SECOND CHAPTER

THE CHOICE OF THE FIELD OF STUDY AND RESEARCH METHODOLOGY

The present study has been conducted with a continued awareness of limitations that could not be overcome by the researcher on account of personal, intellectual and situational context in which he found himself historically bound. It is a study of diffusion and adoption of agricultural innovations in two village panchayats of Sikta Block of West Champaran District of the State Bihar. What has been discussed in the preceding chapter only lays bare the acceptance by the researcher of a critical stance in the study of rural development at the programmatic level. But recognition of epistemological, theoretical or methodological limitations of the ongoing practices in social sciences in general, and sociology in particular, is far from overcoming them in one’s own practice.

The historical context and the social structural macro makeup of the development process which determines the actual diffusion and adoption of agricultural innovations in the two village panchayats selected for intensive field investigation have entered our study only as background assumptions based on, what could at best be described as, random and cursory reading. The study is confined to an understanding of the sociological variables that have been found to be associated with the diffusion and adoption of a
certain set of agricultural innovations in these village panchayats. No effort is made to work out all the socio-political and structural determinants, the international context does not even get a remote mention; and so also the empirical consequences in terms of power distribution and stratification alterations do not find their appropriate appreciation either at the datagathering or analysis level.

The field data have been gathered with the help of a specially prepared interview schedule administered to a selected set of respondents, taken from official records and procured through personal interviews with administrative personnel, both at formal and informal levels. The analysis moves on a simple plane consisting mainly of endeavour in correlational analysis, taking as "dependent" (X) variables levels of adoption of agricultural innovations correlated to various "independent"(Y) variable like informations concerning socio-economic, socio-psychological and communication behaviour of farmers.

It is easy enough to be baffled by quantitative material, but it may not mean much to a sociologist unless it can be related to other sociologically relevant issues. Sociological responsibility does not end with completion
of scientific enquiry, "indeed it may begin at that very point" (Dahrendorf:1968:18). That may require further deep probing and systematic conceptual as well as empirical analysis. The posture of strict adherence to methodology has serious implications of latent intentions, such as, an indifference to policy problems, a desire to achieve a higher scientific ranking in the eyes of policymakers, or simply a belief that non-neutrality might result in a loss of position and professional ranking (Horowitz:1973:6). It further operates at two levels: collection of data without corresponding analysis and empirical generalisation without its relevance to existential situation (Osipov: 1969).

It is believed by the researcher that with all the narrowness of the field, datagathering and analysis operationally adopted for this study, it may have positive consequences for a broad understanding of not only the actual process of diffusion and adoption of agricultural innovations in the specific villages studied but for a much wider regions which have yet to catch with the achievements of the socalled 'Green Revolution' in Punjab, Haryana, Western Uttar Pradesh, parts of Maharashtra, Gujrat, Andhra Pradesh and Tamilnadu.
Limitations of the Study:

The main limitations of the study are as follows:

(a) The study being a student project geared towards a research degree, time schedule and monetary inputs could not be stretched beyond a point. These considerations did not permit study of a larger sample and a comprehensive realistic analysis.

(b) The qualitative analysis could not be adequately associated with theoretical insights as well as the qualitative perspective in a more critical analytical manner. This too speaks partly of the imperfect methodological training and relative immaturity at the time of initiation of the research work.

(c) The findings are mainly based on the ability of the respondents to recall and/or the verbal opinion expressed by them. Hence, the objectivity of this study is limited to their ability to recall as well as their honesty in furnishing the required information. Though it is possible that a part of the failure may be due to researcher's weak tools and procedures.

(d) The area of study being confined to the two village panchayats of Bihar, the generalisation of the findings are bound to be limited to the area, though
comparative analysis have been attempted with the help of published material wherever possible.

Area of Study

An Overview of Underdevelopment of the State Bihar:

The study is mainly based on empirical study of 'contact farmers'\(^*\) of two presumably developed and underdeveloped village panchayats of Sikta Block in West Champaran District of the State Bihar.

The State has been considered to be relatively backward and underdeveloped in various respects. The problem requires a brief historical analysis in a multidimensional manner. Indeed, Bihar has a glorious past, particularly in terms of emergence of powerful empires in ancient times like Magadhan and Mauryan (of Ashoka fame). The natural fertility of the soil, assured rainfall and hard work of the people made for astounding productivity and immense surpluses on the basis of which large empires and kingdoms could emerge. But in due course, the productivity reached its own plateau as the implements of production remained practically unchanged for centuries. After the great empires' disappearance, there arose a great conglomerate social formation characterised by both 'feudalism from above' and 'feudalism from below' (Das, 1985a).

