CHAPTER - XI

NEW AGRICULTURAL STRATEGY
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Introduction

Agricultural situation in the district has experienced considerable development in the post independence period. During this period the production of food grains and other cash crops has multiplied several folds. Such increase has been made possible by means of increase in the cropped area with the help of extended irrigation facilities, increased use of fertilizers and improved seed and adoption of scientific methods of cultivation.

The change in respect of production of crops has been significant since 1965-66. The effects of the physical planning measures from the public front were heartening in the district atleast initially. But from 1966-67 onwards the production of food grains and a number of cash crops surpassed all past records hitherto attained in the district. The most significant component of this growth was the spectacular improvement in crop yield per unit area, but expansion in gross acreage was no less an important factor. That the economy really took a new turn is also evident from the facts that the intensity of
cropping for the district as a whole rose sharply after 1966-67 and the overall crop-combination underwent a distinct change. Besides irrigation facility from canals and tanks there are at least two other factors which had a great bearing on the phenomena. The first was the adoption of a package prescription of high yielding seeds, fertilizers and pesticides and the second was the exploration and utilisation of the underground resources of water. All these factors were nothing but the outcome of so called Green Revolution.

Green Revolution in India

The Green Revolution is defined as the rapid growth in Third World grain output associated with the introduction of a new package of tropical agricultural inputs consisting of improved grain varieties, heavy fertilizer usage and carefully controlled irrigation. In politicoeconomic terms the development of this new technology is very much a part of the post-war Third World strategy of the U.S.A. (Cleaver H.M., 1972, 177)

In India the instrumentalities of rural economic change during the first and second plans were the Community Development Programme (CDP) and National Extension Services (NES). The
CDP did establish the much needed infrastructural base for communication and rural extension service but whatever growth was recorded at the end of the First Plan was mainly due to acreage expansion. In 1957 the CDP was reoriented a democratic decentralization of the plan implementing machinery through the Panchayat Raj. However neither the CDP nor NES could create a stable level of food production to support the programme of industrialisation which was emphasised during the second plan.

Subsequently in the early sixties a completely new orientation was given to the policy of agricultural development in India. This was following a report of a team of experts appointed by the Ford Foundation. One of the important recommendations of the team was that "Instead of spreading the developmental efforts more or less on uniform basis throughout the country without getting any striking results, intensive efforts for production should be undertaken with a combination of all the technological improvements and concentration of manpower and resources in selected areas which had optimum conditions for stepping production without at the same time effecting the normal efforts in other areas which had optimum conditions for stepping production, without at the same time affecting the normal efforts in other areas" (Report of IADP 1961-63).
The first impact of this report was the Intensive Agricultural District Programme (IADP) launched in 1960-61. It aimed at an integrated and intensified approach to the problem of agricultural production in areas which were more responsive to such production efforts. The immediate goal was to achieve rapid increase in the level of agricultural production through a concentration of financial, technical, extension and administrative resources. The long-run goal was to create a self-generating breakthrough in productivity and raising the production potential by stimulating human and physical process of change. It's another goal was to demonstrate the most effective ways of increasing production and providing lessons for extending such intensified agricultural production programmes to other areas. Initially the IADP was introduced in seven districts of seven states in which agriculture was relatively free from natural hazards (4 were rice producing: Andhra, Bihar, Tamilnadu and MP; 2 were wheat producing: Punjab and UP; and 1 millet producing, Rajasthan.)

In 1962-63 the IDAP was supplemented by a wider form, the Intensive Agricultural Area Programme (IAAP). The aim of
IAAP was to bring about a progressive increase in the production of main crops in selected areas by an intensive "Package Approach" i.e. the use of inter-related factors—Physical and institutional in strategic combination, which were likely to exert an impact on agricultural production. The number of IAAP districts was quite large accounting for sizable cultivated area.

