

CHAPTER-III

C H A P T E R - III

TECHNOLOGY ADOPTION : CASE STUDIES OF
REPRESENTATIVE BLOCKS FROM THE
SELECTED DISTRICTS

The pattern and extent of technology adoption in agriculture by the sample farmers have been discussed in this chapter in detail. For this purpose five blocks, representative of the selected five districts from the five physico-climato-edaphic regions of West Bengal (mentioned earlier) have been considered for the case studies. The blocks are (1) Jamalpur (2) Chapra from the agriculturally advanced district of Burdwan and Nadia respectively; (3) Sagar and (4) Onda belonging to the agriculturally less endowed districts of South 24 Parganas and Bankura respectively and (5) Maynaguri from the Jalpaiguri district which is agriculturally the most backward of the five districts selected for the study, which have been clearly observed from the already discussed agricultural profiles of these districts.

To assess the pattern and extent of technology adoption, the indicators that have been used are (1) the use of HYV seeds, (2) the use of chemical fertilizer, (3) the use of improved implements and (4) the use of plant protection measures (discussed in detail in the methodology).

The use of HYV Seeds

For measuring the extent of adoption of high yielding varieties in crops, rice has first been considered as it occupies the major portion of the net sown area.

HYV Rice

For the use of high yielding varieties of seeds in rice, the farmers have been classified into four groups, namely,

- (a) those devoting more than 50% of their cultivated area to HYV rice;
- (b) those allocating 25% to 50% of their cropped area to HYV rice;
- (c) those using upto 25% of their cropped acreage to HYV rice and
- (d) those using no HYV seeds.

As regards the adoption of high-yielding varieties of rice as a whole, the farmers of the Jamalpur block in Burdwan district and the farmers of the Chapra block in the Nadia district occupy the foremost position among the five blocks selected for the study. All of them (100%) are the users of HYV rice. Among the growers in the districts of South 24-Parganas (Sagar block) and Bankura (Onda block), 83.3% and 61.9% cultivate high yielding varieties of rice respectively. On the other hand, the percentage of HYV rice cultivating farmers in the agriculturally backward Maynaguri block from the North Bengal district of Jalpaiguri is very low. It is only about 10%.

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AREA UNDER HYV RICE

Blocks	Area Above 50%	Under 25% to 50%	HYV Rice Upto 25%	Nil	Total
Jamalpur	16/19 (84.2%)	3/19 (15.8%)	-	-	19/19 (100%)
Onda	2/21 (9.5%)	6/21 (28.5%)	5/21 (23.8%)	8/21 (38.1%)	13/21 (61.9%)
Chapra	10/11 (90.9%)	1/11 (9%)	-	--	11/11 (100%)
Sagar	20/36 (55.5%)	6/36 (16.6%)	4/36 (11.1%)	6/36 (16.6%)	30/36 (83.3%)
Maynaguri	-	-	3/31 (9.7%)	28/31 (90.3%)	3/31 (9.7%)

Source : Compiled and tabulated from the field data.

Note : Figures in parentheses indicate percent of farmers.

Turning to the area-wise extent of adoption of HYV rice it is seen from the above table that in the Chapra block of the Nadia district about 90% of the farmers show over 50% of their acreage being devoted to HYV rice. In the Jamalpur block, the pattern has been almost the same - a little less than 85% of the farmers resorting to the cultivation of HYV rice on more than 50% of their farm area. This percentage is quite low in the Sagar block of the South 24-Parganas district, where only 56% of the farmers have devoted above 50% of their land to HYV rice. The picture is different in the less advanced district of Bankura, that is, the Onda block.

