked out a precarious existence by means of their camels and goats, being almost independent of any form of diet other than milk. "Such was the country in which "engineers of Sirkar" were destined to live and labour for many years".

The development of the Canal Colonies brought huge tracts of barren and desolate land under cultivation and turned them into smiling fields of corn. The spacious hunting grounds of the untamed cattle thieves have become a parcelled land of wheat; cotton and oils, of prosperous and expert cattle and horse breeders, of excellent dairy farms, of neat and tidy villages and of shaded water ways. The girgin soil yielded exceedingly generous returns and the magnificient crops converted the poor colonists into men of substance in a short time. A large export trade of wheat and cotton set in brought wealth and prosperity to the province and resulted in making Lyallpur, the Chicago of the East. What a Wrip Van Wrinkle would think if he were to awake from his 40 years' sleep ? A desert land, where once not a blade of grass could grow, has now become the characteristic scenery of the plains and the contrast between the luxurient green appearance before the crops are cut, and the dull brown after is most striking.

From the point of view of all the concerned, the Canal Colonies have effected their purpose. They have proved a most remunerative investment to Government, have greatly relieved the excessive pressure of population in the congested districts of the province, have reclaimed the criminal tribes have raised the depressed classes in the pale of society,

have stabalised the Government's revenues, have made North Western Railway a paying concern, have originated and developed a tendency in the Punjab agriculturist to migrate, have provided a field for the Agricultural Department to give effect to its scientific results, have enriched the cultivators, have enhanced the general wealth of the country and last but not the least have added several thousands of miles to the agricultural area of the Province.

"Prosperity and plenty have followed the canal water in its wake.

"Towns have sprang up in wilderness, all credit to the great organizers.

"Where maize, sugar cane etc. were never heard of;

"Now there are fields covered with Ponda, orchard and flower beds.

"Lovely bungalows with beautiful hedges and creeping ever-greens meet the eye everywhere.

"Bushes have given place to farm crops; through the blessings of canal water.

"A Punjabi Poem".

ਜਾਂਦੀ ਕਿਧਰੇ ਲਹਰ ਪੈਦੀ ਉਧਰੇ ਆਕਾਰ,
ਵਸੇ ਰੇਗਸਤਾਨ ਪੰਜਰ ਪਰਿਸਾਰੇ ਕਿਤਾਂ ਰਾਜਸੀਆਂ,

ਮਰੀਆਂ ਕਮਾਰ ਕਿਥੇ ਜੁਟੇ ਨਵੀਂ ਜੀਅ ਆਰ ਰਹੇ,
ਪੈਲਿਆਂ ਦੇ ਪਾਸ ਤੇਰ ਰਚੀ ਕਸਬਾਤੀਆਂ

ਦੀਗਾਰ ਨੇ ਸੀਰਾਂ ਅਮੇਰ ਪਏ ਗੋਰੇਆਂ,
ਦੇਖ ਨੂ ਨੁਮੰਤ ਉਤੇ ਬਾਗਾਂ ਦੇ ਬਾਗੀਆਂ,

ਪਾਣੀ ਦੀ ਪਾਰਾ ਕਿਤ ਪਾਰ ਦੇ ਮੇਰ ਤੋਂ ਦੀ
ਪੈਦਾ ਤਰਾਰੇ ਸਾਰੇ ਮਾਰ ਤੋਂ ਦੇ ਸਾਰੀਆਂ.

APPENDIX A.

1. The problem of fragmentation and smallness of holdings.

The prevailing system of inheritance among the land owning peasantry leads to a progressuve fragmentation of land and results in what is known as the uneconomic holdings Many owners of a tiny share in a landed heritage have no hope of deriving a living from its produce, and would be better placed if they could realise their cash value, which they fail to do, because a holding which consists of ten minute patches scattering over the land of the whole village cannot be sold, they strugglecan, therefore, and try to liv on a holding, which can never give them more than a starvationy ield. This is what prevails in the districts of Hoshiapur, Jullundur, Sialkot, etc.

The problem of fragmentation of land has led many economists to tax their brains for times out of number. It is this problem which is disturbing like nightmare the sound sleep of the Co-operative authorities. Fragmentation is an evil, the results of hich are clear to everybody and therefore, need no repetition. How to avoid it? What scheme may be put forth to replace the age old law of inheritance? These are the enigmatic questions which still await solution and have, therefore, from time to time forced themselves upon the attention of all those who are interested in rural econimcs and have the welfare of the voiceless millions at heart.

The Co-operative Department is doing its utmost in this connection. The instance lies the village Goraya in the Jullundur District are the living examples of its success. But it may be pointed out that there is nothing to prevent the old victims process of fragmentation from taking place again. The land once consolidated will, though not in a very short time, certainly be fragmented again, if no check is imposed upon this process.

I am, at present, only concerned with the Panjab Canal Colonies. During my ramble for the collection of statistics for my thesis, I have very much been impressed with the smallness of individual holdings especially in the peasant proprietory village. A peasant who had a square of land died and his four sons inherited 6 acres each. I am ready to admit that the problem of fragmentation is not and will not come to be so serious as it is in the older districts. But as far as smallness of the holdings is concerned the time is not far off, when some solution will have to be found in order to enable the increasing population to support itself. In a generation, the peasant proprietor, which once formed the backbone of the agriculturists in the colonies, will be reduced to the level of an agricultural labourer. Even the yeomen grantess (Sufraid Poshs) who seem to be puffed up with the possession of 5 squres of land will, in a course of generation, be reduced to the status of peasant proprietors and the day is not too far to imagine when the posterity of a present Sufraid Posh will either be lowered to the position of small proprietors or be absorbed by some prosperous neighbour. I have been able to collect a few tables and they may be given below in support of what I have said above.

(5 squares) Wir Singh 125 acres

1

1 Kharak Singh (41) | Kartar Singh (41) | 1 Karam Singh (41)

1

1

1 Lahna Singh (20) | 1 Kehr Singh (20)

1 Natha Singh (10) | 1 Karam Singh (10) | 1 Harsarn Singh (10) | 1 Hazur Singh (10)

11. (25 acres) Mangal Singh

Sham Singh (6)	Sant Singh (6(	Waryam Singh (6)	Lal Singh (6)

Mahna Singh (3)	Didar Singh (3)

In the first table, Sirdar Wir Singh was granted 5 squares of land in a village No.213, district Lyallpur, Kharak Singh son of Wir Singh is also dead, and each of his four sons possesses 10 acres of alnd. In the second table, after the death of Mangal Singh, land was divided between his four sons. Sham Singh is also dead and each of his two sons gets about three acres of land. The second table is taken from a peasant proprietory village Bhopal Wala, distri Lyallpur.

All this is to show that the holdings in the Colonies are growing smaller and smaller and there is, therefore, much justification for the conclusion, that as far as the peasant proprietors are concerned, only in a course of a generation or two, the holdings will become uneconomical, other things remaining the same.

The old inhabited land has been divided and sub-divided from generation to generation till it has come to Bighas Kanals and even marlas, the cultivation of which instead of being profitable has actually become a burdensome occupation. Are we going to allow the same horrible and yet apparently inevitable method to go on in our flourishing colonies? No, not al all! We cannot see for once our beautiful acres and squares to be divided into small strips unfit for agriculture and only worthy of children's "mock agriculture".

The Joint Ownership.

