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NOTES

LAND SALES AND LAND VALUES IN BIHAR

The Inspector-General of Registration, Bihar compiles annually figures of *raiyati* holdings having occupancy rights transferred by registered deeds of sale in each district of Bihar. Information is furnished in respect of the number of such registrations, the area transferred, the annual rent payable to landlords in respect of the area transferred, and the consideration money paid therefor. These items of information are given separately for transfers of entire holdings and for transfers of part holdings. The following figures (Table I) in the form of triennial averages from the year 1936—after Orissa was separated from Bihar—have been worked out from the official data.

TABLE I

Triennium		Number		Average area transferred per unit of sale transaction (acres)		Consideration money paid per acre sold (Rs.)		Annual rent payable per acre to landlord on land transferred by sale (Rs.)	
		Entire	In part	Entire	In part	Entire	In part	Entire	In part
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1936-38	.. ..	27,507	154,085	2.00	0.91	98	139	3.24	3.25
1939-41	.. ..	46,808	206,164	1.63	0.95	162	138	2.98	2.83
1942-44	.. ..	49,080	269,295	1.70	0.92	211	250	3.24	3.57
1945-47	.. ..	35,597	207,272	1.59	0.72	408	499	3.29	4.20
1948-50	.. ..	44,036	253,549	1.30	0.67	559	674	3.85	3.38
1951-53	.. ..	43,361	317,597	1.06	0.57	640	793	3.80	3.37
1954-56	.. ..	48,093	301,517	1.02	0.69	505	632	3.84	2.82
1957-59	.. ..	58,565	418,150	0.96	0.61	703	932	2.80	3.16
1960-62	.. ..	68,616	455,580	0.91	0.58	610	987	2.45	2.98

It will be seen that over a period of 25 years the number of entire holdings sold every year has multiplied 2.6 times, while the number of sales of part holdings has multiplied 3.0 times. The number of annual sales of part holdings has been on an average six times as numerous as the sales of entire holdings; but the average quantity of land comprised in the sales of part holdings has been three-fourth of the quantity of land comprised in the sales of entire holdings. This does not take account of changes in the territory of Bihar that have taken place since 1936. The area transferred per unit of sale (Table II) has gone down almost continuously both

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N. B. : The above study is based on figures published in the Bihar Statistical Handbooks (Directorate of Economics and Statistics, Government of Bihar) which reproduce figures compiled by the Inspector-General of Registration, Government of Bihar.

TABLE II

Year			Average value of land sale transaction (Rs.)		Average area transferred per sale transaction (acres)	
			Entire	In part	Entire	In part
1936	..	..	183	130	1.96	0.90
1937	..	..	206	124	2.12	0.96
1938	..	..	197	125	1.92	0.86
1939	..	..	274	135	1.89	1.01
1940	..	..	275	119	1.26	0.93
1941	..	..	239	146	1.94	0.94
1942	..	..	274	153	1.89	0.90
1943	..	..	396	239	1.64	0.96
1944	.,	..	392	285	1.63	0.88
1945	..	..	434	267	1.60	0.85
1946	..	..	457	291	1.56	0.56
1947	..	..	981	500	1.59	0.73
1948	..	..	746	451	1.29	0.73
1949	..	..	713	478	1.28	0.67
1950	..	..	714	433	1.32	0.62
1951	..	..	708	460	1.15	0.58
1952	..	..	662	475	1.00	0.57
1953	..	..	668	427	1.03	0.57
1954	..	..	613	465	1.21	0.65
1955	..	..	520	500	0.78	0.79
1956	..	..	431	372	1.06	0.65
1957	..	..	636	486	1.06	0.67
1958	..	..	718	645	0.81	0.54
1959	..	...	678	581	0.98	0.62
1960	..	...	556	541	0.89	0.57
1961	...	...	544	558	0.84	0.55
1962	...	...	573	638	1.02	0.64
1963	...	...	595	622	0.81	0.73