AREA UNDER HYV RICE

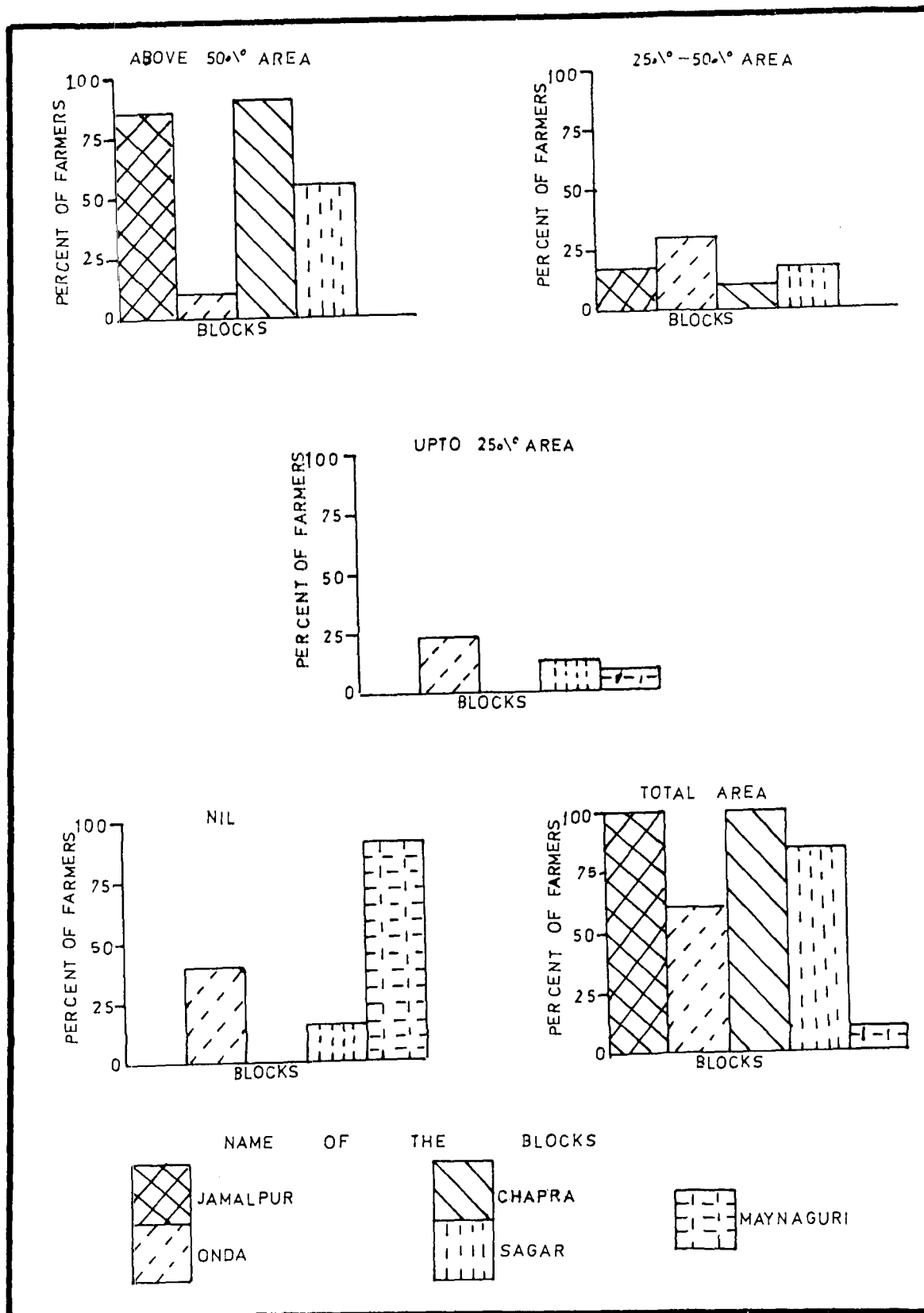


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In that block only about 10% of the sample farmers indicate to have allocated above 50% of their cultivable land to HYV rice. By contrast, in the Maynaguri block of the Jalpaiguri district no farmer has reported the cultivation of HYV rice in more than 50% of the cultivated area.

In the second category, that is those having 25%-50% of cropped land under HYV rice, the farmers of Onda block come first- 28.5% of them belonging to this category ; the farmers of the Sagar block in the South 24-Parganas District rank next, and about 17% of them fall in this category. The cultivators of the Jamalpur block are very close to the Sagar cultivators in this respect, with 15.8% of them falling in this group and only one out of eleven cultivators (9%) in the Chapra block belong to this category. The corresponding percentage for Maynaguri is nil. At the other end of the scale, that is, in the case of farmers devoting only upto 25% of their rice area to high-yielding varieties, the farmers of Onda again rank first (23.8%). In this group, the farmers of the Sagar and the Maynaguri blocks are close to each other and their percentages are about 11 and 10 respectively. In the two agriculturally developed blocks in Burdwan and Nadia no farmer has reported such a low level of HYV adoption. As regards farmers who are non-adoptors of HYV rice, the percentage is nil among all the farmers of the two blocks in the Burdwan and the Nadia districts. In the two other blocks of South 24-Parganas (Sagar block) and Bankura (Onda block), the corresponding percentages are 16.6 and 38. However, the percentage of non-adoptors of HYV rice is the maximum (about nine-tenths) in the Maynaguri block of the Jalpaiguri district.



In underdeveloped region farmers still use bullocks and bullock carts.



From this analysis it has been evident that the region-wise adoption of HYVs is linked with natural conditions, that is, relief, drainage, soil, and climate. Being located in the favourable agro-climatic zones, the blocks from the districts of Burdwan and Nadia are more advanced than the others in terms of techniques of farming. The two other blocks from the districts of Bankura and South 24-Parganas are lagging behind because of their physical location. Onda block of Bankura falls in a droughtprone area and the farmers of the Sagar block of the South 24-Parganas suffer from the problems of salinity of soil. The farmers of the Maynaguri block in the Jalpaiguri district are great laggards in respect of adoption of HYV rice. This is because they are largely interested in plantation crops.

HYV Potato, HYV Mustard and HYV Jute

Turning to the case of three other major crops of the State, namely, potato, mustard and jute, we have considered the farmers only in terms of three general categories, namely, (i) HYV growers (ii) non-HYV growers, and (iii) non-growers of potato, mustard, and jute.

It is notable that all HYV growers of these crops have either devoted wholly or not at all and thus there is no partial adoption of HYV seeds.

ADOPTORS OF HYV SEEDS

Blocks	HYV POTATO		HYV MUSTARD		HYV JUTE	
	HYV growers	Non-HYV growers	HYV growers	Non-HYV growers	HYV growers	Non-HYV growers
Jamalpur	19/19 (100%)	-	11/19 (57.8%)	6/19 (31.5%)	2/19 (10.5%)	-
Onda	-	-	4/21 (19%)	10/21 (47.6%)	7/21 (33.3%)	-
Chapra	-	-	-	-	1/11 (9%)	8/11 (72.7%)
Sagar	-	-	-	-	-	-
Maynaguri	-	-	-	-	4/31 (12.9%)	22/31 (70.9%)
	-	-	-	-	-	5/31 (16.1%)

Source : Compiled and tabulated from the field data.

Note : Figures in parentheses indicate percent of farmers.

Cultivation of potato is considered only for Jamalpur block because it is a major crop of that particular area, all the sample farmers (100%) are in fact growers of high-yielding potato.

As regards mustard, two blocks have been considered, namely, Jamalpur and Onda. In the Jamalpur block about three fifths of the sample farmers are HYV-mustard growers, whereas this proportion for Onda is only about a fifth. Amongst the non-HYV mustard growers, the proportion for the Jamalpur block slightly less than a third, and for Onda it is a little less than a half. The proportion of non-growers is high in the Onda block-over a third, but for Jamalpur it is only about 10%.

