

PART III.

CHAPTER I. SYSTEM OF AGRICULTURE.

Dry crops—Preparation of the ground, Cholam, Cotton, Indigo, Wheat, Flax.—Wet crops.—Paddy, sugar-cane.—Garden crops.—Cocconut, plantains, nut-trees, betel-vines, tobacco.—Manures—Fallows—Rotation of crops—Cultivation statistics—Cattle and sheep—Their diseases.

ACCORDING to the system adopted by the Settlement Department, lands are thus classified :—

1. Alluvial or exceptional series.
2. Régada series.
3. Red Ferruginous series.
4. White and grey calcareous series.
5. Arenaceous series.

The alluvial or exceptionally fertile soils are not found in the district. The "Régada" or black cotton soil abounds especially in the northern and western taluqs. "Lal" is the local name for the third class of soils, and the fourth and fifth classes are comprised in the "Masabu" or mixed soils. The extent to which each of these three classes of soils, Régada, Lal and Masabu is found in the district is roughly shown in the annexed table.

But the crop grown, and the system of cultivation adopted depends not so much on the nature of the soil, as on the possibility of obtaining a sufficient supply of water. In the accounts therefore the land was formerly classified under the heads of :

Regad.....	1,000,000 acres.	
Masabu.....	2,000,000 "	
Lal.....	2,500,000 "	

- I.—Dry or Unirrigated (Punjah or Kúshki.)
- II.—Wet or Irrigated (Nunjah or Tarri.)
- III.—Garden (Totacal.)

Since Mr. Pelly's revision in 1858 all land has been classed either as "Wet" or "Dry." Certain crops however are still known as garden crops.

I. Dry.—The method adopted in preparing the dry lands for cultivation is as follows:—On the first fall of the rains in June at the beginning of the south-west monsoon (locally known as the Mungári rains), the ground is tilled with ploughs (Madaka) of which the size and the number of bullocks yoked vary according to the nature of the soil. In the Masabu and Lal earths, from two to four bullocks are used; but in the stiff black cotton soil, from six to twelve are required. After ploughing lengthways and crossways, a harrow (guntaka) is drawn over the field by which the clods of earth are pulverized, and wild plants and roots removed. The usual manure is the napped in the proportion of about five bandy-loads to an acre, and, when possible, a flock of sheep is penned on the land. The seed is then sown by a kind of plough called a "Gorru." By means of three hollow bamboos which at their lower end intersect a transverse beam at equal intervals, and which at their upper end are tied together and embraced by a wooden bowl (jadigam) three rows of seed are sown at once. The yoke is fastened to the transverse beam, and as the plough goes along the seed is poured by a woman into the 'jadigam' and passes down the hollow tubes into the ground. A flat board placed edgewise and fastened to the machine completes the process by levelling the furrows and covering the seed. A weeding-plough of very simple construction is used twice at proper intervals of time to loosen the earth about the roots and to destroy the rank and wild weeds. The cultivation of dry grain is chiefly carried on between June and September, and the later crops are sown in November and reaped in April. The south-west monsoon assists the growth of the Mungári or early crops, and the north-east monsoon of September and October that of the Hingári or later crops which are afterwards matured by heavy falls of dew.

The diet of the chief part of the population of the district consists of (1) Cholum, (2) Ragi, (3) Korra. These with cotton are the crops more extensively cultivated.

Cotton.—The cotton-growers of Bellary consider irrigation injurious in the heavy black soils, but in the lighter red and mixed soils such irrigation might be of advantage. The experiment so far as

is known has never been tried. The crops raised on these red and mixed soils do not exceed 25 per cent. of the out-turn of the crops on the régada soils, and are reserved exclusively for home consumption.

It is usually sown with "Korra," two rows of the latter being sown for each one of cotton. Mr. Pelly estimated the out-turn on good soil "at 15 maunds (375 lbs.) per acre. Deducting 5 maunds for the remuneration of the coolies, there is left 10 maunds which will give $2\frac{1}{2}$ of ginned cotton."

The cotton crop is not attacked by insects, but sometimes when a wind has blown from the north-east it is subject to a blight. There are three varieties of this blight. In that called "mujjega" the leaves become white; in "mussi" the young leaves turn black and wither away, and in the disease called "Bingi" they become spotted and yellow. Should the wind change and the sun shine brightly, the plant recovers.

Cotton flowers two months after sowing and comes to maturity three months afterwards.