for sales of entire holdings as well as for sales of part holdings; and in the course of 27 years each has gone down roughly by half. One reason for the reduction of the average amount of land sold per sale transaction is the progressive reduction in the size of holdings which must have been going on due to the sub-division of holdings resulting from inheritance and bequest.. Thus while the net area sown in Bihar increased by only 7 per cent from 1930 to 1960, the number of ploughs increased by 40 per cent and the number of working animals by 22 per cent during the same period. The total area transferred annually increased from the triennium 1936-38 to the triennium 1960-62 by about 15 per cent in the case of sales of entire holdings, and by 90 per cent in the case of sales of part holdings. The average price of land transferred by the sale of entire holdings had gone up from Rs. 98 per acre in the triennium 1936-38 to Rs. 610 per acre in the triennium 1960-62; while in the case of the sale of part holdings the value of land had gone up from Rs. 139 per acre to Rs. 987 per acre in the same period. Thus the value of agricultural land had gone up six to seven times in the course of 25 years. The per acre value of land sold as part of a holding has been on an average about 50 per cent higher than the value of land sold as an entire holding. Although the value of land per acre sold as part of a holding has remained almost consistently higher than the value of land when sold as an entire holding, yet the annual rent payable to landlords for each of these categories of land has, on an average, been the same, viz., Rs. 3.2 per acre. Naturally enough, the rent of land per acre, in both the cases, has shown little fluctuations from year to year during the period of 25 years, varying roughly between Rs. 3 and Rs. 4 per acre. The lower sale value of land per acre when entire holdings are sold, may be partly due to the fact that more often it is the holding of poor quality land that is forced for sale than a holding of better quality land; and partly to the fact that the entire holding when put up for sale may have some land (such as fallows) which is not cultivated. Of the two categories of land coming to the market for sale, the price of land sold as part of a holding may be taken to be more representative of the change in the price of cultivated land in general, specially as the sales of such land are much more extensive than the sales of the other category of land. Even so, it may be said that the consideration money paid for the transfer of land is not always divulged in the official document of sale, as a part of the price that may be paid sub rosa. Be that as it may, the figures show that the price of cultivated land had gone up by 1962 to at least seven times of what it was before the last World War. It appears from available statistics that land value has gone up more than the prices of agricultural commodities. Thus according to the Season and Crop Report of Bihar, the weighted index of the harvest prices of 12 important agricultural commodities of Bihar in 1962, with 1937-42 as base (100), stood at 500 against a seven fold rise in land values. One reason for the rise in the value of land outstripping the rise in the price of crops is the increasing land hunger which has been manifesting itself with the increasing pressure of population on the soil. But it may also be partly due to progressive investments made for improving the quality of land resulting in better irrigation, higher soil fertility, multiple cropping, etc.

It is interesting to note that the Bihar Land Reforms (Fixation of Ceiling Area and Acquisition of Surplus Land) Act, 1961 distinguished between five classes of land. For the acquisition of surplus area by the State in excess of the ceiling prescribed, different rates of compensation per acre were laid down for each of these five classes of land, viz., Rs. 900 for class I land, Rs. 600 for class II

land, Rs. 450 for class III land, Rs. 300 for class IV land and Rs. 50—150 for class V land. Presuming that the areas of the different classes of land were in the proportion of 6.5 (land with flow irrigation), 1.0 (areas of lift irrigation), 64.5 (land other than the specified categories), 2.0 (*diara* land) and 26.0 (hilly, sandy and other lands not growing paddy, *rabi* or cash crops), the weighted average value of all categories of land works out to about Rs. 385 per acre. As this value was fixed in relation to the reference period October, 1959, the price so fixed is very much lower than the sale value of land sold as entire holdings during 1957-59 which was as high as Rs. 700. It should, however, be noted that as the choice in respect of the surplus land to be taken over by the State was left to the owners of the land, only inferior land in each category will be available for being taken over by the State. Moreover, the intention of the legislature might have been not to compensate the owners fully for the surplus land which they possessed.

Year to year fluctuations in the numbers of sale and of the total areas sold (Table III) have been roughly parallel in the cases of the sales of part holdings and of sales of entire holdings except that in the period from 1947 to 1955 when the number of sales as well as the area sold remained either stable or showed a somewhat downward trend in the case of sales of entire holdings, an upward trend characterized the sales of part holdings. The years 1943, 1957 and 1961 were marked by peak sales of land as the years 1946, 1955 and 1958 were marked by very low sales. The total quantity of land sold, both in entire and part holdings taken together, amounted in 1943 to 1.75 per cent of the total net area sown in Bihar together with current fallows; while the total area sold in 1946 formed only 0.6 per cent of the net area sown together with current fallows. Although the connection between very good and seasonable rainfall and low sales of land, as in the year 1946-47, and very poor rainfall and large sales of land, as in the year 1957-58, is quite apparent (Table IV), yet moderate deficiencies in rainfall, as in the year 1951 and 1958, did not produce any marked effect on the sales of *raiyati* land. In the case of movements in the price of land (Table V), the year to year fluctuations, as in the case of the number and quantity of land sales, have been broadly similar both for lands sold as part as well as entire holdings.