As regards jute the sample farmers of the Chapra and Maynaguri raise this crop. In Chapra 18% and in Maynaguri more than 70% of the growers report to grow jute. Among the HYV-jute growers the cultivators of Maynaguri come first. The farmers of Chapra are close to them. The percentages of non-growers of jute in the blocks of Chapra and Maynaguri about 73 and 16 respectively.

It may be said that in the case of potato too, the farmers of the Jamalpur block of Burdwan grow the crop because of its favourable ecological conditions and the extent of adoption of HYV potato is universal. As regards mustard, farmers in the Onda block of Bankura lag behind the sample farmers of the Jamalpur block. In the case of jute the growers in the Maynaguri block report greater adoption of HYVs than the growers of the Chapra block of Nadia.

CHEMICAL FERTILIZERS

The second component of improved technology is the use of chemical fertilizers which has been classified into three types, namely, (i) nitrogenous(N) (ii) phosphatic(P) and (iii) potassic(K).

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USE OF CHEMICAL FERTILIZERS

Blocks	N			P			K				
	31 kg/acre and above	21 to 30 kg/acre	upto 20 acre	Nil	26 kg/acre and above	15 to 25 kg/acre	upto 15 acre	Nil	26 kg/acre and above	12.5 to 25kg/acre	upto 12.5 kg/acre
Jamalpur	18/19 (94.7%)	1/19 (5.3%)	-	-	18/19 (94.7%)	-	-	1/19 (5.3%)	18/19 (94.7%)	1/19 (5.3%)	-
Onda	4/21 (19%)	5/21 (23.8%)	11/21 (52.3%)	1/21 (4.8%)	4/21 (19%)	9/21 (42.8%)	7/21 (33.3%)	1/21 (4.8%)	3/21 (14.2%)	9/21 (42.8%)	2/21 (9.5%)
Chapra	11/11 (100%)	-	-	-	8/11 (72.7%)	2/11 (18.2%)	-	1/11 (9%)	8/11 (72.7%)	2/11 (18.2%)	1/11 (9%)
Sagar	25/36 (69.4%)	5/36 (13.9%)	2/36 (5.6%)	4/36 (11.1%)	19/36 (52.8%)	5/36 (13.9%)	7/36 (19.4%)	5/36 (13.9%)	10/36 (27.8%)	10/36 (27.8%)	8/36 (22.2%)
Maynaguri	3/31 (9.7%)	5/31 (16.1%)	19/31 (61.3%)	4/31 (12.9%)	1/31 (3.2%)	3/31 (9.7%)	11/31 (35.5%)	16/31 (51.6%)	-	3/31 (9.7%)	12/31 (38.7%)

Source : Compiled and tabulated from the field data.

Note : Figures in parentheses indicate percent of farmers.