Attempts have been made from time to time to introduce fresh varieties of cotton (Hingunghat, Sea Island, Orleans, &c.) but hitherto without success. In every experiment blight has attacked the young plants when two or three months old. A plan much more likely to succeed is to grow the cotton by selecting for seed the strongest and finest plants. The country cotton is exceedingly fine, and by the judicious selection of seed could doubtless be much improved.

This plan has succeeded in England in the case of wheat and other cereals as shown by Mr. Mechi, and the same results would probably follow were a similar trial made with cotton.

In the appendix will be found a statement showing the number of acres under cotton cultivation for a series of years, and the same particulars for Indigo.

Indigo.—Very little of this is grown, hardly any out of the Tâdpatri, Gooty and Anantapûr taluqs. It grows well in loam, but better in régada. It is usually found under wells and in garden land.

Wheat is very little cultivated. There is not much demand for it; it returns a very small profit, and unless seasonable rain falls it rapidly spoils. Unusual care is required in its cultivation, and it

is very liable to blight. The straw is not of much use. There are two kinds of wheat, the "Salakigondamalu" is grown on dry lands, but the "Javagondamalu" requires irrigation. The flour of the latter is the finer, but for sale the two are often mixed together in the proportion of two of the former to one of the latter. The estimated out-turn is from 150 to 230 seers per acre.

Flax is cultivated in about 98 acres of land in a few villages of the Hindipúr taluq, and is used in the manufacture of gunnies.

II. Wet.—The chief crops raised on irrigated land are paddy and sugar-cane.

The system followed in the cultivation of paddy is as follows:—It is usual in the hot months to pen a flock of sheep on the ground at night. As soon as the rains in June have filled the tanks, the land is inundated for five or six days and then ploughed lengthways and crossways. Leaves of the wild indigo and of the Tangadi tree (*cassia auriculata*) are then spread over the ground as manure and ploughed in house-sweepings, the refuse from bandy-stands and cowdung when available are added. After this final ploughing, a "Gantaka" (harrow) which is a long plank of wood is drawn over the field to break up any clods that remain and smoothen the surface. Seed-beds are only used for that kind of paddy which is grown in gardens. As a general rule the seed is soaked in a pot for 24 hours and then sown broadcast. A light harrow is then passed over the ground and water to a depth of four inches let in. When the crop is a month old, the ryot goes over the field taking out the weeds, thinning out the places where the young shoots are too close together and filling up the gaps in other places. A constant supply of water is needed, and in six months the crop is ready for harvest. The second crop (Vaisakh) which is sown in December or January is a coarser kind of paddy and comes to maturity in four months.

The system followed in the cultivation of sugar-caneis as follows:—The land is prepared by penning sheep upon it and also by ordinary manure. Seed-canes about a span in length and so cut as to leave two seeds in the centre of each piece are planted usually in January or February, and eleven months elapse before they yield a return. Six months after, the canes are cut for the second time. The young cane is usually watered once in eight days, and as it grows its own leaf is carefully fastened round it. The ryots say that unless this precaution is taken the canes will grow thin and burst.

Harvesting.—When the paddy is ripe it is cut down with a sickle (kodali) about four inches from the ground, and is then placed in small stacks, with the ears inward for twelve days. The grain is then trodden out by bullocks' feet. It remains in the husk till required and is stored in underground pits or in large wicker work baskets plastered with cowdung.

III. Garden.—The garden lands are usually either the *régada* or a rich loam. On them are raised cocoanut, betel, plantain and nut trees, turmeric, chillies, onions, hemp, wheat, coriander, tobacco and ragi.

Turmeric and chillies are six months or more in the garden, the latter beginning to bear eight weeks after the seed has been planted. Tobacco, wheat, onions and hemp are four-month crops, and coriander grows in two months. When the main crop of the year, which is generally sown during the north-east monsoon has been harvested, the ryots raise vegetables such as brinjals, cucumbers, pumpkins, gourds, &c. These gardens are usually irrigated by wells, which are large and deep and have been constructed at a cost varying from Rs. 100 to Rs. 800 each. Some of them are very deep and nearly all are lined with stone. The water is raised in large leathern bags pulled up by two bullocks yoked to a rope. When raising the filled skin the bullocks walk down a prepared incline away from the well, and they ascend backwards as the emptied skin redescends into the water. The rope is kept perpendicular in the pit by a pulley over which it runs. The *picottah* is unknown.