While both the IADP and IAAP were concerned with promotion of intensive agriculture, they operated within the limitation set by existing crop varieties which had relatively low response to fertilizers. Further the two unprecedented droughts in 1965-66 and 1966-67 and the biological revolution brought about by the introduction of new strains of various food grains necessitated the launching of a new strategy of agricultural development in 1966-67. The key note of this strategy is the application of science and technology for increasing yield per hectare. This strategy, known as New Agricultural Strategy or Green Revolution (because it created greener looking fields) is based on the extension of high yielding varieties responsive to heavy doses of fertilizers and the package of improved practices in selected areas with
assured rainfall or irrigation facilities.

The programmes included under the new strategy are:

1. The High yielding varieties programmes (HYVP)
2. Multiple Cropping Programme (MCP)
3. Integrated Development of Dry Areas (IDDP)
5. Increased use of fertilizers.
6. New Irrigation Concept
7. Water Management.

The High Yielding Programme: This programme was launched in the Kharif season of 1966 in selected areas having assured rainfall. It envisaged popularisation of the high yielding varieties of paddy, wheat, maize, jowar and bazra over fairly larger areas.

The programme covered 1.99m. hectares under high yielding varieties in 1966-67. The coverage increased to 6.04m. hectares in 1967-68 to 18.17m. hectares in 1971-72 to 31.90m. hectares in 1975-76 and to 32.20m. hectares in 1979-80. The HYVP has been taken up for five crops. Among these the most striking
success has been achieved in wheat. The average yielding of wheat has been 1300 kg/hectare. With high yielding strains (Kalyan Sona, Sonalika, Safed Lerma Choti Lerma, Sharbati Sonare and triple Dwarf varieties like Hira and Moti) the yields have been exceptionally high (over 2000 kg) very high (1801-2200 kg) in Punjab, Haryana, Western U.P. plains and northern parts of Gujrat plain. Elsewhere the yields have been low. The major factor which triggered the wheat revolution in Sutlej-Jamuna plain was the introduction of high yielding nitrogen-responsive dwarf strains of wheat from Mexico; as well as the human elements i.e. efficient and innovation minded group of farmers familiar with irrigated wheat culture.

The yields in the other crops have been rather low. As against the average yield of 1150 kgs of paddy per hectare it increased to 1651-2050 kg. and 1251-1650 kg. per hectare in the core rice regions. The yield increased due to increasing area under improved strains (such as Taichung-1, Taichung 65, Taiaon 3, ADT - 27, IR-8; Padma, Jaya, Hansa, Pankaj, Jagannath Sabarmati, Jamuna, Bala, Krishna, Ratna, IR-20, Kaveri, Pusa Jayanti etc.) plant pest control, the introduction of Japanese method of cultivation and the greatly increased use of
artificial fertilizers. Further minikit programme for increasing rice production was launched under which pre-released varieties of rice are tested at the farmers' field.

Productivity of jowar did not show any appreciable increase. The national average was 470 kgs. In case of bajra the national average was 685 kgs per hectare. It increased to as high as 1000 kgs. (in Punjab, Haryana, Gujrat, Tamil Nadu and AP) to over 200 kgs. On the sandy soils of marusthali.

2. Multiple Cropping Programme: This programme envisages that more crops per year per hectare are raised. The basic idea of this strategy has been the development of irrigation; increased use of fertilizers; proper adoption of water management practice; adoption of late sowing and short duration varieties; adjustment in the time of sowing, planting and harvesting; introduction of new crops in place of or along with traditional crops; and selection of proper rotation which can help in raising additional crops both in mono cropped and double cropped areas. Taking these facts into consideration the Multiple Cropping Programme was launched during 1967-68. As against the target of 3m. hectares the achievement for 1967-68 was placed at 3.64 m. hectare. The
area under multiple cropping increased to 5.53 m. hectares in 1969-70; to 7.04 m. hectares in 1970-71 to 14.3 m. hectares in 1972-73 and to 16.0 m. hectares in 1973-74.