USE OF N FERTILIZER

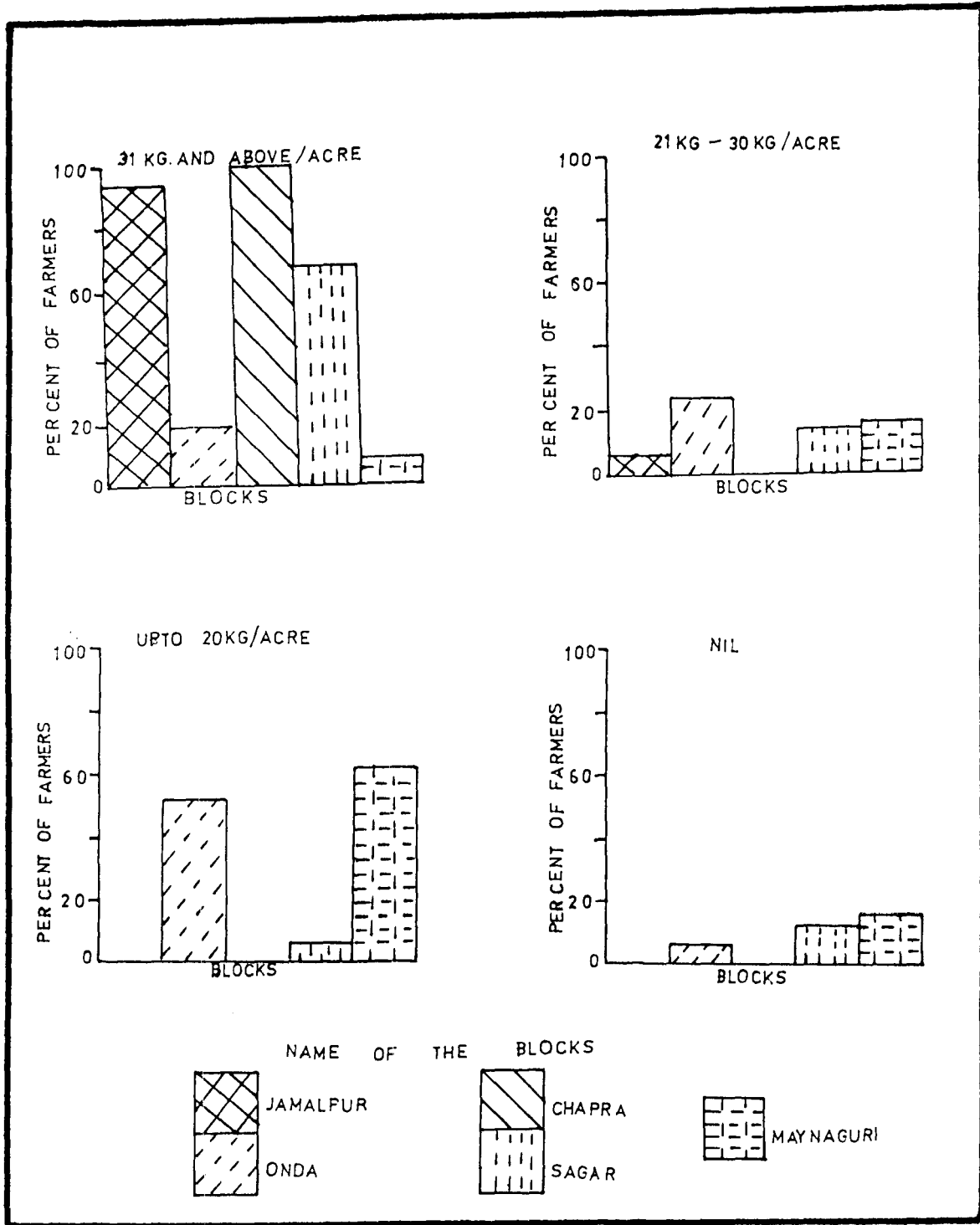


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USE OF P FERTILIZER

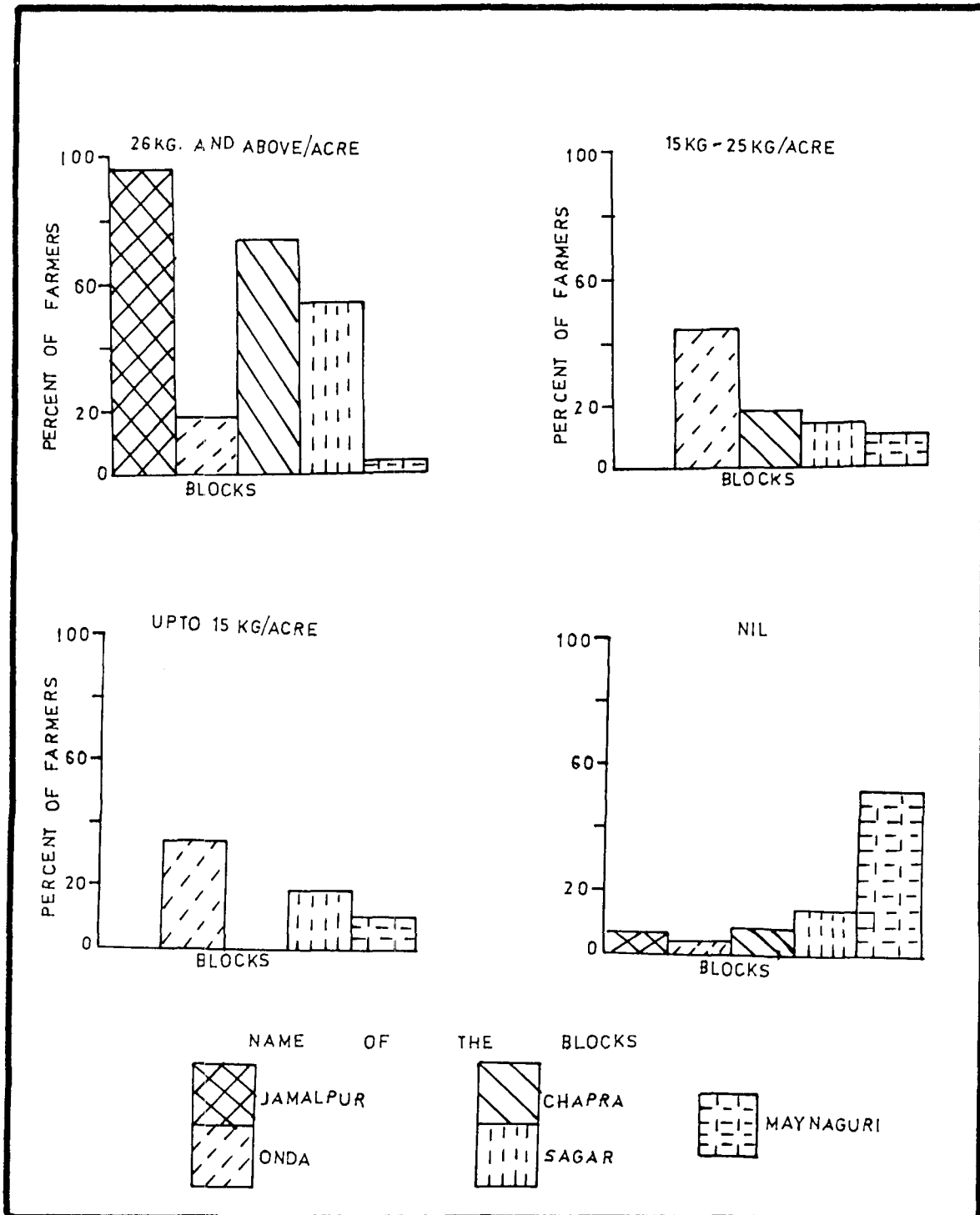


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Regarding nitrogenous fertilizers, it is seen from the table that their use is universal amongst the farmers in the two agriculturally advanced blocks of Burdwan and Nadia. The percentage of non-users is the highest in Maynaguri followed by Sagar and Onda. The modal level of utilization of N fertilizers is 31 kg. and above per acre in Chapra block in Nadia, Jamalpur block in Burdwan and Sagar block in South 24-Pargans districts. The relevant percentages of sample farmers in these blocks is 100, 95, and 70 respectively. In the case of the blocks in the two other districts, the modal use of N is upto 20 kg per acre- the percentages of farmers reporting such use being 61 for Maynaguri, and 52 for Onda. On the other hand, in the 21-30 kg. per acre category the percentage of users is high among the farmers of the Onda block (about one fourth). The corresponding percentages for the other blocks are 16 for Maynaguri, 14 for Sagar, and only 5 for Jamalpur.