It is the practical necessity based on economic considerations, as given above, which has led me to bring forward

the scheme to which I refer to give the name of "Joint ownership", and it is one and the only one solution of this problem of consolidation and smallnes of the holdings in the Punjab. By this scheme of "Joint ownership", I mean that on the death of a Zamindar his land should not be divided among his sons as before, but on the other hand, the whole of the landed property should belong to all of them collectively, none of them being allowed to sell, to mortgage or alienate the land in any way in his individual capacity. Land should be property of the family and not of the individuals separately.

The "Joint ownership" is not a theory, not utopian hope, not an ideal dream, not even a play of fancy; but it is a scheme - a practical one, which even the untutored sense of a common cultivator can realise. Thousands of instances can be brough forward from villages in the colobies, illustrating the workability and practibility of this scheme in its simplest form. Before citing actual cases, let me make it as clear as possible that the "scheme of "joint ownership" will find a congenial soil among the Zamindars, where the joint family system is the predominant custom, where sentiment of "withness" has been for ever strong and where a tendency towards co-operation is quite obvious. It is, therefore, for me to show that this suggest ion of mine is not to be out forward into practice in time to come; but it is already working instinctively and spontaneously in the colonies and elsewhere and therefore if put into practice, will not be regarded as innovation by the Zamindars.

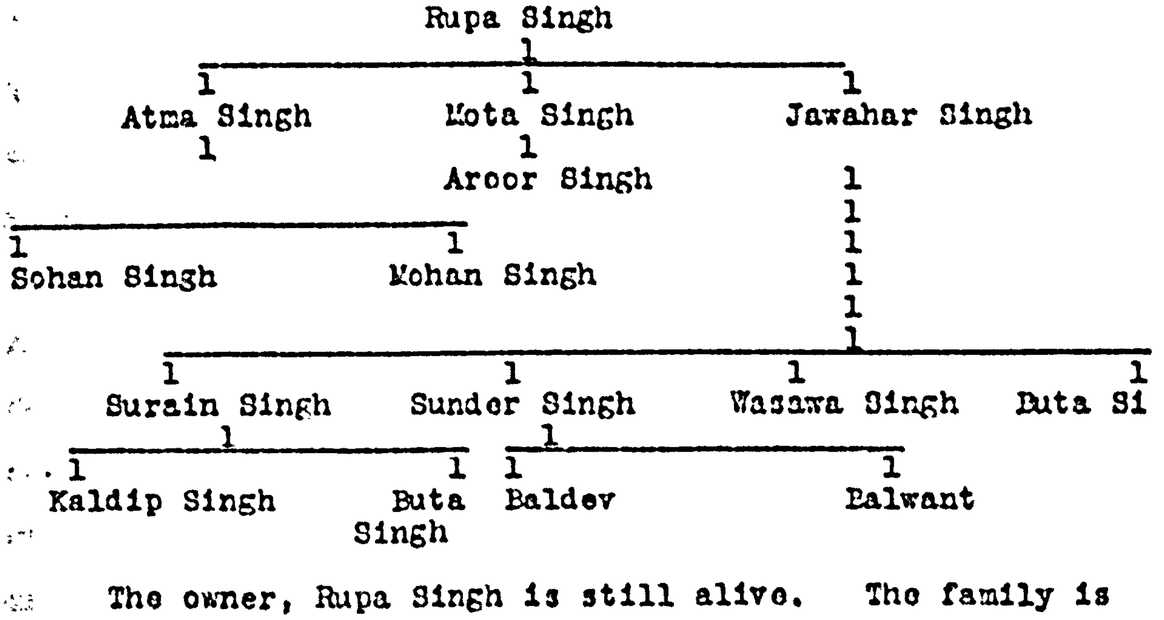
Instance from the Lyallpur district.

I have found that in Chak No. 369 J.B. district Lyallpur, no such division of land, has, as yet, taken place, in spite of the fact that most of the original owners have died.

Most of the agriculturists are working on the basis of the Joint family system. The land is not divided at all, it is on the other hand, jointly cultivated, and the produce is either kept together or divided according to the needs and circumstances.

(a). Nihal Singh owned 2 squares of land, but he died two years after the grant had been made to him. He left behind eight sons, who gradually grew up and all of them are now regarded by the villagers as very good cultivators. They have not divided the land among themselves; but are cultivating it jointly. The land if divided would have formed 8 plots of about 6¾ acres each. It is very easy to estimate what would have been the condition of that family if they had remained separate. These brothers, however, istinctively realised the strength of union and they held together. What do we find to-day? They are the owners of 4 squares of land. All of them have been married, and even some remarried. Had they divided their land, none -- I say none, would have been married.

(b). Rupa Singh of the same village was given two squares of land. HE has three sons.



The owner, Rupa Singh is still alive. The family is divided in three parts - say there are three messes; but all

work together and with results that I would show hereafter.

(c). Nihal Singh was given only one square of land in the same Chak. The table showing the extension of family may be given below:-

```
                    * Nihal Singh
                          1
____________________________________________________________
1                   1                 1                   1
Tehl Singh    Ishar Singh       Sawan Singh    Jaimal Singh
                    1
_____________________________
1        1        1     1    1
Kishna Bishna Gurbachan Amru Kaka    1
                                     1
                                     1
                          ____________________________________
                          1              1                   1
                          Kartara    Tirlochan          Teja 1
```

Such a large family lives on one square. If divided, the land would have formed so small parts that it would have been extremeky difficult to maintain the families separately.

These are only a few of the typical cases, thousands of which can be cited from throughout the colony. In the above village which I have investigated, I have found that fragmentation and sub-division of the holdings have not taken place, even if there were some occasions for this division on account of the death of the head of the family. All this shows a spontaneous tendency towards co-operation. It is however, desirable that this tendency should be originated, developed and strengthened throughout the province, and it is for this purpose that I am advocating the reconnition of the principle of "Joint ownership".

In all the above cases there is a "joint ownership" of land., in its simplest from, but it may be distinguished from joint family system. The latter depends upon the common consent of all the concerned, and the reluctance of even one member may break the joint system. This combination is purely voluntary based on the willing assent . I, however, want that this joint family system should be

developed into a joint ownership system through a legislation, so that no member of the family may be able to withdraw in order to demand a share of the land, however insignificant it may be. The "joint ownership" will thus make the union compulsory while joint family system is purely optional.

(i) It leads to Economy

Advantage of system of "Joint ownership".

If there one square of land, it can be cultivated with two ploughs, and four ploughing cattle. But if that is divided between five sons of a Zamindar, each will get about 5 acres of land. Each of them will, therefore, have to emply two bullocks and in this case they will require 10 bullocks to cultivate the unit of land separately. Thus under the "joint ownership" system, it is possible not only to save the price of 6 bullocks; but also the expenses that may be required to maintain them.

(ii) It leads to efficiency

The present system of cultivation is an extensive and sooner it is replaced by an intensive method the better. The system of "Joint ownership" leads an increase in the supply of labour and thus makes it possible for the land to be cultivated more intensively than if it ia cultivated separately. The family of Nihal Singh to which I have already referred, is generally known as Kirsana (the family of good cultivators).

(iii) It imposes a check on the extravagant habits of Zamindars.