3. Integrated Development of Dry Areas: An intensive programme known as Integrated Dry Land Agricultural Development was launched in 1970-71, initially in pilot projects (in Hyderabad, Rajkot, Hissar, Indore, Sholapur, Bellary, Jodhpur, Tirunelvelly and Jhansi). Later on, it was introduced in 15 more pilot projects during 1971-74. During 1977-78, 24 pilot schemes were in progress. Each project covered an additional area of 800 hectares. The programme include cultivation of drought resistant, short duration and high yielding varieties of crops with package of practices, land development including land shaping and land levelling, construction of wells, bunds and distribution of improved farm machinery, seeds, fertilizers and pesticides. The area under dry farming has increased from 18.1 thousand hectares in 1974-75 to 19.1 thousand hectares in 1975-76 and to 19.2 thousand hectares in 1977-78.

4. Plant Protection Measures: Plant protection programme includes seed treatment, intensive aerial and ground spraying,
weed control and rodent control. The total area benefited increased from 16.6 m. hectares in 1965-66 to 48 m. hectares in 1969-70 to 52.0 m hectares in 1972-73; to 60.5 m hectares in 1974-75 to 74.6 m. hectares in 1977-78. Efforts are being made to popularise effective weed control through use of herbicides.

5. Increased use of Fertilizers: The continuance of high level of soil fertility and its nutritional balance is one of the important means to profitable landuse and sustained agricultural production. The optimum and balanced use of fertilizers is, therefore an indispensable element of the strategy for achieving the objective, particularly with reference to high yielding varieties.

The consumption of fertilizers has been continuously increasing. The consumption of nitrogenous fertilizers increased from 575 thousand tonnes, of phosphatic fertilizers from 132 thousand tonnes and that of potassic fertilizers from 77 thousand tonnes in 1965-66 to 1479, 541 and 236 thousand tonnes in 1970-71 to 2,457, 635 and 319 thousand tonnes in 1976-77 and to 2888, 827 and 463 thousand tonnes in 1977-78; and
3,420; 1,110 and 590 thousand tonnes in 1978-79.

The quantity of rural compost produced was of the order of 205 m tonnes in 1977-78 as against 200 m. tonnes in 1974-75 and 170 m. tonnes in 1973-74. The present coverage of green manuring is estimated at 7 m. hectares. About 5.8 m. tonnes of urban compost was available in 1977-78 as against 5.4 m. tonnes in 1976-77.

6. New Irrigation concept: In the past irrigation was mainly developed as protection against drought. Now it is oriented to intensive production. This implies (i) limitation of "Command Area" so that available water can be more effectively used for multiple crops as well as intensive agriculture. For this purpose the C.A.D. Programme has been started in 17 selected command Areas. (ii) Exploitation of ground water resources is made possible by the use of minor irrigation works, including the construction of tube-wells, dug-wells etc. and the renovation of tanks etc. The additional irrigation potential was created to the extent of 15 m. hectares in 1976-77 as against 1.2 m. hectares in 1973-74. The over-all level of cropped area benefiting from minor irrigation works was 27.7 m. hectares in 1977-78 as against 26.2 m. hectares in 1976-77 and 25.2 m. hectares in 1975-76.
Since the adoption of new strategy for agricultural development in 1966-67 considerable progress has been made in the sphere of ground water development. The number of dug-wells, electric pumps, private tube-wells and state tube-wells increased from 6,500; 2,435; 820 and 20 thousand in 1973-74 to 9,526; 3,153; 412 and 25 thousands in 1977-78.

Evaluation of the New Agricultural Strategy: As a result of the implementation of the above said programmes associated with Green Revolution the production of food grains in India has increased considerable. It increased from 89.00 m. tonnes in 1964-65 to 94.0 m. tonnes in 1968-69 and over 99.5 m. tonnes in 1969-70. It was 121.03 m. tonnes in 1976-77 and 131.37 m. tonnes in 1978-79.

The average yield per hectare of foodgrains was 783 kg. in 1967-68, rose to 872 kg in 1970-71 and to 944 kg. in 1975-76 and to 1025 kg. in 1978-79. In the case of wheat for which the productivity increased sharply, the yield per hectare was 1,103 kg in 1967-68 and 1574 kg. in 1978-79. In case of rice the increase was not so significant. The yield per hectare rose from 1032 kg. in 1967-68 to 1334 kg. in 1978-79.
Effect of Green Revolution on Agriculture in Hooghly.

