CHAPTER V

AGRICULTURE

The following account of the agriculture of the district is condensed from a very complete report by Mr. A. C. Sen.[1]

RAINFALL

For successful cultivation, the most important point is the distribution of rainfall and in Burdwan, as in other districts of Bengal, the total amount is a secondary consideration. The distribution suitable for paddy—by far the most important crop of Bengal—may be gathered from the following rural doggerels :

1. Yadi barshe aghane, Raja namen magane.	If it rains in Agrahayan, kings have to beg.
2. Yadi barshe poushe, taka hay tushe.	If it rains in Pous, even husk brings money.
3. Yadi barshe magher sesh, dhanya rajar punya desh.	If it rains at the end of Magh, blessed is the king's virtuous land.
4. Yadi barshe fagune, china kaon dwigune.	If it rains in Falgun, the yield of china and kangu is doubled.
5. Chaitre mathamathar,	Slight rains in Chaitra.
Baisakhe jhar pathar ;	Storms and hail in Baishakh are good,
Jaistye re na uthe,	In Jaistya the grass should never be allowed to grow ;
Ashare barsha ba the ;	Ashar should be a month of endless rain,
Karkata chharkata,	Frequent showers of rain are required in Sraban ;

1. Calcutta, 1884, (reprinted 1897).

Sinha sukana,	Bhadra should be a dry month,
Kanya kane kan ;	The fields should be brimful of water in Aswin ;
Binabay tula barshe,	If there be rain without wind in Kartik,
Kotha rakhho dhan.	Where shall I keep the paddy ?

These verses were probably composed at a time when some of the crops now under cultivation had not been introduced and as regards those crops they require recásting. Rain at the end of Magh for instance would not be welcomed by the potato grower.

IRRIGATION

The great want of the Burdwan district, especially of its western and central parts, is a proper supply of water for irrigation purposes. The rainfall being often deficient in total amount or irregular in distribution, artificial irrigation is necessary for almost all the important crops except pulses and barley. In fact the cultivation of sugarcane, potatoes, onions and other important crops can only be undertaken in places where water is available.

The importance of irrigation was fully understood in ancient time. In no other part of Bengal are so many tanks to be found, but almost without perhaps exception they have been long neglected, and are now overgrown with weeds and filled up with silt. Wells are not numerous and the cultivators have a superstitious dread of irrigating lands with water raised from them.

In the hill tracts of the west the practice of storing up rain-water is well understood, and the whole system of cultivation there may be said to be dependent upon it. Terrace cultivation, wrongly supposed by many to be peculiar to China, is the out-come of attempts to store rain-water. The hillsides are converted into tiers of rice fields, often of the

smallest size conceivable, which are embanked along their lower edges. The rain-water in its downward course is thus arrested and, instead of being allowed to pass down the hillside in a torrent, is made to irrigate the fields one after another, each retaining its just share and no more. The cultivators along the banks of the smaller streams have also dicovered that at the season when they are apparently quite dry all that is necessary is to make holes in the coarse red sands of which their beds are formed in order to obtain a good supply of pure sweet water.

WATER LIFTS

The implements used in irrigation are simple and inexpensive, but fairly efficient. Water is raised from wells by means of buckets or earthen pots with a rope which is occasionally put round a pulley on a wooden bar fixed on supports. For irrigating from fields, tanks or shallow depressions a *donga* is used to raise the water. This is a canoe-shaped trough of which the free end is attached by a rope to a long lever fixed in an upright above the irrigation channel with a counterpoise. The lever is depressed by the labourer and the free end of the trough dipped in to the water. On its release the lever rises pulling up the trough, the contents of which are poured into the irrigation channel. *Dongas* are now generally made of iron. Water can be raised in this way two or three feet, and if a further lift is required, either the basket *(sini)* which is worked by two men is used, or more than one stage is constructed. This adds considerably to the cost of irrigation.