Garden land is prepared by ploughing it three or four times, and by abundantly manuring it.

Cocoanuts.—The land intended for a cocoanut plantation is prepared by four ploughings, once in each month, commencing with June, and is then exposed to the rays of the sun. For seed, cocoanuts are thrown in numbers into a marshy or boggy pit purposely prepared where they remain for about four months, until the constant moisture has loosened their hard exterior coating. They are then taken out and planted in prepared beds, the top of the cocoanut being exposed about two inches above the level of the ground. In this nursery they are watered about once in eight days, and after about eight months they begin to germinate, when they are transplanted (generally in the month of July) into pits of about half a yard deep, dug in drills at equal distances of seven yards.

The pits are manured in the usual way, and artificial irrigation is supplied every fourth day. Sometimes earth-salt is applied to prevent insects injuring the tender plant. In about twelve years the trees arrive at maturity and the fruit is then picked. After full growth has been attained, two crops are picked each year. Up to fifty years their productive powers progressively increase and then as gradually decline ceasing altogether after one hundred years.

Plantains.—Plantains will grow in almost any soil except the very sandy ones. Shoots are inserted in the ground from July to October, and sometimes in February and March, and are manured with cowdung and rubbish. In a year they bear fruit, and after it has been gathered the trees are cut down. From the stumps, fresh stems spring forth, which yield fruit for three or four years.

Areca Nut.—Nut trees are grown nearly in the same manner as cocoanut trees during the S. W. monsoon. The seeds are sown in small prepared pits about four or five inches deep. They are watered once in four days and germinate in about three months, shooting forth two small leaves. When they are six months old they are transplanted into drills distant about four yards from each other. Three years afterwards they are again transplanted. In the twelfth year of their growth they yield fruit, and their productive powers improve up to the fiftieth year, after which they decay.

Betel-vine.—In the month of August the land is prepared for sowing betel. The Agasi chettu (*Linum usitatissimum*) and the Munaga chettu or Indian horse-radish (*Hyperanthera moringa*) are first planted, and on their branches the betel-vine is trained. In September the vines are first planted in pits in the shade of these trees, and after about two months tendrils shoot out which are carefully trained. When the vines are two years old they are cut once a week with the thumb covered with an iron cap in the shape of a human nail. In this way they will continue to yield leaves for six, eight or ten years according to the care bestowed on them, and the amount of water supplied.

Tobacco.—The ground is ploughed and manured in the month of July, and for convenience of irrigation divided into small squares. The seed is sown by hand, and after the ground has been watered brushwood is placed over it to keep off the rays of the sun. A constant supply of water is needed, and after a month the young plants are fit for transplanting. After another month the top of the

plant is pinched off to prevent it from running to seed, and in four months it is fit for cutting. The plants are cut down by the roots, and left on the ground till morning when they are strung on to ropes and hung up to dry. Ten, or if it is cloudy weather fifteen days are required for this process. The leaves are then taken into a shed, and pressed between stones for five days. They are then made into bundles each weighing 2½ lbs., and in this state are brought to market. The tobacco has a very coarse and almost rank flavour, but seems to be appreciated by some classes. Mr. Broughton, Government Quinologist, reported favorably (Board's Proceedings, 7th July 1871, No. 2,778) on some tobacco grown in the Raidrúg taluq. It contained only 1·7 per cent. of nicotine and was strong in potassic carbonate "which modifies the burning of tobacco in a peculiar way to the improvement of its flavour and also positively assists its burning." On being smoked it possessed "far too strong and pyroligneous a flavour to be agreeable to a smoker unaccustomed to it." Shiraz and Manilla tobacco has been grown with success by Mr. Macartney in Sandúr.

Manures.—The best kind of *régada*, provided due attention has been paid to the rotation of crops requires neither manure nor irrigation. But the red and mixed soils and the inferior kinds of *régada* required to be manured.

1. *Vegetable Manures.*—The leaves and shoots of certain kinds of trees are put on the ground and then ploughed in. The leaves most commonly used are those of the Tangadi (*Cassia auriculata*), Kaniga (*Galedupa arborea*), and Jilladi (*Asclepias gigantea*), and the wild Indigo plant. In lands under the Túngabadra and Haggari rivers, a kind of bean (*Dolichos lablab*) is grown which is ploughed into the land at the proper season. In the Tádpati taluq the stalks and leaves of the Indigo plant are used for manure after the extraction of the dye, particularly for rice-lands. The ryot is also accustomed to pollard the trees in his holding for the leaves and branches, which while still fresh he lays on the land to ferment and decay. Neem leaves are often used for this purpose, and the ryots often buy leaves for manure.