Green Revolution had spectacular effect on agricultural development in the district. As a result of the adoption of some of the programmes of New Agricultural strategy particularly (a) High yielding varieties programme, (b) Multiple Cropping Programme (c) Plant Protection Measures (d) Increased use of Fertilizers (e) New irrigation concept the production and yield of several crops has increased considerable though acreage of them did not show such increase.

Production of rice increased from 267.4 thousand tonnes in 1963-64 to 324.9 thousand tonnes in 1968-69, to 436.1 thousand tonnes in 1974-75 to 505.64 thousand tonnes in 1979-80. Production of wheat rose from 3 thousand tonnes in 1967-68 to 18.6 thousand tonnes in 1968-69, to 61.7 thousand tonnes in 1975-76 (Table 37 Appendix). Production of potato rose from 354.4 thousand tonnes in 1962-63 to 408.2 thousand tonnes in 1971-72, to 567 thousand tonnes in 1977-78, and to 726.2 thousand tonnes in 1978-79.

Yield of rice, the Principal crops has also recorded remarkable increase. It rose from 1421 kg per hectare in 1960-61 to 1521 kg. in 1968-69, to 1920 kg in 1977-78. In the case
of wheat it increased from 882 kg. per hectare in 1967-68 to 2000 kg. in 1968-69, to 2153 kg. in 1977-78. In case of potato against the yield of 13, 200 kg. per hectare in 1960-61, it increased to 14,865 kg. in 1968-69 to 17,662 kg. in 1970-71, to 21,103 kg. in 1968-69, to 17,662 kg. in 1970-71, to 21,103 kg. in 1974-75 to 23,350 in 1979-80.

**High Yielding Varieties Programme.**

With the launching of this programme the hectarage of high yielding varieties of paddy increased considerable. It increased from 35.8 thousand hectares out of total rice area of 202.9 thousand hectares in 1967-68 to 74 thousand hectares in 1970-71, to 110.9 thousand hectares in 1973-74, to 122.228 thousand hectares in 1975-76, to 155-3.91 thousand hectares in 1978-79 to 175.031 thousand hectares in 1979-80 out of total rice area of 266.381 thousand hectares (Table 41 Appendix). Such unprecedented rise in high yielding varieties of paddy hectarage was due to increasing preference of this variety to the local variety because of its higher yield. Area of local varieties of rice having low yield experienced decreasing trend from 167.1 thousand hectares out of total rice area of 202.9
Plate 3. Harvested Aman Paddy (H.Y.V.)

Among the varieties of paddy the hectarage of high yielding varieties of boro paddy recorded remarkable increase in the district since 1967-68. Before 1967-68 this paddy occupied a very negligible portion of total rice area and it was entirely local variety. (0.5 to 3.9 thousand hectares Table 37 Appendix). Low yield of the local variety and availability of limited irrigation facilities were the cause for such low hectarage of boro paddy. But, after 1967-68 the high yielding varieties gained prominence. The hectarage rose from 9.2 thousand hectares to 59.00 thousand hectares in 1971-72, to 62.857 thousand hectares in 1978-79, to 79.247 thousand hectares in 1979-80. (Table 41 Appendix).

In the case of aman variety there is increasing trend in the hectarage of high yielding varieties. It increased from 22.6 thousand hectares out of total aman area of 176.9 thousand hectares in 1967-68 to 40 thousand hectares in 1973-74, to 62.995 thousand hectares in 1976-77, to 86.231 thousand

The hectarage of high yielding varieties of aus paddy increased from 4000 in 1967-68 to 12553 hectares in 1979-80.

High yielding varieties of wheat recorded considerable increase in hectarage. Since 1967-68. It was 27.4 thousand hectares in 1976-77 against 18.9 thousand hectares in 1972-73, 13.2 thousand hectares in 1969-70 and 3.4 thousand hectares in 1967-68.

Area occupied by high yielding varieties of potato like Chandramukhi, Jyoti, Kufri Alankar etc. increased from 21.1 thousand hectares in 1967-68 to 25.4 thousand hectares in 1976-77 to 37.7 thousand hectares in 1978-79.