In the case of phosphatic fertilizers, the percentage of non-users is higher in every block than in the case of nitrogenous fertilizers. Again, the percentage of non-users is much higher in the case of cultivators of Maynaguri as compared with two other relatively backward blocks. The modal level of phosphatic fertilizer use is 26 kg. and above per acre. The Jamalpur block comes first in this case, with 18 out of 19 farmers belonging to this category. The proportion of farmers belonging to this group about three fourths for Chapra and over half for Sagar. More than one-third of the Onda farmers belong to the group

USE OF K FERTILIZER

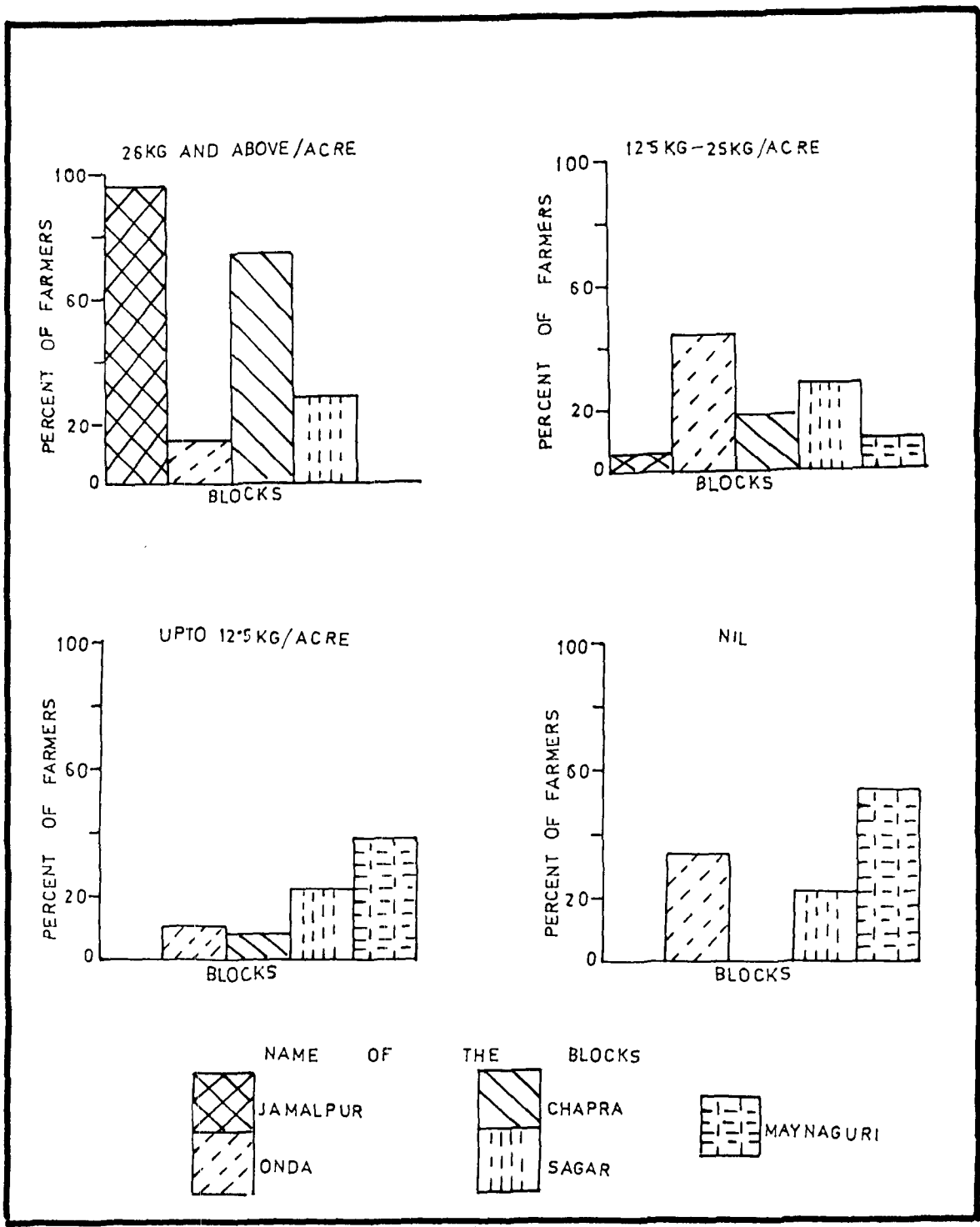


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using 15-25 kg. of P fertilizer per acre. At the other end, in the upto 15 kg. per acre category, the percentage of users is high among the farmers of Maynaguri followed by the farmers in Onda and Sagar.

In respect of potassic fertilizers the percentage of non-users is the highest again for farmers in the Maynaguri block. the percentages of non-users for farmers in Onda and Sagar block are about 33 and 22 respectively. The farmers of the two agriculturally advanced blocks of Jamalpur and Chapra reported to have extensive use of K fertilizers at the highest level, i.e. 26 kg. and above per acre. The farmers of the two other blocks also use K fertilizers to the extent of 26 kg. and above per acre, but their percentages are not so high. In the second category, that is 12.5 to 25 kg. per acre use, the farmers of Onda rank first with well over two-fifths of them falling in this group. The farmers of Sagar rank next followed by Chapra Maynaguri and Jamalpur. At the other end of the scale, that is regarding the lowest level (upto 12.5 kg. per acre) of K fertilizer use, the percentage of growers is the highest in the Maynaguri block followed by farmers in the Sagar, Onda and Chapra blocks.

Thus it is evident that in respect of each of the three types of fertilizers (N, P, K) the extent of utilization by the farmers of Maynaguri block is much less than their counterparts in the three other blocks. The farmers of the Jamalpur and Chapra blocks are in the forefront in regard to this aspect of the adoption of improved technology in agriculture.

IMPROVED IMPLEMENTS

We now take up the case of another component of improved agricultural technology , namely, the use of better equipment which for the sake of our analysis has been divided into (a) tractors, (b) irrigation equipment , and (c) other implements. A table has been prepared to depict the exact picture.