Taking the average of four years 1959-62, it is found that a total of 334 thousand acres of *raiyati* land were being transferred annually by sale in Bihar, whether as entire holdings or as parts of holdings. If all these transfers represent genuine (and not faked) sales, then it follows that about 1.4 per cent of the net area sown in Bihar together with current fallows have been changing hands annually in Bihar in recent years. [Since for several years previous to the final passing of the Bihar Land Reforms Act of 1961 the talk of the imposition of a ceiling on land holdings has been going on, it is possible that quite a few of the big holders of land might have attempted *benami* and similar sales to show themselves as possessing less land than they actually did.] According to the Census of 1961, there were about 5.8 million agricultural households in Bihar. If the area cultivated by each agricultural household may be taken to represent a holding, then the number of holdings in Bihar in 1961 would be 5.8 million. This, however, includes also households who cultivate only unowned land; and they formed 7.38 per cent of the total cultivating households in 1961. If these are excluded, the total number of cultivating households who cultivated owned land either alone or in combination with leased land, is found to be of the order of 5.4 million. According to the

TABLE III

Year			No. of sales (in thousands)		Area of land transferred by sale (in thousand acres)	
			Entire	In part	Entire	In part
1936	..	...	26	145	51.4	131.2
1937	..	...	27	153	57.3	146.6
1938	...	...	29	164	56.1	141.3
1939	..	..	38	158	72.4	159.8
1940	..	..	62	255	77.9	236.7
1941	..	..	40	205	77.9	193.5
1942	..	..	42	222	78.7	199.4
1943	..	..	61	347	99.1	331.9
1944	..	..	45	239	73.1	209.6
1945	..	..	38	216	61.1	182.5
1946	..	..	28	174	43.7	96.7
1947	..	..	41	232	64.7	170.2
1948	..	..	45	240	58.5	175.0
1949	..	..	43	238	55.6	159.3
1950	..	..	43	282	57.2	176.5
1951	..	..	43	296	49:8	170.6
1952	..	..	43	318	43.1	182.6
1953	..	..	44	338	45.2	191.5
1954	..	..	43	282	51.5	183.6
1955	..	..	46	268	35.7	212.8
1956	..	..	56	355	59.3	231.7
1957	..	..	63	400	66.9	267.9
1958	..	..	51	390	41.7	210.4
1959	..	..	61	465	60.1	288.8
1960	...	..	70	465	62.1	266.1
1961	..	..	74	474	62.5	259.5
1962	..	...	62	428	63.2	273.8
1963	..	...	62	440	50.9	320.8(?)

TABLE IV—CHANGES IN RAINFALL AND EXTENT OF LAND SOLD
(ENTIRE AND PART HOLDINGS COMBINED)

Year			Annual rainfall as percentage of the normal (50.53 inches)	Acreage transferred in any year as percentage of 5-year moving average centred at the mid-year
1936	..	..	129	(81)
1937	—	—	104	(90)
1938	—	...	109	87
1939	—	...	104	95
1940	—	...	86	122
1941	—	...	106	89
1942	—	..	107	88
1943	..	...	100	143
1944	—	..	101	103
1945	..	...	91	91
1946	...	..	112	62
1947	..	..	90	110
1948	...	..	100	110
1949	...	...	111	94
1950	...	..	96	104
1951	...	..	83	97
1952	..	..	99	98
1953	..	..	109	101
1954	..	..	85	95
1955	..	...	88	90
1956	..	..	116	105
1957	..	..	77	121
1958	..	..	92	80
1959	—	...	100	108
1960	...	—	97	103
1961	...	—	102	(101)
1962	—	...	90	(106)

N. B. :   The rainfall data related to the year from March to February till the year 1955 when the calendar year came to be adopted for recording rainfall data.   For area transferred by sales of *raiyati* holdings the year refers to the calendar year.   For the first two and the last two years of the period the averages for the respective quinquennia have been used for calculating the percentages of area transferred.