Increased Use of Fertilizers.

With a view to making high yielding variety programme success there has been increase in input of fertilizers. The consumption of basic chemical fertilizers viz. nitrogen, phosphate,
and potassium increased considerably. Per hectare consumption of fertilizers (N.P.K) increased from 57.67 kg. in 1970-70 to 210 kg. in 1983-84. The following table reveals the relative increase in consumption of nitrogenous, phosphatic and potassic fertilizers.

Table 1. Consumption of fertilizers (In 000' tonnes) 1970-71 to 1983-84.

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>Consumption in Kg./Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-71</td>
<td>7.69</td>
<td>2.99</td>
<td>2.89</td>
<td>57.67</td>
</tr>
<tr>
<td>1971-72</td>
<td>7.94</td>
<td>3.24</td>
<td>3.63</td>
<td>67.94</td>
</tr>
<tr>
<td>1972-73</td>
<td>7.64</td>
<td>2.94</td>
<td>3.56</td>
<td>64.68</td>
</tr>
<tr>
<td>1973-74</td>
<td>8.89</td>
<td>1.90</td>
<td>2.75</td>
<td>62.15</td>
</tr>
<tr>
<td>1974-75</td>
<td>10.98</td>
<td>2.84</td>
<td>2.93</td>
<td>76.80</td>
</tr>
<tr>
<td>1975-76</td>
<td>11.48</td>
<td>2.63</td>
<td>1.43</td>
<td>71.27</td>
</tr>
</tbody>
</table>

Contd...
Table 1. (Contd.)

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>P.</th>
<th>K</th>
<th>Consumption in Kg/Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-77</td>
<td>13.94</td>
<td>2.53</td>
<td>2.59</td>
<td>87.60</td>
</tr>
<tr>
<td>1977-78</td>
<td>14.06</td>
<td>2.72</td>
<td>3.12</td>
<td>91.20</td>
</tr>
<tr>
<td>1978-79</td>
<td>18.04</td>
<td>7.11</td>
<td>6.12</td>
<td>143.40</td>
</tr>
<tr>
<td>1979-80</td>
<td>20.04</td>
<td>8.91</td>
<td>3.27</td>
<td>147.76</td>
</tr>
<tr>
<td>1980-81</td>
<td>21.82</td>
<td>9.64</td>
<td>5.12</td>
<td>167.74</td>
</tr>
<tr>
<td>1981-82</td>
<td>19.32</td>
<td>8.06</td>
<td>4.70</td>
<td>147.13</td>
</tr>
<tr>
<td>1982-83</td>
<td>21.52</td>
<td>6.10</td>
<td>4.34</td>
<td>146.55</td>
</tr>
<tr>
<td>1983-84</td>
<td>26.10</td>
<td>11.18</td>
<td>8.62</td>
<td>210.00</td>
</tr>
</tbody>
</table>

Source: Principal Agriculture Office, Hooghly, Govt. of West Bengal.

Consumption of nitrogen has increased from 7.69 thousand tonnes in 1970-71 to 10.98 thousand tonnes in 1974-75 to 20.04 thousand tonnes in 1979-80 to 26.10 thousand tonnes.
in 1983-84. Roughly there has been an increase of 350 per cent in consumption of nitrogenous fertilizers.

Consumption of Phosphatic fertilizer has increased about 400 per cent since 1970-71. Consumption of this fertilizer was 11.18 thousand tonnes in 1983-84 against 2.99 thousand tonnes in 1970-71, 7.11 thousand tonnes in 1978-79, 9.64 thousand tonnes in 1980-81.

Increase in consumption of Phosphatic fertilizer was followed by increasing use of potassic fertilizer. In this case there has been 300 per cent increase. It increased from 2.89 thousand tonnes in 1970-71 to 6.12 in 1978-79, 8.62 in 1983-84.

Though there has not been considerable increase in use of organic fertilizers along with the increase in consumption of chemical fertilizers efforts are being directed to augment the production of such manure through rural compost scheme. Production of rural compost is expected to be 6,75,000 M.T. in 1984-85.