T A B L E 34
USE OF IMPROVED IMPLEMENTS

Blocks	Improved Implements		
	Tractors	Irrigation equipment	Other implements
Jamalpur	3/19 (15.8%)	14/19 (73.6%)	11/19 (57.8%)
Onda	5/21 (23.8%)	7/21 (33.3%)	10/21 (47.6%)
Chapra	3/11 (27.2%)	9/11 (81.8%)	8/11 (72.7%)
Sagar	- -	6/36 (16.6)	25/36 (69.4%)
Maynaguri	1/31 (3.2%)	3/31 (9.6%)	11/31 (35.4%)

Source : Compiled and tabulated from the field data.

Note : Figures and Parentheses indicate percent of farmers.

(a) **Tractors** : In regard to tractors it is the farmers of Chapra who are the largest users. The farmers of Onda (Bankura) rank next while the farmers of Jamalpur come third. The percentage of tractors using farmers is very low in the Maynaguri block. Interestingly, there is no tractor users in the Sagar block.

USE OF IMPROVED IMPLEMENTS

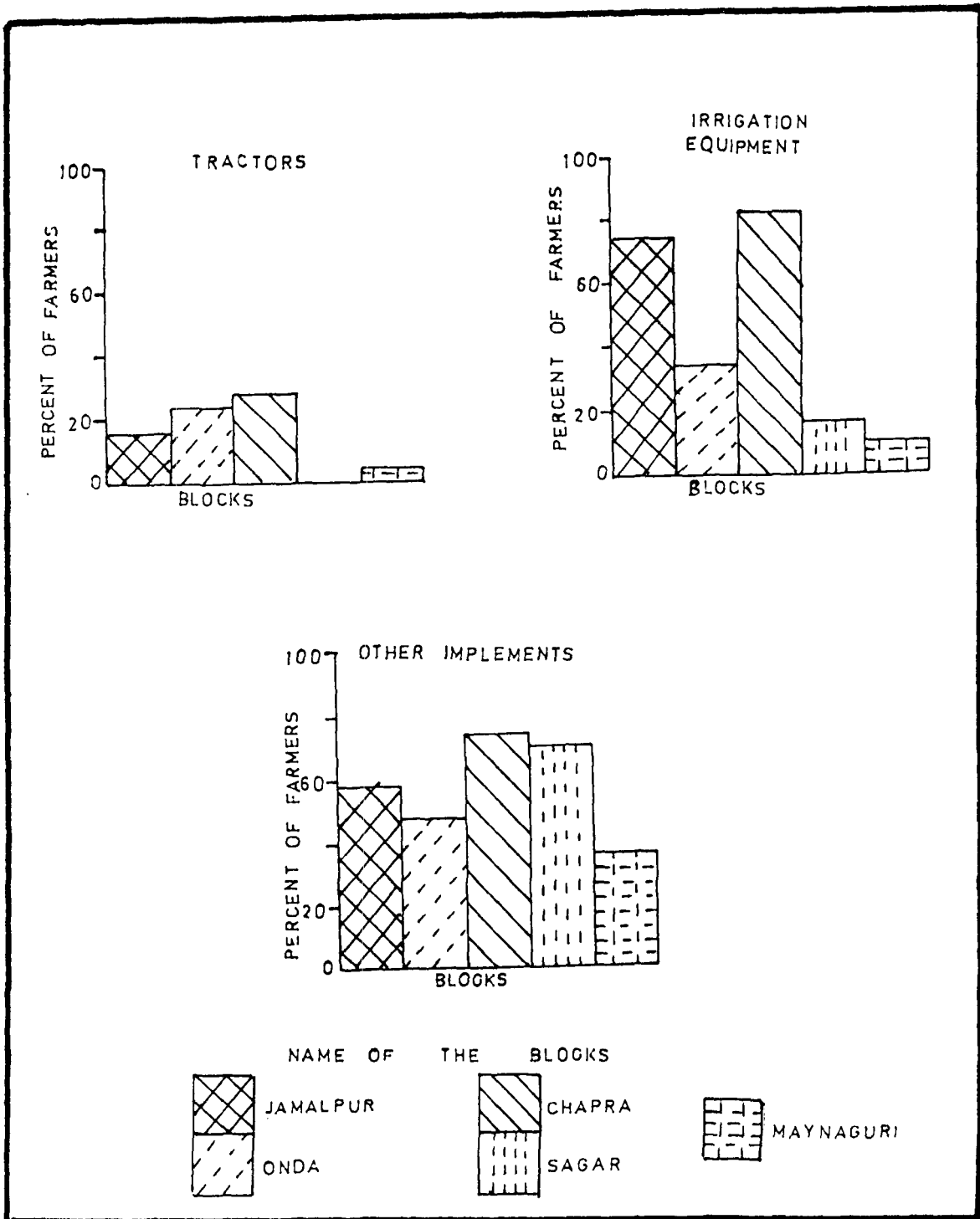


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(b) **Irrigation equipment :** As regards the use of irrigation equipment, the farmers of Chapra again come first, 9 out of 11 have reported their use. Jamalpur rank next with about three fourths of the farmers using irrigation equipment. The corresponding proportion for the two blocks of Onda and Sagar are about one third and one sixth respectively. Only one tenth of the farmers of the agro-ecologically backward Maynaguri block of North Bengal use irrigation equipment.

(c) **Other implements :** Regarding the use of other implements like sprayer, thresher etc. the farmers of the Chapra block(Nadia) rank first. The farmers of the Sagar comes second followed notably, by those in the Jamalpur and Onda blocks. The farmers of the loan North Bengal block of Maynaguri again come last.