2. *Animal Manures.*—The red soils are manured by folding flocks of sheep on them, 1,000 sheep being considered sufficient for six acres in ten nights. The universal practise of using cowdung for fuel and for plastering the walls and floors of houses, prevents its extensive use as a manure. In gardens, sheep's blood, garbage, stale

fish and other stimulating matters are applied to the betel and grape vines. Village sweepings, ashes, and other house-refuse are also employed, and each ryot has a heap of this manure kept carefully close to his house.

3. *Mineral Manures.*—The cultivating population are unacquainted with chemical and mineral manures, though in some parts of the district where there are mountain streams they have not failed to appreciate the benefit derived from the drainage of hills which (as for instance at Kona Upelpád) are composed to a great extent of lime-stone. Captain Newbold mentions that in some cases common salt is applied to the very top of the cocoanut tree, which dissolving is supposed to penetrate downward to the root and increase the quantity and quality of the fruit.

Fallows.—Irrigated lands are never allowed to lie fallow, unless the supply of water is insufficient, and even then a 'dry' crop is generally raised. Nor is it found necessary to leave the best kinds of black cotton soil to lie fallow, though a rest is afforded to the soil by altering the crops raised. At intervals about 20 years the land is thoroughly broken up by the great plough drawn by twenty bullocks, and if this is done and the weeds from time to time removed, the fertility of the soil seems undiminished. But a fallow time is necessary for the poorer red and mixed soils, and the ryots will take up land, cultivate and exhaust it in two or three years and then throw it up altogether for five or six.

Rotation of crops.—As regard rotation of crops there is no established system among the cultivating classes. But the principle of not straining the resources of the soil too far is fully understood, and a crop requiring little nourishment always succeeds an exhausting one. Thus ragi is usually sown after sugar-cane, cotton and indigo.

In the black soils cotton and korra are sown the first year, in the second cholom, and in the third year cholom or some other grain. A cotton crop is rarely raised from the same field oftener than once in three years. In the red soils horse-gram (ulavulu) is sown in the first year, sajja or jonna in the second, oil-seeds, &c., in the third, and in the fourth the land is usually left fallow or relinquished altogether.

Early in 1870 the Board of Revenue called for full particulars of the acreage under each kind of crop during the revenue year commencing 1st July 1869 and ending 30th June 1870, (Fasli 1279.)

From the report submitted by the Collector of Bellary it appears that of the whole area of the district, 60·4 per cent. was appropriated and occupied either on Ryotwari or on Inam tenure. The remainder 39·6 per cent. or 25,000,000 acres is "mountain and hill tract, wood-land, swamp and sandhill and the like, unenclosed pasture land and unappropriated culturable waste.

In round numbers 3,920,000 acres, including minor Inams and entire Shotriem villages were occupied. The area taken up for each class of products is shown as under:—

Food grains, cholom, rice, &c. ...	=	2,687,000	acres.
Oil-seeds of kinds	=	103,000	„
Green and garden crops	=	36,000	„
Topes and orchards	=	18,000	„
Cotton, indigo and sugar-cane ...	=	537,000	„
Fallow	=	541,000	„

a. *Food Grains.*—Rather more than 2½ millions of acres grew food grains. Rice is only grown where the irrigation will permit of it. Cholom, the staple food of nearly all classes occupied more than 1½ millions of acres. Wheat, millet, gram and other pulses were grown in a smaller area.

Rice ...	=	155,000
Cholom	=	1,170,000
Cumboo	=	269,000
Korra...	=	487,000
Ragi ...	=	103,000

b. *Oil-seeds.*—103,000 acres were taken up in the cultivation of castor-oil, gingelly and coriander.

c. *Green and garden crops.*

Sugar-cane	=	3,000
Indigo and dyes	=	3,000
Chillies	=	3,000
Betel and Plantain ..	=	3,000

The sugar-cane is grown chiefly in the Hospett taluq under the Tungabadra channels. 19,000 acres were used for saffron, tobacco, turmeric, &c.

d. *Topes and Orchards.*—Early in the century the district was singularly bare of trees and topes. Since that time and especially during the Collectorate of Mr. Robertson they have been planted all over the district. The tamarind, a hardy tree, will grow almost anywhere. The palmyra flourishes in the sandy soils of some of the eastern taluqs.

