

## ENCLOSURE NO. II.

### INDIGO.\*\*

#### PROGRESS OF THE INDUSTRY.

The indigo industry appears to have been introduced in Bihar between 1782 and 1785 by Francois Grand, Collector of Tirhut (Muzaffarpur and Darbhanga), who left it on record that he introduced the manufacturing of indigo after the European manner, encouraged the establishment of indigo works and plantations, and erected three at his own expense. A few years later the industry was started in Saran, the first attempt to cultivate and manufacture the dye being made in 1793, when Dr. Ivory, Civil Surgeon at Chapra, and Mr. Robert Blake, Assay Master at the Patna Mint, obtained permission from Government to build a factory at Akbarpur (now Sitalpur) in the Sonapur thana. About the same time, Mr. Champain began building another factory close by at Shikarpur, and in 1794 Mr. Shore obtained permission to start a factory at or near Darauli; a license was granted to him to hold 50 *bighas* of land, but we find five years later, in 1799, that his successor was in possession of as much as 3,750 *bighas*, half of which were under indigo. Subsequently Mr. Champain, who had not obtained a licence from Government, appears to have left the factory at Shikarpur; and having been authorized to hold land for indigo cultivation, started work at Anantpur, close to the junction of the Ganges and Gandak, where he was succeeded in 1799 by Messrs. Douie and Maitland.

During the early part of the nineteenth century factories were established in all parts of the district, but up to about 1850 the cultivation of indigo by Europeans seems to have been combined with the growth and manufacture of sugar. About 1850 the high prices obtained for indigo dealt a fatal blow at the latter industry; the cultivation of sugar was replaced by indigo, and the sugar factories were converted into indigo concerns. After this, the industry continued to flourish until the end of the nineteenth century when there were no less than 35 indigo factories and 36 outworks with 45,500 acres under cultivation. During the last ten years the industry has suffered from the competition of the artificial dye in Europe and from high price of foodgrains and the consequent demand for land in Bihar. The price of the natural dye has fallen rapidly and the area under cultivation has contracted greatly being returned at only 11,200 acres in 1906-07. Government has come to the aid of the planters with substantial grants for scientific research, the aim

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\*\* This was the text of Chapter IX "The Indigo Industry" in *District Gazetteer of Saran* published in 1908. This text was omitted in the revised *District Gazetteer of Saran* published in 1930 and was replaced by a small section of Indigo in the text of Chapter VIII (Occupation, Manufacture and Trades). That section is also quoted at the end of this text.

of which is to ascertain whether it is possible to increase the outturn and quality of the dye at a cheaper cost; excellent work in the chemistry, bacteriology and agriculture of indigo has been done and is still progressing; and efforts have been made to improve the quality of the plant by importing fresh seed from Natal. But so far these experiments have not succeeded in arresting the decay of the industry. The price obtained for indigo is barely sufficient to cover the cost of production, and many factories are either closing altogether or are reducing the area cultivated with indigo, growing in its place sugar, cotton and country crops.

### CULTIVATION.

#### *Seed.*

For a long time past the seed used in Saran has been imported, for the most part, from the United Provinces, and the system of getting seed in this way, without any special selection, has caused deterioration in the varieties commonly grown. Recently, however, Natal indigo (*Indigofera arrecta*) has been introduced, the seed being obtained direct from Natal and also from plants acclimatized in Java. This plant has been found to give a very considerable increase of colouring matter, and will produce excellent cuttings for two years in succession and mediocre plants for a third year, whereas other varieties have to be resown annually. It has a more vigorous habit of growth than the old variety, and the leaf contains a larger proportion of the colour-yielding principle.

#### *Soils and Manures.*

Indigo may follow indigo, but is more generally rotated with such crops as sugarcane, tobacco, poppy, cereals and oilseeds. It is an exhausting crop, which cannot well be grown on the same land for more than three successive seasons; on the other hand, being a deep-rooted crop it forms an excellent rotation crop for those which have surface roots, as is the case with many foodgrains. It is usually grown on high lands beyond the reach of floods, deep alluvial loams seeming to suit the crop best. The refuse indigo plant (*sith*) is the manure most easily obtained and is very valuable; but it is said that it is less suited for indigo itself than for rotation crops, such as those mentioned above, and that indigo grown on land heavily treated with *sith* is liable to injury from insect-pests. Farm manures, chemical manures, such as saltpetre and lime, bone-dust and oil-cakes are also used.