\(^*\)Farmers selected for extension purposes under Training and Visit Scheme, explained in Appendix-A.
The passing of political power into new hands had no effect on the conditions of rent-paying peasantry and bonded labourers. In fact, feudalism in medieval Bihar continued for centuries, altering at an imperceptible pace. Under colonial rule, the state experienced the worst kind of imperial exploitation without getting any of the associated, incidental benefits of contact with the West (Das, 1985 b). Bihar continued to be treated as hinterland to be exploited as a raw-material supplier for colonial industrial centres (i.e. opium and indigo). A sizeable zamindar class emerged in Bihar, largely as a result of permanent settlement of land (a land revenue system introduced in 1793 in the then Bengal presidency of which Bihar was a part, and the share of colonial rulers being 90 per cent. Roy:1971:62). The reluctance on the part of this rural elite to face risk and invest resources for industrial growth and the initial absence of native urban elite not only hampered the process of urbanisation and industrialisation but also strengthened the position of landed interests, that furthered the feudal order. The revenue collectors continued to extract as much from the hapless peasantry as they possibly could, leading to famines of increasing severity. The rulers shipped off a large number of people to British colonies as labourers. Thus, there was no resource of Bihar that colonialism did not try to siphon off, in which indigenous intermediaries helped.
Indeed, the articulation of class consciousness remained and continues to remain vague. Social transactions and even economic behaviour have continued to be governed by modified relations of patronage combined with exploitation. It is obvious in the fact that money-and-grain-lending were immensely profitable leading to bonded labour due to usurious interest rates and consequent indebtedness. The fact that the lately developed urban middle class was integrally tied to rural landed interests explains the reality that despite a long history of peasant struggles, beginning from the Mahatma Gandhi- led Champaran 'satyagraha (1917)' to the organisation of Swami Sahajanand Saraswati's 'Kisan Sabha', genuine agrarian reforms still remain a distant goal. With the enactment of the zamindari abolition law, the feudal system could have been done away with, at least in the formal sense, but certainly such legislation falls for short of bringing about attitudinal change, especially when the legislative elite itself fails to get over its class prejudices and reservations (Sinha: 1986; Pranda: 1979; Das: 1985 c). The growing feudalisation and criminalisation of politico-economic process in Bihar can be explained in this perspective, not in terms of mere absence of sub-nationalism (as done by Gupta: 1981).

*Sinha (1986) analyses the effects of recent organisations in Bihar.
There are certain areas of Bihar (i.e. forested areas in the north-western corner, the flood-prone tracts of trans-Kosi and marginal agricultural lands in the plateau region) characterised by less intensive agriculture, scattered and economically weak peasantry and lack of formal governmental presence; where some powerful people have been terrorising and depriving the peasants of lands, amassing large illegal estates. Their immense wealth and the gun and muscle-power at their command has made them invaluable allies of politicians who get their help during elections. They have been called 'robber barons' (Das:1985 c). In place of feudal landlords there has emerged a more ruthless capitalist peasantry which is fast giving up pretences of patronage and is interested only in accumulation through exploitation. As they do not invest in gainful opportunities, the investment is moneylending, gold, land, conspicuous consumption and recently into transport, hotels, and cinema houses. These have become the symbols of power (Das:1985 d). The assertion of wealth and power in its most elemental form has led to a typical form of violence in Bihar. Besides nexus between politicians and criminals, there are evidences of at least nine private armies (senas) in the state, most of them organised on caste lines by landlords and some by the landless demanding land reforms, (Pranda:1979; The Times of India News Service:1985 ), some of the latter declared 'illegal' due to naxalistic affiliations (Singh: 1985 a; India Today:1986).
Another indication of backwardness can be traced to the persistent practice of untouchability. They are still deprived of right to draw water from wells, visit eating places and take out wedding or religious processions through the upper caste locality (The Times of India News Service: 1985 a). More than 90 per cent of them have been found to live below the poverty line.

Statistically stated, Bihar contains 17.20 per cent of entire Indian population but only 5.3 per cent of India's land area. That is, despite being the second most populous state, it ranks ninth in terms of area. The percentage of rural and urban population to the total population is 90 per cent and 10 per cent respectively (Census of India:1981). The state is predominantly agricultural consisting of 6 per cent of the cultivated area of India, while employing 11.3 per cent of cultivators and farm labourers (Bose and Ghosh:1976). The scheduled castes (14.51 per cent) and scheduled tribes (8.31 per cent) population together constitute 22.82 per cent of the total population of the state. There are 33 districts and 587 blocks, and 67,566 inhabited and 10,146 uninhabited villages in the state. A study suggests that at least 58.9 per cent of the rural population fall below poverty line based on 1977-78 prices (Muthayya et al.:1984). Against the national per capita income (at 1982-83 prices) of ₹1,868, the level in Bihar is only ₹.995 - the lowest in country (The Times
of India News Service; 1986). The rate of literacy for the entire state is 26 per cent as against 36 per cent of the country.

The farm sector continues to be afflicted with grave problems. Apart from obvious constraints like the absence of assured irrigation facilities in more than 70 per cent of the net 8.5 million hectares of cropped area, more serious but less visible factors like "tardy implementation of land reforms, non-availability of inputs and scarce use of agricultural implements hinder farm growth in Bihar" (Singh: 1985 b). Moreover, the continued absence of adequate canal network and feeder channels accounts for the waterlogging of as much as 800,000 hectares of fertile rice-growing land of north Bihar. The yields have remained below the national average (Rao et al.: 1981). In 1983-84, the paddy yield was 1,023 kg per hectare against the national average of 1,458; and in case of wheat yield it was 1,554 and 1,851 respectively (Singh: 1985 b). Generally low consumption of fertilizers can be one of the crucial factors of low yields. Moreover, tractors may be seen only in east and west Champaran, Purnea, Patna, Rohtas and Bhojpur districts. Other improved implements are confined to small pockets. Besides lack of proper communication facilities, there is not any effective extension programme. All these have accumulative effect on the underdevelopment of Bihar.
The West Champaran District:

The west Champaran (area 5,228 sq kms) District is located at the north-western end of the Tirhut division of Bihar. It derives its name from the mythological 'Champakarnya' or the forest of Champa flowers (michelia champaca). Only on November 8, 1972, it could have a separate identity after bifurcation of the Champaran District (that had come into existence in 1866 before which it was a part of Sirkar Saran) into east and west Champaran. Geographically it is bounded on the north and north-east by Nepal; on the south and south-east by the district of East Champaran; on the south-west by the district of Gopalganj and on the north-west by the district of Gorakhpur of Uttar Pradesh across the Great Gandak river (also known as Narayani). To the north and north-east the district marches with the Nepalese zila of Persa, and here the frontier, where not naturally formed by rivers, is marked by ditches and masonry pillars. Towards the north and north-west, the area begins to undulate and the alluvial plains give place to a broken hilly region known as the Dun or Ramnagar Dun, consisting of a range of low hills about 20 miles long, north of which the Sumeshwar range extends for about 46 miles along the northern frontier. While in the background tower the Himalayas of Nepal in an

*An enclosed map (I) shows its location in Bihar.*
imposing arc of eternal snow. Below the ranges extend southwards and eastwards large grassy prairies watered by numerous hill-streams and rivers. It receives 56.13 inches of average rainfall, the annual rainfall ranging from 50 to 60 inches. The maximum precipitation in 24 hours ranges from 10 to 15 inches which cause the rivers and streams to come in spate very suddenly, causing devastation and submersion of large tracts of arable land. It has a damp, moist and rather enervating climate although it is cooler than other neighbouring districts. It has some swamps and marshes, and some lakes. As the border of alluvium along the Himalayas is a seismic region, and devastating earthquakes have occurred in 1833 and 1934, it could be expected along this belt in future (Roychaudhury:1960).

Historically, it has always been a march land between Nepal and India. Folklore, mythology and local tradition give it a more peaceful role militating against the physical and political contexts of the district. Local people claim that it was a dense forest area where Vedic ascetics performed their austerities. It is famous for monolithic pillars with foliated capitals (inscribed with edicts of Emperor Ashoka) that are located at Lauriya-Nandangarh, Rampurwa and Lauriya-Areraj. During the British regime, the agricultural scene was characterized
by three forth of the land being under three big zamindar families and smaller ones, European-controlled plantation economy including growth of poppy, indigo and sugarcane, and a long record of agrarian agitations culminating into Gandhi's 'Satyagraha Andolan' of 1917-18 (Mishra:1978).

The present agricultural scene is dominated by descendants of landlords, migrant businessmen (Marwaris and Muslims) a few nouveau riche (mainly accountable to the smuggling racket). The agricultural farming generally consists of a large number of heterogenous, small and medium sized units of production characterized by familial management. The agricultural tools and implements used for various activities have not gone through considerable change, and a century-old description of implements (Grierson:1885, reprint 1975) can be found today. Only large landowners have adopted improved mechanical implements.

In some areas, a peculiar case of kidnapping for ransom had been going on for several years. Through the much publicised operation "black panther", the menace seems to have been checked but such happennings are reported time and again functioning under the alleged protection of ex-landlords, politician and even police (Singh:1985 b). In fact, law-enforcement agency is not likely to provide an answer to the problem rooted in poverty and sustained by feudal system. To mention the overall demographic and
other situation statistically* 87 per cent of the total population (1,972,610) of West Champaran district depend on agriculture. Nearly 92.6 per cent (1,828,862) live in rural areas (1505 villages, 133 of which are uninhabited) and 7.4 per cent (144,548) in urban areas (spread over 4 towns and 9 constituents of towns). The population growth rate (1971-81) is +24.30 (against +24.06 of the State). The sex ratio (number of females per thousand males) is 911, against the State sex ratio of 946. The percentage of scheduled castes to the total population is 14.74 and that of scheduled tribe is 1.36.

Out of the total population, only 32.87 per cent are categorized as main workers and 65.42 per cent are non-workers (females being 85.18 per cent). Out of the main workers, 36.33 per cent are cultivators (against the State percentage of 43.57) and 51.53 per cent are agricultural labourers (84 per cent of which are females). It indicates skewed pattern of land ownership at the one hand, and dependence of the majority on agriculture at the other.

The extent of illiteracy (and consequent lack of opportunities for acquiring skills through education and training in order to get employed and raise living standard) is indicated by the fact of literacy rate that shows only 18.79 per cent literates as against 26.20 of the State.

*Statistical information is based on District Census Handbook of Paschim Champaran, Census of India, 1981, Series-4 Bihar.
Sikta Block*: Some Basic Information

Sikta is one of the 16 development blocks of the West Champaran District. It was established as a block under the Community Development Programme stage-I in 1958, and subsequently went through the stages II and III in 1963 and 1968 respectively (stages explained in Appendix-B). It was brought rather belatedly under the Intensive Agricultural Area Programme** (also known as 'full package programme') in 1969, followed by 'Ayacut Development Scheme'***. The block is divided into 15 Village Level Worker Circles, each consisting of about 800 to 1000 farming families. A new extension scheme 'Training and Visit System' (explained in Appendix-A) was introduced in October, 1978, under which 100 'contact farmers' were selected from each village panchayat.

*The information and data presented is based on the official records made available at the Sikta Block Office. The interviews with the Block officials and VLWs provided further informations.

**IAAP was launched in 1964-65, initially in 1084 Blocks, later extended to remaining ones. The objective was intensive development of important crops in selected areas by a 'package approach' (Mamoria:1976).