CANALS

The question of improving the canal system of the district was fully discussed by the Irrigation Commission. There is only one protective irrigation work, the Eden Canal, an irrigation channel 22 miles in length from Kanchannagar to Jamálpur, which was constructed in 1881 with the object

of flushing the old river beds, whose stagnant and insanitary condition was believed to be largely responsible for the epidemic of malarial fever. Though the canal was constructed primarlily for sanitary purposes it has been largely used for irrigation, and in 1904 the Collector reported that some 20,000 acres of land were irrigated from it. At present about 33 suqare miles in the Burdwan and Jamalpur thanas and the Memari outpost are irrigated from this canal and its distributaries. The finding of the Irrigation Commission on the subject of the Eden canal is as follows :

"That although they were assured in evidence that there was a great demand for irrigation on the Eden Canal, there was no evidence to show that the irrigators would be willing to pay more for the use of the water than they now do, that is, about a rupee per acre. We are of opinion that the irrigation system of the Eden Canal can never be satisfactory until there is a weir across the river at its head sluices. But this canal is not required for protection against famine, and until the irrigators are ready to pay for the water rate sufficient to ensure a fair return on the capital cost we cannot recommend Government to incur this outlay." The conclusion thus reached is that the district does not require irrigation works as a protection against famine. The cost of the weir across the Damodar, to which the Commission referred, is estimated at 8 lakhs of rupees, and as the canal works at an average annual loss of Rs. 10,572 there is no inducement to incur this heavy capital outlay.

SOILS

Burdwan is separated from the Gangetic delta by an important branch of the Ganges, and it is probable that at no very ancient date the main stream of that river used to pass along its eastern boundary. The soil of most parts of the district differs considerably from that of central Bengal, both chemically and physically, as might be expected from the difference in their geological origin. The whole of the

western and a very large area in the eastern portions of the district are formed from the debris of the hills of Manbhum, Singhbhum and the Santal Parganas. In the west in many places the soil is formed directly from the subjacent rock more or less altered by the action of rain-water, atmosphere and other disintegrating agencies. The greater portion of the eastern tract consists of materials transported by mountain streams having their origin in the hills mentioned above and pouring their waters into the Hooghly. Soils showing very evident marks of glacial action are also to be met with. The soil is partly a laterite clay, more or less altered, and partly a red-coloured coarse-grained sand, characteristic of the eastern ranges of the Vindhya formation, large surfaces composed of which are to be found in the beds of the Dwarkeswar, Damodar and Ajay rivers.

Paddy and sugarcane are the two characteristic crops of the Burdwan district. These crops grow both in the laterite clay and the red sand, though a soil formed of a mixture of the two is considered the best for sugarcane. The clay is very difficult to work, turning into a mass of most tenacious mud in the rainy season, and being as hard as stone in the summer. On account of this difficulty in many places nothing but paddy is grown, to which crop this clay is well-suited. After the rains have set in and the clay has been softened by deep ploughing, the rice seedings are planted. Sugarcane also grows well on this red caly which contains the hydrated sesquioxide of iron and is rich in phosphorus, the latter mineral being, as agricultural chemistry tells us, the predominant element in sugarcane. This crop, however, requires irrigation in April when water is very scarce, and lowlying land is unsuited on account of the danger of inundation during the rainy season. It is therefore only within limited areas that this important crop can be successfully grown.

The most practical classification of soils is into high land, low land and *diara*, or alluvial river land. From the

nature of their formation, the elevated tracts lie along the river banks and slope towards the interior. Generally speaking they consist of either sand or sandy loam, whilst the low grounds are more or less of clay. As might be expected, the high grounds are mainly occupied by human habitations and form village sites. The high land remaining for agricultural purposes is that lying around villages, and is more or less sandy, and above the ordinary flood level. In the rainy season the washings of the villages manure this land which fetches the highest rents. It grows a variety of crops. In the rainy season it is sown with *aus* rice or jute, or if it is safe from inundation it may be planted with sugarcane. Vegetables may also be grown on it, and it will pay to manure it heavily and to cultivate potatoes, sugarcane, onions, plantains and other valuable crops. Unfortunately such land forms a very small portion of the area under cultivation.