One of the main causes of the indebtedness of a Zamindar is the facile habit that he can get on the security of his land. If there is no such security, a money-lender will never be willing to advance his money to a Zamindar. Under

*I am very much indebted to my esteemed friend Sardar Sadhu Singh who belongs to the village from which I have got these tables.

the "Joint ownership" system land belongs to a particular family and notto an individual. The members of that family can only distribute the produce from the land; but they have no right as indivuduals to borrow on the security of common property in their individual capacity. If the money is wanted for productive purposes, e.g., to purchase bullocks or to effect certain improvements upon the family land, then the document may be signed by all the major members of the family. Thus the produce, economy and thrift of even one member in the family can save the paternal acres from being mortgaged or sold.

(iv) It leads to very good handling of servants.

No Zamindar can do without a servant, whether he may be rich or poor. A Kama (servant) is always employed, whether he is engaged as a regular servant or as a temporary, depends upon the nature or the amount of work to be done. If the land is divided in frautions each owner will have .....to employ a servant whether a major or minor. But under the "joint ownership" system only one or two servants can do for the whole family and this has been greatly marked that with such families no servant was willing to work, because the members of the family came in turn and the servant is thus kep employed for the full time. There is always one or the other member who will take him to work.

(v) It leads to united strength which consequently leads to social honour. This is quite evident in case of a family to which I have already referred, in which all the eight brothers have been married.

(vi) There are many other econimics which accrue, from the prevention of social waste, e.g. offering to a Faqir, Kamin's due etc.

All these economies that I have pointed out above and many others which cannot be given here on account of the limitation of space, contribute towards the increase of

"family dividend". It may be pointed out in this connection that in each of the cases that I have cited above, there has been gradual purchasing of more land. In the case (a) the increase is from two squares of land to four squares, in (b) from 2 to 3, and in the case (c) from 1 square to 2½ squares.

Criticism of the system of "Joint ownership"

I have put forth this system before my friends, who have criticised it in the light of their experience and study. I have also tried my best to answer their criticism from my inductive inquiry that I have made upon this subject. Their criticisms as well as my answers may be summarised as follows:-

(1) This system will deaden the spirit of adventure.

No statement can be more absurd than this. It is entirely unpsychological, and shows the bankruptcy of knowledge of human behaviour on the part of those who make this point as the basis of their attack. It must be remembered that in all the above cases, which I have cited, some members who are fit for other jobs are spared for those occupations. In (a) instance, Wadhawa Singh is educated by his brothers and he is a contractor in Burma. Sher Singh lives at Amritsar and earns lots. Whenever the family intends to purchase a new square of land, the members who are in service also contribute their quota towards the purchase of land. Teja Singh is serving in the Military Police Burma and the other five are thought to be quite sufficient for the cultivation of the family land. In the case (b) Sunder Singh is a clerk in M.T. Company 25, Rawalpindi. He has also been spared from agricultural iperations. (c) In this case Isher Singh has two children who are quite fit for grazing cattle and sheep respectively and thus these two sons of Isher Singh are also paid from the common dividend.

Thus it has been made clear that in each family whenever there has been an opportunity and whenever some men can be spared we find adventure and subsidiary occupations.

(2) To those who say that the system is impracticable, my only reply is that they must go to the villages and see facts for themselves. The system of "joint ownership" is the only remedy for the worst economic ills of the agriculturists and it will come to them as a blessing.

(3) Some people are afraid of women quarrels, which they think will deal a death blow to these dreams of co-operation. Such people should keep their noble opinions and pious anxieties to themselves. No good scheme should be dropped simply on account of the reason that the women-folk fails to see eye to eye with us.

To sum up, I may say, that the scheme bids fair to succeed. A cultivator will certainly prefer co-operation to poverty, under-feeding and weakness. With the introduction and development of education, the co-operation on the basis of "joint ownership" will be very much strengthened.

Every effort of the Co-operative Department will give an additional force to it. Land, therefore, must belong to the family and not to the individuals, if we want to avoid the impending dangers of fragmentation and smallness of holdings: if we want to save the strength of the peasant, if we want to give permanancy to the consolidation of holdings in the old districts, as effected by the Co-operative Department, if we really want to nip the evil of smallness of holdings in the bud so far as the colonies areconcerned, if we are ready to benefit from experience and lastly, if we really want to help him who is the feeder of us all with a genuine sense of duty and reponsibility. It is here that we stand in need of a legislative measure.

APPENDIX B

"How I migrated to the Colony".

In this chapter I intend to give a brief description of the difficulties that beset an eary settler. I have taken a particular colonist, whose identity I am not at liberty to disclose. He possesses five squares of land, and is quite well-off as an agriculturist. I am thankful to him that he has taken me into his confidence.

He says, "I was a poor man. I had only a few fragments of land which I could call my own on account of continual sub-division of the paternal acres, from which I hoped to eke out only a precarious living. I, therefore, joined the army in 1890. I was quite happy as a soldier, and never expected that in days to come I would become a successful and prosperous agriculaturist. I heard a rumour of land being given to poor Zamindars in the Lower Chenah Canal Colony, and I made up my mind at avail myself of the opportunity.

"It was my first duty to consult my elders, and I performed it, but every one of them sounded a note a warning and discouragement. To migrate to the colony was regarded as an irony of fate, a misfortune and a punishment as a result of our past sins. I had, however, a love for adventureus life, and no amount of the sermons of those considered as the elders could therefore, produce any effect upon my resolute mind. I knew, and knew quite well, that in case of my failure, I would still have a few acres of the paternal land to fall back upon. I went to the district officer, and submitted an application for a grant of land in the Bar. After a few days, I received a hukam (order) that the APPlication has been granted and that I should go to the Colonised area to select five squares of land for myself. I had, by this time, picked up an acquantance with a few other people who were like myself ready to migrate to the colony.

To miggate for Punjabi Zamindarin those days, all bag

and baggage was a hard task indeed. I still remember and can easily visualise the dramatic scene of my departure. It seemed as if I were going to lam (war). My old father never spoke a word to me, on the day when I was to leave my old village. He went out of the home in order to avoid the scene of painful separation. Thanks to the Almighty, that my mother was not living at that time, otherwise no efforts on my pasrt could ever have been able to go against her persuasions. My little son came running to me, and clung to my knees. A promise of bringing sweetmeats at the time when I would be coming back was sufficient for the sweet creature. I could easily hear the sobs of my wife behind the door. She often glanced at me and her speaking eyes very well expressed the tormenting feelings of heavy grief, She was, of course, right to some extent, as I was leaving her at the mercy of joint family system in which a newly-married girl has no voice in the management of the house-hold affairs. I was however, able to resist the displeasure of my father, the sweet expression of my child, and the silent orders of petticoat government, and turned my back upon the village under very propitious times.

All this may seem in these days of the improved maans of cummunications, of light and culture, as self laudatory. But a journey to Sandal Bar, in those days, was not a light adventure. The prospects of would-be settlers were not, at first, very much attractive. I started with three of my companions, who were also feeling an intense hundrr for land; but we had harder times than usual. There was no railways to the colony, and we had consequently, to march there through a country nearly as watse as that to which we were going. The Bar was already inhabited by janglis, who neither desired nor expected the canal to be a success, and who were, therefore, determined to do all in their power to prevent its being so. These people were very violent and

uncouth. The country presented a particularly desolate and inhospitable appearance, so much so that the two of us refused to believe that the land was worth cultivating, and returned to their homes. I also heard that a few of the immigrants died on the way, and never reached the land of promise.