TABLE V—AVERAGE VALUE PER ACRE OF AREA TRANSFERRED BY SALE

Year			Entire (Rs.)	In part (Rs.)
1936	..	..	94	144
1937	..	..	97	129
1938	..	..	103	145
1939	..	..	145	133
1940	..	..	218	128
1941	..	..	123	154
1942	..	..	145	170
1943	..	..	242	249
1944	..	..	241	326
1945	..	..	271	315
1946	..	..	293	522
1947	..	..	617	683
1948	..	..	578	620
1949	..	..	556	713
1950	..	..	542	692
1951	..	..	614	800
1952	..	..	663	827
1953	..	..	646	754
1954	..	..	506	714
1955	..	..	667	629
1956	..	..	406	570
1957	..	..	598	724
1958	..	..	886	1,194
1959	..	..	691	935
1960	..	..	627	945
1961	..	..	644	1,018
1962	..	..	561	997
1963	..	..	730	852(?)

registration (of agricultural land sale) statistics, 66,795 such holdings, on an average, were being sold off annually by their owners for one reason or another during the period 1959-62. Thus about 1.2 per cent of the owner cultivators were becoming either landless workers or purely tenant cultivators. Moreover, as it is only the owners of small sized holdings who are forced to sell their holdings—the average size of entire holdings offered for sale during the period 1959-62 being 0.9 acres—and as according to information collected at the 1961 Census, 20 per cent of the cultivating households (excluding purely tenant cultivators) had holdings of a size of less than one acre, another 26.4 per cent of a size between one acre but less than 2.5 acres, it follows that out of 2.5 million cultivating households with holdings of less than 2.5 acres each, 2.67 per cent were being forced out of the possession of their own land every year.

A cultivator may be compelled to sell his land for various reasons. Unless his land is requisitioned by the State for public purposes, a very common purpose of sale is to clear off debt which a cultivating household has accumulated for meeting obligations imposed by family maintenance, sickness, *sradh*, marriage, litigation, etc. The extent to which his financial obligations leading to the sale of land have gone up during the period of 27 years (1936-63) is indicated by the increase in the average value of a sale transaction (of part holdings) which mounted up from Rs. 128 in 1936-39 to Rs. 588 in 1960-63 (Table II). It increased from an

average of Rs. 133 in 1936-42 to Rs. 270 in 1943-46, to Rs. 456 in 1947-57 and to Rs. 633 in 1958-63.   The inflationary increases seem to have come in spurts in 1943, 1947 and 1958.   He has been able to meet his increased obligations by parting with a smaller parcel of land which fetches him a higher price.

The extent of land sales, as also the per acre value of land sold, in the different districts of Bihar show great variations (Table VI).   Taking the average of 10

TABLE VI

District		Area transferred by sale (entire and part holdings) : annual average over the period 1953-62 (acres)	Area transferred by sale as percentage of net cropped area together with current fallows	Average value of per acre *raiyati* land sold as part holdings (Rs.)	Holdings under one acre as percentage of total holdings
(1)		(2)	(3)	(4)	(5)
Patna	..	10,943	0.94	2,072	22.5
Gaya	..	21,697	1.11	1,118	18.8
Shahabad	..	13,749	0.70	1,199	13.2
Saran	..	13,596	0.92	1,383	30.2
Champaran	..	23,847	1.42	744	25.6
Muzaffarpur	..	21,343	1.42	1,137	39.7
Darbhanga	..	81,390	4.63	340	39.0
Monghyr	..	22,449	1.19	902	21.8
Bhagalpur	..	29,830	2.96	669	17.0
Purnea	..	36,611	1.77	398	9.6
Saharsa	..	30,144	3.52	624	11.2
Santal Parganas	..	4,456	0.23	598	12.0
Hazaribagh	..	15,839	1.25	397	15.3
Ranchi	..	6,839	0.30	633	7.1
Palamau	..	7,560	0.82	266	15.4
Dhanbad	..	7,081	2.03	669	16.7
Singhbhum	..	3,527	0.35	831	11.7
		350,901	1.40	704	21.6

N.B. : The net cropped areas taken for col. (3) are those given as normal net cropped areas in each district in the Season and Crop Report of Bihar for the year 1957-58, while the area of current fallows in each district refers to the year 1957-58.