#### *Tillage.*

The land on which indigo is to be grown is prepared for sowing as soon as the *kharif* crops have been reaped. The land is ploughed and reploughed until the clods are all pulverized, and after being manured, is levelled and smoothed with a plank roller composed of a long heavy beam on which two men stand. The seed is sown

at the beginning of the hot weather and after sowing, the roller is again used to level the surface. The seedlings are very delicate until their roots are well developed, and many perish owing to dry west winds. They make slow progress until the monsoon sets in, when the growth becomes rapid; and they are ready for cutting, which takes place immediately before they flower, in July or August. A second crop, known as the *khunti* crop, is obtainable in September, but usually yields less than the first crop. The colouring matter from which indigotin is derived exists almost entirely in the leaf of the plant. It increases as the plant grows, but deteriorates after a certain stage; and it is imperative that the plant should be cut as soon as it is ripe and carted off quickly to the factory for manufacture.

#### MANUFACTURE.

##### *Steeping and Oxidation.*

The first process of manufacture consists of steeping the leaves, which is done in two sets of vats, one on a lower level than the other. Those on the highest level are used for steeping the plant, which is kept submerged by logs of wood or bars fixed in position. During this process active fermentation takes place, and when it is complete, the liquid is drained off into the lower vats, and is there subjected to a brisk beating, the effect of which is to cause oxidation and separate the particles of dye. As the oxidation proceeds, dark blue particles of indigotin appear in the liquid, and the beating is continued until a little of the liquid placed in a saucer readily throws a dark blue precipitate. Oxidation was at one time accomplished by hand-beating, but in most factories it is now done by a beating wheel worked by power from a central engine.

##### *Boiling and Final Preparation.*

Finally, the sediment (*mal*) which remains in the vat is boiled, strained, and made up into cakes for the market. The first process in the final stages of manufacture is to boil the precipitate which settles after oxidation. The dye matter is next placed on a cloth strainer until it becomes fairly dry. It is then carried to the press and subjected to gradually increasing pressure until it has taken the form of firm slabs, which are cut into cakes and slowly dried on racks.

#### LANDED INTERESTS.

The indigo concerns, as a whole, hold very little land as proprietors or permanent tenure-holders, owing to the reluctance of proprietors to sell their estates or alienate their interests by granting permanent (*mukorari*) tenures. The latter are particularly rare, and as a rule, factories hold practically no land on permanent lease, except the area occupied by their factory buildings and a few scattered patches, which circumstances have enabled them to obtain on favourable terms. The bulk of the factories interest in the land

is of a temporary nature, based on what are known as *thika* leases, which run for short periods hardly ever exceeding nine years. The ordinary conditions of these leases are that the factory shall pay the proprietor a certain amount, which is, as a rule, the total amount of the rent-roll of the village plus Rs. 8 or Rs. 10 per *bigha* available for indigo cultivation, and that on the expiry of the lease the factory shall vacate all lands in the village, after the indigo crop then on the ground has been cut. As undertenure-holders, factories hold a very small area, mainly on mortgage of some kind or other.

The main object of factories in acquiring these proprietary and quasi-proprietary rights is to secure land for the cultivation of indigo, either direct through their own servants, or through the ordinary *ryots* of the villages. A factory rarely attempts to make a profit over rent collections; not infrequently, indeed, it is content to collect less from the *ryots* than it has to pay to the superior landlord, for its object is to keep the *ryots* contented and to make them willing to grow indigo or supply land for the cultivation of indigo.

#### *Temporary Tenures.*

The temporary tenures held by the concerns are either simple leases, under which the factory agrees to pay a certain rent for a term of years, or of the nature of usufructuary mortgages, the factory advancing a certain sum to the superior landlords at the beginning of the lease. The terms of repayment vary. Under a *sadua patua* lease, both principal and interest are liquidated before the end of the period of the lease by yearly deductions from the rent payable to the proprietors. Under a *zarpeshgi* lease, the interest only is liquidated by deductions from the annual rent, and the principal is repayable at the end of the term, the lessee having a right to continue in the enjoyment of the tenure until the principal is repaid. The latter system is the more common, and is preferred by planters, because the proprietor is often unable to repay the advance on the expiry of the lease, and the factory thus continues in possession of the tenure indefinitely.