I and my companion began to roam from one place to another with a view to selecting the land best suited for our purposes. The selection was however, made, and five squares were allotted to each of us. We had simply to submit an application to the Assistant Colonization Officer at Shakhot and Dakhla was given to us.

I cannot help paying a tribute of respect to the amibale manners, encouraging discourse, humurous way of addressing and good nature of Mr. Young, the Assistant Colonization Officer. I am quite sure that if there had been no Mr. Young or an officer like him as a Colonization Officer, the work of the colonization would have become very much more difficult. Whether there was scarcity of the canal water or a change in the water course was desired or in case of a trouble from the nomads, one could call upon Mr. Young at any time, and for whatever purpose. I remember that I had to go to him for a case which had long remained pending under the irrigation authorities. He at once took me to the Executive Engineer and remarked in a humurous way "Do not try to satisfy him with drawing red and blue lines on your map, please do something really useful for him". Every colonist, in fact, could depend upon him in case of a need.

During our wanderings for the selection of land, we often met with strage events. Once we had nothing to eat and there was no Hindu village near by from where we could get food. For a time we tried to prevail upon our appetites

but after all we had to yield and took our food from a Mohammadan gentleman. I may point out in this connection that my companion was a staunch religious man, and had never before this even liked to touch the food cooked by a Mohammadan. The poor fellow had however, to give up his relgiious conviction for the time being.

Then at another occasion we missed the right track, and had to wander for some time in the jungle. We could not find the track up to midnight, when we heard a barking dog, which indicated that we were somewhere near a habitation. It was a bahk (halting place) of the janglis. It was really a piece of good luck that they treated us quite hospitably, and offered us milk to which we did full justice.

It was impossible to cultivate the land without a sufficient labour. We had, therefore, to go back to our homes in order to bring more people with us. No words can express the pleasure felt by my family members, when they again found me quite safe and sound.

I started again with my two brothers and three Kamins. We reached the Bar without any mishap. We first built a few small huts to protect ourselves from scorching geat of the sun. We had to dig pits to place our foods in, in order to keep it safe from the nocturnal visits of jackals.There were no macth boxes available, and we had to keep every night a smouldering piece of dung cake covered under earth, to light the fire in the morning for cooking purposes. It wso happened once that one of us forgot to preserve the fire, with the result that we had to remain without food for a full one day. A man has consequently to be sent to a distant bahk of the janglis to bring the smouldering piece of dung cake.

The opposition offered by janglis was a constant source

of trouble with us. Many times we had to fight with them in order to ward off their perpetual attacks made on us. These janglis never looked after their cattle. It might perhaps be due to their long unsettled conditions and they often let in their cattle to feed on our crops and this sense of irresponsibility on their part led to many serious conflicts between us, in which we always got the upper head. We had, by this time, established ourselves permanently on our land, with eight or nine muzarias (tenants) and ten or twelve kamins.

There was another source of trouble. Irrigation was by no means perfect and the levels taken by officers were far from accurate. I had to construct the waterways and then I found that most of the land was unirrigable. To remedy this defect, I had to incur much expense at the time, when I had very little money with me.

Though we had simply to scratch the land, and the virgin soil yielded bumper crops, our troubles were not yet over. The labour available was insufficient to harvest all and, even when harvested, there was still the difficuly of disposing of the produce, which had to go by the same perilous way by which we had come. I sold my first store of wheat at the rate of Rs. two-annas eight (2/8) a maund.

Many of the difficulties however, were smoothed away by detect and foresight of the colony officers, others were resolved by the mere efflux of time. At present, I am quite happy and prosperous Zamindar. I have permanently settled in the colony and all the important social functions are performed here. I often pay short visits to my old village to see the conditions of my villagers there. Most of them have not more than 2 acres of land. If I had not migrated to the colony, I would have been a man of no sub-

stance. I had only a few rupees with me when I came to this new land. Even that little sum was borrowed from a bania on the security of my wife's ornaments. I shudder to think of those days, when I migrated to this place with very little capital - borrowed on the secutiry of ornaments of one who was most dear and near to me. I have suffered much: but have been amply repaid for my efforts by the promised land of peace, prosperity and plenty. I now live in a beautiful pakka house (the photo of the building is on the front-piece), and enjoy all the comforts which a Zamindar ought to have."

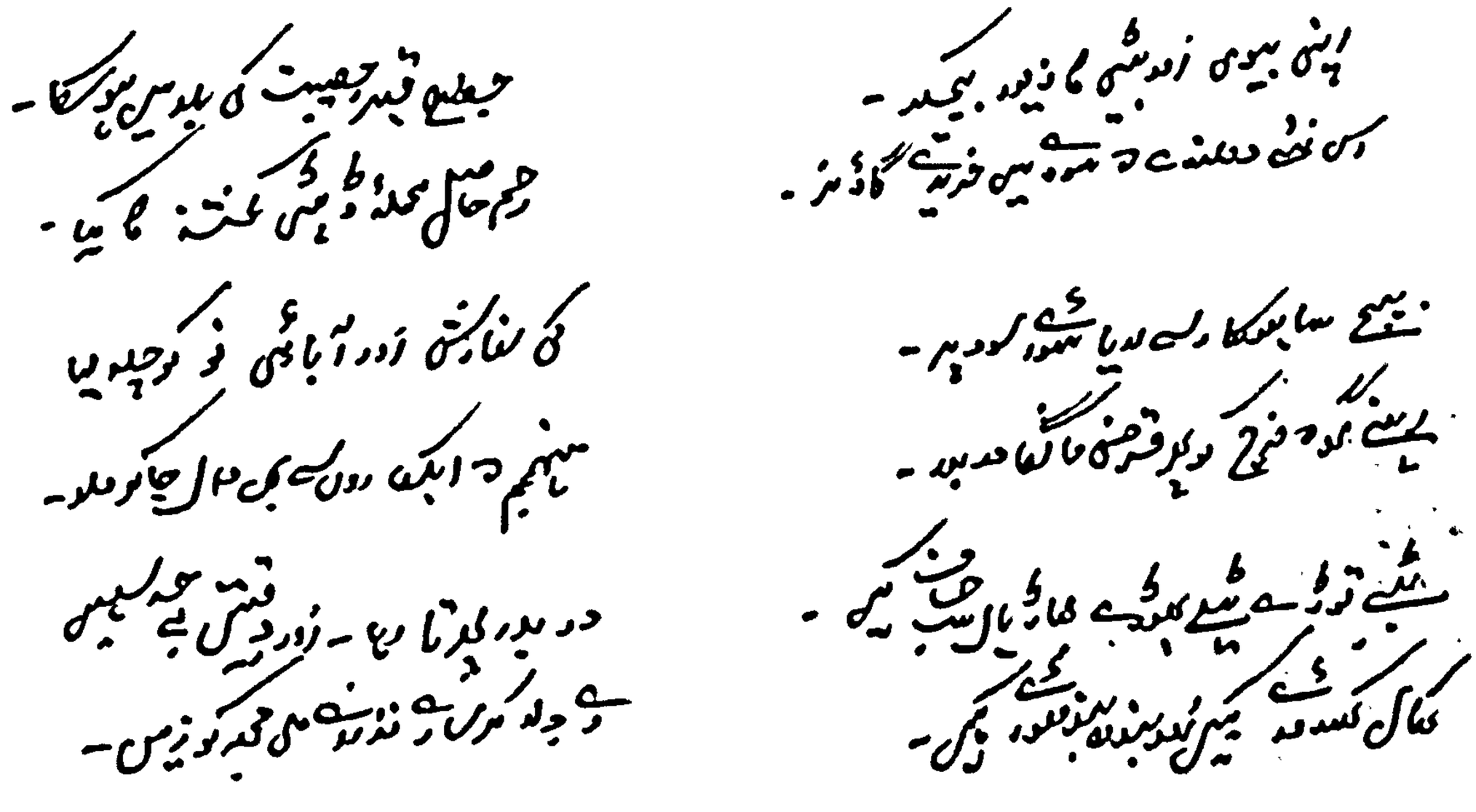
The difficulties that early settlers had to face are very well and beautifully summed up in the following Urdu verse, the translation of which is also given.