Greatly the larger part of the cultivated land consists of the lowlying tracts separating the village sites from one another. This land is mostly clay, is submerged during the rains and remains dry only during the few hot months of the year. The sole crop this land grows is rice except in very rare cases, when near the homesteads a little summer sesamum is sometimes grown. The diara lands are formed by the deposition of river silt in the beds and on the banks of rivers and are most sought after by the cultivators. They are renovated every year during the rains by a deposition of silt, and require no manures. They are the most suitable for winter and spring crops, pulses, wheat, barley, oilseeds and vegetables. These also grow the most luxuriant indigo, and if any fodder and fuel reserves are to be made these are the lands to which attention should be directed. The cultivation of *diara* lands is the simplest in existence. Tillage operations are confined to one or two ploughings, and often the seed in sown broadcast on the soft mud left by the receding inundation without any previous preparation of the land.

PRINCIPAL CROPS

The following table shows the normal acreage of the crops of the district and their percentage on the normal net cropped area :

Name of crop	Normal acre-age	Percentage on normal net cropped area	Name of crop	Normal acre-age	Percentage on normal net cropped area
Winter rice	874,800	81	Summer rice	300	–
Sugarcane	25,800	2	Wheat	1,800	–
Total *aghani* crops *(a)*	900,600	83	Barley	7,000	½
			Gram	9,100	1
			Other *rabi cereals* and pulse	51,200	5
Autumn rice	140,000	13	Other *rabi* food crops	40,000	4
Maize	3,000	½	Linseed	22,500	2
Other *bhadoi* cereals and pulses	6,700	⅔	Rape and mustard	21,100	2
Other *bhadoi* food crops	2,200	⅕	*Til (rabi)*	500	–
Other *bhadoi* non-food corps	10,000	1	Other Oilseeds	1,500	–
Jute	16,500	1½	Tobacco	400	–
Til (bhadoi)	3,300	3/10	Other *rabi* non-food crops	1,200	–
			Total *rabi* crops (c)	156,600	1½
Total *bhadoi* crops *(b)*	181,700	17	Orchards and garden produce *(d)*	5,000	½
Total of *(a)*, *(b)*, *(c)* and *(d)*				1,243,900	115
Deduct area cropped more than once				162,200	5
Net area (normal) cropped				1,081,70	100

RICE

Rice is by far the most important crop of the district : in fact in the alluvial plains to the east little else is grown. All the different varieties cultivated may be grouped under three primary classes distinguished from one another by marked characteristics—the *aus* or autumn, the *aman* or winter and the *baro* or marsh rice. The first is a coarse grain difficult to digest and eaten by the poorer classes alone.

It is grown on high lands, and requires much less water than the other two. When sown broadcast, as is the general practice, it is a good deal more troublesome to grow than the *aman*. It also yields a smaller outturn and fetches a lower price. But it supplies the cultivator with food and his cattle with fodder at a time of year when both are very scarce. It is reaped early enough to permit of the preparation of the land for the spring cereals, pulses, vegetables, potatoes and sugarcane. The *aman* rice includes much the greater number of varieties and is grown over a larger area than any other crop. It is cultivated on low lands with a clay soil, and requires much more water than the *aus*. The finest descriptions of rice belong to this class. The *boro* is a coarse rice, some of the varieties being the coarsest known, and is less nutritious than the other kinds. It is grown on soft mud on the sides of rivers, canals or lakes. Edges of rivers subjected to strong tides are of all places the most suited to growing this class of paddy.

Almost every considerable village has a variety of its own, and every year sees the extinction of some of the old varieties and the appearance of some not known before. Rice is perhaps the best instance known of the variations which plants have undergone under cultivation. Originally an aquatic grass, the one characteristic which it has most persistently retained amidst all the changes brought about by differences of climate, soil and mode of cultivation is the need of abundant moisture for its proper growth. According to the popular saying "*dhan pan nitya snan*"– rice and betel should have a bath every day. It is the well justified belief of the cultivators that give rice but this one thing needful, and it will grow in any soil and under any climate. Indeed, the facility with which it adapts itself to different classes of soil from the stiffest clay to the lightest of sands, and from the peaty to the saline, is wonderful. Compared with the advantages of a proper water-supply all other questions regarding its cultivation are matters of very minor importance.