#### *Panch Kathia System.*

A factory taking a lease of a village obtains direct possession of all lands which were in the cultivation of the proprietor. Formerly it was also the custom for the *ryots*, if required, to give up a certain proportion of their holdings, generally three or five *kathas* in the *bigha*, to the factory for the direct cultivation of indigo. They received a proportionate deduction of their rent during the term of the factory's lease and a promise that their land should be restored to them on its expiry. This system, which is known as *tin kathia* or *panch kathia*, is open to many objections, not the least of which is that it frequently has the effect of obliterating tenant right. Though leases rarely run for more than nine years, they are often renewed as a matter of course, and if they are *zarpeshgi* leases, may continue

for an indefinite period. Thus, a factory may retain continuously the lease of a village and possession of the *panch kathia* lands for a generation or more, and when the time comes for the village to be returned to the proprietor, it is often impossible, in the absence of any map or record, and after the obliteration of field boundaries, which indigo cultivation entails, to say what particular block belongs to a particular holding. The system is, however, now dying out.

#### *Ryoti Interests.*

The factories possess *ryoti* interests in a small area, these interests being usually acquired by purchase at a Civil Court sale for arrears of rent. The provisions of the law facilitate such acquisition of *ryoti* rights in a district like Saran, where proprietary interests are minutely subdivided, and it is common for a factory to hold a lease of a share in an undivided estate. Under a ruling of the High Court, a tenure-holder holding a lease of a share of an estate can acquire occupancy rights during the continuance of his lease, and by paying rent to the proprietors of the share not in lease to him, become a *ryot* for all the land in his direct occupation. Tenure-holding factories especially have taken full advantage of these provisions, for it is worth their while to pay a good price for an occupancy holding containing good lands, and purchase at a Civil Court sale gives them a clear title. Hence, it often happens that, on the expiry of their lease, they are able to retain possession as occupancy *ryots* of a considerable amount of land which they have acquired in this way during the term of the lease.

#### *Kurtauli Leases.*

A considerable area is held by the factories as under-*ryots*, part being acquired on the *panch kathia* system described above, but most being held on what are called *kurtauli* leases, which are gradually displacing the *panch kathia* system. Under these leases, the factory pays the *ryot* a sum equivalent to five or seven years' rental of the land for which the sub-lease is granted, and cultivates the land for that period, at the end of which it reverts to the *ryot*. The main objection to this system from the factory's point of view is the risk of the *ryot* going off with the advance without paying his rent, for in that case the landlord may sell up the holding and refuse to recognize the factory, which consequently loses its money. In practice, however, the risk is not very great, as *kurtauli* leases are usually granted for parts of holdings only, and the *ryot* remains in the village to cultivate the remainder.

#### *Sudbharna Leases.*

A modification of the *kurtauli* lease is the *sudbharna*, which resembles the *zarpeshgi* tenure described above. The factory gives the *ryot* an advance, the interest on which is liquidated by deduction from the annual rent for the land sublet. The principal is repayable at the end of the lease, but as in the case of *zarpeshgi* tenures, the

borrower is often unable to meet his obligations, and the factory retains possession of the land indefinitely. This system is prevented from being common by the fact that, as a rule, only a *ryot* who is deeply involved is willing to bind himself to the factory in this way, and a man in such a position can give the factory no security for its money beyond the land, which is worthless if he should default in payment of his rent to the superior landlord.

#### SYSTEM OF CULTIVATION.

The main systems of indigo cultivation practised in Saran are known as *ziraat*, i.e., the home-farm system of direct cultivation by means of hired servants, the *satta* system of cultivation through factory tenants under contracts, and *khushki* or cultivation by means of outside *ryots*.

##### *Ziraat System.*

The name *ziraat* is applied to all lands cultivated by the factory direct with hired labour, either as proprietor, tenure-holder, *ryot* or under-*ryot*. Over three-fourths of the area under indigo is of this class, and owing to its careful cultivation it returns the best profits.