***'Ayacut Development' refers to water utilization and management in areas recently brought under improved irrigation.
Area, Soil and Irrigation:

Out of the total area of 19,645.11 hectares, 16,653 hectares (88.49 per cent) are cultivable in the block, the rest being either uncultivable or used for non-agricultural purposes. In terms of soil quality, the cultivable area has more clay soil (9,956 hectares), followed by sandy loam soil (6,377 hectares) and sandy soil (320 hectares). Some of the lowlying areas are permanently waterlogged, some during monsoon only. Besides rainfall (average annual 56.14 inches or 1,426 mm), major irrigation sources are rivers (six small and medium), tubewells and canals (two). Nearly 47.25 of the cultivable areas is irrigated. The Triveni canal (initiated in 1914 and subsequently redesigned and extended, and being remodelled during field work) is a branch of Tirhut canal. Its total capacity is 2,750 cusecs but due to lack of proper distributary system and silting, only 230 cusecs were being discharged. The other, Ghorasahan canal (functioning since 1972) is a carrier canal and a branch of Doon canal. It irrigates nearly 2,000 acres of the block through distributories.*

Population and Occupation:

Majority of the total population (95,094) was engaged in farming as 10,604 families were categorized as

*The Executive Engineer (Irrigation) of the Block provided the statistical information about canals.
'agricultural', out of total 14719 families. About 37.49 per cent of the population are categorized as workers (only 18.28 per cent of which being females), and 62.51 per cent are non-workers (81.72 per cent being females). Only 17.95 per cent of population are literates. The percentage of scheduled caste is 13.77 (no scheduled tribe). The different dominant castes in various villages among Hindus were Rajputs, Yadvas and Brahmans; and among Muslims, Shekhs. Most of them own large parcels of land. The higher castes donot tend to soil their hand in the actual farming unlike the traditional agricultural castes as Koeris and Yadvas. The manual work in farming are mostly done by the labourers of scheduled castes and other landless labourers. Some people are also involved in petty business as subsidiary occupation like shopkeeping, seasonal grain trade, conventional caste occupation (barber, washerman, carpenter etc.) and in a handful of cases petty smuggling of foreign goods from the adjacent Nepal. There are little agro-based industries besides 2 rice and oilmills, and numerous flourmills.

Communication and Transport:

The Block is full of dusty 'Kutcha' approach roads that invariably become muddy during monsoon. A single metalled road is nearly 8 kms away from the Block Office,
and daily buses ply to the District headquarter Bettiah (44 kms away) and a small town Chanpatia (24 kms away).

There are three railway stations in the Block, viz. Sikta (adjacent to the Block Office), Bhelwa (10 kms away east) and Marzdawa (10 kms away west). The other nearest town are Raxual (17 kms away east) and Narkatiagunj (24 kms away west) approachable by train. The main transportation vehicles are bullock-drawn carts, bicycles and in a few cases tractors and jeeps and mobikes.

There is only one Post and Telegraph Office at Sikta, and two small Post Offices function in remote villages. The telephone facility is confined to Sikta and a nearby village Shikarpur.

Civic Amenities:

Schools:

There are 69 primary schools, 14 middle schools and three high schools (one for the girls) in the Block. Quite a few families can afford to send their wards outside for higher education. Educational facilities are there in 52 (91.23 per cent) villages.

Electrification:

It was initiated in 1965 in the Block, and only 8 (14.04 per cent) villages (out of 57 populated villages)
had been covered till 1981. It was used for domestic and irrigation purposes.

**Market/Hat:**

Such facilities are there in only 7 (12.28 per cent) villages on permanent/periodic basis.

**Post and Telegraph:**

Such facilities are available in 10 (17.54 per cent) villages only.

**Medical:**

There is only one state dispensary located in the Block premises, and four sub-centres in other areas. A single Veterinary dispensary at Sikta provides services along with its two sub-centres and two field centres. Medical facility is provided to 9 (15.79 per cent) villages out of 57 inhabited ones.

**Cooperatives and Credit:**

Several cooperatives have been formed but most of them are on paper only. Although the block records indicate existence of five cooperative committees: Multipurpose Cooperative Society (29), Primary Agricultural Credit Society (16), Vyapar Mandal, Fisheries and Labour Cooperative Societies (each one). But the last were found to be non-existent. The Secretary of Cooperative Society confessed during interview that the remaining cooperatives
societies were serving only the influential farmers and businessmen.

The farmers were forced to depend on non-institutional sources for credit like money-lenders, mostly the rich farmers and traders who charged usurious rates of interest. There is only one branch each of the Champaran Regional Rural Development Bank and State Bank of India which are institutional agencies for providing credit. Despite their records and claims to provide loans to small and marginal farmers and petty traders, it was reliably learnt from local leaders that the greater share was being siphoned off by the influential people. In fact, one of the bank officials explained in an interview with the researcher that the poor people had no surety, and even if loans were provided, they did not (rather could not) refund and usually spent it for other purposes; but as the formality was to be done, loans were granted to influential persons against names of the needy persons. Same was the condition of short-term and 'taccavi' loans.

Agriculture:

The major crops are paddy and wheat, though cereals are also grown. The main agricultural seasons are 'Rabi' (winter) and 'Kharif' (monsoon), though a third season 'Garma' (summer) exists in which not all farmers could
afford to farm due to non-availability of water from any source. Besides wheat, other 'Rabi' crops are barley, mustard, sugarcane, gram, vegetables and other cereals. And besides paddy, other 'Kharif' crops are new variety of maize and 'moong' pulse.

In case of fertilization, the conventional methods like farm and home wastes, cowdung and some green manures were used. Chemical fertilizers - nitrogenous, phosphatic and potassic - were used sparingly, due to high costs and inadequate availability. (Some farmers informed that they ironically got it smuggled on a cheaper rate from Nepal!). Even in case of plant protection measures, the chemical methods were infrequent, conventional methods like ash-sprinkling and others were popular. Soil testing was rarely done.