AUS RICE

The high lands on which *aus* rice is grown generally produce two crops in the year ; but where irrigation is available three are sometimes grown, viz, *aus* rice, potatoes and onions. As soon as it has been gathered the field is prepared for one of the spring crops, generally in this part of the country one of the pulses or oilseeds. In *diara* lands it is sometimes followed by wheat, barley or potatoes.

Aus lands are almost always manured excepting those near large rivers, which receive a yearly deposit of silt. As the same field generally gives two crops in the year the practice is to apply as much of the manure as possible before rice is put in, end to let the crop following benefit by what is left after the rice has taken its share. This plan is adopted because the direct application of manure is not beneficial to such crops as the pulses, potatoes, etc., and in some cases it is positively injurious. As soon as the previous crop is off the field the land is ploughed twice, once lengthwise and once across the field. Ploughing does not begin usually till the 15th February, unless the rice is to be followed by one of the spring crops or potatoes. In some places the first ploughing is delayed till the 15th April, but good cultivators are well aware of the advantages of early and frequent ploughing in the case of upland. The fields are ploughed seven or eight times and by the end of April are well dried, and the roots of the weeds and grasses are destroyed by the burning heat of summer.

Implements to drilll in the seed are seldom used, and it is generally broadcasted. In the case of rice, however, the general tendency now is to sow in nurseries, and to transplant the seedlings when favourable weather occurs. The plants come out in four or five days, and when they have grown to a height of about nine inches it is well to take advantage of a shower of rain and harrow the field. The greater part of the weeds are thus removed, but sometimes as many as three weedings are needed ; and weeding is a most tedious and expensive operation. The harvest time for *aus* rice extends over the last three weeks

of September. It is reaped while yet slightly green, for if allowed to ripen fully it would shed some of the grain, and the straw being brittle would break. It is cut close to the ground with a sickle and laid in the field in parrallel lines for nearly a week. It is afterwards made into sheaves and taken to the threshing-floor, or put in heaps of some 100 to 150 sheaves each, the tops and sides of which are carefully smoothed to let rain water run off easily without penetrating into them. The outturn per bigha varies from 4 to 8 maunds of grain and 6 to 8 *pons* of straw.

AMAN RICE

Aman rice is grown on lowlying clayey lands, and it requires such a large quantity of water that high lands, unless situated very close to tanks, canals or any other reservoirs of water, are not suited for its production. Some of the best varieties require a clay soil and about one and a half feet of water almost from the time of planting to harvest time. The method of cultivation differs according to the comparative height of the land to the sown, that is, according as it is situated below the *aus* land or much lower down, remaining under water for the greater part of the year. In the first case the land is generally loam and the rice is either sown broadcast or transplanted. In the other case the soil is almost invariably clay, and transplanting is the general rule.

The lowlying clay lands suitable for transplanted *aman* rice receive very little tillage. Some cultivators are of opinion that these lands ought not to be ploughed in summer, for this operation destroys the grasses on the growth of which the success of the crop depends. In April or May, after a heavy shower of rain, the land may be once ploughed, while the soil still contains a large amount of water. This ploughing of the wet land instead of destroying the grasses encourages their growth. At the end of June, when the land has been quite saturated by the monsoon rains, the low embankments round the field should be repaired and water allowed to collect within them. The grasses are then ploughed into the soil and the seedlings planted. There is no doubt some truth

in the statement that grasses serve the purpose of green manuring; but this practice can be carried too far, as is evident from the fact that rice grown on lands which have not been early ploughed frequently suffer from the disease known to the cultivators as *kadamara*.