##### *Satta System.*

The *satta* system is so-called because a document (*satta*) is executed by the *ryot*, who usually belongs to a village of which the factory is the landlord. By this document he enters into a contract to grow indigo on a certain portion of his holding in consideration of an advance of money, either without interest or at a low rate of interest; he further binds himself to pay damages to the factory if he should fail to carry out his share of the agreement. The factory supplies the seed, and carts the indigo when cut to the vats for manufacture, but the *ryot* is responsible for the preparation of the land and for all expenses of cultivation. The indigo when delivered to the factory is paid for at a certain rate per *bigha*; if the crop should fail through no fault of the *ryot*, he is paid between Rs. 5 and Rs. 6 a *bigha* to recoup him for the expenses of cultivation. The agreement is usually executed for the same term as that of the factory's lease of the village, and the original advance, with principal and interest, is worked off by easy deductions from the sum annually payable to the *ryot*. Agreement of this kind are usually only executed by tenants of the factory, but occasionally they are executed by *ryots* entirely independent of the factory, and are then known as *khushki* or voluntary *sattas*.

##### *Khushki System.*

The *khushki* or voluntary system, though more common in Saran than in Muzaffarpur and Champaran is comparatively unimportant. The *ryot* has usually no connection with the factory, nor does he necessarily receive any advance. The factory supplies the seed, but

all the cultivation is done by the *ryot*, who supplies the seed, but all the cultivation is done by the *ryot*, who selects his own land, and when the crop is cut, is paid at the rate of about 3 annas per maund for the green plant. If the outturn reaches 100 maunds an acre, as it may easily do with fairly good cultivation, the *ryot* makes a net profit of between Rs. 12 and Rs. 15 after paying all expenses; his land is also benefited by the rotation of a deep-root crop with ordinary surface crops, and generally yields a good *rabi* crop in the spring after the indigo is cut. This system is not usual as it does not pay the planters. A large outturn of plant per acre is required to give a good profit, and this can only be secured by high cultivation of lands carefully selected on a sound system of rotation, elements which are *prima facie* more likely to be present in a system of direct cultivation under the supervision of the factory manager and his servants.

#### *Badlain System.*

In conclusion, the system known as *badlain* or exchange of lands may be mentioned. Indigo, being a deep-rooted crop, exhausts the soil after two or three seasons, unless it is highly manured. On the other hand it forms an excellent rotation crop with grain and other surface crops. Consequently, it is advantageous both to planter and to *ryot* for the latter to take over for a few years lands which have grown indigo for the cultivation of ordinary crops, giving in exchange an equal area of his own lands for the temporary cultivation of indigo. It is obvious that the system can only be worked successfully if the terms of the agreement are strictly kept on both sides.

#### FACTORIES.

The following list of the indigo factories at work in the district with their outworks has been supplied by the Collector :—

Subdivision.	Factories.	Outworks.
Chapra	Ramkola	..
	Maniara	.. Sipaiya.
Gopalganj	Rajapatti	.. Pakri.*
	Sadoa	.. Shahpur.
Siwan	Bansapali	..
	Chakia	.. Jagdishpur.
	Gopalpur	..
	Jogapur	.. Chauki.
		.. Kahala.†
		.. Madhupur.†
	Partabpur	.. Bankath.
		.. Ratasia.
	Zamapur	..

\* In Chapra.

† In Gopalganj.

*Extract from the Revised District Gazetteer of 1930.*

#### INDIGO.

About twenty years ago there were ten indigo factories with nine outworks and the subject was considered important enough in the first edition of the Gazetteer to have a chapter to itself. There are now only three concerns which grew between them about a thousand acres of indigo in 1928 and none at all in 1929 and a brief history of the industry will suffice. It was apparently started in Tirhut between 1782 and 1785 and the first factory in Saran was built near Sitalpur in 1793. The rapid growth of the industry is shown by the following fact: a Mr. Shore was allowed to start a factory near Darauli in 1794 and was given a license to hold 50 *bighas* of land, five years later his successor was in possession of 3,750 *bighas*, half of which was under indigo. Up to about 1850 the cultivation of indigo was generally combined with the growth and manufacture of sugar. About that time the high prices obtainable for indigo dealt a fatal blow to the sugar industry which was almost entirely given up. Indigo continued to flourish till the end of the nineteenth century when there were 35 factories with 36 outworks and 45,500 acres under cultivation. From then onwards the industry has suffered from the competition of the artificial dye in Europe and from the high price of foodgrains and consequent demand for land in Bihar. For a year or two during the Great War, prices went up and some large profits were made but this state of affairs did not last and as stated above, the cultivation of indigo is now negligible.