Improved varieties of seeds were usually availed from some authorised shops of nearby towns. Block officials indicated arranging seeds from the 'National Seed Corporation' and Agricultural Universities as well as some outside government farms. But it was indicated by the respondent farmers that such seeds were largely cornered by the big farmers. The Block's record of arranging demonstration of improved seeds and other practices was found to have little effect. Improved mechanical and other
farming implements like tractor, thresher, sprayer, pumpset, etc. were confined to some rich farmers. Some implements kept at the Block Office, had turned into junk due to lack of repair and replacement.

**Selection of Two Village Panchayats**: 

The Sikta Block consists of 18 village panchayats that, in turn, consist of 61 villages (3 being depopulated). Two village panchayats were selected so that one of them comprised of relatively more developed area than the other. The reason for selection of these panchayats was to provide a comparative basis. The actual choice was determined by additional considerations of relative convenience of fieldwork and using the prior knowledge of block officials about the area.

Two village panchayats were selected for better comparison (though, in retrospect, it must be admitted that the contrast was nearly non-existent). The 'Dhankutwa' village panchayat was assumed to be relatively developed one and the 'Balthar' village panchayat as relatively underdeveloped one. There are some studies of such opposed villages (Shankariah:1969; Patil:1974; Apparao:1975; Jetley: 1977; Singh:1978; Aslam:1981), but only a few on opposed village panchayats (Ambastha:1974).

*Such information were gathered during interview of the AEO of the Block.

**The map(II) shows their location in the Sikta Block.
On the basis of the information with the block officials crosschecked with some other local informants, it was assumed that the two village panchayat areas had similarity in soil and climate conditions, cropping patterns, irrigation and supply facilities, communication facilities and certain civic amenities. Thus we could reasonably presume that a number of variables pertaining to geographical aspects appear as controlled rather than contrasted in these two selected panchayats. The block officials, particularly Agricultural Extension Officers and Village Level Workers (all were gathered for their periodical training at the block office) suggested, probably on the basis of their own contacts and perceived responsiveness as well as relative yield records, Dhankutwa and Balthar village panchayats as relatively developed and underdeveloped respectively. Thus, the selection was done more on the suggestion of these officials based on their own perception rather than on any direct empirical knowledge.

Dhankutwa and Balthar Panchayats:

For a clear understanding of the existential situation of both panchayats, general informations pertaining to area, population, irrigated (with sources) and unirrigated area, cultivable waste land and uncultivable area, communication and civic facilities have been mentioned.
Balthar village panchayat consists of six villages of varying sizes, namely Balthar (the largest one after which the panchayat is named), Bhaura, Parsa, Lal Parsa, Bhauri and Khap Parsa (respectively in descending order of size in area and population). Only Parsa village is in close proximity to the Indo-Nepalese border as well as the main bazar and block office of Sikta. It has the only rice mill of the panchayat. The only railway line divides the panchayat area into two zones, three villages falling on the north side of it and the remaining three on the south. The carrier canal of Ghorasahan passes through the northern area of panchayat. The only metalled road coming from the north-west border (and passing through the adjacent Mainatad block) passes through the south side of the panchayat.

Dhankutwa panchayat consists of only one village of the same name, though certain hamlets (called 'Tola') are there as can be found anywhere. The main branch of Triveni canal and a river flow nearby the panchayat. A single Kutcha approach road passes through the middle of the village.

The following table (no. 1) indicates general statistical information about both the village panchayats in a brief manner.
Table 2.1 (a). Brief Information about the Area of Study

<table>
<thead>
<tr>
<th>Village</th>
<th>Population</th>
<th>Schools</th>
<th>Area (ha)</th>
<th>Source-wise Irrigated Area (ha)</th>
<th>Unirrigated Cultivable Area (ha)</th>
<th>Uncultivable Waste Area (ha)</th>
<th>Uncultivable Waste Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balthar</td>
<td>9175</td>
<td>P: 3, M: 1</td>
<td>1679.64</td>
<td>881.66 5.66 2.43 2.02 - 113.75</td>
<td>474.57</td>
<td>23.43</td>
<td>108.15</td>
</tr>
<tr>
<td>Dhankutwa</td>
<td>4595</td>
<td>P: 10</td>
<td>394.75</td>
<td>485.94 3.24 4.86 2.02 5.26 17</td>
<td>277.20</td>
<td>9.11</td>
<td>97.12</td>
</tr>
</tbody>
</table>

P = Primary
M = Middle

Table 2.1 (b). Distance of Important places from Panchayat Office (in kms)*

<table>
<thead>
<tr>
<th>Village</th>
<th>District headquarter</th>
<th>Block Office</th>
<th>VLW's Office</th>
<th>Railway station</th>
<th>Bus stand</th>
<th>Post office</th>
<th>Telegram office</th>
<th>High School</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balthar</td>
<td>28</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Dhankutwa</td>
<td>25</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

*Based on 1981 census, Paschim Champaran District Handbook.
It was gathered through observation and informal discussions that in both panchayats, there are two communities - Hindu and Muslim, belonging to various castes and subcastes. The approximate percentage of people of both communities is 40 per cent in each case, while scheduled castes form the remaining 20 per cent. Higher caste farmers rarely soil their hands in the fields, though the stigma attached to it is gradually fading away. The agricultural castes consist of Yadav, Koeri and Kewat, ritually counted as medium castes, though constitutionally backward castes in the State. Other castes are Brahmans (usually not quite prosperous), Rajputs (most being well-off), Bania (involved in petty business) and a few service-castes. Most of the Muslims are quite poor lot, involving in small farming; but at least one family in Balthar is multimillionaire owning rice mill, some shops and landed property. Some hierarchical ritual arrangement is found among Muslims quite akin to the castes.