Cocanut... ..	=	3,000
Palmyra	=	5,000
Tamarind	=	8,000
Areca nut	=	2,000

e. *Special crops.*—32,900 acres were taken up for cotton and indigo; 227,000 were under cotton, and 52,000 under indigo. In the Appendix will be found a table giving the acreage under these crops for a series of years.

At different times estimates have been made of the value of the different crop raised and of the out-turn per acre, but no accurate trials have ever been made. These estimates differ so widely from each other, and many of them are so obviously inaccurate, that it has been thought better to take no notice of them, especially as during the present year careful experiments are to be made.

Cattle and Sheep.—According to the agricultural statistics of 1866, there were then in the district 466,000 sheep and 496,000 horned cattle.

The best bullocks are imported from Nellore, and a good pair will bring from Rupees 80 to Rupees 100. Trotting bullocks are worth Rupees 100 to Rupees 150. In the south of the district there is a small but hardy breed of cattle much used for ploughing in paddy-fields. Buffaloes are seldom used for ploughing except in stiff clay soils. The females are kept for milking and the males carry things to and from the fields on their backs. The following account of the principal diseases of the horned cattle is taken from the Medical Topographical Report of the Ceded districts.

Pedda Rogam (The big sickness) "is a purging of slime and blood during which the animal neither eats nor drinks. It occurs when heavy dews prevail. The native treatment consists in giving equal parts of the bark of the mango and fig trees with the astringent bark of the neredi chettu (*calyptanthus caryophyllifolia*) in sour buttermilk (tyre), about a pint of which is administered daily." The mortality from this disease is very great, four-fifths of the animals attacked die. Where Dr. Thacker's system has had a fair trial it has succeeded, and there are signs that the ryots are beginning to place some confidence in segregation.

Domma Rogam is a swelling of the abdomen attended by watery purging, cough, want of appetite, great thirst and frequent passing of urine, and is a disease of the hot weather. In this complaint a mash of onion, buttermilk and rice is usually given for three days, the animal is then fired on the chest, head and flanks, after which four drams of arrack are given daily for three days.

Bubba Rogam is a swelling and trembling of the whole body in which the animal neither eats nor drinks, and there is a constant flow of saliva from the mouth. The disease occurs during the rains. In the treatment a mixture of common salt and turmeric is rubbed on the tongue, and green gram and onions in buttermilk are given frequently.

Gali Rogam or maggots in the hoof.—The native treatment is to mix camphor, green tobacco and soot, and apply the mixture to the feet.

Diseases of Sheep.

Bubba Rogam in sheep is an eruption over the whole of the body which makes its appearance in the rains. It is probably due to feeding on the coarse rank grass which grows soon after the first rains.

Domma Rogam is a disease of the hot weather in which the animal is affected with puffiness of the belly, a loose watery purging and loss of appetite. Three lines are fired across the nose, but no medicine is given.

Kitkomba Rogam is a very fatal disease which appears in the rains and prevails extensively. The symptoms are swelling of the head and face, severe purging and trembling of the head and body. When it becomes epidemic, one-half of the flock at least is attacked, and the mortality is as much as 90 per cent.

The simple agricultural instruments in use have already been mentioned. The old country carts are of singular construction, but are fast disappearing and are now chiefly used by Wudders in carting stone. The wheels are from one and a half to two feet in diameter, and are made either of flat circular pieces of wood or of stone slabs. The axles revolve with the wheels, and the body of the cart is well raised above them by two straight pieces of wood on each side, in which the wheels run. The present country cart is made more solidly and has good wheels with spokes, &c., and is capable of carrying from 5 to 6 cwt.

CHAPTER II.

TRADES AND MANUFACTURES.

*Cotton Goods—Preparation of the Cotton, Tape, Carpets, Rope.—
Woollen Goods—Cumbles, Carpets, Felt—Stamping of Chintzes
—Dyes—Oils—Sugar and Jaggery—Paper—Tanning—Glass-
bangles—Ropes and Fibres—Iron foundries—Pottery.*

1. **Cotton.**—Of the agricultural products of the district *cotton* is the most important. It is the indigenous cotton (none of the foreign varieties having been introduced with success), and it is exported