"By the sale of the ornaments of my wife and daughter,
I purchased bullocks to cultivate the newly-acquired land.

Got seeds at heavy rate of interest,
In order to run the house had to get into still further debt.

Cleared an levelled the lands,
Dug water courses and raise bunds.

With great difficulty enlisted the sympathy of the Revenue Department.
With their recommendation migrated to the colony and had to pleased Irrigation Subordinates.
After suffering many humilitations, and privations, and
After the payment of many Nazranas I obtained this grant of land."



Appendix C.

Balance sheet Kundan Lal ade. He possesses 8 acres of land and cultivates it himself, in Chak No. 293 R.B., District Lyallpur.

Land Revenue, Water Rates cesses etc. - 80 Rs. a year.

Incime (Repaid)	Amount	Date	Expenditure	Amount	Sambat 1976
Wheat 10 maunds	40-11-6	Har.15	Cash for domestic purposes	21-1-0	Katak 26
American cotton 10 maunds	100- 0-0	Poh.23	Neunda Cash	5-0-0	Maghar 6
Gur L maund	7-0-0		Purchased a new Bullock and gave an old one in return	13-0-0	" 19
			cash. Baring letter	2-0	"
			To go to Hardawar in connection with a death ceremony	19-0-0	Poh. 3
			Miscellaneous	0-4-0	"
				1-12-0	Magh.6
			Purchased a woman	371-6-0	Phagan 13
			Rice, Ghee etc. for his marriage, etc	6-1-0	Chet 1
			For his marriage	40-0-0	Katak
			Interest at 18% per annum.	86-0-0	Magh 19
Total	147-11-6	Magh 19	Grand Total	572-10-0	

Account settled on the 19th, Magh 1877, balance being Rs. 424-14-6

Thumb mark of the debtor

					1977
			Balance carried forward	424-14-6	Magh.19
American cotton 14 seers	5-8-0		Ticket	0-1-0	
			Purchased a horse	68-0-0	" 20
			" 30 seers of wheat	4-8-0	30
			Wheat and Bajra for the use of family	13-0-0	Phagan 14
			Wheat one maund	10-0-0	Magh. 9
			Total	520-7-0	
			Interest at 18% pap	94-6-6	
			Grand Total	614-14- 0	

Income (repaid)	Amount	Date	Expenditure (borrowed)	Amount	Sambat
Accounts settled on 1st. March 1978 balance being Rs.609 As 6					
			Balance carried forward	609-6-0	
			Ticket	0-1-0	
		1979			1978
Wheat 6 maunds	33- 6- 0	Har.15	For land revenue	22-0-0	Magh 13
Cotton (American) 3¼ maunds	50-4- 0	Magh.30	Purchased Rice 20 Seers	5-4-0	Phagan 8
			Purchased Wheat 30 Seers	7-8-0	22
					1979
			For domestic purposes	20-3-0	Magh. 16
			Total	644-9-0	
			Interest charges at the rate of 18%	138-8-0	
					1980
			Grand total	803-1-0	Chet 24
Accounts settled on the 24th, Chet, 1980 balance being Rs. 719, As 7 (Thumb mark of the Debtor)					
			Balance carried forward	719-7-0	1980 Chet 24.
			Ticket	0-1-0	
			Rice, Haldi, condiments, etc	2-11-0	
					1981
			For going to Lyallpur	1-13-0	Bhadon Asuj 2
			For domestic purposes	9-4-0	23
			Purchased sugar	0-6-0	
			For domestic purposes	9-10-0	Katak 25
			Total	744-2-0	
			Interest charges at 18%	30-0-0	
			Grand total	774-2-0	

Accounts settled on the 31st. March 1981
The Debtor is to pay Rs. 774, as 2
(Thumb mark)

Analysis:- Last balance of debts - 774-2-0 (11) rate of interest 18%
(3) Land revenue local rates etc. (average for a year) Rs.80
(4) Debts' multiple of land revenue - 7.15 (of 1st. year only).

Balance Sheet of Gaman Chiman s/o Hasham of Chak No.160 Rakh Branch, district Lyallpur. He owns ½ square of land, 12½ acres, which he cultivates himself.

Income (repaid)			Amount	Date	Expenditure (borrowed)	Amount	date
Cotton 3½mds. (desi)			45-5-0	Magh	Balance carried forward	708-2-0	1978 Chet 20
Toria	4	"	14-8-0		Cash for purchasing wheat		
Gur	8½	"	31-1-6				
"	1	"	[illegible]-13-0			10-0-0	1974 Posh 1
					Land revenue etc.	55-0-0	Magh 4
Wheat			48-8-0	Har			
					Faslana Patwari	1-0p0	" 5
					For domestic purposes	8-48-0	" 7
					Paid to a pawnbroker and got his ornaments. cash.	1-0-0	
					Interest charges 12%	108-4-0	
Total			146-3-6		Total	938-6-3	

Accounts settled on the 18th. Har. 1975 balance being Rs. 792. As. 2. Ps. 9 (thumb mark) 1975

Balance carried forward	792-2-9	Har 18
Ticket	0-1-0	
Land revenue etc.	106-5-0	Har
The money-lender sold a bullock	115-1-0	
Cash for a marriage.	146-1-0	
Land revenue etc.	153-3-0	Magh. 7
For Chawkidara	0-5-0	
Faslana Patwari	1-0-0	
Purchased a buffalo	85-1-0	Phagan20 1976
Land revenue etc	59-1-0	Har. 2
Faslana Patwari	1-0-0	
	85-0-0	
Neonda ( )	16-1-0	Bhadun 30
"	6-0-0	" 31
Cotton seeds for animals	1-0-0	Asuj 2
Land revenue etc.	98-4-0	Magh 6

Income	Amount	Date	Expenditure	Amount	Date
			Cash for seed of sugar-cane	2-8-0	Magh 25
			Purchased wheat for consumption	26-10-0	Phagan 14
			Land revenue 75-0-0		1977
			Purchased a bullock 25-0-0	126-1-0	Har 11
American cotton (16 maunds)	324-0-0	Magh 15	Land revenue for the square of Hayat Bibi his mother-in-law		
Toria 1½ maunds	10-0-0	1976	- 18-0-0		
			Misc.	8-1-0	
Wheat 25 "	118-8-0	Har.	For domestic purposes	9-0-0	Har 13
American cotton 10½ mds.	205-8-0	Magh			
			Neonda	4-4-0	Sawan 17
Toria 3½ "	29-12-0	"			
			"	12-8-0	" 18
Wheat 32 "	136-0-0	Har 15			
			"	16-0-0	Asuj 29
Toria 17 "	137-8-0		"		
Paid in cash	19-0-0	Magh 10	Cash for domestic purposes	8-0-0	Katak 29
American cotton 6½ mds	65-8-0	" 15	Land revenue etc	40-2-9	Magh 10
Toria 1½ "	13-0-0	" 19	Cash for domestic purposes	2-8-0	Chet 4
			Total	1826-2-6	
			Interest charges at 12%	323-10-9	
Total	1058-12-0		Grand Total	2149-13-3	