years (1953-62), it is found that in respect of the sale of entire holdings the districts which show the highest sales, both in numbers as well as in area sold, are Purnea, Bhagalpur and Monghyr; while the districts which show the lowest sales of entire holdings are Singhbhum, Ranchi and Hazaribagh. In respect of the sale of part holdings, both in respect of numbers of sales and of area sold, Darbhanga and Muzaffarpur districts show large sales, while Santal Parganas, Singhbhum, Ranchi and Palamau districts show low sales. The low land sales in Santal Parganas and in the districts of the Chotanagpur division may partly be due to special tenancy laws imposing restrictions on the transference of land from the tribal to the non-tribal population. However, as the sown area, together with current fallows, varies considerably from district to district, the average area of land sold annually, both as part and entire holdings, forms varying proportions of the arable area of the district. It is found that on an average of 10 years' sales (1953-62) the area sold annually formed the highest percentage of net sown area together with current fallows in the district of Darbhanga (4.6 per cent), Saharsa (3.5 per cent), Bhagalpur (3.0 per cent), Dhanbad (2.0 per cent), Purnea (1.8 per cent), Muzaffarpur (1.4 per cent) and Champaran (1.4 per cent); while the proportion was the lowest in the districts of Santal Parganas, Ranchi and Singhbhum, in each of which it did not exceed 0.3 per cent. It is difficult to unravel the causes which account for large sales of land in some districts. The comparatively large proportion of *batai* land cultivated in the districts of Saharsa, Purnea, Monghyr, Bhagalpur, Champaran and Darbhanga may be a factor promoting sales of land in these districts. Again to the extent that poverty of the cultivator compels him to sell land, the districts which show a large proportion of small cultivators cultivating less than one acre of land, may be expected to show large sales of land. Such districts are Muzaffarpur (39.7 per cent), Darbhanga (39.0 per cent), Saran (30.2 per cent) and Champaran (25.6 per cent). Another indication of the poverty of the cultivator which may lead to sale of land, is provided by the low level of gross agricultural income of the cultivating household. Such incomes were low in the districts of Darbhanga, Muzaffarpur, Saran, Saharsa and Hazaribagh. The comparatively large land sales in Dhanbad and Hazaribagh districts may be due to the acquisition of agricultural land for industrial and mining purposes.

The average per acre value of land sold also shows great variations from district to district. The value was found to be high (average of 10 years 1953-62) in the districts of Patna, Saran, Shahabad, Muzaffarpur, Gaya and Monghyr districts (exceeding Rs. 1,000 per acre for part holdings); and low in the districts of Palamau, Hazaribagh, Purnea and Darbhanga (less than Rs. 500 per acre). It should, however, be borne in mind that since a little more than one per cent of the agricultural land comes to the market for sale annually, and even this one per cent may not be a random sample of the entire agricultural land (for example, different classes of land existing in any district such as canal irrigated, flow irrigated, unirrigated and *diara* land, may not come up for sale in proportion to their extent in the district), the price per acre of land calculated from the sales effected may not be representative of land values in general in each district. This may be the reason why although the average value of outturn of crop (1961-62) per acre was low in the districts of Ranchi, Palamau, Saharsa and Gaya districts, yet excepting Palamau, the per acre value of land sold in the other three districts was not found to be the lowest among the districts of Bihar.

The study has shown that the number of annual sales of agricultural land has increased three-fold during the last 25 years, yet on an average a seller of agricultural land sells only half as much land as he did before. This indicates that there has been a progressive decline in the size of land holdings—due largely to the splitting up of holdings—and that economic distress among the small holders is on the increase. Cultivation in the tribal region of Chotanagpur and Santal Parganas is more stable than in the north-eastern region of Bihar where land holdings change more often. It would be interesting to know the class of persons who are acquiring possession of the dispossessed lands of the small holders; but such information is not available from the registration statistics.

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CULTIVATION OF HYBRID MAIZE AND PADDY ON EXPERIMENTAL FARMS—A COMPARATIVE STUDY†

The objective of this paper is to study the mathematical relationship obtaining between output and inputs in the case of hybrid maize and paddy crops raised on experimental fields in 1967 in the Karim Nagar district, Andhra Pradesh. Among the various types of production functions used in farm production analysis, Cobb-Douglas type is well known. The Cobb-Douglas function allows diminishing marginal productivity to each input factor as well as increasing or decreasing returns to scale. It assumes a constant elasticity of production over the entire range of inputs. This type of function can be expressed as linear in logarithms and is easy to fit by the method of least squares. The regression coefficients thus obtained give directly the elasticities of the respective input variables. Accordingly, this type of function has been selected for the present study.

The Cobb-Douglas production function can be written in the following general form :

$$P = AX_1^{b_1} X_2^{b_2} X_3^{b_3} \ldots\ldots\ldots\ldots\ldots\ldots\ldots X_n^{b_n}$$

Where P is the dependent variable and $X_1, X_2, X_3 \ldots X_n$ are independent variables, b_i's (i = 1, 2, .., n) are the regression coefficients to be estimated and A is a constant which is also to be estimated. After logarithmic transformation the function assumes the following form :

$$P = a + b_1 x_1 + b_2 x_2 + \ldots\ldots\ldots\ldots\ldots + b_n X_n$$

where $p = \log P$, $x_i = \log X_i$ and $a = \log A$.

Variables Considered

The following variables have been considered for the present study.