PLANT PROTECTION

Turning to the fourth component of superior technology adoption, namely, the use of plant protection it is seen that this is more extensively resorted to by the sample farmers in all the blocks in general as compared with the other three components of improved technology. The farmers of Chapra once again top the list with all of them taking it recourse to plant protection measures. They are followed by the farmers of Jamalpur, Onda, Sagar and Maynaguri blocks.



Use of thresher.

USE OF PLANT PROTECTION MEASURES

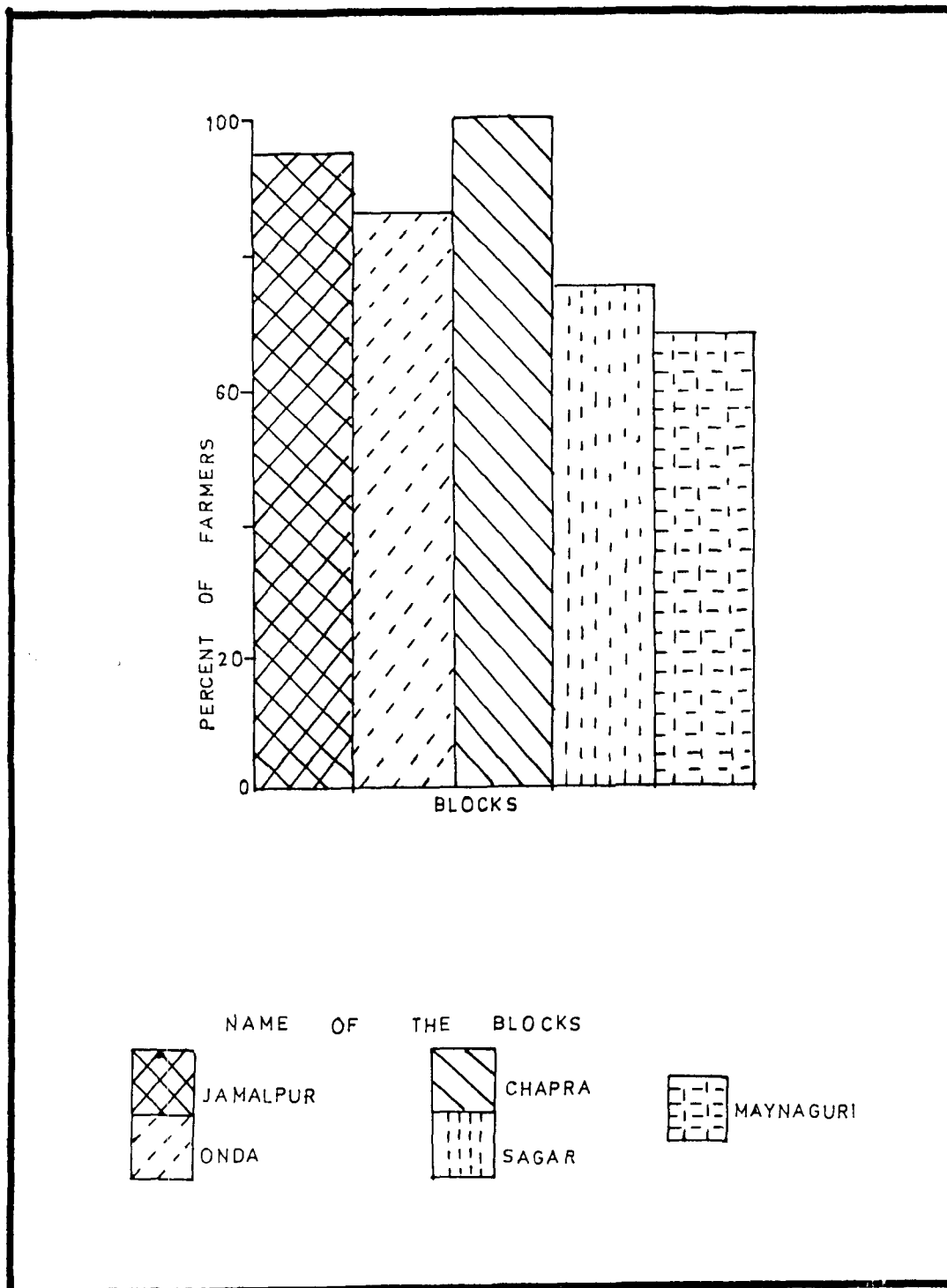


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T A B L E 35

USE OF PLANT PROTECTION MEASURES

Blocks	Plant Protection Measures
Jamalpur	18/19 (94.7%)
Onda	18/21 (85.7%)
Chapra	11/11 (100%)
Sagar	27/36 (75%)
Maynaguri	21/31 (67.7%)

Source : Compiled and tabulated from the field data.

Note : Figures in parentheses indicate percent of farmers.

Thus regarding the use of plant protection too it may be said that farmers in the two agriculturally advanced blocks of Nadia and Burdwan show better performance.

Altogether, the picture that emerges is that farmers in the Chapra block of Nadia and the Jamalpur block of Burdwan two agro-ecologically well endowed districts of the State of West Bengal are the greater adoptors of improved agricultural technology symbolised by the Green Revolution. They are followed by the farmers in the two other blocks namely, Onda (Bankura) and Sagar (South 24-Parganas). The farmers in the agro-ecologically disadvantaged block of Maynaguri in the district of Jalpaiguri rank last in respect of all the aspects of technology adoption in agriculture.

ANALYSIS IN TERMS OF COMPOSITE TECHNOLOGY ADOPTION INDEX

More light is thrown on the situation regarding the relative degree of technology adoption in different representative blocks of the different districts by using the Composite Technology Adoption Index (CTAI). The calculation of the CTA Index has been discussed in the methodology in detail.