**Plant Protection Measures**

Simultaneously with the increase in use of organic and chemical fertilizers there has been increasing use of pesticides and fungicides as a measure of plant protection. The
Plate 4. Spraying of agricultural medicine
following table reveals the consumption of agricultural medicine in 1983-84 in the district.

Table 2. Consumption of agricultural medicine (1983-84)

(1) Insecticides.
   a) Dust .. 255.634 M.T.
   b) Liquid .. 42.48 Litres
   c) Granular .. 92.643 M.T.
   d) Wetable Powder (W.P.) .. 51.286 M.T.

(ii) Fungicides .. 48.401 M.T.

Several plant protective measures are adopted through the use of medicines in the district. The following table reveals the item of work in this respect and area covered by them.
Table 3. Area covered and used treated seeds 1983-84

<table>
<thead>
<tr>
<th>Item of work</th>
<th>Area in hectare</th>
<th>Used treated seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Seed treatment</td>
<td>64,329</td>
<td>52,545 M.T</td>
</tr>
<tr>
<td>b) Field treatment</td>
<td>156,371</td>
<td></td>
</tr>
<tr>
<td>c) Rodent control</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>d) Weed control</td>
<td>49,230</td>
<td></td>
</tr>
</tbody>
</table>

Source: Principal Agriculture Office Hooghly, Govt. of W.B.

Multiple Cropping Programme

With the installation of this programme i.e. growing of more crops per year per hectare the production of various crops has increased manifold in the district. Area sown more than once increased from 42.5 thousand hectares in 1966-67 to 68.9 thousand hectares in 1967-68, to 93.3 thousand hectares in 1973-74, to 136.4 thousand hectares in 1981-82. The following table reveals that the net sown area in the district remained almost the same, of course with slight decreasing
tendency. It has decreased from 224.5 thousand hectares in 1966-67 to 204.4 thousand hectares in 1981-82. Where as the gross cropped area in the district increased from 267 thousand hectares in 1966-67 to 320 thousand hectares in 1972-73, to 361.4 thousand hectares in 1974-75, to 403.7 thousand hectares in 1981-82. This was the result of multiple cropping programme which was materilaised by the development in irrigation, increased use of fertilizers, adoption of late sowing and short duration varieties, adjustment in the time of sowing, planting and harvesting, introduction of new crops in place of or along with traditional crop, and the selection of proper rotation.

Table 4 reveals that net area sown experienced a great fluctuation during the period from 1966-67 to 1977-78 and thereafter gradual decreasing trend was noticed. Before 1977-78 the fluctuation was caused by current fallowing due to climatic hazards or socio-economic factors. The decreasing trend after 1977-78 was due to use of agricultural land for non-agricultural purposes like construction new high ways, installation of brick building industry and sand quarries.

Area sown more than once and gross cropped area though recorded overall increasing trend since 1967-67 were not also free from such fluctuation as it was noticed in net sown area.
### Table 4. Net sown area, area sown more than once and gross cropped area (Area in 000' hectares.)