For the nursery a plot of ground is chosen either in a corner of the field itself or in a place where water is easily available. It is heavily manured with well-rotted dung and ashes after careful ploughing. For sowing advantage is taken of a slight rain, or the moisture necessary for the purpose is obtained by artificial irrigation. A maund of seed is sown broadcast on a bigha of nursery land. Sometimes a little more. The field must not be watered after sowing, for this causes the soil to sink and cake, which greatly interferes with the proper germination of the seed. The seedlings are ready for transplantation when they are about a foot high. After they have been taken out their roots are well washed. They are then made into bandles, each bundle containing as many plants as can be grasped with both hands and kept floating in water. They may be transplanted either on the day they have been removed from the nursery or the day after, further delay being, according to general opinion, injurious. But on this point opinions differ. Some think that the seedlings should never be planted fresh, and that they can be kept for three or four days without being any the worse for it. One bigha of land will require 60 to 70 bundles of seedlings, and this is the produce of about two kathas of nursery.

The usual time for transplanting is the end of June and the beginning of July, but very much depends in this respect on the period and amount of rainfall. The seedlings are planted in the soft earth at a distance of nine to fifteen inches apart, four to five being placed together. Being a crop of the rainy season *aman* rice does not generally require artificial irrigation, but in October and November, just when the plants begin to blossom, it is sometimes necessary. Manuring is not much practised in its cultivation, but in some places the more intelligent cultivators use 20

baskets of cowdung or a maund of oil-cake per bigha just before transplanting the seedlings.

POTATOES

This valuable crop is largely cultivated in the Burdwan district, and the cultivation is yearly increasing. The localities generally selected for its cultivation are the old beds of rivers, and the crop is grown with great success in the neighbourhood of Chakdighi, Saktigarh, Satgachia and Bohar. It is also grown largely in the portion of the district which lies to the south of the Damodar river. The best potato soil is a sandy loam having as fine a texture as possible. It must not be saline, nor contain too much iron. Soils containing *kankar* or nodules of carbonate of lime are also considered unsuited for potatoes. As artificial irrigation is indispensable canlas, tanks, marshes or some other form of reservoir must be close by. Irrigation from wells is not resorted to, but the practice of potato-growers in the Patna and Shahabad districts shows that where labour is cheap and the water is within a reasonable depth this mode of irrigation can be profitably adopted. Potatoes are often grown on the same field year after year, a newly broken field not giving a good outturn. They are generally grown after autumn rice as a second crop ; but a field which grows only potatoes gives a better and much earlier crop which brings greater profit to the cultivator, although early sowing is attended with risk of serious injury from late rain. Of the other crops sugarcane, oilseeds and pulses are grown every- where and a small quantity of jute is grown in the thanas of Kalna and Jamalpur. Indian-corn is raised on the western border.

EXTENSION OF CULTIVATION

No statistics showing the extension of cultivation are available, but it is known that large areas have been brought under cultivation within the last half century, especially in the western part of the district, which a hundred years ago was an unpeopled wilderness of *sal* forest and jungle. There

is now little land in the district of any agricultural value which is not used for crop.

IMPROVEMENT OF METHODS

Little has been done to improve the methods of cultivation and, until recent years, to introduce new crops or to improve the fertility of the crops grown. The implements used by the ordinary cultivator are simple and inexpensive and yet efficient ; and it would be hard to find any substitutes that would so well suit the condition of the people and the climate. Perhaps the most important mechanical advance has been the introduction of the Behia sugar mill which has in most places superseded the old wooden screw. Iron pans have replaced earthen vessels for boiling the sugarcane juice and, as has already been noted, irrigation vessels are now often made of iron instead of wood. Attempts have from time to time been made to introduce iron ploughs, but without much success.

MANURES

Manures are largely used and their use is well understood. In most villages few fields, excepting those grown in rice, can be found which receive none, while no farmer would dream of growing without manure such crops as sugarcane, potatoes, onions, etc.

Those generally used are–

Cowdung,
Cowdung ashes,
Oil-cakes, including both castor and mustard cake,
Hide salt, and
Tank mud.