Selection of Respondents and Problems of Data gathering:

The respondents of the study were the 'contact farmers*', numbering 100 in each village panchayat. The 'contact farmers' had been selected only two years before the field work was conducted in 1981. As they belonged to

*Explained in Appendix-A.
different groups, it was deemed convenient and suitable to interview them. The names of these 'contact farmers' were gathered from the VLWs of the village panchayats - Dhankutwa and Balthar.

While it was easier to get their names from the official record, it proved quite difficult to contact them for interview in order to get required information. As the ARO of the block had introduced the researcher to the headmen ('Mukhiya') of both the village panchayats, one of the initial problems, that of accommodation was solved. The headmen also proved helpful by introducing the researcher to some known persons of the area such as a few other elected members of 'panchayat', 'patwari', 'chaukidar' and a few farmers, shopowners and teachers. Though the researcher was conversant in the local dialect 'Bhojpuri', the respondents initially seemed hesitant to answer queries about their personal and familial matters to a stranger. Initially, in nearly all cases, the researcher had to request the already introduced persons to accompany him to the homes, and in some cases, farms of the respondents. Sometimes the respondents were not present, or if present, too busy to spare time. At other times, they could not spare enough time, leaving the interview incomplete and rushing to attend some work. Such cases proved more difficult, as they had to be met again to complete the
interview. In quite a few cases, the 'contact farmers' (invariably the active seniormost members and heads of their families) took the help of their elder sons or brothers to provide the required information. The researcher had to visit some respondents' home quite often as they had shown some interest in the work and had promised to introduce to other respondents.

Most of the respondents had to be convinced of the researcher's objectives and persuaded to provide informations. It was but natural in some cases of respondents to be overcautious in providing information regarding, for example, land and income. No doubt, some of them might not have provided the exact information (as was told by some introduced and acquainted persons), but there was no certain way to confirm it; except in a few cases of land size that were later corrected on the basis of information provided by the 'Patwari'. Very few respondents narrated their tales of woes to the researcher, mistaking him to be a government official who can arrange loans for them besides reporting their problems to the competent officials. When, later on, they could somehow be convinced of the identity and purpose of the researcher, their behaviour verged on disdain towards someone betraying or wasting their time. Such respondents proved more difficult, but
luckily their number in both areas was not more than five or six. In only one exceptional case of respondent (at Balthar), the researcher initially encountered an impassioned refusal to answer any question despite persuasion by the person accompanying him. As he was one of the 'contact farmers', replacement was out of question. Only after the personal intervention by the VLW later and the respondent's son (who was out of village during the first encounter), he conceded and provided information.

For reasons best known to the villagers, the researcher found the respondents of Dhankutwa more hospitable, helping and sympathetic than those of Balthar. Probably the headman of the former village panchayat had more hold and better impression on the villagers, and as the researcher was his guest for considerable period, he got friendly treatment. Some sort of hostility against the headman of Balthar was sensed even by the researcher during informal talks with villagers, and somewhat less cooperative manner of response was the projection of the same as the researcher happened to be the guest of the headman.

It is imperative to specify the working hypotheses of the study before elaborating the techniques of research used.
Hypotheses:

Hypotheses are deduced propositions put forward for an empirical test. They are formed on the basis of various empirical studies in diffusion and adoption of agricultural innovations. These working hypotheses were formed to facilitate and to direct the field work. These are tested with the help of data collected in the area of study and evaluated in the concluding chapter.

The hypotheses are as follows:

1. There is little difference between the respondents of the developed (Dhankutwa) and underdeveloped (Balthar) panchayats in their responses to innovations.

2. The younger age, more education and higher caste are associated with higher adoption of innovations.

3. While type and size of family is not related significantly with adoption, presence of earning members and subsidiary occupation is related to higher adoption.

4. Size of land and assured labour and irrigation source are associated with higher adoption of agricultural innovations.

5. Interpersonal sources like neighbours are major information sources of innovations and effect adoption more than mass media and town visits.
6. More contacts with VLW have direct bearing on higher adoption of agricultural innovations.

7. Higher educational aspirations and aspirations for mechanised farming for sons are associated with higher adoption of innovations.

8. Political aspiration is positively associated with higher adoption, and such farmers associate both prestige and benefit with political achievement.

9. Liberal, conservative and progressive value orientations (towards poverty, caste deprivations and traditions versus modernity) are not significantly related to adoption of agricultural innovations.

**Explication and operational definitions of concepts used:**

Certainly terminologies have been used denoting context-specific connotations in the study. Concepts presumably direct the research to a particular orientation of shared experience within a corresponding perspective, though few concepts can be shared in concrete terms. However, an operational definition may redefine an older concept in a new dimension, altering certain elements and adding some more. Since concepts are abstractions, it has meaning only in a specific theoretical framework. In
the diffusion and adoption studies, most of the conceptual
definitions stem from implicit acceptance of 'modernization'
approach, and particularly 'diffusionist' model of
development.

For the purpose of present research, certain
concepts have been explicated and they can be operationally
defined as follows:

(a) Diffusion and adoption:

Both terms have been used interchangeably here.
This process indicates 'extended, repeated and continued
use' of certain agricultural innovations, at least till
the time of research.

(b) Agricultural innovations:

These are dependent variables in the study, and are
recently introduced items or practices for use in agricul-
ture, communicated to the farmers from outside (included
in the study are improved varieties of wheat and paddy,
chemical fertilizers and improved implements). These do
not include improvements and alterations effected by
farmers on their own.