Accounts settled on the 14th Har 1978, balance being Rs. 1091 as 1 ps 3 . (thumb mark)

Concession from the interest	25-0-0		Bal. carried forward	1091-1-3	
			Land revenue etc	83-6-0	Har. 15
Maize one maund	3-0-0				
			purchased seed of whaat	11-0-0	Katak 8
Wheat 24 "	132-0-0		Purchased seed of wheat		
Cotton 4 "	48-0-0		Land revenue	43-9-0	
Gur	16-0-0		In cash four Post cards	1-0	
			Faslana Patwari	2-0-0-	

Income	Amount	date	Expenditure	Amount	Date
			Cash for Maju in payment of his debts	14-0-0	Bhadun 10
			Land Revenue	50-1-0	Magh 15
Total	222-0-0		Total	1295-2-3	

Accounts settled, balance being Rs. 1073, As. 2 Ps. 3

The debtor mortgaged ( ) his half square of land on Rs. 1,073, as 2, Pies 3 for 4½ years.

(i) The last balance of debt 1073-2-3-

(ii) Rate of interest 12%

(iii) Land revenue local rates etc. (average) of a year - 120/-

(iv) Debts multiple of land revenue (for the first year) - 8

Balance sheet of Gulab, a tenant of Sardar Jawand Singh, Sufaid Posh Chak No. 185, district Lyallpur. This tenant cultivates one square of land under two ploughs.

Income (repaid)	amount	date	expenditure (borrowed)	amount	date
			Cas. for domestic purposes	8-0-0	1975 Chet 20
			For purchasing a bullock	50-0- 0	25
					1976
			For his son's marriage	20-0-0	Bisakh 1
			Seed of foffer	3-0-0	Jeth 4
			seed of grain	10-0-0	" 6
			Cash for utensils	10-0-0	" 7
			Cash for domestic purposes	2-0-0	" 16
Wheat 55 mds.5 seers			For his son's marriage	100-0-0	
sold at the rate of Rs.5 as. 6	269-4-9	Har 24	For ornaments	2-0-0	
			Land revenue	85-8-0	Har 15
			For purchasing a bollock	62-8-0	" 21
			Interest charges	12-0-0	" 24
Total	296-4-9		Total	366-8-0	" 24

Accounts settled on the 24th, Har Sambat 1976, balance being Rs. 70, As. 3, Ps. 3 (thumb mark)

					1976
			Balance carried forward	70-3-3	Har 24
			Ticket	0-1-0	
			For the marriage of his son	232-8-0	
			Ticket	0-1-0	
			For the marriage of his son	150-0-0	
			Ticket	0-1-0	
			Seed of Toria	0-4-0	
			Seed of Toria, 13½ seers	5-6-6	

Income (repaid)	Amount	date	Expenditure (borrowed)	Amount	Date
			Purchased seed of wheat 6 maunds at Rs. 6 a maund	36-0-0	Katak 1
			Purchased 3 maunds of wheat	18-0-0	Katak 14
			Seed of rice and 4 As. cash	1-8-0	
			Purchased 1 maund of wheat	6-0-0	Poh 21
			Purchased Bhusa	32-2-0	" 22
			For domestic purposes.	15-0-0	" 25
			For clothes of family	25-0-0	Magh 1
Detail paid in cash 102-0-0	401-0-6		Purchased maize (7 maunds)	30-0-0	Phagah 13
Sold American cotton 5½ mds at Rs. 18 per maund.			For an ornament	10-0-0	" 14
Sold Desi cotton worth Rs.100			Purchased 4 seers of cotton	1-12-9	" 18
			Land revenue etc.	45-8-0	" 30
					1977
			Purchased gram (10seers)	1-2-6	Baisakh 10
Sold Gur (8 mds) of Rs. 67, as 9 Ps. 9			Purchased Gur (10 seers)	2-8-0	" 12
Sold Shakar (10 seers) of Re. 1, as 14			for Purchasing utensils	5-15-0	" 18
sold Totia of Rs. 129, as 10			Cash	1-0-0	
			Cash For domestic purposes	1-0-0	
sold fodder of Turnips	86-2-3		Cash	2-0-0	
Paid in cash	118-0-0		Cash	3-0-0	
sold 2¾ mds. of grain at Rs. a md.	22-0-3		Paid to his friend	5-0-0	
			To attend a fair	4-0-0	
sold 25½ mds. of wheat Rs. 4/-	102-3-3		Interest charges at 24%	116-12-0	
Sold 40 " at 6 rs.	175-0-0		Land Revenue etc	85-8-0	Har
Total	904-5-9		Total	907-5-9	Har 7

Income (repaid)	Amount	Date	Expenditure (borrowed)	Amount	Date
Accounts settled on the 7th, Har 1977 balance being Rs. 3.					
			Bal. carried forward	3-0-0	1977 Har 7
			Purchased 23 seers of wheat	3-3-6	
			Purchased Gur	1-0-0	
			" seed of Toria	3-1-6	
			" " gram	1-1-0	
			" " wheat	19-11-0	Asuj 29
			" " of Toria	1-210	
			" " of wheat	22-8-0	
			Purchased seed of wheat	3-15-0	Katak 27
			Purchased seed of wheat	15-12-0	" 28
			Purchased wheat for eating purposes	33-12-0	
			Purchased seed maunds 3, for Massu	16-14-0	Magh 1
Sold American - cotton 10 Mds at Rs. 9 a maund	95-0-0		Purchased seer 28	3-15-0	" 28
Sold a mare	25-0-0		Purchased 2 mds	11-410	Poh 1
Sold 15 maunds of Toria	116-4-0		Cash for domestic purposes	30-0-0	" 20
" 4seers of Toria	0-12-6		Purchased Bhusa, 59 maunds	92-3-0	
				2-1-0	" 29
Paid by Mula singh	26-0-0		Cash for shons	5-0-0	" "
sold wheat 73½ mds. @ Rs.5.as a maund.	432-3-0		Paid on his behalf to some o other man	18-0-0	Magh 1
			Interest charges	33110-0	
				362-6-0	
			Land revenue etc.	41-5-0	" 15
			For the purchase of a bullock	120-0-0	

Income (repaid)	Amount	Date	Expenditure (borroqed)	Amount	date
			Purchased wheat	3-3-0	Phagan 5
			Cash for domestic Purposes	20-0-0	
			For the purchase of a bullock	44-5-0	
			Payment for his standing of a surety	45-8-0	Chet 16
			Purchased Maize and Rs. 10 cash	21-0-0	
			Purchased green fodder	1-9-0	
			Purchased cotton seed	1-41-0	
			Purchased one maund of gram	7-0-0	1978 Har 12
			Cash for domestic purposes	5-0-0	
			Land revenue etc	93-0-0	Har
			Interest charges	39-0-0	
			Paid ot Mula Singh.	13-0-0	" 27
Total	695-3-6	Total -		775-3-0	