Cowdung is to some extent wasted by being used as fuel, but generally no good cultivator would think of doing so. Cowdung is considered *the* manure, and the Bengali term for manure is synonymous with it. An idea may be formed of the high appreciation in which it is held by the popular rural saying "*sar satya Lakshmi*"—Cowdung is the

real Lakshmi (goddess of fortune). Every farmer has his dung-heap. For this a piece of low ground is selected close to the cowshed, or a hole is made in which is collected the daily supply of dung, dung ashes, wood ashes, waste straw, refuse of vegetables, and in fact everything that has the least manurial value. Both castor and mustard cakes are now very largely used especially in potato, sugarcane, ginger and cabbage fields. The other manure most commonly used is the black mud which is scraped off the bottom of tanks. To obtain the best results it is necessary to apply it in large quantities.

The rotation of crops is practised, but it cannot be said that any regular system of rotation is followed. The condition of the field at the time, the state of the weather, the demand in the market and the individual means of the particular farmer are the considerations that usually determine the particular crop. The general custom is to grow rice after rice on the lowlying lands, and on the higher grounds surrounding the village sites to grow autumn rice in the rainy season and one of the pulses as a winter crop. Potatoes, onions, etc., sometimes take the place of the pulses. Sugarcane is a special crop requiring a full year to ripen, and is grown at intervals of three or four years.

CATTLE

The plough cattle of the district, like those of the rest of Bengal, seem to belong to a special bread, perhaps indigenous to the Gangetic delta. Generally speaking only as many animals are kept as are needed for the cultivation of the land and the supply of a few ounces of milk for family use. All the live-stock that an average farmer possesses consist of a pair of bullocks and a milking cow and calf. Simetimes one spare bullock is kept, but as often as not the cow and the calf are wanting. The area of land that can be worked with a pair of bullocks depends very much on the nature of the soil. Where rice is the only crop

grown a pair of good animals is considered sufficient for 20 to 25 bighas of land. Cattle suffer much from want of pasturage. In the west the country is hilly and undulating and mostly devoid of natural vegetation ; the wild grasses on the laterite soil are few in number and yield a very small amount of fodder. In the eastern portion of the district the pressure of the population is such that no land which is in any way fit for cultivation can be spared for pasture or for raising any crop specially meant for fodder. The grazing grounds which were formerly common to the village have been absorbed, and the rice straw which is by far the most important, if not the only fodder for the cattle, is required for thatching. Hay-making is practically unknown, and the system of grazing followed is most wasteful. The grazing grounds, where such exist, and the fields are never protected by fences, and the cattle are at liberty to run over them at all times without restriction. Grasses thus get no chance to grow as the cattle crop them down as soon as they appear above ground.

FAIRS

Annual fairs are held at Agradwip in the Katwa subdivision, at Bagnapara and Uddhanpur in Kalna, and at Dadia and Kanchannagar in Burdwan. These gatherings, particularly those at Bagnapara, which is a Vaishnavite place of pilgrimage, and Agradwip where there is a religious festival in April every year at which some 10,000 people assemble, are mainly of a religious character, but are also used for trade purposes.

BURDWAN AGRICULTURAL FARM

The Palla farm was started by the Burdwan Raj in 1885 and is situated at Palla on the bank of the Eden Canal, about three miles south of the Burdwan Railway Station. The area is 31 acres of which 25 are cropped, the remainder being under roads, buildings, etc. The station is maintained

by the Burdwan Raj under the supervision of the Agricultural Department. The annual expenditure amounts to Rs. 4,500 and the annual income now is about Rs. 2000. Under a recent agreement the Raj deposits annually in the Burdwan Treasury Rs. 2,500 to the credit of the Deputy Director of Agriculture. If in any year the profit on the station exceeds Rs. 2,000 or the total expenditure is less than Rs. 4,500 the proportionate sale-proceeds will be credited to the Raj. The chief crops grown are paddy, jute, potatoes and sugarcane.

AGRICULTURAL ASSOCIATION

An Agricultural Association has recently been started, the members are landholders and pleaders and the proceedings are usually conducted in English. The cultivators' holdings are generally very small, but it is hoped to reach the actual cultivator of the soil through the landlord by means of the Association. It has already done much in the way of seed distribution to cultivators, and there is an annual agricultural show in connection with it.