(c) Levels of adoption*:

These are three: high, medium and low, based on the
scoring weightage of adoption of various agricultural
innovations.

*Explained in the following pages while presenting scoring
techniques.
(d) **Interpersonal communication:**

Informal exchange of ideas between individuals of in-group has been considered as interpersonal communication. It is a part of interaction process as distinct from impersonal mass media communication.

(e) **Aspirations:**

It indicates certain goal striving of a person and his expectations from his children.

(f) **Value-orientation:**

It denotes the attitudes and opinions of persons who express their preference and perception of desirability of certain values (that have been analysed and categorized in terms of conservative, liberal and progressive values in the study).

**Techniques of Research:**

To get better conceptual insight and factual awareness of varied situations, secondary sources were extensively consulted. They include earlier diffusion-adoption studies, empirical and evaluative works on rural-agricultural development and official statistical records, (i.e. census reports, block office records) as well as informal discussions with the officials of different bearing of the block and bank. They enable to get access to historical as well as current socio-economic situations.
Certain significant techniques of research used in the study are presented here.

**Interview Schedule**:  
An interview schedule was formulated on the basis of hypotheses, relevant variables as suggested by earlier studies, and discussions with the block officials and VLWs during the first visit of area of study to gather preliminary information (in 1980). The nature of questions were both structured (closed) and open-ended to permit record of desired and exact information as well as opinions and perceptions of the respondents.

**Data Collection**:  
Interview schedule served as the basic tool for data collection from the selected respondents of both village panchayats. Primary sources of information have their own problems when they encounter strange questioners who probe into their personal, rather reserved life. They suspect and try to avoid. The AEO of the block and the VLWs of the panchayats were kind enough to introduce the researcher to some of the respondents and initially explain the purpose of questioning. The researcher had the added advantage of fluent command over local dialect ('Bhojpuri'). Once assured of the researchers' intentions and purposes, the  

*Presented in Appendix-C.*
respondents readily cooperated and responded. The interviews were usually completed in one sitting. The researcher got an opportunity to observe the rural life.

**Scoring Techniques**: 

As the variable and the responses were not scored initially, as is the practice, it was done later in order to analyse data systematically. The scoring is based on certain pre-existing scoring patterns, developed in earlier studies (Pareek and Trivedi: 1964; Muthayya: 1971; Sachchidananda: 1972; Jetley: 1977; Sujan: 1982). An element of arbitrariness was bound to creep in due to post-fieldwork scoring and lack of rigorous application and clear understanding of such techniques. The criteria was the frequency numbers in the increasing order on the basis of importance of variables in researcher's perception.

(1) **Levels of Adoption**: 

The maximum weightage point came to be determined on 31 on the basis of total weightage given to innovations. It was categorized into three levels of adoption: low, medium and high, respectively ranging as 1-10, 11-20 and 21-31. The weightage for all the innovation variables are as follows:

*All the scored raw data of all the respondents of the two areas of study is presented in the Appendix-E.*
Agricultural Innovations:

It is the only dependent variable.

(a) The maximum score was fixed on 10 (in case of those using both improved seeds separately for 5 or more than 5 years), the minimum score being 1, indicating actual year of use in case of improved varieties of wheat and paddy.

(b) In case of chemical fertilizers - nitrogenous, potassic and phosphatic - each was given 1 point, while the 'mixed' use 3 points. The scores were to be totalled in case of use of more than one. The maximum score was, thus, 6 in this case.

(c) Improved implements: The scoring was done on the basis of relative importance and cost of implements. The maximum score was 15, and the points were to be totalled in case of use of more than one implement. The following weightage was given: tractor - 6, pumpset - 3 and in case of thrasher, cultivator and sprayer 2 points for each.

(2) Personal, social, economic variables:

(a) Age: The chronological age of the respondent was taken as the scoring weightage.
(b) **Education:** It was categorized on a continuum ranging from 'illiterate' to intermediate and above, and the points were accorded on the basis of increasing intensity as follows: illiterate - 0, self-designated ability to read only - 1, ability to read and write - 2, primary schooling - 3, middle schooling - 4, high schooling - 5, intermediate and above - 6.

(c) **Caste:** The castes were categorized into four - low, service, medium and high, and accorded points in increasing arithmetical order, viz. 1, 2, 3 and 4 respectively. It was done on the basis of ritual and locally accepted place of castes.

(d) **Type of family:** Having categorized the types into two - conjugal and extended, the scoring points were given 1 and 2 respectively. While the former includes spouses and unmarried children, the latter also includes married ones, married and unmarried brothers and sisters and other relatives living together.

(e) **Size of family:** The scoring is based on frequency of numbers of members. The two frequency categories '1-5' and '5 and above' were accorded points as 1 and 2 respectively.
(f) **Off-farm earning members**: Scoring points were given on the basis of actual number of member engaged in off-farm occupation and providing remuneration.

(g) **Subsidiary occupation**: Such occupations were accorded weightage on the basis of relative importance and probable remunerative nature as follows: labour - 1, cast occupation - 2, business - 3, independent profession - 4, cultivation - 5 and service - 6.

(h) **Size of operational land**: The size were categorized in increasing order of frequency distribution in acres and given points as follows: below 1 = 1, 1-5 = 2, 5-10 = 3, 10-15 = 4, 15-20 = 5, and above 20 = 6. The operational land includes all farmed land, owned and leased in and excludes leased out and uncultivated land.