T A B L E 36

COMPOSITE TECHNOLOGY ADOPTION INDICES OF FARMERS

Block	Adopter Group			
	High	Medium	Low	Nil
Jamalpur	13/19 (68.4%)	6/19 (31.5%)	-	-
Onda	7/21 (33.3)	10/21 (47.6%)	4/21 (19%)	-
Chapra	9/11 (81.8%)	2/11 (18.2%)	-	-
Sagar	11/36 (30.6%)	17/36 (47.2%)	7/36 (19.4%)	1/36 (2.8%)
Maynaguri	-	10/31 (32.3%)	18/31 (58%)	3/31 (9.7%)

Source : Compiled and tabulated from the field data.

Note : Figures in parentheses indicate percent of farmers.

Table brings out that there are no low and nil adopters in the two agriculturally advanced blocks of Jamalpur and Chapra. In the high-adopter group the farmers of Chapra account for the highest percentage (over four-fifths). The farmers of the Jamalpur block rank next, but the farmers in two other relatively

COMPOSITE TECHNOLOGY ADOPTION INDICES OF FARMERS

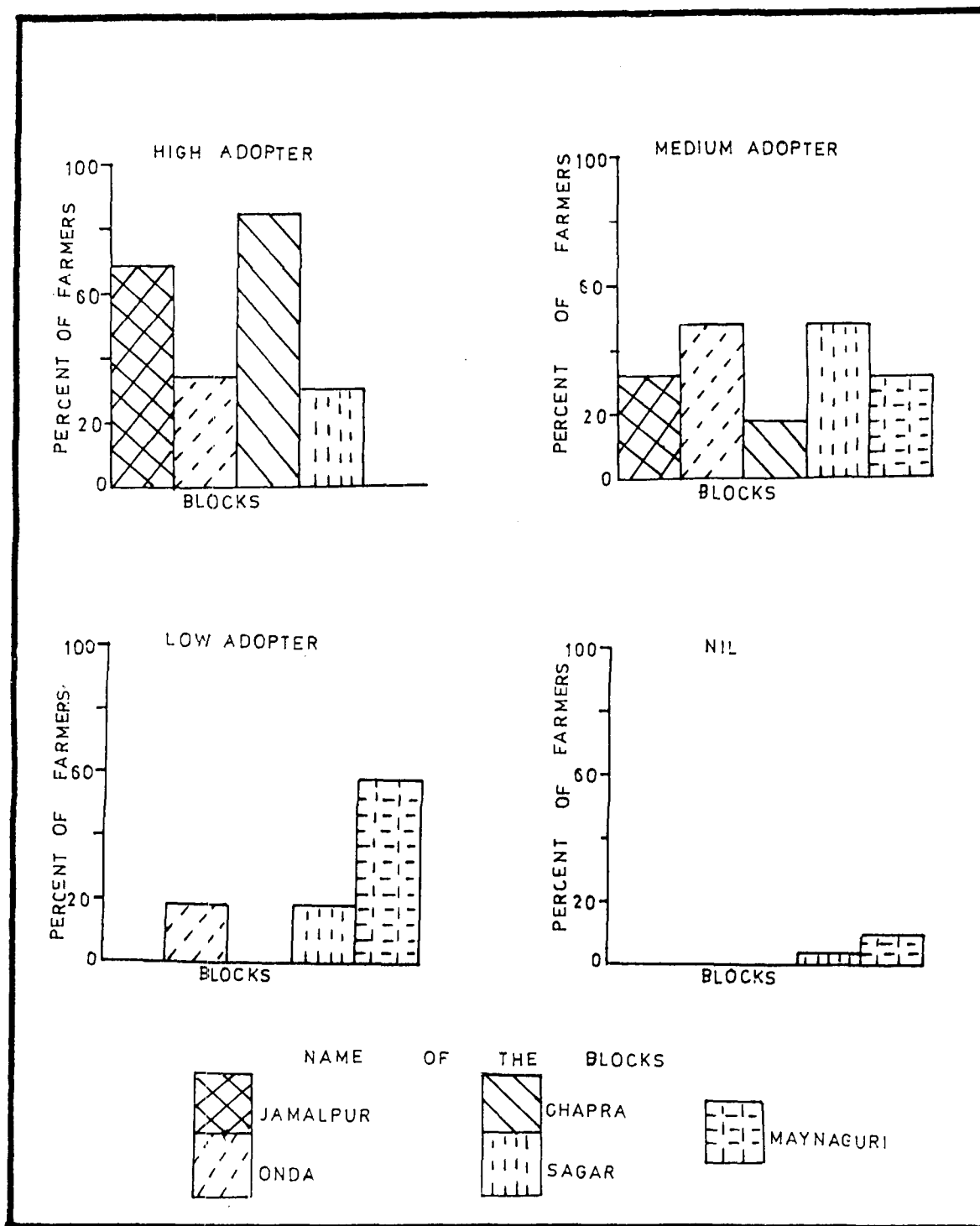


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less-developed blocks of Onda and Sagar lag behind. It is interesting to note that there are no farmers belonging to the high-adopter group in the Maynaguri block.

Turning to the case of the medium-adopter group, Chapra show the lowest percentage of farmers. Jamalpur rank next. The farmers of the Sagar and Onda blocks are close to each other in percentage terms. However, of the 31 sample farmers only ten are even medium adopters in the Maynaguri block. On the other hand in the case of the low-adopter group, the most backward farmers of the Maynaguri block come first, about three fifths of them belonging to this group. In the two other relatively advanced blocks of Onda and Sagar this percentage is about 19. At the other extreme, some farmers of only the Maynaguri and Sagar blocks fall in the nil-adopter category, and the percentage of farmers in this category is much higher in a Maynaguri, compared with Sagar, where the percentage is very low.

Thus our findings based on the CTAI regarding relative adoption of agri-cultural technology in the five blocks basically confirm, those obtained earlier on the basis of our analysis of the individual components of technology. This further corroborates the analysis dealt in detail in the agricultural profiles of the selected districts.