Accounts settled on the 20th. Har, Sambat 1978
balance being Rs. 80, As 15, Ps. 6 (thumb mark)

Bal. carried forward	80-15-6	
Ticket	0-1-0	
For purchasing a bullock	100-0-0	Sawan 9
Purchased 10 maunds of wheat	50-0-0	Bhadon 5
Purchased seed of Toria	2-3-0	" 9
Purchased seed of wheat	26-8-0	Katak
" " S ain ji	10-0-0	" 16
" "wheat	32-2-0	" "
" " "	14-5-6	Maghr 1
" " "	80-0-0	" 11

Income	Amount	Date	Expenditure	Amount	Date
			Ticket	0-1-0	Maghar 11
			For the marriage of his daughter	10-0-0	
			" " "	75-0-0	
			For domestic purposes	4-0-0	
					1979
			For Din Mohamad	70-0-0	
			Land revenue etc	61-8-0	Har 9
			Purchased Gur (32 srs)	6-6-0	Sawan 5
			For domestic purposes	13-0-0	
			For purchasing oil for cattle	11-11-0	Bhadun 18
Sold Rice	16-10-0	Asuj 17			
			Purchased 2 mds. 4 seers of Massar	7-12-0	Asuj 25
Paid by Din Mohd	1-1-0				
Sold American cotton	5-15-3		" wheat	3-0-0	Magh 18
Sold American cotton (2m. 8srs).	24-0-0		" Massar (2 mds)	10-0-0	Phagan 13
Sold Gur 19½ mds.	174-11-0		" wheat	2-8-0	
Sold Toria 10¾ mds.	62-0-0		For purchasing necessaries for marriage of his daughter.	73-0-0	Chet
Sold Massar 7 mds.	31-8-0				
Sold cotton	24-12-0		Purchased seed of chori	1-8-0	1980 Jeth 2
Sold wheat 74½ mds.	391-2-0		Purchased cotton	0-8-0	
Sold wheat	12-8-0		" brash	10-0-0	
Sold Barley	0-10-0		For purchasing cotton seed for cattle	5-12-0	
Concession in the interest charges	0-12-0		Land revenue etc	93-13-0	Har
Total	745-8-3		Total	1029-4-6	

Accounts settled on the 7th, of Har Sambat 1980 balance being Rs. 283, As Ps. 3

In studying this balance sheet the following points should carefully be borne in mind.

1. The cultivator is the tenant.
2. The produce is divided between owner and the tenant on the half and half (Batai) system.
3. Half of an old revenue is paid by the landlord.
4. The seed for all the crops must be provided by the tenant himself.
5. The landlord has a capitalistic relation with the tenant. The capital is advanced by the landlord and the whole of the produce (including the tenant's share) thus comes to the landlord, the price of which is credited to the account of the tenant.

Analysis

1.	The last balance of debts	Rs. 283-12-9
2.	Rate of interest 18%	
	Average amount of land revenue etc for a year	Rs. 120-0-0
3.	Debt's multiple of land revenue - 6½	

Balance sheet of Sayad Chima son of Hasham. He owns and cultivates half a square of land (12 acres) in Chak No 162 Rakh branch district Lyallpur.

Income (repaid)	Amount	date	Expenditure (borrowed)	Amount	Date
Sold wheat 2 mds 6 seers	29-1-0	Magh 15	bal. carried forward	708-0-0	1973 Chet 20
Sold Toria 5½ seers	14-8-0	Phagan 8	For domestic affairs (cash)	10-10-0	Basakh 20
Sold Gur 8½ "	34-0-0		Purchased wheat (6 maunds)	21-0-0	Maghar 20
" wheat 6 "	21-3-6		Land revenue etc.	55-10-6	Magh 4
			Purchased wheat	9-0-0	Chet 20
Sold a bullock	33-1-0		For domestic uses	3-4-0	" 21
			Fuslana Patwari	1-0-0	" 29
			Total	808-8-6	
			Interest charges at 12%	105-5-0	1975
Total	131-13-6		Grand total	913-13-6	Har 18

Accounts settled on the 18th, Har, 1975, balance being Rs. 782/-/- (thumb mark)

					1975
			Balance carried forward	782-5-0	Har 23
			Purchased a bullock for 45 Rs.	152-5-0	
			Land revenue 100 rs.		
			Miscellaneous Rs. 7/4		
			Payment for Chawkidara	0-5-0	
			Ticket	0-1-0	
			Cash for clothes	5-3-0	
			For domestic purposes (cash)	10-10-0	Phagan 15
			" "	12-12-0	Chet 13
			Neonda	21-5-0	Bisakh 23
Sold Gur 1 md	3-9-0		Purchased green fodder	10-10-0	Jeth 17
Wheat 12 "	43-8-0	Har 15	Land revenue etc	131-5-0	Har 15

Income	Amount	date	Expenditure	Amount	date
Sold a bullock	250-0-0	Magh 9	For purchasing a bullock	53-0-0	Har 18
Toria 1¼ maund	10-4-0		For domestic purposes	10-10-0	Bhadun 11
Wheat 34 mds.	183-0-0	Har 15	Cotton seeds for animals	18-8-0	" 3
Sold a buffalo	100-0-0	Asuj 16	In cash	1-0-0	"
Sold American cotton 8 mds.	157-0-0	Magh 15	Rice for feast on the birth of his son	5-5-0	Maghar 16
			For Hayat-Bibi-his mother-in-law	576-1-9	Magh 22
			In cash for domestic purposes	10-10-0	Poh 9
			Total	1801-0-9	
			Interest charges at 12%	140-9-0	
Total	747-5-0		Grand total	1941-9-9	
Account settled on the 27th Poh Sambat 1976, balance being Rs. 1194, As. 4, Ps. 9			(thumb mark)		
			Bal. carried forward	1194-4-9	Poh 27
			Ticket	0-1-0	
			For domestic purposes	4-4-0	" 28
			Land revenue etc	73- 2-3	Magh 9
			Land revenue for the square of Hayat Bibi, his mother-inl law for the purposes of a cart	5-8-0	" 10
				54-4-0	Phagan 14
			Cotton seed for cattle	29-13-0	Chet 2
Sold Toria 12 mds 3 srs.	89-4-0	Magh 15	Seed of sugar cane	11-4-0	"
" " 20 mds	137-8-0				

Income	Amount	date	Expenditure	Amount	Date
		1977	For the payment of an instalment the price of a bullock	218-12-0	1977 Mar 12
Sold wheat 46 mds.	187-0-0	Mar 15	For domestic purposes	5-5-0	Bhadun 15
Paid in cash	125-0-0		For Neouda	10-0-0	Asuj 14
sold American cotton 5½ mds.	54-0-0	Magh 18	" "	21-0-0	Asuj 29
sold two bullocks	500-0-0		For Hayat Bibi	1-5-0	Maghar 5
			For a policeman	1-0-0	Poh 24
			Payment of instalment	85-1-0	Magh 4
			Land revenue etc	68-1-0	" 12
			For domestic purposes	5-4-0	Chet 4
			For "Suntan" ceremony Int.	40-1-0	" 22
			charges @ 12%	193-0-0	
Total	1103-12-0		Total	2036-12-0	

Accounts settled on the 14 Mar Sambat 1978 balance being Rs. 933

			Bal. carried forward	933-0-0	
			Ticket	0-1-0	
			Sugar' dal etc.	0-2-0	
			Land revenue	107-1-0	1978 Mar
			Purchased a male buffalo	18-0-0	Sawan 3
			For domestic purposes	8-0-0	Phagan 1
Concession in interest charges	10-0-0		For "Niaz"	9-8-0	" 23
Paid in cash by the money-lender	995-0-0		Purchased 3½ mds. of wheat		
Paid by his mother-in-law	224-0-0		Purchased one md. of wheat	11-0-0	
			For land revenue	18-0-0	
She also mortgaged her land			Interest charges	86-12-0	
Total	1229-0-0		Total	1229-0-0	

The debtor is already in debt to the extent of 1229 Rs. He has taken a sum of 995 Rs. more from the money lender and has mortgaged his half a square of land for his total debt 2224 Rs. for six years. This system of clearing debts is known by the term Khistarji.