(i) **Labour**: It is based on the nature of labour used in farming, analysed as family and hired one, and given points of 1 and 2 respectively.

(j) **Irrigation sources**: It has been classified into five and scores have been given on the basis of relative capacity to irrigate maximum acreage as follows: no source - 0, only river - 1, well - 2, canal - 3, handpump - 4, pumpset - 6.
(k) **Farm building:** It was categorized into three in case of cattleshed and scoring given on the basis of durability and expense as follows: nil - 0, kutcha - mixed - 2, pucca - 3. In case of storage only 1 point was accorded.

(l) **Livestock:** Both - milch and draft cattles were scored separately, the basis being the numbers' ranges as follows: nil - 0, 1-2 = 2, 3-4 = 4, 5 and above = 6.

(m) **Vehicles:** Five types of vehicles were scored on the basis of relative utilization and cost as follows: nil - 0, bicycle - 1, bullock-cart - 2, motorcycle - 5, tractor - 6, jeep/car - 6.

(n) **Marketing agency:** It has been categorized into four dominant forms and points given according to relative scope of operation as follows: local bania - 1, local bazar - 2, rice mill - 3 and town bazar - 4.

(o) **Time of sale:** The scores were given on the basis of implied conditions of farmers reflected in the pattern of sale-timing as follows: just after harvest - 1, at buyer's choice - 2, and when maximum price - 3.
(3) **Information sources, mass media and contact with VLW:**

(a) **Information sources:** It has been classified into four categories and points were accorded on the basis of relative importance, exposure and authenticity as follows: neighbours/friends/relatives - 1, VLW - 2, salesman - 3 and block official - 4.

(b) **Exposure to mass media:** It is based on the frequency and purposes of listening radio and reading newspaper. In case of radio-listening and newspaper reading frequency the scores were as, never - 0, sometimes - 1 and mostly - 2. And in case of purposes of radio-listening the scores were as, entertainment - 1, news - 2 and farm news - 3.

(c) **Town visits:** The scoring is based on frequency and purposes of average town visits (annual). These are in case of frequency as, never - 0, rarely (2-6) - 1, sometimes (7-16) - 2, and mostly (17 and above) - 3; while in case of purposes of visits, the scores are as, meeting officials - 1, visiting bank - 2, buying farm inputs - 3, visiting farm exhibition - 4, and others - 1.
(d) **Contact with VLW:** The scoring was done according to approximate frequency and purposes of contacts during the preceding year of field work. The points given in case of frequency are as, never - 0, rarely (below 4) - 1, sometimes (4-6) - 2, and mostly (7 and above) - 3; while in case of purposes, farming information - 3, farm inputs - 2, other - 1 and none - 0.

(e) **Evaluation of VLW's performance:** It has been scored in terms of the respondents' perception of VLW's regularity in visits to their area and efficiency in providing farming information. The weightage points in case of regularity is as, none - 0, low - 1, average - 2 and high - 3. The same weightage is accorded to the same categories in terms of efficiency, but scored separately.

(4) **Socio-psychological Realm:**

(a) **Educational aspiration and expectation for children:** It is based on the level of education the completion of which is expected from children. Increasingly higher weightage have been given to higher levels as none - 0, primary - 1, secondary - 2, higher - 3 and graduate - 4.
(b) **Occupational aspirations and expectations:** The scoring is based on relative importance of occupation for farming as follows: none - 0, service - 1, agro-based industry - 2, dairy/poultry/fishery - 3 and mechanised farming - 4.

(c) **Political aspirations:** It is classified into four on the basis of levels of aspirations and scored according to increasing expansion in scope, such as, none - 0, village level - 1, block level - 2, district level - 3 and constituency level - 4. If such aspiration is shown for any other family member, additional 1 point is to be given.

The reasons of political aspirations are also scored on the basis of perceived objectives of aspiration as follows: none - 0, benefit - 1, prestige - 2, contacts - 3 and serving others - 4.

(d) **Value-orientations:** It is concerned with the opinions and attitudes in terms of certain conservative, liberal and progressive values as indicated by agreement or disagreement with certain statements pertaining to reasons of poverty, plight of lower caste and traditional and modern ideas (eight statements in each case)*. The scoring weightage is given in increasing order to the statements showing values as: conservative - 2, liberal - 4, and progressive - 6.

*Explained further in the chapter five and mentioned in the Appendix-D.
Analysis of Data:

For logical presentation of data collected, certain statistical tables were prepared based on computerised correlational analysis at alpha level (5% level of significance). The formula of coefficient of correlation used for such analysis is Pearson's Product-Moment Correlation one that is as follows:

\[
r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]}}
\]

in which X and Y are dependent and independent variables respectively.*

The researcher is aware that statistical measure of correlation does not necessarily indicate causation. Correlation reveals a mathematical relation in the sense that values vary with one another. However, "it is undoubtedly an aid in discovering, if only by inference, where causation operates and how strong it is" (Muller and Schuessler:1969). Moreover causal determination cannot be discerned on the basis of responses of respondents, since it may not provide correct insight into the determinants of their behaviour (Festinger and Katz:1976). But a researcher will always combine and blend the potentialities of statistical tools with the subtlety of his own imagination and perceptive cognition.

*An example of correlational calculation in case of higher adoption level and caste is shown in Appendix-D.
In any case, the correlational analysis enabled to show the relations between the dependent variable (i.e. adoption levels of agricultural innovations) and all other independent variables on a comparative plane of analysis. Such analysis of the collected data is presented in the following three chapters dealing with socio-economic background, communication behaviour and socio-psychological aspects of respondents regarding adoption of agricultural innovations.