<table>
<thead>
<tr>
<th>Years</th>
<th>Net area sown</th>
<th>Area sown more than once</th>
<th>Gross Cropped area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966-67</td>
<td>224.5</td>
<td>42.5</td>
<td>267</td>
</tr>
<tr>
<td>1967-68</td>
<td>239.9</td>
<td>61.9</td>
<td>301.8</td>
</tr>
<tr>
<td>1968-69</td>
<td>219.2</td>
<td>68.9</td>
<td>288.1</td>
</tr>
<tr>
<td>1969-70</td>
<td>234.3</td>
<td>71.4</td>
<td>305.7</td>
</tr>
<tr>
<td>1970-71</td>
<td>213.6</td>
<td>93.3</td>
<td>306.9</td>
</tr>
<tr>
<td>1971-72</td>
<td>220.2</td>
<td>96.0</td>
<td>315.2</td>
</tr>
<tr>
<td>1972-73</td>
<td>230.9</td>
<td>89.0</td>
<td>320.0</td>
</tr>
<tr>
<td>1973-74</td>
<td>217.9</td>
<td>133.7</td>
<td>351.7</td>
</tr>
<tr>
<td>1974-75</td>
<td>232.2</td>
<td>129.1</td>
<td>361.4</td>
</tr>
<tr>
<td>1975-76</td>
<td>229.8</td>
<td>124.2</td>
<td>354.1</td>
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<td>1976-77</td>
<td>232.4</td>
<td>117.4</td>
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<td>1978-79</td>
<td>220.6</td>
<td>117.5</td>
<td>338.1</td>
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<td>1979-80</td>
<td>220.7</td>
<td>140.2</td>
<td>360.9</td>
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<tr>
<td>1980-81</td>
<td>220.6</td>
<td>117.5</td>
<td>338.1</td>
</tr>
<tr>
<td>1981-82</td>
<td>204.4</td>
<td>133.7</td>
<td>403.7</td>
</tr>
</tbody>
</table>

Source: Principal Agriculture Office, Hooghly, Govt. of W.B.
Plate 5. Shallow tube well
Increased Irrigation facilities:

The increase in gross cropped area and area sown more than once was achieved through extension of irrigation facilities from different sources. Net area irrigated increased from 123.1 thousand hectares in 1967-68 to 183 thousand hectares in 1971-82. Such spectacular achievement in irrigation was the result of installation of minor irrigation projects particularly tapping underground water by means of shallow and deep tubewells and river lifting.

Table 5. No of minor irrigation installation 1973-74 to 1983-84.

<table>
<thead>
<tr>
<th>Year</th>
<th>Deep tubewells</th>
<th>Shallow tubewells</th>
<th>River Lifting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973-74</td>
<td>240</td>
<td>5720</td>
<td>219</td>
</tr>
<tr>
<td>1976-77</td>
<td>240</td>
<td>6081</td>
<td>262</td>
</tr>
<tr>
<td>1983-84</td>
<td>342</td>
<td>19,672</td>
<td>323</td>
</tr>
</tbody>
</table>

ii) Annual plan of Agriculture in Hooghly '84.
Plate 6. Deep Tubewell
The above table reveals that the number of minor irrigation installation has increased considerably. In 1983-84 the number of deep tubewells was 342 against 240 in 1973-74. Number of shallow tubewells increased from 5720 in 1973-74 to 19,672 in 1983-84. River lifting unit increased from 219 in 1973-74 to 323 in 1983-84.

**Conclusion:**

Though overall progress in the production and yield of crops has been achieved in the district as a result of the implementation of various programmes of Green Revolution, all the farmers, rich and poor have not been able to apply equally the benefit of the programmes. Rather, disparities in incomes have been widened by these innovations. Agricultural inputs (in particular chemical fertilizers) were largely cornered by rich farmers, whereas the poor farmers found themselves handicapped by small size of farms and inadequate inputs, techniques, and water supplies. Green Revolution has, therefore, tended to have its most concentrated
Plate 7. River lifting station
application on large farms and by big farmers. Earnest Fedear
has correctly observed "Green Revolution is a programme for
landowners par excellence and cannot be different; they are
already better equipped, have almost exclusive access to inputs
and output markets and are the major, if not the exclusive
recipient of agricultural credit".

It is, therefore, imperative to take up several measures
to bring the benefit of the so-called Green Revolution to
all categories of farmers particularly the poor. Adequate
loan facility from banks and co-operative societies is to
be provided to the small and marginal farmers in order that
they may purchase improved seeds and fertilizers during
a particular crop season with a view to achieving multiple
cropping programme. The small and marginal farmers should
also be provided with financial assistance from the banks
for the purchase of pump set, improved agricultural machinery
like tractors, thrasher and installation of shallow tubewells
at subsidized rates. The small farmers should also be encour-
gaged providing financial assistance to install shallow tube-
wells on co-operative basis with a view to making the minor
irrigation scheme a success.
References:


7. Agricultural Situation in India, New Delhi, Various Issues.