Analysis.

(1) Total amount of debt for which the land is mortgaged Rs.2224

(II) Rate of interest charged throughout 12%

(LLL) Average amount of land revenue per year. Rs. 120/-

(IV) Debts multiple of land revenue. 6.6.

The annual family budget of a Jangli family.

This family belongs to Chak No.87 R.B. District Lyallpur. It consists of:-

1 male 1 female 4 children	cultivating 12½ acres of land under one plough (hull).

(a). Income from land

cotton ½. acre (2½mds.)	- 27-0-0
sugar cane ½ acre.	
bajra 1 acre.	
lucum 1½ acre (fodder).	
wheat 6 acres (63 mds.)	
sag 2 acres (fodder).	
Barley ½ acre.	

(b). Income from other sources:-

sold a buffaloe - 180-0-0	
sold a mare (his share only)	- 250-0-0
profit (bachat) from a Thoka)	- 120-0-0
Total income	- 577-0-0

Expenditure.

(a). Land revenue, Abiana, etc.	- 113-3-0
(b). Cost of implements.	- 2-4-0

(c). Cost of home consumption.

wheat --- all produced		
cotton --- 1½ md. "		
dal ---	4-0-0	
tobacco --	12-0-0	
meat ---	8-0-0	
Gur --- (purchased)	20-0-0	
salt, oil, matches, huldi etc.	22-0-0	
clothes (including for festival)	50-0-0	
shoes (2 for each member)	24-0-0	
		140-0-0

(d). Special expenses.

Nazrana to Pirs and Sayeds	2-0-0
Faslana to Patwari	2-0-0
Bribery (thanedar's munshi)	10-0-0

Neundra	150-0-0	164-0-0
e) Non recurring expenses.		
purchased a bullock	200-0-0	200-0-0
Grand total of income		577-0-0-
Grand total of expenditure		504-0-0
Surplus		73-0-0-

Note:-

It should be clearly noted in the case of a Jangli that he keeps large herds of cattle and therefore much of his land is devoted to the cultivation of fodder. This family budget is an important illustration of this point. Out of the whole produce only 1¼ maund of cotton is marketed. Everything else is used as fodder excepting wheat which is kept for the use of the family. At present the family possesses 11 buffaloes; but it is interesting to note that there is no sale of ghee which is of courseconsumed by the family.

APPENDIX "D"

As a set off against the enormous benefits which have been conferred on the province by canal irrigation, a notable drawback has to be remembered. The most urgent and important problem connected with canal irrigation is concerned with the question of water-logging. Every year spring level steadily rises and chronic water-logging has already declared itself in specially situated localities of Gujranwala and other districts. The spectre of water-logging is a nightmare to thoughtful canal engineers and to all those who are interested in the progress of canal irrigation in the province.

I have studied the rise of sub-soil water in a few villages of the Lyallpur district with very astonishing resylts. The annual rise of the level of the sub-soil water seems to be a little more than a foot. The case of my own village is important as the figures available are almost correct and reliable. The first well was constructed in 1904 and at that time its water level was 71 feet from the surface. In 1920, as my father has told me the level of the water is known to be at 55 feet. Now I have measured the water at 51 feet from the surface. For the purpose of comparison the figures tabulated as follows:-

In 1904,	the level	of the sub-soil	water at	71 feet	(47 Haths)	
In 1920	Do	Do	Do	55 "	(37 "	)
In 1925	Do.	Do.	Do.	51 "	(34 "	)

The case of village Pawlani near Sangla, is equally illustrative. There is an old well, the water of which is now at 15 feet below the surface. Nobody knows when and by whom it was constructed and in 1896, when the land was granted to the occupants of this village, there was no water in this well, which was therefore known as Dal (an old and out of use well) From the time of the introduction of canal and the consequent increase in the store of sub-soil water. ....

therefore, for me to show that the rise in the sub-soil water in the canal irrigated land is at the expense of some other part of the province. This fall may be due to lower level of the river water than before, caused by the extensive system of our canals. It may also be clearly noted that while water logging, as a result of canal irrigation, is doing immense harm to the agricultural prosperity in one part of the province not a small trouble is being caused by these canals in some other part of the province. It may be due to too much carrying away of water from the rivers and thus causing a fall in the level of sub-soil water in certain districts. Further it may also be pointed out that the rate of rise and fall in the level of sub-soil water into different parts of the province are equally disastrous. One may hamper agricultural prosperity by water-logging while the other may obstruct agricultural operations through the scarcity of water supply in the wells.

Thus we find that water-logging is a very serious danger to the agricultural prosperity of the canal irrigated areas. It is often said by the Zamindars, that the prosperity of the colonies cannot last more than fifty years. It may not be literally true but they are certainly justified in holding this view when the danger of water-logging is growing so imminent and when before their very own eyes they see the vast tracts of land being devastated by this serious disease.

The evil of water logging is being tackled by the government. The formation of the Drainage Board in 1918 and the appointment of a special Drainage Engineer are important steps towards the prevention of water-logging. On the scientific side enquiries have been prosecuted in regard to the mechanics of water-logging, the rise and fall in the sub-soil water table and the possibility of water proofing

the level of water in the well began to rise. The reclamation of this well is regarded by the villagers as the miracle of a Faqir; but in reality it is all due to canal irrigation.

This rise in the sub-soil water is quite manifest in the tracts of land extending along the main-lines of the lower and upper Chenab Canals respectively. It is due to the former that the most of the land along the Railway line from Shahdara to Chichokimalian and Kalashahkaku respectively presents a very disparaging view. no vestige of cultivation excepting a thick growth of Dibh in water pools meet the eye. It is here that agriculture has been entirely abandoned and land has become the favourite hunting ground of the Shikaries of Lahore.

The condition of many villages near Samberial district Sialkot, deserves a special consideration. These villages once comprised one of the best corn-growing area. With the introduction of canals, however, water-logging has appeared and nothing but big pools of water are seen all round. I have been to these villages which are largely affected by water-logging and I think that so far constructions of the drains has effected no improvement. This area is very much infected with fevers which are responsible for very high mortality. It has only a few days ago that the inhabitants of these villages made a presentation to the Government for the grant of land to them in some other part of the province. But, so far, nothing seems to have been done for them. In Gujranwala and Amritsar also the presence of water-logging has long been recognised as inimical to health and its eradication has been the subject of much though and endeavour.

It may be interesting to note in this connection, that while the level of the sub-soil water is rising in the canal irrigated areas, it is, on the other hand falling in the older districts like Jullundur, etc. It is,